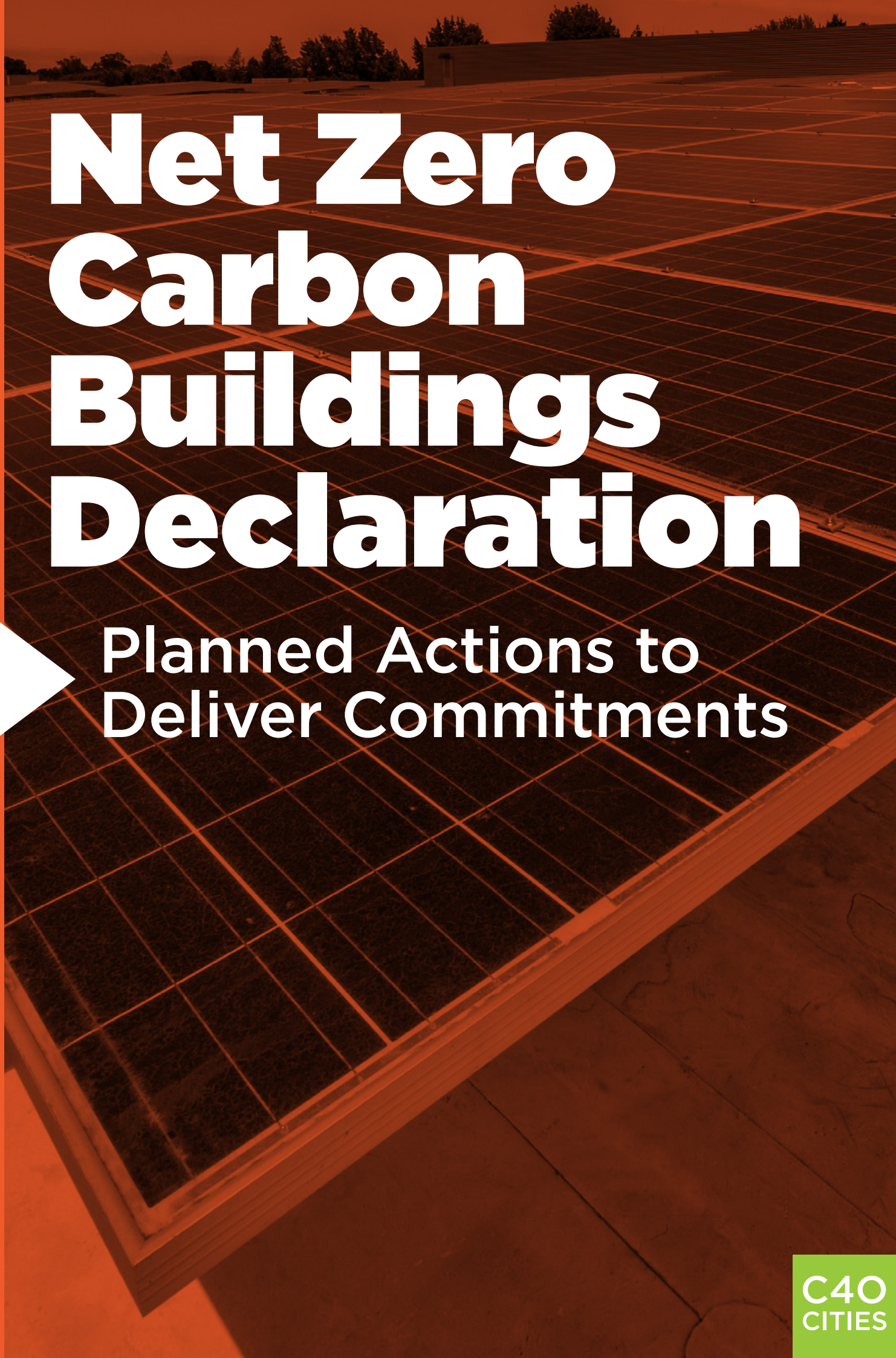


Net Zero Carbon Buildings Declaration

Planned Actions to Deliver Commitments

C40 CITIES

Cape Town

© Istock / Mlenny

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	A proposed new building by-law is being developed as part of work supported by the C40 South Africa Buildings Programme. The intention of bylaw is to ensure that all new buildings are net zero carbon by 2030. It will address mandatory requirements to optimize the design and construction of buildings and building services such as heating, cooling, ventilation, and lighting.	The City is participating in the C40 Reinventing Cities programme and has selected five sites to be catalytic demonstrations for the design and implementation of carbon neutral developments. Carbon neutral development conditions currently being developed will be applicable to these catalytic sites – it is intended that these will be extended to all precinct scale developments in Cape Town.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	A proposed Residential 'Sustainability Declaration' by-law will require that, at the point of marketing of all houses this declaration will be made available to prospective buyers by the seller (via the estate agents or directly). The declaration will serve to inform the buyer about the sustainability features (namely energy and water) and operating costs of a residential property, and so drive retrofit improvements (by sellers and/or buyers).	Energy Performance Certificates – by 2019 National Government will require all non-residential buildings >1000sqm to publicly display building energy consumption. Further to this, the City will aim to establish energy performance benchmarking targets (including small scale embedded renewables) for all building types. Specific targets with dates for the transition to net zero carbon for all buildings by 2050 will be informed by the modelling currently underway.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The roadmap for Net Zero Carbon buildings in Cape Town will be informed by the C40 South Africa Buildings Programme and the Deadline 2020 pathways. Developing the roadmap will involve the update of the current Energy 2040 model to Carbon Neutral 2050, revision of the targets, extensive stakeholder and sectoral engagements, council approval, roadshows etc.	
Develop a suite of supporting incentives and programmes.	Incentive and disincentive packages for carbon neutral developments are being developed under the C40 South Africa buildings Programme. This also includes specific development conditions incentives for the transit-oriented development (TOD) sites and zones. Further to this, the Municipal Spatial Development Framework (MSDF) is premised on spatial transformation: intensification, diversification and	inclusivity of the urban core. This is fundamental to achieving a carbon neutral city. To drive this transformation, the MSDF supports prioritisation of public investment and incentivised private sector investment within the urban core; development outside of the core areas is actively discouraged through lack of investment in infrastructure support, zoning etc.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	The City of Cape Town is developing an 'Integrated Resource Management Protocol for Municipal Operations'. Municipal building specifications are being developed which will require that all new municipal buildings be net zero carbon in operation by 2030. In addition to actions already undertaken and underway (see below), existing municipal buildings will require a further detailed zero carbon retrofit plan with costing, in consultation with key City stakeholders and including the identification of capacity within the municipality.	Due to the high investment cost of retrofitting and competing asks for budget, implementation will rely on the development of appropriate business models so as to manage challenging budget availability (and staff capacity to manage retrofits). Therefore, actively seeking climate finance advice and access will need to play an important role in the municipalities ongoing approach to delivering this commitment.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	The municipality undertakes regular assessments of municipal buildings' energy demand and carbon emissions. Monitoring and reporting is done annually. In 2016,municipal buildings were responsible for 87 853 tCO2e. Much of this process is now automated through an integrated municipal smart data platform–this is under constant improvement. To date, the municipality has undertaken numerous supporting actions to reduce energy consumption and carbon emissions from its buildings:	These include: • retrofitting of 39 large municipal administrative buildings to date; • installing of rooftop PVat 7 buildings with a total capacity of 523kWp, with planned installation of 844 kWp at 8 additional sites this year; • measurement and verification on all projects; • smart metering to improve energy management and measurement/ reporting; • Fundamental Energy Management training of facility managers.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	A roadmap for net zero carbon municipal buildings by 2030 will be developed by 2019. This will be informed by ongoing work on the C40 South Africa Buildings Programme, Deadline 2020 Climate Action Plan programme and the 'Integrated Resource Management Protocol for Municipal Operations'.	

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- City of Cape Town budgets
- National grant budgets
- Staff resources
- Partnerships with relevant stakeholders
- Climate finance

© Mlenny / Getty images

© Istock / Brzozovska

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	Copenhagen does not have regulatory powers related to energy in new private buildings, it is the national building regulations that set requirements in this area. However, it needs to be stated that the national building regulation are really ambitious, and have a strong focus on a low energy usage in buildings. Instead Copenhagen's ambitious CPH2025 Climate Plan will ensure that Copenhagen is supplied by 100% carbon neutral electricity and heat in 2025, which means our buildings will be net zero carbon users. Together with the city utility company the Copenhagen will invest in new wind turbines and develop biomass fuelled combined heat and power networks. This also need to be considered in the context of Copenhagen where most buildings are connected to district heating networks and there are very few buildings requiring individual solutions.	Copenhagen have set four ambitious targets related to energy savings, to ensure the success of the CPH2025 Climate Plan will be as cost effective as possible. It is estimated that Copenhageners could save approx. DKK 500 million p.a. on heating bills. Target set for the energy consumption in Copenhagen by 2025: • 20% reduction in heat consumption • 20% reduction of electricity consumption in commercial and service companies • 10% reduction of electricity consumption in households • Installation of solar panels corresponding to 1% of electricity consumption in 2025. It is important to emphasize that Copenhagen cannot ensure the success of these targets through regulations, but instead we must develop different initiatives that will increase the building owner's incentives to invest in energy savings.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	As abovementioned, CPH2025 Climate Plan will ensure that all buildings in Copenhagen will be supplied by carbon neutral energy by 2025. Also, the abovementioned targets are applicable for existing buildings, and most of the initiatives we develop focus on the existing building stock.	Therefore, there is high focus in CPH2025 Climate Plan on energy retrofitting, and ensuring an efficient operation of district heating units in the basement of the large buildings. Furthermore, Copenhagen also have a vision of becoming fossil free by 2050, which will also include the construction phase of buildings.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	No specific roadmap will be established for our commitment to reach net zero carbon buildings, since the CPH2025 Climate Plan aims for carbon neutrality in Copenhagen by 2025. It consists of three roadmaps divided over the lifespan of the plan: • 2013 - 2016 • 2017 - 2020 • 2021 - 2025	One of the four themes within this plan focuses on reducing energy consumption, and it consists of multiple initiatives that need to be implemented to achieve this ambitious target of carbon neutrality in a cost-effectively way.
Develop a suite of supporting incentives and programmes.	The current Roadmap 2017-2020 includes 9 initiatives with a focus on reducing the energy consumption within the existing building stock. Furthermore, Copenhagen have also established different schemes with financial support:	• Energy savings in properties involved in urban-renewal projects • Energy savings in social housing

© Ardi / Getty Images

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	In the CPH2025 Climate Plan there is a target to reduce the energy consumption within the municipal building stock (approx. 2. Million m2) by 40% over 2010 levels. This is a highly ambitious target that requires innovation and a strong political will.	The buildings owned by Copenhagen municipality will be net zero carbon buildings by 2025, due to Copenhagen being 100% supplied by carbon neutral electricity and heat from our utility company HOFOR.
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	Copenhagen won the C40 award due to our comprehensive energy surveillance system, which is installed in almost all municipal buildings. This allow us to monitor the electricity, heat and water consumption on an hour-by-hour basis through a digital system. The system also estimates what the energy consumption should be based on different parameters e.g. weather, and thereby it is possible to compare that to the actual consumption. It is a state of the art solution developed in collaboration with different private stakeholders, and it is now being upscaled to the private buildings in Copenhagen.	There is an established a task force in the department of building properties, that works on how the municipality can save energy from its buildings. With the help from the energy surveillance system this task force identifies opportunities, and on based on this information develops aconcrete business cases. Also, if suddenly a building has an unusual consumption pattern, the task force can act upon this. Copenhagen has since 2012 succeeded in reducing the energy consumption within the municipality's building stock by approximately 8%. Currently we are developing a method to monitor the total energy use on a yearly basis, which will make it much easier to monitor the overall progress of reducing the energy consumption by 40%.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	Copenhagen has with the CPH2025 Climate Plan set our path towards 2025, and within this plan the municipal buildings have a high political focus. Roadmap 2017-2020 is our current working programme that dictates how we will achieve our target. But in 2021 we will establish a new Roadmap for 2021-2025, which will include new initiatives that will allow us to reach net zero carbon buildings.	The City of Copenhagen has also developed a specific plan for social housing and municipal buildings called 'Sustainability in Construction and Civil Works'. This plan allows us to set more ambitious building requirements than the national codes. E.g. this plan requires that all new buildings constructed will be more ambitious than the current valid national code, and instead meet the future code applicable from 2020. Also, it sets high requirements for retrofitting projects in social housing and municipal buildings.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Develop a suite of supporting incentives and programmes.	Annually the department of building properties develops detailed business cases that describe the new initiatives, their costs and potential energy savings. There is a high focus on energy efficiency since the huge potential in operating the district	heating units, ventilation, lighting and other systems. These business cases ensure funding for a number of projects, which can then be implemented afterwards.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- The City of Copenhagen have a financial scheme for private building owners, who can apply for co-funding in larger retrofitting projects. The scheme is partly financed by the municipality and the national government, and the total funding varies year by year.

Durban
EThekwini Municipality

© Istock / michaeljung

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	EThekwini is working towards implementing ambitious local legislative measures by 2020 that would enhance national regulations by allowing for all new buildings to be Net-Carbon Zero, by 2030. Existing responses in the Durban Climate Change Strategy include: "Businesses adopt a range of energy efficiency technologies with 90% of lighting, heating, ventilation and cooling (HVAC) and water heating equipment within facilities becoming energy efficient by 2030"; "40% of Durban's electricity consumption is supplied from renewable energy by 2030 in line with the national long term mitigation targets". The South African National Development Plan specifically aims to; "Progressively strengthen the energy efficiency criteria set out in the South African National Standard 204 to achieve a zero carbon building standard by 2030". The latest iteration of the standards will be ready for implementation, by latest in early 2019. These will include a requirement to reduce electricity consumption from approximately 175kWh/m2/year to approximately 75kWh/m2/year. Additional measures in the revised standards include: an energy map replacing the climatic map, introduction of cavity walls, insulation of exposed flooring, and shading by latitude. In addition, eThekwini Municipality is exploring embedding appropriate requirements in Land-use Planning schemes. A simple example of this would be that a particular site must include renewable energy that supplies at least 50% of the site's energy requirements.	
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	Detailed analyses, consultations, and interventions will be undertaken before specific regulations and policies are developed to deliver this commitment. Dependant on outcomes of the research and available financial mechanisms, eThekwini is of the view that this target can be achieved. This will be done to align with the commitment of the Municipality to develop a Paris Agreement compatible climate action plan by 2020.	It is thought, that an incentive and voluntary approach will be included – that could be potentially extended to existing buildings from the C40 New Buildings Programme, which is focusing on new buildings.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The Municipality is developing a pathway for net zero carbon new buildings as part of work supported by the C40 South Africa Buildings Programme. In addition, the Municipality is currently developing its Paris Agreement compatible climate action plan to ensure the city emissions are neutral by 2050 and meets its commitment to the Paris Agreement.	It is envisaged that by 2025, a 10% reduction from 2018 will be achieved on new buildings, and by 2050 a 70% reduction from 2025 will be achieved. This will be coupled with a progressive increase in on and off-site RE generation.
Develop a suite of supporting incentives and programmes.	Incentive Programmes are already under development for the New Buildings Programme. Furthermore, conceptualisation has begun for a 'Shared Savings model' for privately owned buildings. This concept will shift the upfront capital burden of energy efficiency and renewable energy interventions from the property owner to Energy Services Companies.	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	EThekwini commits to ensure that all new and existing facilities that are owned, occupied and developed by the city are net-zero carbon in operation by 2030. The greenhouse gas emissions of local government operations are calculated and accounted for on an annual basis. This accounting process includes focusing on individual facilities and identifying performance improvement opportunities. Indeed, the Durban Climate Change Strategy includesthe following wording: "Implement viable small-scale renewable energy generation such as micro-hydropower, rooftop solar photovoltaic and anaerobic digesters within municipal assets"..."EThekwini Municipality adopts a range of energy efficiency technologies with 90% of lighting, heating, ventilation and cooling (HVAC), distribution systems, water and waste water treatment and water heating equipment within facilities becoming energy efficient by 2030". By the end of 2019 the Municipality will have delivered a roadmap that will outline how all municipal facilities, new and existing, will reach net zero carbon in operation by 2030. The roadmap will build on the Durban Climate Change Strategy that already includes a response for embedding renewable energy technologies on municipal assets. This roadmap will consider how the energy load will be switched to renewable sources, ideally powered by on-site generation, then off-site purchases. The strategy will consider if any offsets are required and the role energy efficiency can play in reaching this ambitious goal.	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	All Municipal owned properties are-already being individually assessed for yearly energy consumption, which is utilised to calculate their carbon emissions. For 2016, Municipal buildings emitted 134,822tCO2e and these figures are updated on an annual basis. Detailed baselines for each facility will be undertaken 1 year before a retrofit or replacement project.	Pipeline projects already exist for municipal facilities, in terms of energy efficiency. However, a comprehensive plan will be drafted. The plan will be submitted for formal approval of the eThekwini Municipal Council, and will probably be called "Existing Municipal Net-zero carbon Buildings Pipeline Programme".
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	By the end of 2019 the Municipality will have delivered a roadmap that will outline how all municipal facilities, new and existing, willreachnet zero carbon in operation by 2030.	

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- It is important to keep in mind eThekwini Municipality is a developing city, in a developing country, on a developing continent. As a result, there are a multitude of pressing aspects that need urgent attention, such as provision of housing, water and sanitation.
- The development of policies, generally have low financial costs and will be covered by eThekwini Municipality. However, it is highly likely that prior to development of relevant policies, detailed assessments and studies will have to be conducted. Depending on the cost of these assessments, it might necessitate eThekwini Municipality approaching C40 for additional support.
- If financial Incentives are offered to property owners, this will be covered through standard budgeting processes of eThekwini municipality.
- Within that context, eThekwini Municipality has established a small team of experts within the Energy Office that will drive the processes at a strategic level, with critical input from Architecture Department, Planning Unit, and other relevant Units.

Heidelberg

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	Heidelberg are working towards net zero carbon new buildings through: Energy Concept Bahnstadt (new buildings in the district must be built according to Passive House Standards) Energy Concept Conversion Areas (new buildings in areas must be built according to Passive House Standards) Energy Concept 2010 of the City of Heidelberg (all new buildings built on properties bought from the municipality must be built in Passive House Standard) Due to federal building laws, the city has limited power to set building standards within the city. New development areas, such as the Bahnstadt or the conversion areas, are an exception as the city can set stipulations within the purchase agreement of the plots of land. In areas that are outside of our control, we are trying to incentivise building developers with our support program “Rational Use of Energy” that subsidises the construction of Passive Houses. Additionally we are advocating to national government for both more power and higher national energy efficiency requirements for new buildings. The use of off-site production of renewable energy and offsets could also be used to tackle areas where we have limited powers. Expand Heidelberg district heating grid and enhance the renewable share of district heat. The main strategies of our municipal utility to decarbonise the district heat grid are 1. Connect waste incinerator CHP to the grid 2. Build power-to-heat plant combined with heat storage using cheap renewable power from peak solar or peak wind 3. Investigations on the potential of low-ex district heat to benefit the use of renewable heat in district heating systems at a lower temperature level (i.e. solar thermal, geothermal, sewer heat, waste heat from data centers etc.) and heat production using heat pumps are in process Enhance solar energy use on buildings • The city is currently running a support campaign for solar energy use that offers free consultations to homeowners. In 2018 this was limited to residential buildings, it has been extended to commercial buildings since. • The municipal utility (Stadtwerke Heidelberg) also offers leasing services that make it easier for homeowners as well as tenants to use their own buildings for solar energy production. (ENERGIEDACH and MIETERSTROM)

Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• We have commissioned a detailed solar potential analysis for municipal buildings that is currently being finished. We are constantly working together with the municipal utility to install photovoltaic systems on high potential roof areas of schools, kindergartens, sports halls etc.	• Photovoltaic systems are also a stipulation for any building built in the conversion development areas, according to the energy concept of the conversion development areas. Any suitable free roof areas of the constructed buildings should be used for solar systems, either solar thermal or photovoltaic.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	The Masterplan 100% Climate Protection (Climate Action Plan) includes carbon reduction targets of 95% by 2050, and a decrease in final energy demand by 50% until 2050. To achieve this there are existing and planned support programs for energy renovations: • Already established: Support Program “Rational Use of Energy”. This program offers citizens who achieve energy renovations at a certain standard a subsidy based on the area that receives insulation. It supports both individual measures as well as complete renovations and the construction of new Passive Houses. • Already established: Offer consultancy on energy use (Climate Protection and Energy Consulting Agency KliBA as well as “electricity savings check” program) • Develop energy redevelopment concepts for specific districts. Further improvement of building standards for renovations concerning heating, cooling and electricity include: • Raising rates and standards of retrofits, particularly insulation – for renovations of municipal buildings as well as privately owned buildings. This is mainly encouraged through the already established support program “Rational Use of Energy” (see above). • Cooling strategies like exterior shading and natural night cooling are communicated to planners, architects and engineers in municipal projects.	• The Office of Environmental Protection of the City of Heidelberg has published a guideline to using combined extensive roof greening and photovoltaics. The city aims to increase the share of renewables in district heat and electricity to 100% in 2050 and is doing so via: • Replacing oil and natural gas by fuels from regenerative sources and electric heat pumps. • District heating is our current main focus of decarbonising heating in the city. • An additional goal is increasing the share of district heat on the heating market from 47 to 50 percent by 2030 – but we expect to realize a higher share. Strict regulation on energy retrofits is not suitable for the City of Heidelberg because there is limited regulatory power and the city has a high share of listed buildings that are landmarks of the city landscape. However, the city can define a redevelopment area and the municipal council can issue a redevelopment statute, which is currently the case for the conversion areas within the city. Further redevelopment plans are under discussion. Our main strategy to reach net zero carbon buildings is to focus on decarbonising heat and electricity and incentivising retrofits through our support programs as well as offering free consultations from the energy agency KliBA.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	A roadmap has not been established yet, however the next few steps have been set. In response to the Lord Mayor declaring the climate emergency, an action plan will be presented to the municipal council later this year. This might include actions that will play into NZC Buildings developments. Updating the Masterplan 100% Climate Protection (Climate Action Plan) in 2020 to set interim targets for 2030. Updating the Energy Concept 2010 of the City of Heidelberg in 2020 to further improve building energy standards. [see also Municipal Buildings Commitment]	This applies to private buildings as well in the case of property sale by the municipality where the compliance with the municipal energy concept is regulated in the sales contract. Detailing concept for turnover to 50% renewables in district heat grid by 2030. In general, support programs will most likely be updated and more heavily advertised. Focus will not only be retrofits and building standards but also carbon free energy supply. This is due to the fact that not all buildings in Heidelberg are fit for energy renovations because of the protection of historical monuments.
Develop a suite of supporting incentives and programmes.	Solar campaign to increase the number of buildings that have solar panels on their roof (already established). Seminars and training courses by the energy division (of the Office of Environmental Protection of the	City of Heidelberg) and the energy agency KliBA for architects and engineers to increase skills and knowledge of energy efficient building (already established).

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	Energy Concept 2010 of the City of Heidelberg (all new municipal buildings must be built in Passive House Standard) A Municipal Energy Management is established to work on optimizing operations as well as supervise renovation projects and new construction projects to ensure the energy concept is adhered to. All municipal buildings receive renewable electricity. All municipal buildings will be supplied with renewable heat by 2030	The City of Heidelberg currently procures 100% renewable electricity from its own municipal utility. The electricity has the German “Grüner Strom-Label” which is the highest seal of approval given by an independent association that is endorsed by leading environmental organizations in Germany. https://www.gruenerstromlabel.de/en To reach the 100% renewable heat target, the City of Heidelberg will have to procure carbon-free gas alternatives such as biogas or synthetic gas from power-to-gas, using renewable electricity (windgas).

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	The City of Heidelberg has been using an Energy Controlling System (ECS) to monitor the current energy demand of municipal buildings since 1995. All municipal buildings are monitored in general. However, the buildings responsible for 80% of the energy demand are monitored in detail using the ECS.	From 1993 to 2015 the monitoring and the resulting building optimizations and renovations have resulted in energy reduction by 62% and reduction of CO2 emissions by 57%. The Office of Environmental Protection, Trade Supervision and Energy runs the municipal energy management

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Financial Support Program “Rational Use of Energy” (subsidies of energetic renovation measures)
- Financial Support Program “Energy Efficiency in Companies and Clubs” (subsidies of investments in energy efficiency within companies or clubs)
- Municipal budget for Municipal Energy Management, quality control in Passive House construction, etc.

Johannesburg

© Istock / FrankvandenBe

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• The City of Johannesburg is currently implementing the New Building Efficiency programme which aims to enhance the City's current policy work towards ensuring the development of net zero carbon new buildings. •In 2008, the City developed design guidelines for Energy Efficiency in Buildings with the emphasis on integrating design solutions to minimise energy demand in buildings, these guidelines provided an outline similar to the SANS 204 standard of the National Building Regulations that was later developed in 2011. •The City will review the existing Energy Efficiency Design Guidelines that were developed in 2009, with the aim of creating awareness on building 'design for climate' strategies through extensive stakeholder engagements with developers and designers. This process will inform the programme scoping or the development of the Green Building or Energy Efficiency Bylaw. The City is currently in the process of developing its Green Building or Energy Efficiency Bylaw for all new and existing buildings to mandate higher energy performance requirements for the construction of ultra-efficient buildings within the City. •The City of Johannesburg is committed to a green economy transition as indicated in growth and development strategy for 2040 and beyond; in particular, Outcome 2 which states that "The City plans to lead in the establishment of sustainable, eco-efficient infrastructure solutions (e.g. housing, eco-mobility, housing eco-mobility, waste, water and sanitation and information and communication technology) to create a landscape that is liveable, resilient, sustainable and supports low carbon initiatives.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	• The proposed Green Building/ Energy Efficiency Bylaw will apply to both new and existing buildings (including major refurbishments) for planning and building approval. • Furthermore, the Energy Efficiency Retrofit guidelines were developed by the City in 2017 in order to guide building owners and managers on effective ways to encourage the increase of energy efficiency of existing buildings.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Establish a roadmap for our commitment to reach net zero carbon buildings.	• The city will be developing a roadmap for NZC buildings as part of the work it is implementing with support from the C40 South Africa Buildings Programme that is running until the end of 2020. • Johannesburg's pathway towards carbon neutrality involves a baseline assessment of the building plan approvals and their compliance to the SANS 10400-XA building regulations. Compliance to the regulations will be measured at a precinct level by 2020 i.e. the Inner City Regeneration programme The City will review the existing EE Design Guidelines that were developed in 2009, with the aim of creating awareness on building 'design for climate' strategies through extensive stakeholder engagements with developers and designers. The City's Energy Efficiency Retrofit guidelines (2017) are currently underutilised and provide an opportunity to. The City will leverage on built environment industry reduce energy demand and enhance building energy performance for residential and commercial buildings solutions from the Green Building Council (GBCSA), DoE and existing development concepts. • This roadmap to NZC buildings will entail the following: - Strategic appraisal of all EE, DSM policies and by-laws within the city - Review of local and international best practice w.r.t. low- and zero-carbon buildings and developments Stakeholder engagement and communications - Development of Green Building Policy/ By-Laws – By December 2019 - Develop a suite of incentives programmes to support the programme - Consultations and stakeholder engagements with internal and external stakeholders to inform– ongoing - Measurement of energy performance though a pilot programme – 2019-2020 - Education and Awareness - ongoing
Develop a suite of supporting incentives and programmes.	The City will investigate the option of financial and non-financial incentives to support the Net Zero Carbon in buildings, these include the following: **Financial:** • Rates rebates – evidence-based cost-benefit analysis (CBA), Reduced Application costs, access to municipal negotiated finance and/ or interest rate reductions from financial institutions; Increase of development tariffs to non-compliant developments. **Non-financial:** Expedited application processes, assistance in applying for grants or tax incentives; 'bulk bonus' for green buildings (increased revenue stream i.e. more bulk = revenue base). • Engagement around incentives/ disincentives programme in order to bring private developer's to the table (towards zero-carbon) will look at creating a recognition platform in the form of "green leadership awards" programme endorsed by the City to award the most innovative sustainable solutions. • Mayor's 71 Properties programme within the Inner City to dispatch municipal land to developers for revitalisation and redevelopment.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION		
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	• The development of a Green Building By-Law with voluntary and mandatory energy performance requirements will apply to both new and existing municipal building stock. • As part of the Energy Efficiency and Demand Side Management (EEDSM) programme under the National Energy Efficiency Strategy (2015), the city will continue to retrofit its own buildings in order to optimise the energy performance of all its buildings and to meet the net zero carbon target. The City of Johannesburg has been selected to pilot the Energy Efficiency in Public Buildings Programme (EEBIP) which is currently being developed by the Department of Energy (DoE) to complement the EEDSM programme through the Vertical National Appropriate Mitigation Action (VNAMA) facility. The City will use this platform to integrate building design and technical solutions to accelerate the efficiency of our own buildings in order to meet the net zero carbon target for all our buildings. • In line with the Energy Plan, the City is currently in the process of investigating local PV and off-grid solutions for municipal buildings by 2025–and will look at energy supply solutions to support indigent settlements for energy security and safeguard the infrastructure in the City network. The City has a target of 40 MW for alternative energy generation for the current 2018/19 year which could potentially increase the uptake of renewable energy. • With regard to ensuring net zero carbon buildings the City is looking at exploring two through small-scale embedded generation in line with the national NERSA regulations in which the building owner invests in PV assets. The City will also investigate the design of a program to create a portfolio of PV power on the roofs of customers, with a corresponding allocation of the green energy to participating customers anywhere on the grid. Whilst the development of this project is currently at an early strategic and project planning stage, we are actively exploring how to ease the burden of operating small-scale PV systems for stakeholders involved in the day-to-day management and operation of municipal building stock.	

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	• Benchmark existing energy demand and emissions from municipal building stock through GHG Inventory which is currently being updated – November 2018. • Conduct audit of electricity consumption and establish a baseline for energy consumption and emissions trajectory – *dependent on budget availability Jan 2019.*	• Model potential costs and savings impact of 100% penetration of the best known efficiency interventions and prioritise EE and RE interventions and set targets for all buildings – March 2019.

Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	• Through the C40 South Africa Buildings Programme, development for a transformation Green Building By-Law which will include all buildings and thus align with the declaration target.	
Develop a suite of supporting incentives and programmes.	• The City has embarked on an Education and Awareness approach to empower its Facilities Managers through a training programme -the Fundamentals of Energy Management Training course was held in partnership with the Johannesburg Information and Knowledge Exchange (JIKE) hub on the July 11, 2018.	• The City will also empower young graduates to perform energy audits for municipal buildings which will lead to detailed studies further auditing building energy performance. • The City has the potential to receive grant funding of all EE and DSM initiatives through DoE's VNAMA facility.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- For all new buildings, C40 has embedded a technical resource who is helping the City for three years. The resource, enabled by financial support from C40, is enhancing the city towards pathways to a Net Zero Carbon through review of the By-Law and other Key baseline studies linked to SANS 10400.
- In an effort to achieve NZC target, the city will avail its budget to advance the NZC buildings agenda.
- The City will also leverage from available Green Climate Funding initiatives.

© Getty Images / CHAIWATPHOTOS

London

© iStock / _ultraforma_

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• Net zero carbon homes and offsetting policy came into effect on 1 Oct 2016 (current London Plan) • Net zero carbon development (residential and non-residential) and offsetting policy to be introduced when new London Plan is adopted (expected to be 2019, but subject to the examination in public). • Energy efficiency targets to maximise on-site carbon reductions before offsetting is considered (new London Plan, but subject to examination in public) - A 10% improvement on national building regulations for residential development - A 15% improvement on national building regulations for non-residential development • A new, higher carbon offset price to incentivise on-site reductions (new London Plan, but subject to examination in public) • Reporting of unregulated emissions and the requirement to undertake whole life-cycle carbon emission assessments (new London Plan but subject to examination in public) Further detail on how London meets and defines zero carbon can be found in the London Environment Strategy and Draft London Plan: https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/download-draft-london-plan-0
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	London to be zero carbon city by 2050 (London Environment Strategy target) which includes reducing emissions from homes and workplaces including greater use of renewable energy through, for example, the Energy for Londoners programme.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Establish a roadmap for our commitment to reach net zero carbon buildings.	**New build** • Adoption of new London Plan policy (expected 2019), subject to examination in Public. • A new requirement for developers to monitor buildings post-construction for at least five years to assess compliance with zero carbon target as part of London Plan adoption (subject to examination in public) • Planning guidance produced for developers alongside new London Plan **Existing buildings** • As part of our Environment Strategy London has mapped the energy efficiency and low carbon heating uptake required to reach zero emissions buildings by 2050. The Mayor has adopted a system of 5 year carbon budgets (for homes and workplaces) needed to put London on this pathway. **National Policy** • The Mayor's programmes alone cannot deliver the necessary measures to meet the zero carbon ambition. This will also require supportive policy and funding from national government. The Mayor will continue to advocate for policies that can be delivered by government, or by devolving more powers to the Mayor to deliver in London. Further detail on this and policies advocated for can be found in the London Environment Strategy: https://www.london.gov.uk/sites/default/files/london_environment_strategy_0.pdf
Develop a suite of supporting incentives and programmes.	• Mayor's Energy for Londoners programme which aims to make London's homes warm, healthy and affordable, its workplaces more energy efficient, and to supply the capital with more local clean energy. This includes: • Cleaner Heat Cashback scheme: a £10m boiler scrappage scheme, helping small businesses to replace older polluting boilers with a more efficient, cleaner source of heat. • Commercial sector energy efficiency programme • Retrofit programmes: RE:FIT, RE:NEW (and successor scheme) • Decentralised Energy Enabling Project (DEEP) • Solar Action Plan • See London Environment Strategy Implementation Plan for further details: here

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- As part of the work London undertook with C40 and Arup in the production of a climate action plan for the Deadline 2020 programme, the GLA provided a detailed breakdown of its resources and capacity to achieve the ambitions of the Mayor's London Environment Strategy, including measures outlined for the commitment above.

- Further to this, there are number of dedicated funding streams to support implementation to deliver the commitments. This includes:

  - The Mayor's Energy Efficiency Fund, the Mayor's new £500 million fund working with European Regional Development Fund and private sector investors and Amber Infrastructure to support public buildings and small businesses access finance and implement energy efficiency measures.
  - Mayor's £34 million Energy for Londoners programme which aims to make London's homes warm, healthy and affordable, its workplaces more energy efficient, and to supply the capital with more local clean energy. This includes the funding through retrofit programmes: RE:FIT, RE:NEW (and its successor scheme)

Los Angeles

© iStock / Dave1957

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• The Los Angeles Green Building Code houses guidelines known as Tier 1 and Tier 2 Voluntary Measures. These requirements serve as "stretch codes" where applicants can choose to incorporate design strategies such as increased solar reflectance on the roof, increased permeable paving in parking areas or exterior walkways, or net zero energy design. Moving forward, we intend to evaluate the effectiveness of the voluntary performance measures and determine which measures would be appropriate as mandatory requirements to ensure new buildings operate at NZC by 2030. • Per updates to the California Energy Code that will become effective in 2020, all new residential construction with 3 or less stories will be required to install Solar PV Systems which will move low density residential new construction closer to net zero carbon (this code change makes California the first in the nation to mandate solar PV at the State-level). According to the California Energy Code, once made effective, the new standards will also help nonresidential buildings use 30 % less energy due to required lighting upgrades. • The Mayor's Office is currently working on updating our Sustainable City pLAn (initially released in 2015). The update to the pLAn, which will be released in 2019, will include zero net energy (ZNE) targets that align with the declaration.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	• LA's Existing Building Energy and Water Efficiency Ordinance (EBEWE), adopted in 2016, requires buildings 20,000+ sq. (and 7,500+ sq. for municipally owned) to benchmark, report annual energy & water use & conduct audit & retrocommissioning actions every 5 years (or show a 15% energy reduction over the same time or provide proof of Energy Star certification). The ordinance covers roughly 2% of LA's building stock which uses about 40% of city's energy. • The Mayor's Office is currently working on updating our Sustainable City pLAn (initially released in 2015). The update to the pLAn, which will be released in 2019, will include zero net energy (ZNE) targets that align with the declaration. Additionally, new targets and initiatives for building electrification will be included in the pLAn refresh. Targets for 100% building electrification by 2050 are under consideration. • In February 2018, LA City Council instructed the LA Department of Water & Power (LADWP) to include building electrification in their upcoming 2018 Strategic Long Term Resource Plan. • The State of California has passed a bill to reach 100% renewable energy by 2045 (not yet signed into law); Mayor Garcetti has committed to 100% renewable energy and LADWP is undertaking a unprecedented comprehensive analysis for how to reach this goal. • Mayor Garcetti has committed to net zero carbon emissions for the city by 2050 (which covers building stock)

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Commitment to reach net zero carbon buildings.	• An update to LA's Sustainable City pLAn, the City's roadmap for an environmentally healthy, economically prosperous and equitable city, will be released in 2019, and will incorporate the roadmap to reach NZC buildings. • Los Angeles Department of Water and Power (LADWP) is undertaking a joint study with other California utilities on building decarbonization.
Develop a suite of supporting incentives and programmes.	• *Building Forward LA* was launched in 2017 by City & local development nonprofits; this effort resulted in 9 actions to enhance development services & department processes to increase the total high performance buildings in LA. One of these actions is to develop incentives for applicants who intend to build to high performing energy standard such as ZNE. • LADWP has a portfolio of energy efficiency and rooftop solar programs that help reduce and decarbonize energy consumption in various building types. It is currently studying building electrification and will roll out targeted incentive programs and rebates to encourage electrification based on its findings.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Financial resources needed to deliver commitments will be determined during the development of City Department budgets.
- LADWP currently sets aside $180 M annually for energy and water rebate programing for both residential and commercial entities in the City. An additional $100 M to be used over the next five years has been allocated toward insulation programming.
- Building owners can access private utilities' Self Generation Incentive Program for rebates on battery storage.
- LADWP Feed-in tariff program offers 14.5 cents/kWh for solar on commercial rooftops

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES		ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	To this date by national standard, Resolution 549 of 2015, a maximum of 45 - 50% reduction of CO2 equivalent emissions has been defined. Achieving 100% would be done with a series of passive and active measures that consider energy and water savings as well as the reduction and recycling of solid waste. The Municipality of Medellín has the authority to implement more stringent measures in the area of sustainable construction than national requirements, for buildings with net zero carbon emissions, in accordance with the Colombian Political Constitution, Article 287: Autonomy Principle of territorial entities. It ascribes specific competences to the aforementioned territorial entities in environmental matters. The Municipality's strategy is based on: • Precautionary Principle of Law 99 of 1993, Law of the Environment	• The Low Carbon Development Policy and in compliance with the goals of the Territorial Planning Plan POT Agreement 48 2014., of the COP 21 Paris 2015 • The National Policy of Sustainable Construction: CONPES 3919, March 2018 • The Resolution 549 of 2015 of the National Ministry of Housing, City and Territory; Parameters and guidelines for sustainable construction and a guide for water and energy saving in buildings • The Policy and the Metropolitan Guides of Sustainable Construction, Agreement 5 of 2014 • The Internal Technical Regulation: Manual of Sustainable Construction, in the process of approval and consolidation given its constant updates • Agreement 066 of 2017. Article 315. Municipal Tax Statute. Sustainable construction incentives	**Establish a roadmap for our commitment to reach net zero carbon buildings.**	Recently constructed buildings of the Municipal Administration and partly of the Department Administration, were built under conditions of Sustainable Construction: EDU, Plaza de la Libertad, Edificio Inteligente EPM. Those already existing must be reconverted, with the implications of costs, technologies, redesigns, amongst others. The strategy must be designed with agreements and financing, put forward to take place between 2019 and 2022. It depends on national guidelines. There is not yet a specific roadmap. The roadmap will be established, based on the guidelines of the Climate Action Plan - currently under development - and the commitments and principles of COP 21 of Paris 2015. Its milestones, strategies and objectives are based primarily on: • Updating and projection of baselines of carbon emissions and energy envelopes. • Prioritization of buildings with higher carbon emissions, to proceed with their readaptation and reconversion, in the first phase.	• Interventions for buildings with intermediate carbon emissions that can be upgraded to net zero carbon emission buildings. • Establishment of guidelines, goals, programs and projects for new municipal buildings, under the goal of reaching zero carbon emissions. • Precision of financial, technological, legal, cultural and educational aspects for the implementation of the Goal of buildings with Zero Carbon Emissions. • Establishment of mechanisms for evaluation, monitoring, corrective measures and compliance indicators.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	The Municipality of Medellín, is committed to developing detailed plans to achieve the goal that all buildings operate at net zero carbon by 2050. These plans will include the financial aspects, the implementation of construction technologies and adequate equipment. In addition to this, the plans will include education and awareness raising of the different stakeholders in order to meet this goal. New strategies, projects and measures will be developed, considering technological, financial, social and professional factors to accelerate action to meet the commitment.				

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Develop a suite of supporting incentives and programmes.	It is already established. Work has been carried out jointly with the Ministries of Housing and the National Planning Department. Agreement 066 of 2017 Article 315. • Exception of partial or total payment of the contribution to the valuation for public works. • Exception of partial or total payment of the share in capital gain • Tax benefits: decrease of the property tax and / or industry and commerce tax; temporary freezing and / or differentiated increment plan of the property tax • Tax rates and taxes: deduction in urban delineation taxes - The general royalty system. As for the destination of its resources for sustainable construction in works executed by the public administration. - Income generated for the maintenance and administration of real estate owned by the Municipality of Medellín: provision of resources to allocate them to sustainable construction works executed by the public administration - Housing subsidies resources of the national level and housing subsidies resources of compensation or mutual funds. - International cooperation resources for urban development and habitat improvement. - Implementation of green credits, to be established directly by the municipality or in association with financial institutions or banks • Expected completion date: December 31 2030 SUPPORT PROGRAMS: • CONVENTION 886 2016 United Nations One- Planet- Metropolitan Area. It is executed by CAMACOL through Agreement 235 of 2017. Duration two (2) years.	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	The Municipal and Metropolitan Sustainable Construction Policies and Plans, which include the goal of Zero Carbon Emissions, are in place and their objectives are also established and defined. It is planned and in fact it will be executed in the new buildings for public use, health equipping, education, communal, recreational, administrative and judicial facilities of the Muncipality of Medellin.	In the existing buildings, efficiency actions and savings are implemented in water, energy, gas, changes in lighting, air conditioning systems, elevators, amongst other actions. The commitment is that the municipality “owns, occupies and develops only assets that are net zero carbon in operation by 2030”. The basic principles are those of high efficiencies in consumption, evaluation and continuous improvement of the implemented measures.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	The city has established reference points or baselines, for energy demands and carbon emissions for the construction and operation of the buildings, through an agreement with the IFC-World Bank 2013. These will be updated and used to establish actions of reduction of emissions and to reach the commitment through the collaboration of multiple dependencies that integrate the Municipal Administration; as well as with the architecture and construction associations of the city.	Many buildings were over designed in their electrical systems. The sustainable construction would be achieved with the use of new technologies, such as LED lighting, low energy consumption equipment, cooling and heating technologies and solar energy.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	The roadmap for this commitment will be developed in the first quarter of 2019 and the corresponding actions will be implemented in the period 2019-2023.	The evaluation of the buildings, their envelopes, the possibilities for savings in consumption of public services and architectural transformations must be carried out. The application of the principles of the World Green Building Councilnet zero carbon definition will be included.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- The Municipality has allocated resources for incentives such as for new housing development. Resources are allocated for municipal building refurbishment from building maintenance budgets. Other budgets are to be determined.

Melbourne

© Getty Images / Prasit photo

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	City of Melbourne's Climate Change Mitigation Strategy to 2050 (CCMS), endorsed in 2018 identifies Zero Emissions Buildings and Precincts as one of the four strategic priorities, with a goal of all new buildings in the city to be net zero emissions by 2030. Specific actions identified in the Strategy include to "Renew and implement planning policies to support the development of zero emissions buildings and precincts". The City is currently developing the business case to pursue a planning amendment via which buildings will be required to reduce their emissions along a pathway aligned with the Green Building Council of Australia Carbon Positive Roadmap and the World GBC Advancing Zero project. For 5 Star buildings, the Carbon Positive Roadmap requires: • 100% renewable energy supply (on or offsite) by 2023 • Fossil fuel free by 2026 • Full net zero, including embodied carbon, by 2026. Planning amendments must be approved by state government, who are engaging with the work and considering implications and opportunities for the state planning scheme. In addition, the City is working with partners to advocate for Australia's National Construction Code to adopt and implement a rapid net zero trajectory, which would apply to all new buildings and major renovations across the country.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	While the City of Melbourne has no regulatory power over existing buildings, the CCMS endorses a range of advocacy and support actions to achieve the identified goal of all buildings achieving net zero emissions by 2050. As part of this we will continue to strongly advocate for periodic energy performance disclosure for a greater range of commercial and residential buildings, plus supporting policies, working with government and industry partners to present a combined voice.	In addition, we will continue to target 100% renewable energy, by advocating for a more ambitious renewable energy targets at state and federal level, as well as supporting and accelerating corporate Power Purchase Agreements. City of Melbourne has already implemented the Melbourne Renewable Energy Project 10-year renewable energy power purchase agreement for our organisation and 13 partners, and we are currently facilitating a second group agreement and sharing our expertise across the market. We are also investigating community energy opportunities for residents and small businesses.
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	City of Melbourne operations have been certified carbon neutral under the Australian Government National Carbon Offset Standard since 2012. The City's Emissions Reduction Plan 2016-2021 commits the organisation to reducing operational emissions in line with our share of the global 1.5 degree budget. There is an ongoing commitment to continue to implement emissions reductions for our operations and develop a new plan for 2021-2025. The City's commitment to zero carbon municipal buildings (new and existing) is outlined in its Emission Reduction Plan for our Operations 2016-2021, which sets out how the City ensures its emission reduction objectives are delivered at each stage of the asset decision cycle. An enhanced commitment to deliver and demonstrate innovative carbon positive buildings and operations are included in the City's Climate Change Mitigation Strategy (2018) - action 2.1, including on	major projects such as the Queen Victoria Market Renewal Project and ongoing work in the Town Hall Precinct. As of January 2019, all City of Melbourne operations including all of our office and community buildings have been powered by 100% renewable energy as a result of the Melbourne Renewable Energy project 10-year power purchase agreement.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The Climate Change Mitigation Strategy sets out the actions committed to by the City, and needed from state and federal government, to achieve the four strategic priorities of: • Net zero carbon buildings and precincts • 100% renewable energy, • Zero emissions transport • Reducing the impact of waste	The Strategy includes a rolling 5 year implementation plan setting out timeframes and delivery partners/collaborators as well as the anticipated emissions reduction for each action. A comprehensive evaluation of the targets and implementation plan will take place after five years, in 2023
Develop a suite of supporting incentives and programmes.	We will continue to accelerate office tenants' energy efficiency programs through CitySwitch, working with national partners. We will develop a Commercial Office Buildings Sector Plan to focus further on how we can refresh our programs to enable building owners to take action- learning from institutional property owners who are	leading the way and developing industry partnerships to improve performance in mid-tier buildings. As the planning amendment is adopted, we will consider what incentives and support are required to help developers target maximum emission reductions as early as possible.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	City of Melbourne measures and publically reports energy demand and carbon emissions from buildings on an annual basis in line with the requirements of the Australian Government Carbon Neutral Program. Each year the City implements energy efficiency and renewable energy projects to achieve our science-based emissions reduction target of 4.5 per cent per year. Further emissions reduction initiatives are listed in the City's Emissions Reduction Plan 2016-2021.	City of Melbourne has achieved a 31 percent reduction in operational emissions across our building portfolio since 2012. The City has installed 1 MW of solar across its property portfolio since 2003, maximising rooftop solar on our buildings, and undertaken AU$17 million worth of energy saving upgrades and retrofits in existing buildings, including a number of heritage listed buildings such as the Melbourne Town Hall.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	The City's municipal buildings are already certified net zero in operation, consistent with Australia's National Carbon Offset Standard and the City's own 2016-2021 Emissions Reduction Plan. The City of Melbourne's Climate Change Mitigation Strategy (2018) commits to continue to implement emission reductions for our operations and develop an Emissions Reduction Plan for 2021-2025, which will identify the next stage of upgrades, retrofits and building management energy saving opportunities	

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Financial resources available to deliver the above commitments in the 2019-2020 financial year include an operational budget of approximately AU$2.3 million. This budget supports the City's work on renewable energy, existing buildings, advocacy and the planning scheme amendment to support the delivery of the above commitments. Similar resources are expected to be committed in subsequent years, subject to Council annual planning and budget.

© Ippei Naoi / Getty Images

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	The Ville de Montréal has held two public consultations on the subject to reduce the consumption of fossil fuels and boost the use of renewable energy: - A first, on designing buildings in a perspective of sustainable development on the territory of Ville de Montréal. - And a second, to reduce dependence on fossil fuels in Montréal. Further information and recommendations is provided in the following documents: http://ville.montreal.qc.ca/pls/portal/docs/PAGE/COMMISSIONS_PERM_V2_FR/MEDIA/DOCUMENTS/RAPPORT_CM_20170424.PDF http://ocpm.qc.ca/fr/energies-fossiles The specific targets will be developed as part of the 2020-2030 planning that will take place during 2019-2020. From a provincial perspective on the energy transition, the Québec government conducted the public consultation as part of the development of the first Energy Transition, Innovation and Efficiency Master Plan, in which the Ville de Montréal has participated, presenting its comments and offering full collaboration to achieve the objectives. Those public consultations are a good starting point to enact regulations and/or planning policy to ensure all buildings operate at net zero carbon in the future. Also, in 2018, the Ville de Montréal presented the progress of GHG reduction, as well as potential directions by 2030 given the 2030 and 2050 GHG targets. These include: • Targeting GHG emissions from stationary energy in order to reach short-term objectives. • Consider GHG reduction objectives in the Ville's housing subsidy programs. • Accelerate the adoption of supply requirements for renewable natural gas. In the past, Montréal has proposed a bylaw to regulate the use of wood-burning stoves and fireplaces in order to improve air quality. The use of solid-fuel-burning devices and fireplaces were one of the main sources of fine particulate matter pollution in Montréal. Montréal could enact other bylaws to regulate fossil fuels use. The Ville de Montréal is currently participating in C40 Reinventing Cities Program with the De la Commune Service Yard site.

Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	The plan to meet this commitment will be developed during the preparation of the 2020-2050 plan.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Establish a roadmap for our commitment to reach net zero carbon buildings.	The roadmap will be developed during the preparation of the 2020-2050 plan.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	At the municipal level, various policies, programs and plans are aimed at the use of renewable energies, energy efficiency and the GHG emissions reduction, namely: A) The Sustainable Development Policy for Municipal Buildings of the Ville de Montréal (2009). It should be noted that this policy is being reviewed by the Advisory Committee on Sustainable Development. B) 2013-2020 Montréal Corporate Greenhouse Gas Emissions Reduction Plan.	It should be noted that a follow-up of this plan was published in 2018. It made it possible to draw up a preliminary assessment of the progress of the GHG reductions projects, as well as to make recommendations allowing the reduction of the GHG emissions from municipal activities. The Ville de Montréal Climate Planning Committee is in implementation phase to propose new targets and action to reduce local government GHG emissions. In addition, a GHG Reduction and Energy Consumption Plan is currently being prepared.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	In the 2015 GHG emissions inventory from municipal activities in the Montréal agglomeration, the energy consumed by the various sources was evaluated, as well as the GHG emissions attributed to this consumption. This inventory is available online:	http://ville.montreal.qc.ca/pls/portal/docs/PAGE/ENVIRO_FR/MEDIA/DOCUMENTS/INVENT_GES_ACTMUNI_2015_VF.PDF
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	As mentioned above, a GHG Reduction and Energy Consumption Plan 2018-2021 is currently being prepared and will be reviewed by the city's Climate Planning Committee.	

New York City

© Istock / Predrag Vuckovic

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	NYC passed Local Law 32 of 2018 to require that all new buildings and substantial renovations be built to a stretch energy code achieving at minimum a 20% improvement over the base code in 2019 and in 2022, and that large new buildings adopt very low energy design targets similar to Passive House standards in 2025. NYC's public buildings are now required by local law 31 (LL31) to be designed to achieve 50% improvement in energy performance over the baseline.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	Through its 1.5° Climate Action Plan, NYC is committed to legislating aggressive energy and greenhouse gas performance mandates for existing buildings that will require significant GHG reductions in the short term and will aim to establish net zero carbon requirements for all buildings by 2050. Mayor de Blasio announced the City's commitment to pursue energy performance mandates in September of 2017. The City is working with the Council and stakeholders to enact a local law as soon as possible.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	A roadmap to 2050 will be established via legislation.	NYC is also leading the development of a Carbon Neutrality Protocol for Cities in partnership with C40 and other global cities.
Develop a suite of supporting incentives and programmes.	NYC will dramatically expand its support programs for existing buildings, like the Retrofit Accelerator, High Performance Retrofit Track, Community Retrofit, and Benchmarking Help Center programs, and will launch a new supportive program for new construction under a new umbrella Building Energy Efficiency Program to develop the market for very low energy and very low carbon buildings.	

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- The City's current building energy efficiency programs were funded with $16 million over three years. The next iteration of the programs will significantly expand in both budget and scope.
- Since Mayor de Blasio took office, the Department of Citywide Administrative Services has invested more than $580 million in energy efficiency projects located in over 1,250 public buildings. These projects are expected to yield more than $68 million in avoided annual energy costs and approximately 187,000 metric tons of avoided GHG emissions, the equivalent of taking more than 40,000 cars off the road.

© Istock / deberarr

Newburyport

DECLARATION COMMITMENT

Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.

SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES

• The City of Newburyport committed to a net zero energy community by 2050 in its publicly approved 2017 Master Plan.

• The city will require all new buildings to operate at net zero by 2030. This will need to be codified into Sec 5 of the City's general ordinances, entitled Buildings and Building Regulations.

• The City of Newburyport became a Green Community in 2010 and therefore adopted the Massachusetts stretch energy code which incrementally increases the efficiency targets for new construction (10% better than base code, 20% better, 50% better, etc.)The city will also evaluate / set targets that go beyond stretch code to help reach net zero.

• Local building code and zoning ordinances will be enacted and enforced as well as setting sub goals by building typology and energy use profile. We will evaluate codes and zones to incorporate strategies such as: requiring energy modeling and Energy Star targets from initial planning stages of projects, meeting LEED integrated design criteria, establishing solar readiness and requiring cost/benefit analysis of electrification and other technology options.

• The city will look at incentives projects that meet net zero ahead of the stated target and will demonstrate leadership by disseminating lessons learned from projects such as Hillside Sustainable Community (included link) and/or pursuing net zero for the next economically feasible municipal new construction project.

• Education and training for contractors and inspectors will be offered.

• The city will coordinate formal feedback processes with insurance groups, bond rating groups, fire prevention, and other allied stake holders.

Methods for measuring operational carbon and tracking progress are described below.

Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.

• The City will develop building codes in conjunction with historic preservation groups to create phased in approach to net zero for our historic building stock. Programs through Mass Clean Energy Center, insurance and utility incentives, HEAT loans, and community development loans will help with costs.

• Develop training programs with local schools for contractor certifications (such as MassCEC "Learn & Earn" Clean Energy training programs.

• New construction to meet LEED Platinum standards (with a focus on Energy & Atmosphere credits) starting in 2020. Key stakeholders will be engaged in a process to re-evaluate building codes to create a phased in approach to net zero for industrial, commercial, and other existing properties. Residential buildings will also be re-evaluated with relevant standards such as HERS rating and PassiveHaus. The City will have final authority to enact building code changes which may include incentives for projects exceeding standards, and baseline standards expected for all projects. The city's building commissioner and zoning administrator will oversee adherence.

These broader goals will incorporate existing buildings through renewal / renovation and efficiency opportunities, as well as off-site renewables as needed.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Establish a roadmap for our commitment to reach net zero carbon buildings.	**The Newburyport Energy Advisory Committee (2007) will finalize the plan with input from the city council and public as well as oversee the implementation plan and recommendations.** Newburyport's Energy Advisory Committee is developing the scope and subsequent comprehensive Net Zero Energy Plan for review by the Mayor, City Council and City Departments. This plan is to be completed and agreed upon by the stakeholders by 6/30/19. The plan outline is below: •"Net zero" buildings will be defined using the WGBC Net Zero Carbon Buildings criteria, so as to include both on-site and off-site renewables[• A comprehensive community-scale GHG inventory is under development, following the Global Protocol for Community Scale GHG Emissions Inventories (GPC). The inventory will be used to identify the sectors, activities, and sources contributing to the City's carbon footprint. • Establish priorities, targets, and timelines based on KPIs such as capital cost, payback, feasibility, and GHG reduction potential for GHG mitigation measures. Market trends and building specifics (i.e. solar - roof, orientation; geothermal – land area / geological properties, etc.) will factor into decision-making for on-site systems. The City will continue to evaluate large-scale green power and biogas (natural gas replacement) contracts for its procurement, as well as more regional agreements for off-site renewables. Offsets will be considered as the last option. • The city is actively pursuing a community solar formalized residential aggregation program for all city residents. • Heating will be addressed through options such as fuel switching, biogas contracts, encourage area oil distributors to raise bio fuel standard above 50%, air-source and ground-source heat pump and wood pellet boiler technologies, etc. • A municipal building retrofit program is being initiated using the Mass Energy Insight (MEI) software, including analysis of energy-use-per square foot compared to peer buildings, expectations for building life/ renovation cycle, and based on knowledge of facilities team regarding poor-performing buildings. Will also utilize an ASHRAE Level II Energy Audit or comparable analysis of measures, costs, and savings. The program will be co-financed by City, utility incentive programs as well as grants from the Green Communities program. We will target a minimum of 1-2 buildings per year, subject to available funding. • All municipal buildings to be insulated to R32 or better by 2020. • All municipal buildings to be converted to renewable energy, electricity, or high efficiency heating and cooling systems by 2030. • Rooftop and parking canopy solar will be required on all municipal buildings by 2025, where feasible. • A city solid waste reduction plan includes consideration of anaerobic digestion to produce bio-gas. • Offsite renewable electricity purchase will potentially be considered as part of the city electric aggregation program by 2030. • Projects such as the Hillside Sustainable Community will be rolled out to spearhead and demonstrate net zero carbon building innovations.

Develop a suite of supporting incentives and programmes.	•Set up reporting structure for applicable city departments to capture and track population changes, building sector's energy type and use data. • Adopt fees on non-renewable energy consumption modified for each fuel type, carbon intensity, and annual consumption. Fees will be utilized to establish a green revolving fund and possibly to pay for carbon offsets. • Adopt incentives for renewable fuel use. • Set up additional EV charging stations in all city parking lots. • Replace municipal vehicles with electric.	• Offer rebates and fees to property taxes for energy efficiency improvements in housing and building stock. Evaluate a Property Assessed Clean Energy Program (PACE). • Look at adding a percentage financing fee to building purchases to fund renovations. Our programs will capitalize on state funding such as MA Green Communities Act grants, Massachusetts Clean Energy Center grants, and partnership with utilities to take advantage of energy conservation funding available through efficiency charges on utility bills. These programs will help to reduce energy demand and promote efficiency, and the deployment of renewable and resilient energy solutions at the building and community scale.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	• Existing municipal structures will complete an updated energy audit by 2025 with site specific energy plans for energy savings and conversion to electricity or renewables for heating and cooling • Working with utilities / MassSave to characterize Newburyport's community building stock and energy performance based on known utility data, Assessors' data on building types/age/size, previous MassSave audits conducted within the City, and /or running a pilot program to conduct energy audits of representative buildings.	• The city will continue community outreach for programs such as MassSave efficiency programs, HeatSmart, Solarize, etc. • Any new buildings when appropriate and feasible will become LEED certified. As described above. • New elementary school (2014) is a Collaborative for High Performance School (CHPS) verified building. • Business Park has expedited permitting for as of right renewables or alternative energy facilitates.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	Since being designated a MA Green Community in 2010, Newburyport has reported annually on municipal energy use and efficiency projects. Data is reported by building/ meter in the MEI software. A municipal GHG inventory is under development (following ICLEI protocols), which will allow for metered buildings to be further assessed for their energy demand and GHG emissions impact.	
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	See Net Zero Energy Plan above. • City of Newburyport Master Plan https://www.cityofnewburyport.com /sites/newburyportma/files/uploads /2017-master-plan-final-printed- version-w-adoption-dates.pdf	• City of Newburyport Clean Energy Roadmap https://www.cityofnewburyport.com /sites/newburyportma/files/file/file/ roadmap_newburyport.pdf • GHG Inventory being finalized • New Zero Energy Plan currently underway

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Green Communities Program grants, Mass Clean Energy Center grants, utility incentives, and other state and private grants.

© Joseph Sohm / Getty Images

Oslo

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	**Ambitious policy when subcontracting new building:** Several of the municipal bodies subcontracting new buildings have ambitious regulations on how to operate, and new buildings are normally required to be zero-emission, carbon neutral and/or energy-positive buildings. This goes for the municipal bodies responsible for - nursing homes (OBY) - schools (UBY) An example is the new environment strategy for the municipal body responsible for nursing homes, day cares etc. (OBY). Their strategy states that all new buildings they build shall be energy positive houses and they will reduce the energy consumption from their buildings by 20% from 2017 to 2021. **Financial support schemes for innovative refurbishment of existing buildings** The City of Oslo has a financing scheme of 2.5 million EURO for stimulating innovative energy efficient solutions in the municipal building mass.	**The Climate and Energy Fund** This is a fund operated by the Climate Agency of Oslo with funding schemes available to the residents in Oslo to stimulate renovation and new energy efficient solutions. E.g. support for - heat pumps - replacement of old wood stoves with lean burn stoves - increased insulation - Pilot- and R&D projects on energy efficiency and new renewables **FutureBuilt** This is an Oslo-region agency to promote the most ambitious building projects. So far 50 pilot projects with a goal of reducing GHG emissions related to transport, energy and materials have been developed. **Regulation on Technical Requirements for Construction Works** This is a national level regulation (building code) that sets minimum requirements for energy efficiency in new buildings (among other technical building requirements)
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	The City of Oslo established in 2012 a target of substituting all fossil energy supply for heating (oil boilers) by 2018. This has turned into national policy, and the use of heating oil for heating is banned from 2020.	By 2020 there will be no operational emissions from buildings in Oslo.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	*As described over, the City of Oslo will have no emissions from the operation of buildings.*	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	**On embodied carbon:** Municipal buildings are required to have emissions accounting, including for embodied carbon, for all phases of project and need at least 2 EPDs for the 10 largest categories of building materials.	The City Council's proposed Climate Strategy to 2030 states that a quantitative target for embodied carbon in new buildings shall be set by 2021.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	The net energy demand for stationary use in Oslo is approx. 12 TWh annually.	The population in Oslo is growing. In the City Council's proposed Climate Strategy to 2030 there is a target to reduce the total use of energy in 2030 by 10% compared to 2009-level.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Financial support scheme for innovative refurbishment of existing buildings (see description above)
- The Climate and Energy Fund (see description above)

Paris

© Istock / RossHelen

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	"All new buildings built in Paris will be low-carbon and energy-positive." (New Climate Plan of Paris, March 2018) From 2018, any new construction in Paris will have to target a regulatory consumption of 50 kWh/m²/yr (primary energy), the Energy 3 and Carbon 1 requirements levels of the Positive Energy Building and Carbon	Reduction reference standard (référentiel Bâtiment à Énergie Positive & Réduction Carbone) (E + C-) and the best performance standards through energy labeling, and aiming for energy neutrality. These performance objectives will be incorporated into the social housing funding circular from 2018.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	"The City of Paris gives all stakeholders in the City the objective of renovating 100% of the existing builds to a very low consumption level by 2050". (New Climate Plan of Paris, March 2018). **Local Land Use Plan (Plan Local d'Urbanisme - PLU)** Article 15 of the PLU lays down the obligations imposed on buildings, works, installations and developments in the field of energy and environmental performance. The city	of Paris continues to seek new regulatory levers to strengthen the integration of renewable energies and energy performance in the PLU. Thus, from 2020, the orientations of planning and programming (Orientations d'Aménagement et de Programmation - OAP) on the theme 'energy-climate' will be studied, with the aim of setting objectives for the planners and manufacturers in terms of energy performance, production of renewable or carbon neutrality and adaptation to climate change.

Renovation of social housing
The city of Paris will continue to support providers of social housing in their efforts for the massive renovation of their building stock. The objective is to achieve a reduction of 35% of energy consumption over the entire social housing stock by 2030 and 50% on the horizon 2050 compared to 2004, taking into all improvements made.

Support of private condominiums
Currently the Parisian condominiums are accompanied by the City and the Paris Climate Agency (Agence Parisienne du Climat - APC) in their energy efficiency work, notably via the Eco-renovate Paris (Éco-rénovons Paris) scheme which contributes to the reduction of energy consumption and the fight against energy insecurity.

On the private building stock, the 'Éco-renovate Paris' programme (launched in 2016) aims to encourage the energy retrofit of private housing buildings, reduce their environmental impact and fight against energy insecurity.

This programme and those of the APC are intended to be strengthened and adapted in order to stimulate the pace of energy retrofits. All the sector stakeholders will have to make a decisive commitment to this process. In particular, joint ownership associations will be encouraged to participate actively in the procedures for energy works in the condominiums.

Exemplary administration
In 2020, the city of Paris will develop a blueprint for energy performance of public buildings (Schéma Directeur de Performance Énergétique des Bâtiments Publics) in order to optimise the management of its assets.

Advocacy
The city of Paris is to argue in particular with the state for a genuine national strategy for the energy retrofit of the existing building stock at a very low consumption level.

Zero oil heating in 2030
In order to improve air quality, the city of Paris will communicate with the Parisians to encourage them to replace the central heating systems fueled by oil. The objective is that by 2030 all boilers have been converted to lower emission and less polluting modes of heating.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	« The Paris Climate Action Plan defines the political project for Paris' carbon neutrality. It aims to build a low-carbon society through all its components (transport, habitat, food, waste, energy, adaptation, etc.). These guidelines will be operational in the development of thematic roadmaps for the different departments of the City of Paris in order to disseminate the objective of carbon neutrality within all municipal activities. » [New Climate Plan of Paris, March 2018]	The first roadmaps must ensure the implementation of the acceleration actions by 2020 and the implementation of the operational actions in the period 2020-2030 included in the Climate Plan. The objective is that the city's directorates have all defined their roadmap by the end of the first half of 2019. The topic of buildings is one of the priority projects.
Develop a suite of supporting incentives and programmes.	Thermal renovation is paramount to achieve the targets of energy consumption reduction set by the Climate Plan. For the work to be done, the City of Paris develops and supports various programmes:	• Renovation of social housing (Parisian social housing stock = 230 000 dwellings in 2016) – ongoing. 30,000 homes will have been renovated by 2020 by the social housing providers with the support of the City. The pace will then

accelerate with 5000 eco-renovated housings per year with a minimum gain of 60%.

• Support of Condominiums – Ongoing. The City of Paris associated with the APC, through the programme “Eco-renovate Paris”, helps condominiums at every stage of the building’s renovation, from the definition of needs to the delivery of the work, including for requests for financial aid.

In the tertiary sector, large specialised operators and major client organisations will have to continue renovating their real estate and can benefit in particular from the dynamics of the Paris Action Climate Charter (Charte Paris Action Climat).
In addition, the City of Paris will establish a programme to accompany the renovation work specific to small businesses (shops, artisans, etc.) after 2020.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT

Own, occupy and develop only assets that are net zero carbon in operation by 2030.

DESCRIPTION

Carbon neutrality in Paris is attainable only if the energy supply in Paris is 100% from renewable sources.
In 2014, Paris consumes 17% of renewable energies, of which 5% is produced locally. By 2050, Paris wishes to promote the “right to clean energy for all” (« droit à une énergie propre pour tous »). In the same way as the right to drinking water, everybody must be able to have clean energy by 2050.

The City of Paris, as the organising authority for the distribution of energy in its territory, will ensure the development of a 100% renewable and recovered energy distribution system. By then, the share of renewable energy consumed in Paris will have to go from 17% in 2014 to 25% in 2020, 45% in 2030 and 100% in 2050.

To achieve the commitment to reach NZC in operation for municipal buildings by 2030 the City will explore how to set up a local carbon-offsetting scheme by 2020. This scheme would comprise a dedicated platform to connect project leaders with funders, as well as an operator that would run the platform, verify the integrity of the transactions and guarantee that the project reduces emissions without counting carbon credits twice.

100% renewable energy for municipal services
Since 2015, the power consumption of municipal services has been fueled by electricity from renewable sources. The electricity is produced from hydro, solar and wind power, the origin of which is guaranteed through certified certificates, demonstrating that the supplier produces a quantity of electricity higher than the consumption of its client.
To meet the commitment the City is exploring ways to decarbonise energy providing heating and hot water for municipal buildings, moving from gas to renewable energy sources and to district heating.

Renovation of municipal equipment
The efforts already undertaken will be continued with the renovation of 60 additional schools to reach 300 establishments (out of 600) in 2020, with the objective of energy gain at a minimum of 40%. Beyond that, the City sets ambitious targets for the renovation of its most energy-consuming buildings in order to reduce the energy consumption of its entire building stock by 40% in 2030. For example, it will undertake a multi-year programme to renovate its most energy-consuming buildings, including 300 schools, 40 high schools and 15 swimming pools.

Buying green energy
The City of Paris will continue the process of greening its energy purchases by supporting the production of renewable energy through the acquisition of ‘green certificates’ (certificats ‘verts’). As of 2018, it will aim to broaden its purchasing group to its public partners and will share its experience to initiate new purchasing groups with other public and parapublic institutions. This requirement also concerns the supply of gas for borough councils (mairies d’arrondi-Wssements) and the heat network and will gradually extend to all municipal consumption to accompany and stimulate the development of the renewable gas sector.

New construction
From 2020, new construction projects for municipal buildings subject to thermal regulation will reach energy passivity (label E + C-). Beyond 5,000m² they will reach the maximum levels of this label (passive or positive energy buildings).

36 energy ambassadors
The city of Paris will deploy on the field 36 energy ambassadors by 2020 to act on its public buildings stock. Their role is to build a bridge between the building managers, the technicians, the management directorates and the borough councils in order to reduce energy consumption.

Multi-purpose (Multi-usage)
From 2020, the energy performance of buildings will be taken into account in the planning of different activities within public facilities. In addition, the city will impose a “multi-purpose” criterion for any design of new municipal equipment. The objective is to reach 10% of the modular and multi-purpose municipal equipment in 2025.

ADDITIONAL SUPPORTIVE ACTIONS

Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.

DESCRIPTION

Consumption display
The buildings in the City of Paris will display their energy label in their main lobby.

Blue Climate - Annual Monitoring Report
Since the first Climate Plan in 2007, the city is publishing the ‘Blue Climate Energy’ (« Bleu Climat Énergie »),an annual monitoring report of actions to combat climate change and adaptation to it, which contains numerous indicators - financial and operational. The city will continue to write this evaluation document, which allows to share and disseminate the progress of major projects. It will be the reference document for the Climate Plan’s different governance bodies.

In 2004, the city of Paris began to assess its activities’ impact in terms of greenhouse gases. In 2006, the first greenhouse gas balance sheet of the Paris Administration was published. It established the most emitting sectors: public equipment (56%), municipal transport (20%) and consumer goods (24%). In total, in 2014, the Paris Administration’s emissions account for less than 2% of the territory’s carbon footprint with 262 000 t CO2/yr.

Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	**Energy performance blueprint for public buildings** (Schéma Directeur de Performance Énergétique des Bâtiments Publics) In 2020, the city of Paris will develop a blueprint for energy performance of public buildings in order to optimise the management of its assets.	
Develop a suite of supporting incentives and programmes.	On social housing, which is part of the City's buildings portfolio, the City of Paris will continue to support social housing providers in their major efforts to renovate their real estate.	In 2014, in consultation with the main social housing providers, the City of Paris has set up a unified financing system for the housing production and renovation programmes.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- **GREEN BONDS**

  From 2015, the city issued a first green bond of 300 million euros respecting the 4 components of the 'Green Bonds Principles'. The city launched a 'Sustainability Bond' on November 9, 2017 for 320 million euros and plans to launch a " Resilience "Bond" from 2020. With its first successful experience, the city of Paris now intends to maximise the use of green borrowing mechanisms in order to stimulate the financial markets players to propose innovative banking devices and to promote investment in energy and ecological transition. More than 150 million euros are devoted to the energy retrofit of public buildings and social housing and the installation of renewable energy production equipment.

- **ENERGY-SAVING CERTIFICATES (CERTIFICATS D'ÉCONOMIE D'ÉNERGIE - CEE)**

  In order to accelerate the renovation of its building stock, the city of Paris will continue its policy of managing Energy conservation certificates (CEE) as an additional financial lever in the service of its energy management projects.

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• Implement the net zero carbon building roadmap (currently in progress) to initiate and advance the development of net zero carbon new homes and commercial buildings. Roadmap recommendations may include new policies that elevate the energy performance requirements for new building projects in Portland (where not in conflict with the statewide energy code).	• Although Oregon has a statewide code, Portland will actively participate, testify and advocate to the governing boards that the State continuously improves the residential and commercial building energy code to achieve net zero carbon in all new buildings by 2030 (an action adopted by the City's 2015 Climate Action Plan).
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	• Implement the recommendations of the net zero carbon building roadmap (currently in progress) to retrofit existing homes and commercial buildings. Actions may include enabling weatherization legislation, levying fees that finance energy efficiency and investing in workforce training. Portland's Climate Action Plan hierarchy prioritizes energy efficiency. Building electrification strategies will emerge from the net zero carbon building roadmap. • Provide 100% renewable electricity by 2035 and 100% renewable energy to all buildings by 2050 (June 1, 2017 City Council 100% Renewable Energy Resolution).	• By ordinance, the City currently requires commercial buildings 20,000 square feet and larger to report annual energy performance and carbon emissions. Also, by ordinance, the City requires a time of listing disclosure of a home energy score for single family homes. These regulations will allow the City to measure its progress towards net zero carbon by 2050.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The City is currently establishing a net zero carbon building roadmap as part of USDN's Zero Cities Project. The roadmap will identify key policy and program actions to achieve zero net carbon emissions	in all new buildings and homes by 2030. Equity considerations will shape recommendations so that outcomes do not harm or unduly burden low-income populations or communities of color.
Develop a suite of supporting incentives and programmes.	The roadmap will include recommendations for a suite of supporting incentives that may include zoning	bonuses, system development fee reductions and rebates for highly efficient buildings.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	• The City is currently partnering with Portland State University, Oregon Health & Science University and Portland Community College to develop a new office building that meets the Architecture 2030 Challenge net zero carbon targets. The project's experience (including opportunities and challenges) meeting the energy performance targets will inform an update to the City's Green Building Policy for the design of new City-owned buildings.	• Prioritize installation of renewable energy equipment such as photovoltaics and methane to fuel digesters over the renewable energy credit purchases that are currently required for building energy consumption by City bureaus (June 1, 2017 City Council 100% Renewable Energy Resolution).

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	• As part of the City's Commercial Building Energy Performance Reporting Ordinance, municipal buildings 20,000 square feet and larger are required to annually report energy performance metrics.	
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	• The Cityis currently establishing a net zero carbon building roadmap as part of the USDN's Zero Cities	Project. This roadmap will include municipal buildings and is planned for completion by June 2020.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- In 2018, the City of Portland was one of twelve U.S. cities to receive over $300,000 in consulting services from the Global Philanthropy Partnership to develop a net zero carbon building roadmap as part of the Urban Sustainability Director's Network Zero Cities Project. The roadmap will inform an update to the City's 2015 Climate Action Plan that is currently funded for completion by 2020.
- The City has the equivalent of approximately three full time staff working on net zero energy related goals and policies.

San Francisco

© iStock / kropic

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	The City and County of San Francisco's (CCSF) municipal green building requirements for new construction and major renovations provide a regulatory foundation for new building net zero carbon operations. LEED Gold is required for projects >10,000 square feet, and recent policy updates include requirements to analyse the feasibility of achieving Net Zero Energy and deploying energy storage to support post-disaster resilience. The San Francisco Green Building Code (SFGBC) requires all new construction and major alterations of both private and municipal buildings to go "above code" on energy performance. The SFGBC provides a regulatory foundation to establish requirements for new building net zero carbon operations, is updated on the State's triennial code cycle, and continues to exceed California's strict building and energy requirements. CCSF is working with key external stakeholders to identify and eliminate the bias for natural gas thermal end-uses. The just-passed California 2019 Title 24 Energy Standards make substantial progress in allowing electrification of small low-rise residential buildings. Efforts continue to enable electrification of nonresidential and high-rise residential buildings, which are the predominant construction type in San Francisco. In 2016, CCSF passed the "Better Roofs" ordinance which requires new residential buildings of any size and new non-residential buildings that are at least 2,000 gross square feet and 10 occupied floors or fewer, to install solar photovoltaic, solar thermal, and/or living roofs on a minimum of 15% of roof area. The pending "Central SOMA Area Plan" includes requirements for new developments to purchase 100% renewable electricity. The Plan will enable over 20 million square feet of new development over 25 years, including 8,300 units of housing.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	Enacted in 2011, CCSF's Existing Commercial Buildings Energy Performance Ordinance (ECBO) provides a policy foundation for future regulatory and incentive-based efforts to achieve zero carbon building operations. ECBO currently requires non-residential buildings with >10,000 square feet of conditioned space to assess energy performance with ENERGY STAR Portfolio Manager, publicly disclose the results, and conduct an energy assessment every 5 years. In 2019, the ordinance will be updated to include certain classes of multifamily residential buildings. Since 2011, San Francisco Public Utilities Commission has been analyzing energy performance of over 460 public buildings totalling approximately 49 million square feet. An annual report identifies high-performing buildings as well as those that may benefit from cost-effective energy efficiency investments. This contributed to a 27% reduction in operational GHG emissions from municipal facilities since 2010. California Public Utilities Commission is currently revisiting a regulation that prevents ratepayer funds to be used for electrification incentives and technical assistance. CCSF is engaged as a key stakeholder in a coalition petitioning the revision of this rule, so that rebates become available for electrification rather than just for replacing gas-based equipment with more efficient gas-based equipment. If successful, this will unlock vital financial and technical support to accelerate the transition to zero carbon buildings.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Establish a roadmap for our commitment to reach net zero carbon buildings.	CCSF is finalizing an Emissions Pathways Report outlining the necessary actions to meet net zero emissions by 2050. Phase 1 of the analysis will be complete in September 2018. CCSF is an active participant in Carbon Neutral Cities Alliance's (CNCA) Zero Cities Project. This effort is producing a roadmap to zero carbon buildings through a detailed technical analysis of the existing building stock, including a description of the physical assets, energy trends, and development projections. The project will be complete at the end of 2019. The Zero Cities Project roadmap and Emissions Pathways Report building sector analysis will guide future actions to achieve net zero carbon buildings, including recommendations for new policies and programs, specific actions tied to key intervention points by building sector and segment, a multi-benefit analysis of equity and inclusivity, and outreach and education necessary to transition operations of the built environment to 100% renewable electricity.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Develop a suite of supporting incentives and programmes.	CleanPowerSF is CCSF's Community Choice Aggregation program that offers residents and businesses the opportunity to power their daily activities with up to 100% renewable electricity (e.g., "SuperGreen"). The program also has a "Green" product option that contains a minimum of 40% renewable electricity, 5% more than Pacific Gas & Electric Company's (PG&E) standard electricity mix. (PG&E is the Investor Owned Utility that currently serves most customers in northern California.) CleanPowerSF's goals for 2020 are to ensure the "Green" product delivers a minimum of 50% renewable electricity and enroll all San Francisco utility customers into the program. To date >95% of customers have participated in this program. San Francisco Energy Watch (SFEW), a partnership between CCSF and PG&E, is a direct install energy efficiency program that the City has offered to commercial and multifamily business and property owners/managers for over a decade. In that time, the program has paid over $24 million in incentives on 11,000 projects, reducing 92,000 tons of carbon emissions. San Francisco Department of the Environment implements SFEW services throughout the city. Bay Area Regional Energy Network (BayREN) is a collaboration of the nine Bay Area counties led by the Association of Bay Area Governments. BayREN provides regional-scale energy efficiency programs, services, and resources. Current offerings include: single-family and multifamily incentives; code compliance improvement and training; and financing support. Upcoming offerings include a new performance-based incentive program aimed at small and medium commercial buildings across the region that will be available mid-2019. San Francisco Department of the Environment implements BayREN services throughout the city. Property Assessed Clean Energy (PACE) financing, available to both residential and non-residential building owners, supports a wide range of energy efficiency, renewable energy, and other electrification retrofits including electric vehicle charging and heat pump hot water heaters for private buildings. "Residential Retrofit Roadmaps" is a new project that will analyze energy consumption and relevant asset data (e.g. historical permit data of key equipment types) of every home in San Francisco. Based on detailed hourly energy models coupled with financial/economic models, specific upgrade packages for different building typologies will be produced demonstrating optimized electrification opportunities in the residential sector. The study will be complete at the end of 2019. San Francisco Department of the Environment led development, along with a group of external stakeholder organizations, of a grant-funded project called "Realize," which is focused on the rapid delivery of affordable integrated zero net energy retrofit packages for multifamily buildings coupled with a business model that can drive this solution at scale. The project targets a 50% cost reduction on installed measures that deliver a 50% reduction in energy use, combined with a market facilitation platform that aggregates demand, empowers action, and inspires innovation. The project is underway and expected to be completed in 2021.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Currently, the San Francisco Department of the Environment is leveraging grant funding for building sector technical and policy analyses. Ratepayer funding is supporting continued energy efficiency activities, including the SFEW and BayREN programs. The San Francisco Public Utilities Commission is funding a new study to assess municipal buildings to understand the challenges and opportunities for electrification. State funding has been awarded to develop the Realize zero net energy multifamily project state-wide. Additional funding will be necessary to continue the work required to achieve this commitment, including unlocking ratepayer funds to incentivize electrification efforts.

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	Climate Smart San José, San José's climate action plan approved in February 2018, includes metrics and milestones for San José to ensure that all new residential (by 2020) and commercial (by 2030) buildings are net zero carbon (NZC). All new commercial buildings built in San José from 2030 will be zero net energy (ZNE) and existing commercial will be retrofitted to reduce their energy consumption and eliminate their use of natural gas. By 2030, emissions for the City are projected to be 3.66 MTCO2E, with the City's commercial building stock policies contributing to a reduction in emissions of -0.31 MTCO2E towards the projected emissions. These policies will lead to the following by 2030: • Retrofitted commercial area (k sq. ft.): 4,318 • New build ZNE commercial area (k sq. ft.): 2,656	• New build ZNE 0-10k buildings: 95 • New build ZNE 10-20k buildings: 22 • New build ZNE 20-30k buildings: 5 • New build ZNE 30-40k buildings: 4 • New build ZNE 40-50k buildings: 2 • New build ZNE 50k+ buildings: 12 The package of efficiency retrofits (for the numbers above), which include Thermal Envelope Retrofits, HVAC, Smart Thermostats, Recommissioning, Lighting, and Office Equipment replacement will lead to savings of 2.1 MTCO2E through 2030 over the baseline. The largest contributor is HVAC, with the assumption being that all HVAC units will be replaced with Air Source Heat Pumps at time of replacement.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	Beyond its goals for NZC in all new construction by 2030 (stated above), Climate Smart San José (CSSJ) includes metrics and milestones (for 2030, 2040, and 2050) to 1) increase renewables in the power mix, 2) increase the installation of onsite solar, 3) increase the percentage of homes that are all-electric, and 4) reduce household energy usage. Together, these goals lay out a plan for San José to have all buildings operating at NZC by 2050.	All of this work will support efforts that will be underway as a result of Title 24 of the California Energy Code, which requires all commercial buildings must be ZNE by 2030. City staff is looking into developing a reach code to continue progress on fuel switching.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	Climate Smart San José Road Map includes: 1. Options for performance based electric rates and on-bill financing to incentivize fully-electric homes, 2. Feed-in tariff program to pay for excess solar generation, 3. Partnerships to expand solar accessibility to low-income households, 4. Incentives for solar photovoltaic and hot water on buildings,	5. Options for removing fees, streamlining permitting, and training building department staff to incentivize the installation of electric end-use upgrades and NZC buildings, and; 6. Open-access data portal for residents to understand their neighborhood and city-level patterns of energy consumption.
Develop a suite of supporting incentives and programmes.	Through its current City Energy Project (CEP) grant (concluding at the end of 2018) and forthcoming Bay Area Air Quality Management District grant (running through 2020), the City will be developing a NZC demonstration project, NZC marketing/ informational materials and online resources, NZC trainings for professionals and residents, incentives (both material and in the form of recognition) to learn about and implement NZC buildings in San José, and rebates for the conversion of natural gas home equipment to electric. As part of CEP, the City is in the process of developing and bringing to City Council an Energy Benchmarking and Transparency (B&T) ordinance that will require benchmarking of energy usage in buildings to complement California's AB 802, which requires commercial buildings over 50,000 sq. ft. to benchmark starting in 2018 and multifamily buildings in 2019. The proposed	policy will set a threshold of 20,000 sq. ft., covering 2,600 buildings that include commercial and multifamily. Means of transparency will include at least a spreadsheet prepared by the City of San José, to be made public annually, and 1 formal summary report after the first 5 years of implementation. Data made public could potentially include: building identification, ENERGY STAR Portfolio Manager energy score (where available); and site and source energy use intensity, among other data. Through other cities that have participated in CEP, this type of ordinance has been shown to reduce building energy usage by up to 8%, while also increasing City staff access to building data to allow for targeted energy program development.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	**New Buildings** All CSSJ measures related to commercial NZC buildings (identified above) would apply to municipal buildings, including metrics and milestones for San José to ensure that all new commercial buildings are NZC by 2030. **Existing Buildings** San José's municipal building stock spans over 400 buildings across 200 locations and nearly 3 million sq.ft. As such, progress will require significant resources and support to own and occupy NZC buildings. As an important starting point, the B&T ordinance will provide City staff needed data on current municipal building energy usage and will be used to develop a comprehensive strategy that includes: thermal envelope retrofits, smart thermostats, retrocommissioning, lighting, and office equipment replacement. This data is expected to be available to City staff within the first two years and will be used to inform steps the City will need to take.As early steps, the City will continue to expand conservation efforts to municipal buildings and meet the goals of solar feasibility and installation, and energy reductions goals set out in the B&T ordinance. Actions under the proposed ordinance will require a 15% improvement in energy efficiency every 5 years in municipal buildings. Energy demand will also continue to be reduced with conservation projects through the ESCO program. San José has also established San José Clean Energy, the country's largest Community Choice Aggregator. In September, municipal buildings will begin to receive power from 100% carbon-free energy, with the energy coming from 40% renewables and 60% hydropower. As early as Spring 2019, businesses and residents may have an opportunity to opt in to 100% renewable energy, and by 2021, all of the energy will be 100% carbon-free. The City will evaluate the feasibility of solar for all municipal buildings and install where feasible. By 2030 the City should have installed 668 MW of solar PV, with 28 MW being installed for municipal buildings. This translates to 1.0 MTCO2E avoided by 2030. Apart from electricity usage, currently municipal buildings utilize natural gas for heating and domestic hot water and will require further analysis and a strategy to fully electrify, including switching to electric heat pump water heaters, and for space heating switching to geothermal heat pumps.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	As part of the CSSJ progress tracking, the City will include a metric subset for tracking municipal energy usage and associated carbon emissions. Additionally, as part of CEP, the City is exploring the possibility of setting a lower threshold for municipal buildings as part of the B&T ordinance below the 20,000 sq.ft.level. Actions under the proposed ordinance will require a 15% improvement in energy efficiency every 5 years in municipal buildings.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	Apart from the immediate switch to 100% carbon-free electricity as part of San José Clean Energy, San José's Municipal Green Building Policy includes building to a minimum of LEED Silver and commissioning requirements for new construction. A road map as part of CSSJ includes completing lighting upgrades for buildings, parks, and parking lots, and audits of all its remaining buildings. In addition to facility upgrades, LED street light upgrades have been targeted and spread throughout the city to ensure equity. Success also includes work towards a policy to require regular cycles of retrocommisioning for City facilities, in conjunction with the B&T ordinance process.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- San Jose Clean Energy (SJCE), BAAQMD grant, CEP grant, Silicon Valley Energy Watch grant

© SpVikX / Getty Images

© Istock / TraceRouda

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	As of May 1, 2017, Santa Monica enforces an Energy Reach Code. All new residential buildings (1-3 stories) shall be designed to use fifteen percent (15%) less energy than the allowed energy budget established by the 2016 California Energy Code (Title 24), and use solar photovoltaics to achieve an Energy Design Rating (EDR) of Zero, achieving net zero energy.	In March 2018, Council directed staff to explore the feasibility of eliminating fossil buildings, including municipally owned buildings. Staff will explore options to prohibit natural gas systems in new construction, reduce natural gas use through electrification and source natural gas from renewable resources. Staff have been replacing conventional HVAC units for efficient heat pump units. By 2021, Santa Monica City Hall will be fossil fuel free.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	The City is a founding member of the Clean Power Alliance of Southern California and has a goal to deliver up to 100% carbon-free power to all Santa Monica utility customers by 2030. The City is in the early stages of policy development focusing on the existing building stock. Over the next seven years existing buildings will be required to benchmark energy usage and participate in a performance pathway to achieve energy/carbon savings.	In March 2018, Council directed staff to explore the feasibility of eliminating fossil buildings, including municipally owned buildings. Staff will explore options to prohibit natural gas systems in new construction, reduce natural gas use through electrification and source natural gas from renewable resources.

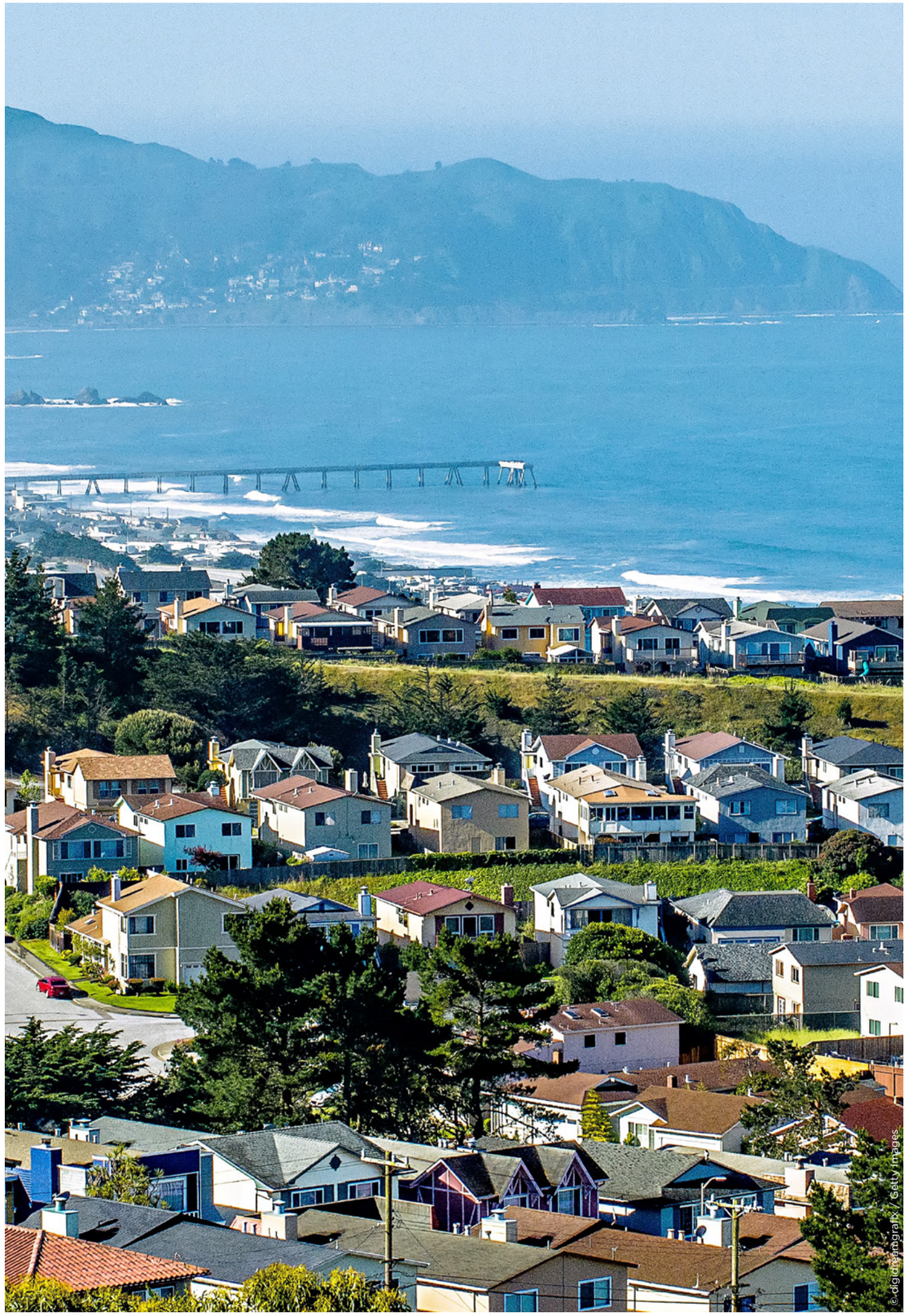
ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The City will soon be adopting a Climate Action & Adaptation Plan (2019) to highlight the policies and programs to significantly reduce greenhouse gas emissions from buildings and support the net zero carbon buildings commitment.	
Develop a suite of supporting incentives and programmes.	The City will be establishing a Sustainable Retrofit Accelerator to support property-owners participating in green building activities.	Santa Monica program which provides technical assistance to property owners (residential and commercial) seeking to install solar, energy storage and electric vehicle charging stations.
	The City has maintained its Solar	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	100% of the City's electricity supply is carbon-free. We have an Administrative Instruction that requires City projects to meet: • LEED v4 Gold Certification. • Net-Zero Energy Building. Certification from the International Living Future Institute. • Zero potable water may be used for non-potable end uses in the building or in any newly installed adjacent landscaping.	The City will develop a long range plan and capital investment strategy to increase building energy efficiency and eliminate fossil fuel-based systems. For fossil fuel use that cannot be eliminated, the City will procure carbon offsets.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	In 2018, the City updated its Municipal Operations Sustainability Report which evaluated performance goals based on seven metrics, including energy demand and carbon emissions. From 2011-2017, energy use in City facilities decreased 4% from 24.94 MWh to 23.88 MWh and carbon emissions decreased 5% from 23,538 to 22,406 mtCO2e.	There are opportunities to reduce natural gas consumption and emissions. For example, the City plans to switch out natural gas equipment used for heating buildings and domestic hot water to electric heat pumps which are more efficient and utilize the utility grid's 100% renewable power.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	The City will work to develop a long range plan and capital investment strategy to increase building energy efficiency and eliminate fossil fuel-based systems. For fossil fuel use that cannot be eliminated, the City will procure carbon offsets.	

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- The City may utilize Capital Improvement Project funds.
- The City may utilize financial resources from Southern California Edison such as Strategic Planning Grants or on-bill financing.



© digidreamgrafix / Getty Images

Seattle

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• Seattle will actively participate and advocate in the WA State legislative process to pass a residential stretch code bill that would include tiers of efficiency and provide local juris- dictions authority to adopt a more progressive residential energy code than the state's. As the code is up- dated every three years, tiers would be similarly updated for both great- er efficiency and thus favor electric only end uses. In Seattle, with our carbon neutral electric utility this would mean homes would all be zero carbon. • Seattle's Energy Code high performance heating provision mandates a choice between high performance heating systems/no fossil fuel or highly efficient windows. • Propose and adopt a rigorous Seattle commercial energy code that regulates GHG emissions standards in heating and cooling. A new code provision known as the Total System Performance Ratio (TSPR), which incorporates a carbon efficiency metric, was developed as a proposal to the 2018 Washington State En- ergy Code, and in early August the state's Technical Advisory Group voted to approve it and the State Building Code Council will vote on its adoption later this year. If not en- acted at the State level, Seattle will incorporate the performance ratio in our local proposed code amend- ments. As the code is updated every three years, the carbon efficiency metric will be strengthened towards zero carbon by 2030.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	• Continue to provide 100% carbon neutral electricity through our municipal electric utility. • Promote electrification of buildings through policy and incentives. Continue to provide incentives to residential buildings to switch from oil heat to electric heat pumps. Develop policy and implementation plans to transition low-income households on oil heat to electric heat pumps. • By ordinance, Seattle currently re- quires commercial buildings 20,000 square feet and larger to report annual energy performance and carbon emissions. By ordinance, Seattle requires buildings 50,000 square feet and larger to perform operational and maintenance improvements every 5 years to achieve energy and water efficiency. These regulations allow Seattle to monitor its progress towards net zero carbon by 2050. • Develop energy and GHG Performance Standards Ordinance for existing commercial buildings to be in place in 2020 with a compliance start date of 2030. • Maintain the City's commitment to help reduce energy use for low-income households through weatherization services.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION
Establish a roadmap for our commitment to reach net zero carbon buildings.	• The 2013 Climate Action Plan and 2018 Seattle Climate Strategy are roadmaps for meeting Seattle's carbon neutral goal by 2050 • The 2018 Action Strategy incorporates the pathway to net zero carbon for commercial buildings, with building performance standards in place by 2030, supported by incentives programs. • For residential buildings, we are developing the net zero carbon residential building roadmap (currently in progress) as part of the Zero Net Cities project in collaboration with USDN and CNCA. Roadmap will include recommendations for new policies and programs that are centered on equity.
Develop a suite of supporting incentives and programmes.	• Seattle's municipal electric utility will continue to provide energy efficiency incentives for new and existing buildings, including net-metering incentives for solar PV generation • Implement the recent Ordinance enabling Seattle's municipal electric utility to provide Energy Efficiency as a Service and Pay for Performance program which provide incentives for actual energy savings over time rather than on estimated energy savings on a first-year basis. • Through its Green Permitting program, Seattle provides expedited permits for new buildings built at least 15% more energy efficient than code requires. • Update and promote incentive programs that provide additional height, floor area or density in certainzonesforprojectsthatmeetthe City's Green Building Standard. Update will also include a no fossil-fuel provision. • Promote the Living Building and 2030 Challenge Pilot Programs which provide additional height and floor area for up to 40 buildings that meet more extensive green building criteria, which includes achieving energy efficiency at least 25 percent better than code and with no on-site combustion of fossil-fuels.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Supportive actions: The cost of municipal electric efficiency incentives is covered in their ongoing conservation budget. Permitting and land use incentives provide expedited permitting or additional height and floor area with the only cost to the City being staff time allocated to reviewing these projects.

DECLARATION COMMITMENT

Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.

SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES

Current road map for all GHG emission:
Strategy for a fossil fuel free Stockholm by 2040 (https://interactive-pdf.uniflip.com/2/35014/1084119/pub/html5.html) includes energy production for heating/cooling and electricity for buildings.

There is no local heat production in new buildings (e.g. gas or oil) except ground source heat pumps. Therefore, decarbonisation take place in the energy production systems, i.e. district heating/cooling and electricity production. The only fossil fuel emissions in the district heating are those from incineration of fossil-fuel plastics for Combined Heat and Power. In addition to these emissions methane and nitrous oxide emitted from incineration in district heating should be added, both from renewable and fossil fuels, as well as scope 3 emissions (LCA - Life Cycle Assessment). In 2030 the emission factor for district heating is expected to be reduced from today's 68 g CO2e/kWh to approx. 50 g CO2e/kWh in 2030. In 2030 the emission factor for electricity production in the Nordic production mix is expected to be reduced to approx. 20 g CO2e/kWh including scope 3 emissions (LCA) from today's 63 g CO2e/kWh.

Current energy efficiency target for new buildings:
The energy standard for new buildings built on city owned land (70 % of all land within municipal border) is set to 55 kWh/m2 compared to the national standard 80 kWh/m2.
The standard includes electricity for building operation (10 kWh/m2), heating/cooling (20 kWh/m2) and tap water (25 kWh/m2). The estimated reduction for the period 2016-2019, with current emission factors, is 25 000 tonnes CO2e.

In 2030 there will still be some CO2e emissions from the energy use in the buildings with the calculation model (C40 GHG Protocol) used by Stockholm. To reach Net Zero Carbon standards these remaining emissions have to be compensated for. Determining how, and with which compensation instrument this will be made, will be subject to further investigations and policy making.

Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.

Current city target: Fossil fuel free city by 2040.

Road map:
Strategy for a fossil fuel free Stockholm by 2040 (https://interactive-pdf.uniflip.com/2/35014/1084119/pub/html5.html)
Including heating/cooling and electricity for buildings.

There are currently only a small number of oil heating systems in use in Stockholm with approximately 330 for multi-family buildings and 390 for single-family houses. The trend is that oil heating is being phased out due to high costs and the inconvenience of maintaining the systems. The oil heating systems are being replaced by district heating or ground source heat pumps. The city has an Energy Advice Service with national financing to support private building owners. Well before 2050 all oil heating is expected to be phased out.

The climate strategy is updated with new short term targets and specific actions every fourth year following the political mandate periods. The updated climate strategy has to be approved by the City Council. The actions to meet the short term target are followed up annually in a progress report to the City Council.

Current short term goal:
GHG emissions per capita reduced to 2.2 tonnes to year 2020 (from 5.4 tonnes 1995 and 2.7 tonnes 2015). Calculations include emissions of CO2 equivalents, where methane and nitrous oxide emissions are also included as well as Scope 3 emissions (LCA) from energy production. Methane and nitrous oxide emissions occurs also with biofuel incineration.

Actions agreed for building sector to meet current short term goal:

- **Decarbonised heating/cooling by** 1) New biofuel CHP taken in operation 2016, 2) reduced use of existing coal fired CHP, 3) oil phased out from peak production burners. Estimated reduction: 240 000 tonnes CO2e. Reduction effect is for all buildings in the city.

- **Decarbonised electricity production.** Improved emission factor for Nordic electricity mix. Estimated reduction: 66 000 tonnes CO2e. Reduction effect is for all electricity use in the city.

Other potential new actions will be analysed to reduce the CO2e emissions for the next four year period 2020-2023 and form the basis for a new short term reduction target in 2023.

In 2050 less fossil-fuel plastics will be expected in the CHP waste incineration making the district heating system almost fossil fuel free and the Nordic electricity mix is expected to have become fossil fuel free by this time. This trend is supported by the increased awareness of the draw backs of plastic use and the national climate legislation with a target to become a welfare state with net zero CO2 emissions by 2045.

There is a potential for energy efficiency in the existing building stock that can reduce the use of natural resources when net zero carbon is achieved. The city can act as a forerunner with measures taken in its own building stock, governed by the city's environmental programme (http://www.stockholm.se/miljoprogrammet/).The current goal is a reduction of energy use by 10 per cent during the four year programme period. A new environmental programme is developed every fourth year following the political mandate period and is adopted by the City Council. The city is also run retrofitting demonstration projects to promote energy efficient retrofitting and climate smart solutions e.g. the current EU project GrowSmarter (http://www.grow-smarter.eu/home/). On-site advice in the buildings is given to private property owners through the city's Energy Advice Service.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The city's strategy for a fossil fuel free Stockholm by 2040 with frequent updating every fourth year constitutes the roadmap to reach net zero carbon buildings. The City Council has also adopted a target to become a fossil fuel free city organisation by 2030 and	a roadmap to meet the target is under development. A very small number of buildings owned by the city, mainly cultural buildings, still have oil or natural gas heating which will be converted to district heating, bio gas or ground source heat pumps well before 2030.
Develop a suite of supporting incentives and programmes.	In addition to actions in the strategy for a fossil fuel free Stockholm by 2040 the city runs demonstration projects to support faster market introduction of smart climate positive solutions such as the EU financed GrowSmarter project. Through the Energy Advice service free support is given to private building owners to reduce the energy use in their buildings, both on site and through telephone and web	information. The Energy Advice service also runs externally financed projects e.g. a current project to optimize energy performance of condominiums. The city has developed a solar radiation map that covers all roofs in the city to facilitate PV installations for building owners.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	As an organisation the City of Stockholm owns approx. 10.000.000 m2 of floor space and is responsible for approximately 10 percent of greenhouse gas emissions across the city and should set an example by becoming fossil-fuel free by 2030. This city leadership target is articulated within the city's broader Strategy for a Fossil Fuel Free Stockholm by 2040. A detailed road map is under development to deliver on this commitment for a fossil fuel free city organisation by 2030. Within this roadmap, buildings will be one of the central priority actions areas, addressing energy used for heating.	The city has already conducted many actions that are conducive with the commitments outlined above e.g. phasing out fossil fuel heating in the building stock. A few remaining natural gas-and oil heating systems have been identified and will be phased out well before 2030. Eco labelled electricity is since many years procured by the city to 100 %. The city may require fossil free heating in lease agreements where the city rents office space from other landlords.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	Energy demand, energy carriersand carbon emissions are evaluated annually and reported to the City Council. In the environmental programme for the period 2012-2015 a target was set to reduce the procured energy by 10% and a 11% reduction was achieved.	In 2017 1.118 GWh heat, 394G Wh electricity and 8 GWh for district cooling was used for the operation of the municipal building stock, corresponding to emissions of 101 000 tonnes CO2e with current emission factors for heat, cooling and electricity production.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	The City Executive Office is leading the work to develop a detailed road map to deliver on the commitment to become a fossil fuel free city organisation by 2030.	

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Financial resources to deliver the commitment are Integrated into the annual city budget.

© Strategy for a fossil-fuel free Stockholm by 2040

Sydney

© Istock / africanpix

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	The City is currently undertaking technical studies and industry engagement to establish a planning pathway for net zero buildings. This pathway will identify key milestones for changes to planning policy such as improved energy efficiency and onsite renewables. As the City does not have full control over building standards and planning policy, we will collaborate with industry and State Government to develop a pathway for the City's planning controls to be strengthened over time to deliver net zero building standards.	The City is a member of the Australian Sustainable Built Environment Council (ASBEC) advocating for net zero trajectory in the Australian Building code (National Construction Code). This could impact not only Sydney's relevant planning controls, but also other cities around Australia.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	The City will advocate for national and state policies to develop net zero building codes, electrification and 100 per cent renewable electricity supply. We will continue to work with key stakeholders and showcase leadership in the property industry to support net zero planning pathways.	We will continue to encourage carbon positive commitments via key partnerships including the Better Buildings Partnership, CitySwitch Green Office, Smart Green Apartments and the Sustainable Destinations Partnership.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	Develop pathways to net zero emissions by 2050 across all sectors of our economy, including buildings, as part of the development of Sustainable Sydney 2050. This work will be completed in 2019. The city has an existing target of being a Net Zero community by 2050.	
Develop a suite of supporting incentives and programmes.	Continue to deploy sustainability programs & partnerships, advocacy for improved state and national policies and programs, design competitions and voluntary planning agreements. These actions are already documented in our current Environmental Strategy and Action Plan 2016-2021, Residential Apartment Sustainability Plan, Sustainable Office Plan, and Sustainable Destination Plan. The City is rolling out rebates, an "solar concierge" service, Mayor's Challenge, and partnering with the local energy network provider to facilitate renewables installation in the local area.	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	The City of Sydney has been carbon neutral in its operations since 2007, and certified by the National Carbon Offset Standard in 2011. This commitment will be retained annually. Our Environmental Strategy and Action Plan provides detail on the various initiatives that we have planned	to achieve our 2021 and 2030 emission reductions goals and renewable energy target (see page 23)

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	The City of Sydney has sophisticated tools for monitoring its energy and emissions which require continual review and improvement as well as oversight to ensure issues and opportunities are responded to accordingly. The City has procured the Sustainability Management and Reporting Tool (SMART), which manages data for energy and emissions as well as water and waste. The City has reduced its operational emissions by 25% since 2006, in line with our trajectory to a 70% reduction by 2030.	Major opportunities underway are property efficiency and LED lighting upgrades, installation of solar PV, and procurement of renewable energy. These opportunities are outlined in "waterfall" charts within our Sustainability Strategy and Action Plan

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	Establish a roadmap for our commitment to reach net zero carbon municipal buildings. The City has already achieved net zero carbon municipal buildings. Our carbon neutrality includes stationary energy, onsite fuels, waste and refrigerant emissions from our buildings through measurement, improved efficiency, onsite renewable energy and accredited offsets. Focus is currently on reducing energy use and increasing renewable energy from local and grid sources. This is outlined in our current Environmental Strategy and Action Plan.	
Develop a suite of supporting incentives and programmes.	The City has an Executive level Environmental Steering Committee, chaired by the CEO that oversights the progress of all environmental actions. All Directors have environmental criteria included in their performance plans. There several coordination groups that report to this committee. The City has a carbon budget for its asset portfolio, targets for particular asset clusters, allocated responsibilities and a reporting framework to monitor and report on our progress through our publicly available bi-annual 'Green Report'.	The City is continually reviewing opportunities and governance structures to drive energy efficiency through the organisation. We lead by example by mirroring or exceeding any environmental targets that can apply to both the City organisation and the community.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- In July 2018, the City of Sydney approved a budget of $4.6 million AUD to support programs that accelerate the uptake of renewable energy, both within our area and beyond, that count toward the City's targets for renewable energy and emissions reduction. This is in addition to a previously approved renewable energy capital budget of $10 million.

- Nine new staff roles and operating budget were also added to accelerate action on climate change in 2017 following the C40 Mayors Summit in Mexico 2016 and the Deadline 2020 report.

© narvikk / Getty Images

© iStock / Byleng

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	1) Set new “evaluation criteria” to promote zero energy buildings in Tokyo under the “Tokyo Green Building Program”, which has been enforced since 2002 based on the Tokyo Metropolitan Environmental Security Ordinance and requires large-scale buildings to meet energy conservation performance standard or use renewable energy. (Scheduled to be prepared in financial year 2020)	2) Develop and promote a new house specification, ”Tokyo Eco-Friendly House Specification”, to building owners, in order to promote the construction of net zero carbon houses for detached or collective houses. (Scheduled to be developed in financial year 2018)
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	1) Tokyo Metropolitan Government(TMG) has implemented the Tokyo Cap-and-Trade Program, the world’s first city level cap-and-trade scheme, mandating emissions reduction for existing large facilities by the Tokyo Metropolitan Environmental Security Ordinance since 2010 (The facilities covered under this program have achieved 26% reduction from their base-year emissions in financial year 2016). Aiming to develop a net-zero carbon emission facility as the foundation making Tokyo a zero emission city, TMG has a plan to set a new emissions cap for facilities covered under this program in order to promote energy efficiency and expand renewable energy usage. (Scheduled to be prepared by financial year 2019)	2) Tokyo Metropolitan Government (TMG) has implemented the Tokyo Carbon Reduction Reporting Program, mandating emissions reporting and a carbon reduction plan submission for existing small and medium facilities by the Tokyo Metropolitan Environmental Security Ordinance since 2010. Aiming to develop a net-zero carbon emission facility as the foundation of future “Zero Emission Tokyo”, TMG will advance the program to promote the use of renewable energy and other measures. (Scheduled to be prepared by financial year 2019) 3) Develop and promote a new house specification, “Tokyo Eco-Friendly House Specification”, to building owners, in order to promote the construction of net zero carbon houses for detached or collective houses. (Scheduled to be developed in financial year 2018)

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	1) The Tokyo Environmental Master Plan developed in March 2016 is a blueprint for actions and main policies to meet our medium-term goal; “Reduce Tokyo’s GHG emissions by 30% below 2000 levels by 2030”.	2) Specific means of consolidating actions toward the “Zero Emission Tokyo” schedule will be clarified in each program, one after the other. (For example, the specific scheme from 2020 to 2030 on Tokyo Cap-and-Trade Program will be clarified by financial year 2019)
Develop a suite of supporting incentives and programmes.	1) Strengthen the action from power users in existing buildings to choose low carbon power supplier (Scheduled to be prepared in financial year 2020) 2) Implement subsidy programs to advance energy efficiency and insulation efficiency in existing houses.	3) Promote net zero carbon house specifications, in cooperation with real state rental companies, as one of the initiatives of the “Team Mattainai”, which TMG launched with private pioneer businesses in August, 2018.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- Enact provisions of the Tokyo Metropolitan Government budget and issue the “Tokyo Green Bond”; fund projects by TMG for promotion of zero emission buildings owned by TMG.

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	City Council as part of TransformTO established the goal that all new buildings in Toronto will be near-zero GHG emissions by 2030: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4 To achieve this goal, Council adopted a Zero Emissions Building Framework as part of the Toronto Green Standard Version 3 – requiring all new construction achieve superior environmental performance through site plan review. The Framework introduces four performance tiers, Tier 1 being mandatory for all new construction as of 2018. The TGS is part of a 4 year update cycle, the intent being that in 2022 Tier 2 becomes mandatory, in 2026 Tier 3 becomes mandatory and in 2030 Tier 4 becomes mandatory: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PG23.9 These ambitious existing actions alongside further actions will form the strategy to meet the NZC commitment.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	City Council as part of TransformTO established the goal that all existing buildings are retrofitted to the highest emission reduction technically feasible, on average achieving a 40 percent energy performance improvement over 2017 levels, while limiting affordability impacts to residents, by 2050: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PE19.4	Toronto is in the policy development process to create an existing buildings retrofit strategy, which includes examination of a retrofit/recommissioning regulation and be designed to deliver NZC for all buildings by 2050.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	Toronto City Council adopted a Zero Emissions Building Framework as part of the Toronto Green Standard Version 3 – requiring all new construction achieve superior environmental performance through site plan review: http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2017.PG23.9	
Develop a suite of supporting incentives and programmes.	Through the Toronto Green Standard, developments that elect to achieve the higher voluntary tiers are eligible for a development fee rebate. Technical assistance and support accessing incentives, is also available through the Better Buildings Partnership High-Performance New Construction program: here	City of Toronto is also in the process of developing retrofit programs focused both on the reductions possible through low-interventions and deep retrofits to showcase the feasibility of net-zero retrofitting.

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	City Council as part of TransformTO established the goal to design and build all new City-owned facilities to be near zero greenhouse gas emissions by 2026; and to retrofit all City-owned buildings, including social housing, to the highest emission reduction technically feasible, on average achieving a 40 percent energy savings over 2017 building energy performance by 2040: http://app.toronto.ca/tmmis/view Agendaltem History.do?item=2017. PE19.4 This is achieved through the Toronto Green Standard, which uses GHGs as a key metric, and is implemented through City of Toronto's Corporate Energy Conservation and Demand Management Plan that prioritizes whole building deep energy efficiency. In addition to these existing policies, the City of Toronto is currently developing a roadmap to achieve our low-carbon municipal building goals and are exploring how to deliver net zero carbon municipal buildings, in operation, as quickly as possible. The initial framework will be completed by the end of 2019.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	Toronto publishes an annual report on energy demand/ consumption and carbon emissions from our mu- nicipal buildings: https://www.toronto.ca/wp-content /uploads/2017/10/98e6-Annual-En- ergy-Consumption-and-GHG-Emissions-Report-City-of-Toronto-2016.pdf Every five years we complete and Energy Conservation and Demand Management plan identifying opportunities to reduce consumption and improve efficiency:	https://www.toronto.ca/wp-content /uploads/2017/11/915c-City-of-Toronto -Energy-Conservation-Demand -Management-Plan-2014-2019-Sec- tion-1.pdf https://www.toronto.ca/wp-content /uploads/2017/11/9166-City-of-Toronto -Energy-Conservation-Demand-Man- agement-Plan-2014-2019-Section-2.pdf
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	City of Toronto is currently devel- oping a roadmap to achieve our low-carbon municipal building goals and are exploring how to deliver net zero carbon municipal buildings,	in operation, as quickly as possible. We plan to complete the initial framework by the end of 2019.

Tshwane

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES		
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• A Green Building / Building Efficiency Programme for the city is being implemented to enhance the current policy work of City of Tshwane towards ensuring net zero new buildings development. • The City is currently reviewing its Green Building Bylaw for new buildings to mandate higher energy performance requirements for green building development in the. More importantly the Bylaw review is about putting the city`s built environment pathways on an incremental energy efficiency, moving from the current levels towards net zero carbon by 2030. Currently, the bylaw indicates a requirement for all buildings to meet 20% of energy requirement from renewables or natural methods. With the current review, the plan is to ensure that by 2025 there is a requirement for an additional 25% energy efficiency over and above then current levels. By 2030 the city will further review energy requirements incrementally to a further 30% energy efficiency, with an increased renewable energy supply from on-site and/or offsite generation to reach net zero carbon new buildings. The review of the bylaw will be done with proposed incentives in mind as these are important to have full support from all stakeholders to make the net zero carbon buildings target possible.	• The City`s Bylaw is linked to the National Building Regulation (NBR) Technical Standard SANS 10400, meaning the bylaw will ensure that net zero carbon performance levels are being implemented through city-lead regulation even if the NBR does not reach NZC by 2030. At this stage it is also understood that the SANS 10400 will continue to tighten energy intensities. Recently the Minister of Energy published a gazette on energy performance certificates for public comment. Once finalised and is passed into law all buildings with over 2000 m2 will be required to display energy efficiency certificates which we think is a major step in the right direction. Cumulatively the anticipated impact of the City`s Bylaw and these policies and plans will move the city and generally South Africa towards net zero carbon by 2030. With the review of the bylaw, there is an expectation to go beyond the National Building Standards and ensure that the city is transitioning towards net zero carbon buildings in the city. • In support of this the Green Economy Strategic Framework which was approved in 2014 guides the transition to higher buildings efficiency and a sustainable built environment in the city.	

Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	• The City of Tshwane Bylaw applies to both new buildings (and refurbishments of buildings) that require planning or building control approval. • The city will use its work on energy efficiency in existing municipal buildings by 2030 to demonstrate best practice and will be used to drive and plan policy and programmes for private buildings in line with the city's climate action plan to be carbon neutral by 2050 in line with the city's commitment to the Paris Agreement.	• The BEA- WRI funded programme the city working with GBCSA on HB Philips in retrofitting that existing building and raising standards for greening existing buildings • The Minister has also issued the Energy Performance Certificates for new and existing buildings over 2000m2	

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION		
Establish a roadmap for our commitment to reach net zero carbon buildings.	The City`s current work on the Green Buildings Programme, including new builds (New Building Energy) with assistance from C40 and retrofitting existing city`s owned buildings through the assistance of Building Efficiency Accelerator Initiative and capacity building through other local entities such as Green Building Council of South Africa (GBCSA) and Green Building Design Group (GBDG) will be consolidated towards developing the first ever City Strategy on Resource Efficiency and Resiliency. The Road Map will need to be developed and clarified by April 2019.	A work plan and programme of action will be drawn up with technical and financial resource consideration and linkages. Annual energy efficient targets will be set and these will be linked to the strategy to reach net zero carbon buildings by 2030.	
Develop a suite of supporting incentives and programmes.	In the review of the current By-Law and Policy, a number of incentives will be proposed for the new Bylaw as an enhancement of those proposed in the old policy. These will be both non-financial and financial support mechanisms. Broadly financial mechanisms proposed or to be proposed will include reduce Building Plans application fees, increased bulk (per additional square meter for green builds), discounts/ rebuts on specified city services etc. For non-financial support, these will include reduction on application approval time, access to green building and energy efficiency networks,	facilitation to access green builds conferences, easy access to information on efficient management of green builds, access to suppliers of alterative green buildings material, etc. As to the exact nature of the incentives, this will be dependent upon city approvals and proposes, including processes on the approval of the bylaw.	

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION		
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	The Green Building Bylaw (2012) encouraged the development of sustainable and efficient new buildings, for both the public and private sectors. The focus of the bylaw was on energy efficiency (including renewables), water management, waste management and transportation -very much part of the built environment. This was approved at Council level, indicating the city's commitment to a sustainable built environment. Currently the bylaw is being reviewed with the intention to underpin such a commitment by enforcement measures (lacking from the current bylaw due to capacity and skills challenges). The review of the bylaw will align with the city's Embedded Generation Policy, which encourages small scale embedded renewables across the city, both from public and private sector, new and existing buildings. By leveraging the work of the city on the Green Building Bylaw and the revision of the Strategy on Green and Low Carbon Development (in 2019), the political and strategic vision will be laid out to include an ambitious leadership commitment for municipal buildings, based on projects and research currently taking place. For city operations to lead by example in terms of building performance and carbon emissions reduction, the city is currently considering how to increase the contribution of renewable energy in city buildings; including the newly built Tshwane House. Once this review process has been completed in the next 6 months, Tshwane House will be a case upon which all future City of Tshwane owned, occupied and developed assets will be based, in terms of the requirement to move gradually towards low carbon and then net zero carbon standards by 2030.	The City will also be working with the World Green Building Council (WG BC), the World Resource Institute (WRI) and local partners the Green Building Council South Africa (GBC SA), and ICLEI supporting Tshwane in the Building Efficiency Accelerator Programme (BEA -coordinated by WRI). Focusing on building efficiency for existing buildings by retrofitting and refurbishing city owned buildings, it is the aim of this BEA activity to encourage the private sector to follow the example set by the city with the goal of reducing carbon emissions from buildings. This work will be done by also introducing PV installations in city owned buildings and other assets towards net zero carbon standards. There are currently proposed pilots for installing Solar PV on city owned buildings which will form part of the BEA Programme activity. Lastly, the City is in the process of benchmarking energy, waste management, and water consumption in its own buildings. The study will inform which buildings will be prioritised for retrofits towards energy efficiency. The 2020 New Building Energy, C40 Municipal Buildings Programme, and Building Efficiency Accelerator Initiative for building retrofits will be used as levers to continue to enhance the work of the city towards owning, occupying and developing only assets that are net zero carbon in operation by 2030.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	In its concerted efforts to evaluate current energy demand and carbon emissions from its municipal owned and occupied buildings and identi- fy opportunities for reduction, the City of Tshwane is in the process of working with the Council for Sci- entific and Industrial and Research (CSIR) to construct an energy and water usage baseline study in about 50 of its city buildings. The idea is to get an estimate of the current energy and water consumption levels and, based on the final results, take executive decisions on the best way ahead in making the buildings energy efficient.	The study will commence in September 2018 and will be complet ed by December of this year. Once the decision has been made to go ahead with retrofits and refurbish- ment of buildings based on the baseline study, there will be mon- itoring in terms of performance of these buildings (pre and post retro- fits) to determine carbon emission reduced and also monitor savings from these initiatives. This will also assist in building a solid case for the city in prioritising net zero Carbon buildings because of the data avail- able from this exercise. The city intends to use the study to inform the development of baselines and plans to develop and implement energy consumption and emissions monitoring for all municipal buildings in Tshwane.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	For 2018/19, there are two base- line studies the city is working on, namely a baseline study in compli- ance of SANS 10400 XA, secondly buildings performance audits on energy, waste, and water manage- ment. There will also be a review of the Green Building Bylaw. It should be noted that the current bylaw and its review is aligned to the existing Green Economy Strate- gic Framework which was approved in 2014. This framework gives direction in terms of the City's aspirations for green buildings and low carbon development and provides strategies on how to achieve this, both for new and existing buildings. The review of the bylaw is expected to be fi- nalised and approved by the end of 2019. The progressive aspiration with all these studies is to accom- plishall major refurbishments, major renovations and retrofit: over 30% of municipal buildings will need to be retrofitted in the first year, 35% in the second year, with the balance of the city buildings in the 3rd year.	This will set the pathway towards achieving the commitment to 'own, occupy and develop only assets that are net zero carbon in operation by 2030.' For new buildings, the plan is to integrate the work through the bylaw so that by 2025 there is a requirement for an additional 25% ener- gy efficiency over and above then current levels. By 2030 the city will have further reviewed energy requirements in- crementally to a further 30% ener- gy efficiency, with an increased re- newable energy supply from on-site and/or offsite generation to reach net zero carbon new municipal buildings. It should be noted that the bylaw has to go through an approval processes and these aspi- rations in terms of percentage sav- ings towards net zero still need to be deliberated through stakeholder engagement and council.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- For all new buildings, C40 has embedded a technical resource who is helping the City for three years through the C40 South Africa Buildings Programme. The resource, enabled by financial support from C40, is enhancing the city towards pathways to net zero carbon through review of the By-Law and other key baseline studies linked to SANS 10400.

- For municipal buildings the City has just been approved for support through the Building Efficiency Accelerator (BEA). Work on retrofits and installation of PVs on Tshwane owned buildings is in the pipeline and will be partly based on this technical support.

- Additionally the city has just received support through the Clean Energy Technical Assistance from C40. The technical assistance is mainly to conduct a pre-feasibility in one of the city's buildings, see the feasibility, assess the financial viability and build a business case on the installation of Solar PVs that has a battery storage system. And the chances of replicating such to other city owned buildings.

- To increase resources for the NZC, the city does also have its own budget through the City Sustainability Unit in the Office of the Executive Mayor which is currently advocating for net zero carbon.

Vancouver

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	• Green Buildings Policy for Rezonings has specific GHG limits per unit area. Will be updated in 2021 and again in 2025 with zero emissions requirements for rezonings. • Building code has GHG limits per unit area for most building types and will be updated in 5 year increments so that it will require zero emissions from all new construction by 2030	• Incentives in place to support voluntary adoption of near zero emissions standards for new private developments • Ongoing expansion of the City's Neighborhood Energy Utility to new developments
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	• Building renovations must comply with new construction requirements; all equipment replacement post 2030 will need to comply with zero emissions requirements • The City's Existing Building Retrofit Strategy will be updated prior to 2020 to include policies and actions that will achieve 100% renewable energy for all buildings by 2050.	• Considerable research and industry capacity building will be required to enable this to happen effectively

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	• Zero Emissions Building Plan for new building as approved by Council in 2016.	• Renewable City Action Plan establishes a high-level road map to get all buildings to zero emissions; a more detailed Zero Emissions Buildings 2050 Plan to address existing buildings will be completed by 2020.
Develop a suite of supporting incentives and programmes.	• Zero Emissions Building Policy provides an extra 5% buildable area for voluntary adoption of Passive House or ILFI Zero Carbon standard.	• Numerous regulatory barriers to zero emissions building approaches have been removed (such as exempting increased wall thickness for increased insulation from permitted floor space calculations

ADDITIONAL MUNICIPAL BUILDINGS COMMITMENT	DESCRIPTION	
Own, occupy and develop only assets that are net zero carbon in operation by 2030.	• The City of Vancouver has been carbon neutral in its operations since 2012, including all buildings that it owns and occupies –thus meeting the declaration commitment. • Renewable Energy Strategy for City Owned Buildings approved by Council in 2016. All City-owned buildings will be zero emissions in their operations before 2040–eliminating the need for carbon offsets. The strategy is comprised of eight pillars, which will cumulatively result in a 100% reduction in emissions.	• New City owned developments must be built to Passive House or alternate near zero emissions standard beginning in 2018.

PILLAR #	PILLAR NAME	POTENTIAL GHG SAVINGS 2040 BAU vs 2015 (tonnes of CO_2e)	POTENTIAL GHG SAVINGS (%)
1	Zero Emission New	3,000	19%
2	Zero Emission Renewal	3,200	20%
3	Neighbourhood Renewable Energy Systems	5,800	37%
4	Energy Retrofits & Optimization	1,600	10%
5	Gas Conversion to High Efficiency Electric Heating	1,900	12%
6	Low Thermal Demand Retrofits	650	4%
7	On-site Renewables	800	6%
8	Renewable Natural Gas	1,700	11%
	TOTAL	**18,650**	**100%**

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Evaluate the current energy demand and carbon emissions from our municipal buildings, and identify opportunities for reduction.	• The City conducts annual energy and GHG emission benchmarking of all 130 buildings using EnergyStar Portfolio Manager. Energy and emissions are tracked quarterly as a part of internal reporting.	• As a part of capital renewal and maintenance planning, buildings are identified and scheduled for zero emission retrofits. This work is ongoing as a part of the Renewable Energy Strategy for City Owned Buildings.
Establish a roadmap for our commitment to reach net zero carbon municipal buildings.	• The Renewable Energy Strategy for City Owned Buildings identifies how each building will achieve zero emissions and the timeline for doing so • Three major opportunities –zero emission new buildings, zero emission renewals, and neighbourhood renewable energy systems –are estimated to achieve three quarters of the desired global emission reduction target. This is because a large portion of the civic building floor space is expected to be replaced with new (including completely renewed) zero emission facilities, which is generally cheaper and technically less complex than retrofitting existing buildings to such a high performance standard. In addition, many of the current biggest emitting civic buildings fall into existing or planned neighbourhood renewable energy systems, making their connection the biggest single opportunity to achieve cost-effective GHG reductions (about 37%).	The conversion from natural gas to electricity for space heating, energy retrofits & optimization projects and replacing natural gas with renewable natural gas will all make similarly significant contributions to the 100% renewable energy target.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

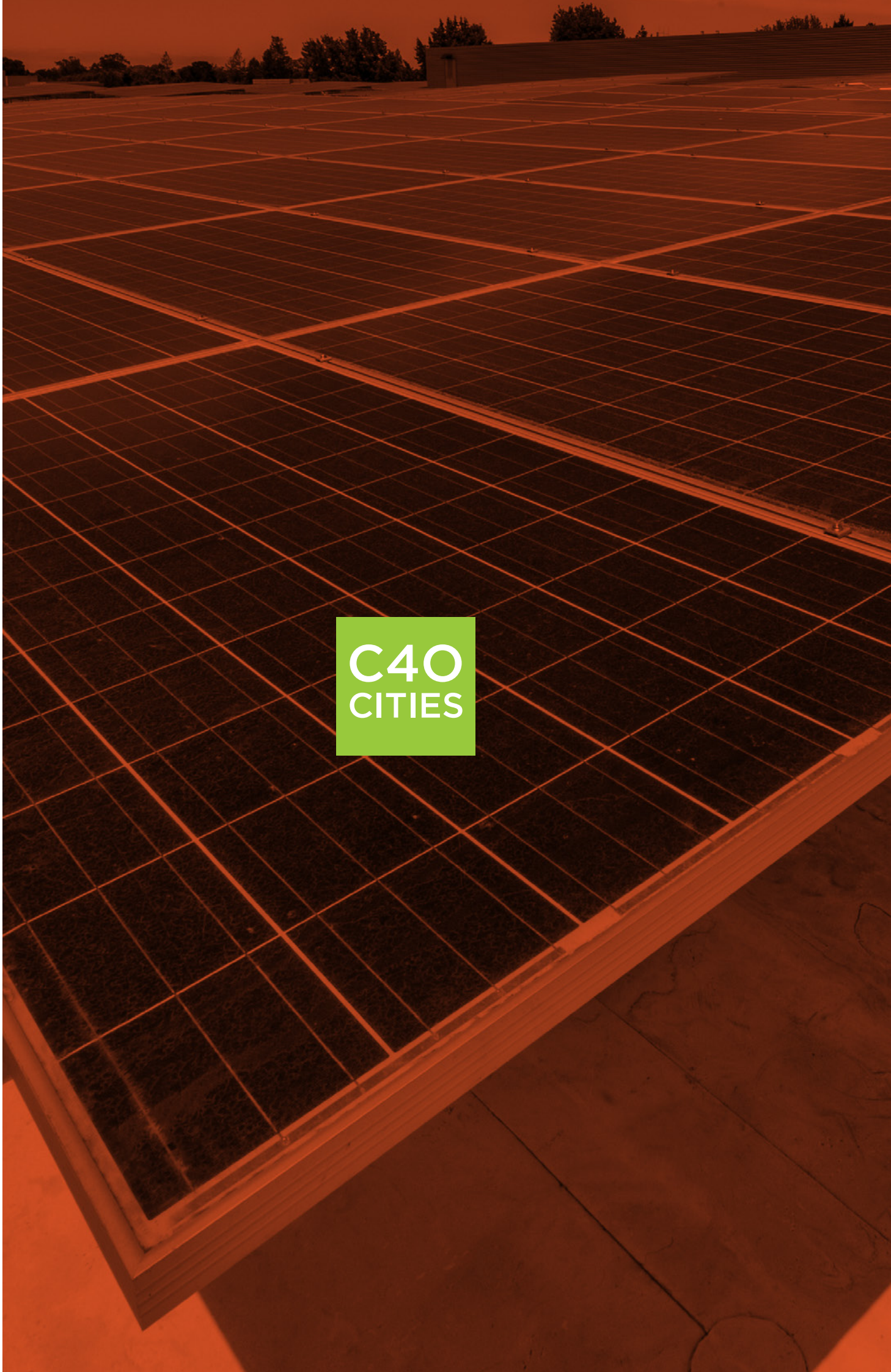
- $16M in energy retrofit and optimization projects in City building completed in last 10 years have resulted in 5,600 Tonnes CO2e/yr ghg reductions.

DECLARATION COMMITMENT	SPECIFIC EXAMPLES OF EXISTING OR PROPOSED REGULATIONS AND POLICIES	
Enact regulations and/or planning policy to ensure NEW buildings operate at net zero carbon by 2030.	The District's Clean Energy DC plan lays out a roadmap for adopting net-zero energy codes for residential buildings by 2022, and commercial buildings by 2026. As part of the pathway to net-zero energy codes, the 2018 DC Building Code (pending) will result in a 15% energy savings over existing code. It will	also include "Appendix Z," to provide code language and consistent modelling requirements for those seeking net-zero energy voluntarily. Between now and 2020, the District will work to develop incentives and technical assistance programs to encourage use of the standard.
Enact regulations and/or planning policy to ensure ALL buildings operate at net zero carbon by 2050.	To meet the District's goal of carbon neutrality by 2050, all buildings will have to operate at net-zero energy. Clean Energy DC identified a Building Energy Performance Standard (BEPS) as an essential policy on the pathway to cutting emissions from buildings. The proposed Clean Energy DC Omnibus Act would take effect in 2020 for private buildings over 50,000 square feet and DC-owned buildings over 10,000 square feet; the BPES would expand to include all buildings over 10,000 square feet by 2026. Under the proposed BEPS, all affected buildings would be required to meet the median ENERGY STAR score for their building type, either through a performance or prescriptive pathway.	Once fully implemented, the policy is estimated to reduce building energy consumption by approximately 20% and citywide GHG emissions by 12%. By 2023, the District must propose a strategy to shift the policy from one based on energy performance, to carbon. Key to this policy's implementation is providing robust technical assistance for building owners and operators, and aligning and crafting incentives to accelerate compliance ahead of the deadline.

ADDITIONAL SUPPORTIVE ACTIONS	DESCRIPTION	
Establish a roadmap for our commitment to reach net zero carbon buildings.	The District will complete a Deadline 2020 Plan by December 2020 which will include a pathway to zero carbon buildings that builds on the Clean Energy DC actions through 2032.	
Develop a suite of supporting incentives and programmes.	The District currently spends approximately $20 million per year on energy efficiency incentive programs delivered through the DC Sustainable Energy Utility and similar amount to support the deployment of solar energy that benefits low income residents through the Solar for All program. The District also offers PACE financing. Next year the District will launch the DC	Green Bank which will supplement these existing programs and provide low-cost financing for deep energy efficiency and renewable energy projects. All of these incentives programs, including technical assistance, will support compliance with the performance standards and building codes.

EXAMPLE OF FINANCIAL RESOURCES AVAILABLE TO DELIVER THE COMMITMENTS

- In July 2018, Mayor Bowser signed legislation creating the DC Green Bank which will use public funds to catalyse private sector investment in clean energy and energy efficiency projects. The Green Bank will be seeded initially with $7 million per year for five years. The Green Bank will be aligned and targeted to leverage other funding and financing sources, including the DC Sustainable Energy Utility, and the District's Property Assessed Clean Energy (PACE) financing program.


C40
CITIES