		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	. Tra	Increase Cycling/ Walking Infrastructure	Car Free Zones Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	pi do	New Residential	New Commercial	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	<u>6</u> 9	Solar PV Ground Mount	Expanded District Energy	Energy Storage	Wind	Renewable Natural Gas	Climate Shiff 6. Negative Emissions	Climate Shift 5: A Just and Equitable	
City Vancouver	Action Details Accelerate existing sustainable transportation target by 10 years so that by 2030, 2/3 of trips in Vancouver will be by active transportation and transit.		1	1		1										5																	
Vancouver	By 2030, 50% of km driven on Vancouver's roads will be by zero emissions vehicles.		1	1						1	1	1																					
Vancouver	By 2030, 90% of people live within an easy walk/ roll of their daily			1									1																				
Oslo	Carbon Accounting	1																															
Vancouver	By 2025, all new and replacement heating and hot water systems will be zero emissions.														1	1 1	l 1																
Vancouver	By 2025, all new and replacement heating and hot water systems will be zero emissions.														1	1		1	1														
Vancouver	By 2030, embodied emissions in new buildings and construction														1																		
Vancouver	projects will be reduced by 40% compared to a 2018 baseline. By 2030, restoration work will be completed on enough forest and coastal ecosystems in Vancouver and the surrounding region to																																
Vancouver	Proceed with the formation of the Climate and Equity Working Group according to the objectives, process, timelines, participants and budget described in this report.																															1	
Vancouver	Proceed with the development of a carbon budgeting and accountability framework for corporate and city-wide carbon pollution that meets the objectives described in this report.	1																															
Winnipeg	By 2030, achieve a 17% reduction in GHG emissions relative to total city emissions in 2011: Specifically, by 2030, the city will achieve a mode share of 50% auto-driver, 21% auto-passenger,		1	1		1	1	1																								1	
Winnipeg	15% public transit, and 14% walking/ cycling. By 2030, establish an active transportation network of 800 km.		1	1		1		1																								1	
Winnipeg	By 2030, electric vehicles should make up 8% of the total fleet of vehicles in the community of Winnipeg.		1	1						1	1	1																					
Winnipeg	The Brady Resource Recovery Centre's landfill gas collection system will be expanded over time and its methane collection efficiency will improve to 75%.																				1									1			
Toronto	By 2030, all new buildings will be built to produce near-zero GHG emissions.														1	1 1	1																

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Tra	merease cycling/ walking illiastructure	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	nici	Increase City Density	Increase Building Use Intensity	Chift 9. Emission	Cilmate Snirt 3: Emissions Neutral Buildings New Residential	New Commercial	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Roonop	ed District	Energy Storage	Wind	Renewable Natural Gas	Waste Heat Climate Chiff 6: Nogative Emissions	Climate Silit o. Negative Ellissions	
City Toronto	Action Details By 2050, all existing buildings will have been retrofit to improve energy performance by an average of 40%.														1	ס 1		1															
Toronto	By 2050, all existing buildings will have been retrofit to improve energy performance by an average of 40%.														1	1		1	1														
Toronto	Increase application of the Toronto Green Standard to new buildings.														1	1 1	1 1																
Toronto	Increase application of the Toronto Green Standard to retrofits.														1	1		1	1														
Toronto	Trigger applying the Toronto Green Standard when buildings are														1																		
Toronto	Retrofit multi-unit residential buildings pre-1984 (Tower Renewal+).														1	1		1															
Toronto	Retrofit multi-unit residences post-1984.														1	1		1															1
Toronto	Retrofit pre-1980 single family homes through the HELP+ program.														1	1		1															1
Toronto	Retrofit post-1980 single family homes through the HELP+														1	1		1															1
Toronto	Retrofit commercial and office buildings through the BBP+ program.														1																		
Toronto	Apply Toronto Green Standard to new buildings.														1	1 -	1 1																
Toronto	All commercial buildings are systematically recommissioned to ensure that the building systems are operating as intended.														1	1			1														
Toronto	Reduce dwelling unit size													1	1																		
Toronto	Reduce commercial floor space per employee.													1	1																		
Toronto	By 2050, solar PV is installed on all new buildings, providing 25% of the building's electricity.															1 -	1				1					1							
Toronto	By 2050, solar PV is installed on 75% of pre-2016 buildings.															1		1			1					1							
Toronto	Apply integrated solar thermal and solar PV systems to facades.																				1					1							
Toronto	Develop offshore wind turbines																				1								1				

City Toronto	Action Details CAFE Standards for Light-Duty Vehicles	Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	increase Cycling/ Walking Intrastructure	Car Free Zones	Car Share Enhanced Transit	Financed Hansit	Electrify commercial Vehicles	Electr	Electrify Municipal Fleet		Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retrofit Residential	Ketrofit Commercial Marove Industrial Efficiency		Reduce Waste	Heat Pumps		Air-source Heat Pumps	Solar FV Roontop Solar PV Ground Mount	Expanded District Energy	Energy Storage	wind Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
Toronto Toronto	Community Energy Planning (CEP) program considers energy early in the land use and infrastructure planning process for an area and identifying opportunities to integrate local energy solutions at the building and neighbourhood scale. Focusses on low carbon thermal energy and electricity generation Densification around transit included buses, LRT and subway, and within 500 m.											1								1						1					
Toronto	within 500 m. All areas that exceeded a heat density threshold of 140 MJ / m2 gradually have renewable district energy systems added to them until by 2050, 110 million m2 out of a total of 300 million m2 are																			1						1					
Toronto	Expand the use of renewable natural gas in district energy systems.																			1								1			
Toronto	In those areas that aren't served by district energy, natural gas heating is replaced with air source heat pumps. By 2050, 50% of residential building stock and 60% of the commercial building stock have air source heat pumps by 2050. Note that this goal depends on increased efficiencies in building envelopes and lighting.													1	1					1		1									
Toronto	Expand zero carbon district energy systems including: - deepwater cooling - captured waste heat - geothermal																			1			1			1			1		
Toronto	By 2025, 100 MW of energy storage will be distributed throughout Toronto, reducing the city's reliance on fossil fuels at times when renewable energy isn't available. This will increase to 1000MW by 2050.																			1							1				

	Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retrofit Residential	Retrofit Commercial	Climate Shiff 4: Renewable Revolution		Reduce Wasie	Heat Pumps	Geomermal Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy	Energy Storage	Wind Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
Action Details By 2030, natural gas consumption in the industrial sector will be reduced by 24%. By 2050, this will increase to 40%.														ı		1					1												
Improve industrial process efficiency.																1					1	ı											ļ
Expand the Smart Commute program which targets areas of the city with high VKT and provides personalized transportation		1	1	1																		ı											
Car free zones are established in Yorkville, Kensington Market, Chinatown, Downtown, the Entertainment District, and the Waterfront gradually beginning in 2017 and being completed in 2050.		1	1			1								ı								ı											
Achieve a state in which half of the employees in the city (i.e. community) work only four days per week. This is expected to result in a decrease in VKT of 15% (including some rebound traffic as those not working travel for other reasons). Note that this is not tele-working, this is a 3-day weekend.			1											ı								ı											
Expansion of transit includes 24 additional rapid transit lines, Regional Express Rail (RER+) adds stops at Richmond Hill and Milton (CP Freight Line), and the development of an express bus network across the city.		1	1					1						ı								ı											1
By 2040, all light rail, subway, streetcars and buses are electric.		1	1						1													ı											ı
By 2030, all new private vehicles are electric.		1	1								1											ı											1
Car Share		1	1				1															ı											1
Beginning in 2020 and by 2042 100% of the city's fleet is electric, excluding transit.		1	1									1										ı											
AVs are assumed to be adopted at the same rate as EVs, and are																						ı											ı
By 2030, 40% of heavy truck sales are zero emissions and 20% more are near zero emissions. By 2040, all conventional vehicle sales are phased out and only fuel cell, electric and plug-in hybrid trucks are sold. Additional petroleum fuels are eliminated for all modes, and by 2050 all liquid fuels are renewable.		1	1							1				ı								ı											
Two strategies will be applied to reduce energy use required by last mile of transportation of goods: relaxed delivery times (e.g. replacing "next day delivery" with "two day delivery") and the introduction of collection delivery points.			1																														

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		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electing Commercial Venicles Flortrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy	Energy storage Wind	Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City Toronto	Action Details 95% diversion by 2050.														Ö					1	1											
New York, NY	By 2020, New York City has committed to having 100 MW of energy storage.																			1								1				
Chicago, IL	Retrofit 40% of Chicago's residential housing stock by 2020 to reduce emissions by 1.44 Mtonnes.													1	1			1														
Chicago, IL															1			1														
Chicago, IL	Simplify and align the Chicago Energy Conservation Code with the latest international standards. Eliminate 1.13 Mtonnes of GHGs.													1	1	1	1															
Chicago, IL	Require renovations to existing commercial and residential buildings to meet these standards. Eliminate .31 tonnes of													1	1			1 1														
Chicago, IL	Increase the total number of rooftop gardens to 6,000 citywide by 2020, and plant more than a million new trees. These actions combined would result in .17 Mtonnes of emission reductions																														1	
Saskatoon	Create an electric and thermal energy consumption cap for new home construction by utilizing a municipal step code. Improve energy use intensity (EUI) and thermal energy demand intensity (TEDI) for new residential buildings, targeting net zero ready by													1	1	1																
Saskatoon	Require new homes to include roof solar Photovoltaic (PV) installations in the final year of a municipal step code. 5													1						1					1							
Saskatoon	Create an electric and thermal energy consumption cap for new ICI construction by utilizing a municipal step code. Improve energy use intensity (EUI) and thermal energy demand intensity (TEDI) for new residential buildings, targeting net zero ready by 2036.													1	1		1															
Saskatoon	Require new ICI buildings to include roof solar PV installations. In the final year of a municipal step code.													1						1					1							
Saskatoon	Incentivize and later mandate homeowners to perform deep energy retrofits													1	1			1														
Saskatoon	Incentivize and later mandate ICI owners and operators to perform deep energy retrofits													1	1			1														
Saskatoon	Require energy efficiency improvements residential and ICI building lighting systems.													1	1			1 1														
Saskatoon	Incentivize and later mandate homeowners to upgrade household appliances to energy and water efficient models														1			1														

		Climate Shift 1: Tools and Targets	ow Carbon City an		Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings		New Commercial	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps		Solar PV Ground Mount	Expanded District Energy Energy Storage	Wind	Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions
City	Action Details															1	<u>5</u>			1				1	1	1							
Saskatoon	Retrofit home heating and cooling systems with groundsource or air source heat pumps.			П													1			I				l '	ı	ı							
Saskatoon	Retrofit ICI heating and cooling systems with ground-source or air source heat pumps.															1	1				1 1	1		1	1	1							
Saskatoon	Increase the efficiency of industrial processes																1				1												
Saskatoon	Electrify personal vehicles through incentive programs, education, and automotive dealer partnerships		,	1 1								1																					
Saskatoon	Work with car dealerships to bring in more electric vehicles and provide maintenance support for those vehicles.		,	1								1																					
Saskatoon	Fund and implement improved cycling and walking infrastructure to		1	1 1		1																											
Saskatoon	Improve and expand waste management programs and services to increase reduction and diversion.			П																		1	1										
Saskatoon	Build complete, compact communities through infill development, mixed-use buildings, and compact housing.													1	1	1																	
Saskatoon	Focus development on densification in previously developed areas, increasing the number of multi-family buildings		,											1	1																		
Saskatoon	Encourage existing residential building owners and mandate new buildings to install solar PV system through programming and bylaw.															1	1	1		1		1					1						
Saskatoon	Encourage existing ICI building owners and mandate new buildings to install solar PV systems through programming and bylaw.															1	1		1		1	1					1						
Saskatoon	Increase Landfill Gas Capture from the Saskatoon Landfill																					1									1		
Saskatoon	Install new solar PV utility-scale facilities within or adjacent to city boundaries. With areas within city boundary to be prioritized first.																					1						1					
Saskatoon	Implement district energy systems in the downtown and north downtown areas.																					1							1				
Saskatoon Saskatoon	Construct a hydropower plant at the weir. Install renewable electricity storage over time																					1							1				
Saskatoon	Procure 1600 MW of renewable electricity from third party producers outside of Saskatoon.																					1							•	1			
Saskatoon	Import renewable natural gas to displace 50% of natural gas demand.																					1									1		
Saskatoon	Achieve a 5% reduction in emissions by implementing a vehicle pollution pricing program (coordinated with parking pricing) in high			1																													

City Action Details Saskatoon By 2009, active reduction and diversion rates of 90% for organics, 95% for plastics and 90% for paper, resulting in a total diversion of 70% of its waste from the landfill by 2023. Saskatoon Increase transit routes and frequency. Saskatoon Increase transit routes and frequency. Saskatoon Afforestation, Plant additional trees in residential neighbourhoods as well as unused areas such as boulevards, right of ways, including a result of the state of the s			Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrity Commercial Venicles	Electing Fersonal venicles Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retroit Residential	Improve Industrial Efficiency		Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	þe	Energy Storage	Wind	Renewable Natural Gas	Waste Heat	Shift 6: Negat	Climate Shift 5: A Just and Equitable
Saskatoon Saskat	-															딩					1	1											
Saskatoon Increase transit routes and frequency. Saskatoon Afforestalion, Plant additional trees in residential neighbourhoods as well as unused areas such as boulevards, right of ways, industrial areas, etc. Saskatoon Create an LED replacement program where all households get affordable free LEDs for household lighting. Saskatoon Implement a large-scale report stralegy that examines building envisione that commissioning, blower door testing, PACE infraoring, deep energy retroffits and provide retroff incentives to residential, industrial, commercial and institutional facilities. Saskatoon Use detailed smart meter water, gas and electricity data as a decision-making tool and to monitor building performance in city buildings. Saskatoon Complete strategic infill development including the N Downtown sustainable infill design. Saskatoon Implement a green fleet policy that includes life cycle considerations before procuring/ renting equipment and vehicles e.g. determine which vehicles and equipment are least costly after taking into account capital costs, maintenance costs, fuel costs, carbon pricing and GHG emissions. Convert city-owned buses, vehicles and equipment to electric (where reasible). Saskatoon Create a Feed-in-Tariff Program to allow customers who install renewable power to receive a price for the electricity they produce that reflects actual installation costs glue as rosts glues are some and the relection of the reflection of the electricity they produce that reflects actual installation costs glues are produced and the relection of the reflection of the remaind on dy facilities where appropriate, including 9 swimming pools.	Cuchatoon	95% for plastics and 90% for paper, resulting in a total diversion of																															
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City Saskatoon	Action Details Improve development standards to become more efficient, and encourage density. E.g. allow pipe sizes to be increased, but do not		1										1			Cli																	
Saskatoon Saskatoon	allow more pipes to be put in. This will reduce sprawl. Champion carpooling, ridesharing and car sharing programs. PAYT - Pay as you throw utility + city wide organics combined for single family dwellings. Also adopt variable unit pricing for garbage, with relatively low costs for small bins/ amount of waste and high costs for large bins.		1	1				1														1	1										
Saskatoon	Make changes to building code to advance building energy performance, renewable energy infrastructure and energy production within the city. Zoning bylaw exemptions should be made for set back and encroachment requirements for insulation retrofits.														1	1			1	1													
Saskatoon	Develop Community Energy Plans (CEPs) for new growth areas and regional centres to detail energy use requirements, establish a plan to reduce energy demand, consider alternative forms of energy generation, and improve building efficiencies and siting.														1							ı											
Saskatoon	Support energy and water efficiency audits on an annual basis for all commercial and/ or multi-unit residential buildings.														1	1			1	1		ı											
Saskatoon	Transition 2050 - High energy poverty program that will provide incentives (resources/ technical assistance) specifically to low															1			1	1												1	
Saskatoon	income households. Incentive program for implementing energy efficiency in affordable housing, the project is a corporate-owned initiative; the emissions reductions will fall to community (owned by Sask Housing Authority - Provincial body).														1	1			1													1	
Saskatoon	Mandate new civic buildings and retrofit projects to divert a specific percentage of their construction waste from the landfill and reuse a certain percentage of building materials in redevelopment projects.																					1	1										
Saskatoon	Implement bylaw-based organics waste program for multi-unit residences.																					1	1										
Saskatoon	Consider opportunitiws to process organic waste (and waste water) using anaerobic digestion/ methane digesters.																					1							1				
Saskatoon	Increase support for Recovery Park by setting up facilities so that used materials are made available for reuse or upcycling, swap and share, as well as providing recycling and re-use options for construction and demolition waste.																					1	1										

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrity Personal Venicles	Liecuiny Municipal Fleet	increase City Density Increase Building Hee Intensity	moreage building Ose interiorly	Climate Shift 3: Emissions Neutral Buildings		New Commercial	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooltop	Expanded District Energy	Energy Storage	Wind	Renewable Natural Gas	Waste Heat	Shift 6: Negat	Climate Shift 5: A Just and Equitable
City Saskatoon	Action Details Create a model low carbon neighbourhood that includes renewable energy generation, public and active transportation networks, mixed-use zoning, urban agriculture, green buildings, district															1																		
Saskatoon	energy and green space. An existing neighbourood adopts a "Smart City" pilot that includes a smart grid, smart metres, battery storage (including electric vehicles), and smart transport networks. The program would be organized and run by the municipality; neighbourhood residents and businesses would implement and take advantage of incentives.																																	
Saskatoon Saskatoon	Install CHP in municipal buildings and city hospitals. Expand community, allotment, vacant lot and boulevard gardening opportunities. Designate and reserve uncontaminated land in each neighbourhood for intensive food production. Create incentives for farmers to use this land and for people to obtain their food from these sources.																																	1
Seattle, WA Berkeley, CA	Ban natural gas lines from new homes - legislation to be introduced Ban natural gas lines from new homes																																	
Toronto Saskatoon	95% of methane produced from anaerobic digestion and compose is captured for use as biogas (renewable natural gas). Supply electric vehicle charging at all City facilities.		1	1								1										1									1			
Saskatoon	Improve efficiency and collection of landfill gas collection/ generation system where feasible.																					1									1			
Saskatoon	Sponsor Work from Home policies within the corporation and the broader community.			1																														
Saskatoon	Increase the power-saving settings on all computers in the corporation, and the broader community.																																	
Saskatoon Saskatoon	Reduce the number of vending machines in city facilities. Right-size city vehicles.			1																														
Saskatoon	Perform route optimization for city vehicles.			1																														
New York, NY	By the end of 2019, there will be almost 200 solar installations on city buildings, totalling over 25 MW.																					1					1							
New York, NY	Focuses on energy use intensity. Applies only to city buildings that are either new constructions, building additions or major repoyations															1 1	1	1	1	1														

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Commercial Vehicles	Electrity Personal Venicles	Increase City Density	moreage building Ose mensity	Climate Shift 3: Emissions Neutral Buildings	9	New Commercial		Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Heat Pumps	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy	Eller gy Storage	Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable	
City New York, NY	Action Details Focuses on LEED certification.		ОШ											ا 1 1	5 1 1	1	1	1																,
	Compels the city o pass a stretch code in 2019 that is at least 20% more stringent than the state code.																																	
New York, NY	The City will create legislation requiring all large buildings to limit fossil fuel use long-term below intensity targets by 2030 and 2035.												•	1 1	1 1	1	1	1																
New York, NY	Beginning in 2015, the City allocated 2.7 billion to retrofit Cityowned buildings. This must be accelerated to achieve a 20% deeper reduction in energy consumption by 2025.												•	1 1	1		1	1																
New York, NY New York,	Requires commercial and multifamily building owners to conduct four above-code energy-saving actions: - Local law 87 of 2009 mandates that buildings >50,000 sq ft undergo periodic energy audit and retro-commissioning measures. - NYC Local Law 88 of 2009 requires lighting retrofits to meet current NYCECC standards and to install electric sub-meters for each tenant space. - Local Law 33 of 2018 requires building owners subject to the city's benchmarking ordinance to display an "energy efficiency grade" at each public entrance of the building. - Intro 1253 regulates emissions from buildings larger than 25,000 sq ft on an annual basis and subjects those properties to penalties for excessive emissions. Buildings are classified by "type", and for each type, the sq ftage is multiplied by an acceptable emissions intensity factor. Sometimes these factors are subdivided by fuel type, and they change over time out to 2050. By 2050 City conducts energy audits and retrofit evaluations in its own building stock, and funds those with the most potential first.													11 1 1	11 11 11	1		1																
New York, NY New York, NY	Launch a Commercial Property Assessed Clean Energy (C-PACE) program to finance clean energy and energy efficiency upgrades at This is an incentive for energy efficiency upgrades in affordable housing projects.												,	1 1	1		1	1															1	
New York, NY	Passed in 2015 and prohibits stores from leaving doors or windows open while air conditioning is running.																																	

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings Climate Shift 3: Emissions Neutral Buildings	New Commercial	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy Storage	Wind	Renewable Natural Gas	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City New York, NY	Action Details Deptmt of Cultural Affairs redistributes reusable materials, city agencies and public schools to divert them from landfills.		ОШ													i					1	1									
	Creating a new position to work with cultural organizations to help them reduce their energy costs, with the view that they're reducing their own costs, as 25% of the funding from this deptmt to cultural organisations goes to energy costs.			ı																											
New York, NY	NYC Food Policy diverts organic waste from landfill through its work with agencies, rescue organizations, food businesses, and residents. It also encourages the procurement of sustainable and local products.																				1	1									1
New York, NY	NYC partners with the City University of NY to lead collaboration with NY State and city agencies, utilities and industry to integrate solar and storage into NY infrastructure. This results in more people skilled to deploy these technologies in the City.																				1				1		1				1
New York, NY	The Office of Environmental Remediation is expanding its materials exchange program to include promoting local reuse of surplus material resources generated during construction. This will reduce GHG emissions from transportation, and provide building materials																				1	1									
New York, NY	to construct flood control structures that will increase resilience. Programs include: - NYC Retrofit Accelerator and Community Retrofit NYC programs assist 4,000+ buildings in identifying energy and water saving retrofit opportunities and connecting to financial and technical resources. - NYC Carbon Challenge voluntary leadership program works with 100+ companies and organizations that have committed to 30, 40 or 50% reductions in GHG emissions.															1 1		1	1												
	The City will work to expand these and launch a new program to support the real estate industry to implement low energy design for new construction and substantial renovations. The Clty will also release a free planning tool for high performance energy retrofit strategies for existing large buildings to achieve deep energy reductions.																														

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrif	Electrify Commercial Vehicles	Electrity Personal Venicles	Lieculiy mullicipal Fleet	increase City Density Increase Building Hee Intensity	moreage building Ose interiorly	Climate Shift 3: Emissions Neutral Buildings		New Commercial	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	ed District I	Energy Storage	Wind	Renewable Natural Gas	Waste Heat Climate Shiff 6: Negative Emissions	Olimpto Olik F. A 1104 and Emissions	Climate Shift 5: A Just and Equitable
City New York, NY	Action Details All buildings > 25,000 sq. feet are already required to report annual energy and water consumption. As of Oct 2020, these buildings must also obtain an Energy Star evaluation and post an "energy grade" at the building entrance.															1 1				1														
New York, NY	Upgrade buildings to passive house standards.															1 1				1														
New York, NY	Catalyze adoption of high-efficiency electric heat and hot water systems paired with appropriate efficiency measures in buildings through policies and programs.															1 1			1	1														
New York, NY	The Department of Design & Construction is developing a new Construction Excellence program to ensure city contractors have the necessary skills to build low-energy facilities.															1 1	1	1																1
New York, NY	Expand the use of building envelope commissioning.	Ш														1 1			1	1														
New York, NY New York,	Advocate for more stringent efficiency standards for appliances and vehicles at the regional and national levels. Improve the subway and bus systems.		1	1					1																									1
NY New York, NY	Create 50 new miles of protected bike lanes per year.		1	1		1																												
New York, NY	Expand bike share program sufficiently to double the number of active cyclists by 2020.																																	
New York, NY	Support shared mobility options, to reduce personal and comercial vehicle miles traveled.		1	1				1																										
New York, NY	Expand smart parking policy that prioritizes access to curb space.		1	1								1																						
New York, NY	Create low emission zones that limit access in the city for the worst polluting vehicles.		1	1			1																											
New York, NY	Fire departtment has idle reduction or stealth technologyy on 26% of ambulances. This will be increased to 46% by end of 2019.			1																														
New York, NY	Implement city-wide organic waste collection. In 2017, it served 2.5 million residents. By the end of 2018, it was to serve the whole city through curbside pickup and dropoff sites.																					1	1											
New York, NY	Processes to get approvals for alterations and energy efficiency measures such as triple pane windows, HVAC equipment and solar panels are being simplified.																																	

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transporta	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car share	Enhanced Transit	Electrify Fransit Flectrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy Energy Storage	Wind	Renewable Natural Gas	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City New York, NY New York,	Action Details Enhance curbside collection in NYC by implementing a zone-based system for commercial waste, offering single-stream recycling, and developing a blueprint for a Save-as-you-Throw program. Explore feasibility of mechanisms that pool purchasing power of		ΟÜ													Clir					1	1										
NY	residents and businesses to procure additional low-cost renewable energy.																															
New York, NY	Increase energy storage for renewably-generated electricity.																				1							1				
New York, NY	The City will invest a minimum of \$10 million to install 50 fast charging hubs across all five boroughs by 2020 with at least one in each borough by 2018.		1	1							1 1	1																				
New York, NY	The City will explore the role of electric car share.		1	1				1			1	1																				
New York, NY	The City will explore producing zero- and low-emissions freight vehicles.		1	1							1	1																				
New York, NY	Development of retail alternative fueling facility in Hunts Point to offer alternative fuels (compressed natural gas, biodiesel, ethanol, and truck stop electrification positions) to reduce diesel truck traffic.			1																												
	Expand the Off-Hour Delivery program to reduce peak period congestion and related GHG emissions.																															
New York, NY	Achieve a 50% reduction in fossil fuel consumption in the City's vehicle fleet by 2025 by continuing to upgrade and replace with clean fuel vehicles.			1																												
New York, NY Washington, DC New York, NY	Replace petroleum-based diesel with biodiesel wherever possible. (This program began in 2007.) Implement a Building Energy Performance Standard requiring deep energy retrofits in existing buildings. Connect green building retrofits to workforce development initiatives.			1											1	1			1 1 1 1													1
New York, NY	Provide energy use information to more building owners, managers, staff, tenants and residents, including by requiring energy disclosure at point of sale and energy grades for large														1	1			1 1													
New York, NY	Promote the development of community energy projects, including microgrids and district systems to provide social, environmental and economic benefits.																															1

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy	Energy Storage	Wind Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City New York, NY	Action Details Expand capacity for material and renewable energy recovery at water supply and wastewater treatment facilities, including by optimizing biogas production for beneficial use, expanding food waste co-digestion opportunities, and moving toward net-zero energy at all in-city wastewater treatment plants while reducing fugitive emissions and landfilling of biosolids.													S					1									1		
New York, NY	Assess consumption-based GHG accounting methods to complement the current GHG inventory methodology.	1																												
New York, NY	Partner with manufacturers and industry stakeholders to ensure availability and competitive pricing of high-efficiency construction materials, renewable energy technologies, and energy efficiency technologies.												1																	1
New York, NY	Collaborate with City agencies, universities, unions and trade organizations to ensure NYC workforce is prepared to deliver on climate objectives.																													1
New York, NY	Actively participate in the NY Independent System Operator's (NYISO) exploration of carbon pricing in electricity markets and continue to advocate for aggressive federal regulation of carbon.																													
New York, NY	Community events use compostable and recyclable products that meet the city's Environmentally Preferable Purchasing guidelines.																		1	1										
New York, NY New York, NY New York, NY	Replace all lightbulbs in city buildings, facilities and parks with LEDs. Actions that improve local air quality will be carried out first in neighbourhoods that have the most air pollution. Minimize and mitigate risks of actions resulting in reduced housing affordability or access.												1	1			1													1
New York, NY New York, NY	Engage with communities to ensure actions are anchored in community priorities and needs. Align efforts to address climate change with efforts to address diminished health outcomes, economic opportunities and quality of																													1
New York, NY	Target the most at-risk communities when planning resilience and adaptation programs for the city.																													1
Basel, Switzerland	There is a law which is saying, that 50% of warm water use has to be produced with renewable energy within the next 15 years: new buildings, schools, restaurants, hospitals, indoor swimming pool etc.																													

Climate Shift 5: A Just and Equitable	1
Waste Heat	
Renewable Natural Gas	
Wind	
Energy Storage	
Solar PV Ground Mount	
Solar PV Rooftop	1
Air-source Heat Pumps	
Geothermal	
Heat Pumps	
Reduce Waste	
Climate Shift 4: Renewable Revolution	1
Improve Industrial Efficiency	
Retrofit Commercial	
Retrofit Residential	
New Commercial	1
	1
Climate Shift 3: Emissions Neutral Buildings	1 1
Increase Building Use Intensity	
Increase City Density	
Electrify Municipal Fleet	1
Electrify Personal Vehicles	1
Electrify Commercial Vehicles	1
Electrify Transit	
Car Share	
Car Free Zones	
Increase Cycling/ Walking Infrastructure	1
Transportation Marketing	
Transportation	1
Climate Shift 2: Low Carbon City and Zero Emissions Transportation	1
Climate Shift 1: Tools and Targets	
	n ol e
on Details has Revolving Loan Funds available for energy efficient	pment upgrades and building retrofits. to reduce 10% from the motorized traffic on city street between and 2020: walkability/bikeability strategy, tram 2020, limited ing space, parc&ride beyond the city boundary, priorising ic transport, street hie-rarchy (speed 50-30-20km/h). Parking for electric vehicles. Passe San Francisco's canopy cover by 25% (50,000 trees) by 20. The City's Urban Forest Plan focuses on improving the th and sustainability of the urban forest by protecting and anding the city's tree population and recommending increased ing for street tree planting and maintenance. Pugh the City's adoption of the International Green Construction e, the City of Baltimore now requires all new construction lings to incorporate onsite renewable energy generation into buildings. The City uses 11 megawatts of solar energy. Jose Clean Energy is a program that enables San José to pool electricity demand of the entire city and develop and/or bulk-hase renewable power on behalf of the residents, businesses, government electricity users within our jurisdiction. Being a ice entity, SJCE will be subject to the rules of transparency, in meetings, notices, and other protections provided by law. E will be completely ratepayer funded. This means that only e who use the service will pay for it, but it will make carbon-free tricity available to all users in San José. Having direct ership and control over our electrical power allows us to be the ing edge of California's renewable energy transformation. From 8, SJCE will allow us to have carbon-free electricity with a ficant share of renewable energy — at least ten percent more PG&E — combined with low-carbon sources such as large opower. There are many other actions discussed in the Climate art San José plan.
	equipr Law to 2010 a parcin public Free p Increa 2030. health expan fundin Throug Code, buildir their b San Jo the ele purcha and go public open r SJCE those electri owner leadin 2018, signific than F hydrop

Salt Lake

Switzerland

City, UT

Basel,

Oslo

San

CA

MD

Francisco,

Baltimore,

San Jose.

City **Action Details** Washington,

The District's Renewable Energy Portfolio Standard (RPS) requires electric suppliers to source a percentage of their electricity from solar (thermal or pv) located in the District through the purchase of Solar Renewable Energy Credits (SRECs). In 2016, Mayor Bowser signed legislation to expand the RPS to 50% by 2032 and the local solar requirement to 5% by 2032. SRECs provide the owners of solar energy systems a substantial source of revenue. Modeling in the Clean Energy DC plan suggests the additional generation spurred by the local solar RPS requirement will result in 87,000 less MTCO2e in 2032, as compared to business-as-usual. Additionally, the legislation creates the Solar for All Program to reduce, through solar power, at least 50% the electric bills of at least 100,000 of the District's low-income households by 2032. In Fiscal Year 2017, DOEE announced \$13M in funding under this program to install solar on multifamily homes, commercial buildings, non-residential surface spaces, low-income single-family homes, small businesses, and owner-occupied nonprofits. Sustainable DC has a goal to build 1,000 new residential and commercial renewable energy projects between 2006-2032; in 2017 alone, the District added over 685 systems totaling 15.2MW AC.In 2015, DC Water completed construction and began operating a cogeneration facility which uses thermal hydrolysis and anaerobic digestion to generate ~10 net MW of electricity, enough to power a third of the facility's operations (see also in government operations strategy)Net metering is currently available to DC's residential and commercial customer-generators with systems powered by renewable-energy sources, combined heat and power (CHP), fuel cells and microturbines, with a maximum capacity of 1 megawatt (MW). The term "renewable energy sources" is defined as solar, wind, tidal, geothermal, biomass, hydroelectric power and digester gas. In 2013 the Community Renewable Energy Amendment Act of 2013 was enacted to allow renters and other District residents and businesses who are unable to install PV solar panels on their own

roofs to use a "virtual" net metering program to purchase solar

energy from systems installed elsewhere in DC.

Transportation Marketing

Increase Cycling/ Walking Infrastructure

Car Free Zones

Enhanced Transit Electrify Transit

Electrify Commercial Vehicles

Electrify Personal Vehicles Electrify Municipal Fleet Increase City Density

Increase Building Use Intensity

Climate Shift 3: Emissions Neutral Buildings

New Residential

Retrofit Residential Retrofit Commercia

New Commercial

Improve Industrial Efficien

Air-source Heat Pumps Heat Pumps Geotherma Shift 4: Renewable Revoluti

Solar PV Ground Mount

Solar PV Rooftop

Expanded District Energy

Energy Storage

Renewable Natural Gas

Climate Shift 5: A Just and Equitable Climate Shift 6: Negative Emissions

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify I ransit Flectrify Commercial Vehicles	Electrify Personal Vehicles	Increase City Density	Increase Building Use Intensity	Buildings Climate Shift 3: Emissions Neutral Buildings	New Commercial	Retrofit Residential	Retrofit Commercial	ē	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop Solar PV Ground Mount	Expanded District Energy	Energy Storage	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
y nver, CO	Action Details Building energy efficiency is a key component of the City's efforts to achieve Denver's 2020 Sustainability and Climate Action Plan goals of reducing greenhouse gas emissions below 1990 levels by 2020 and by 80 percent by 2050. Energize Denver aims to reduce the energy consumption of large buildings by 10 percent by 2020 and 30 percent by 2030. Denver's benchmarking ordinance requires owners of buildings over 25,000 square feet to annually benchmark													1 1		1	1												
shington,	for the District as part of an initiative to research innovative tools for financing clean energy projects. The Mayor introduced legislation,																												
ronto	and in June 2018 the DC Council passed the District of Columbia Green Finance Authority Establishment Act of 2017. In 2013, City Council approved the first Strategic Forest Management Plan (2012-2022): Sustaining and Expanding the Urban Forest. The Plan highlights six strategic goals to protect and improve the urban forest, including the goal to expand tree canopy cover to 40%, achieve equitable distribution of canopy cover and increase biodiversity in Toronto.																											1	
aris, rance	Paris in the hydrogen eraThe growth of the electric car market foreshadows the development of hydrogen – currently a rapidly expanding sector for vehicle energy storage and supply applications. To maintain this momentum and ensure the development of renewable hydrogen supplies (produced by water electrolysis), the City of Paris will draft a hydrogen development strategy. This will incorporate support for research into the development of the most innovative technologies, an adapted low-carbon production process, an extensive and safe distribution system throughout the entire area, an information policy for territorial stakeholders and a monitoring system for hydrogen consumption.			1																									

Increase Cycling/ Walking Infrastructure		
Transportation Marketing		
Transportation		1
Climate Shift 2: Low Carbon City and Zero Emissions Transportation		
Climate Shift 1: Tools and Targets		
Action Details	1. Develop the "Taipei City Commercial & Industrial Sectors Energy Efficiency & Carbon Reduction Ordinance": Through legal means, checking and testing indoor air temperature and lighting equipment in industrial and commercial workplaces are conducted to regulate their energy use behaviour.2. Counselling and assessment in energy efficiency for commercial & industrial sectors: For major power users, it provides expertise counselling and delivers suggestive reports to guide them on improving energy efficiency.3. Developing the "Principle of Taipei City Industrial and Commercial Energy Saving Subsidy": For those enterprises who embrace energy conservation voluntarily and have over 100 kW electricity demand on contract capacity, we provided counselling service for the managements and improvements of electricity, lighting, air conditioning and heat system. The government attempts to encourage business and industry to introduce smart energy-saving systems and improve energy use efficiency. Moreover, itsupports the development of the domestic green energy industry. There were 1189 cases fulfilled, electricity saving up to 57.4 million kWh, equivalent to reduce the GHG emissions about 31,650 metric tons.	Implementation of the Telework modality in the city of Rio de Janeiro. Improvement of the quality of life of the citizen, with the reduction of bottling rates and, consequently, of the reduction of greenhouse gas emissions, by means of example and incentive to the initiatives of telework in the private sector. The City of Providence has earned the U.S. Department of Energy's Silver SolSmart designation for The City's effors to reduce barriers to going solar. SolSmart is a program that offers technical assistance to local governments in order to promote widespread solar implementation in the United States. Providence helps homeowners and businesses transition to solar by minimizing certain costs pertaining to zoning, planning, permitting, inspection, and customer acquisition. Providence supports solar implementation through its zoning codes, staff training programs on solar PV permitting and inspection, and efforts to work more broadly with the State of Rhode Island to develop solar programs.

Taipei

Rio de

Janeiro

for participation in the SolSmart Program.

All of these qualities helped make Providence a strong candidate

Car Free Zones

Electrify Transit

Electrify Commercial Vehicles Electrify Personal Vehicles Electrify Municipal Fleet Increase City Density

Increase Building Use Intensity

New Residential

New Commercial

Climate Shift 3: Emissions Neutral Buildings

Retrofit Residential

Retrofit Commercia

mprove Industrial Efficie

Air-source Heat Pumps

Heat Pumps Geotherma Solar PV Rooftop

Solar PV Ground Mount Expanded District Energy

1 1

Renewable Natural Gas

Climate Shift 5: A Just and Equitable

Climate Shift 6: Negative Emissions

New Residential		1	1
Climate Shift 3: Emissions Neutral Buildings		1	1
Buildings			1
Increase Building Use Intensity			
Increase City Density			
Electrify Municipal Fleet			
Electrify Personal Vehicles			
Electrify Commercial Vehicles			
Electrify Transit			
Enhanced Transit	1		
Car Share			
Car Free Zones			
Increase Cycling/ Walking Infrastructure			
Transportation Marketing			
Transportation	1		
Climate Shift 2: Low Carbon City and Zero Emissions Transportation	1		
Climate Shift 1: Tools and Targets			

New Commercial Retrofit Residential

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Retrofit Commercia

Improve Industrial Efficie

Air-source Heat Pumps

Heat Pumps Geotherma Solar PV Rooftop

Expanded District Energy

Solar PV Ground Mount

Renewable Natural Gas

Climate Shift 6: Negative Emissions Climate Shift 5: A Just and Equitable

City Action Details

Phoenix, AZ Transportation 2050, approved by the voters, is a \$32B transportation that that will reduce transportation emissions by 80%

by 2050 through tripling of the light rail, increase bus a rapid bus service and encouraging other sustainable modes of transportation. On June 4, 2018, Piedmont's City Council decided to opt-up all residential electricity accounts into East Bay Community Energy's (Alameda County's new Community Choice Aggregate) 100%

Piedmont, MD

Renewable Energy option. This energy plan will begin providing 100% renewable energy to customers in November 2018.

Residential Energy Conservation Ordinance (RECO) leading to 2.5% improvement in energy efficiency in the residential sector.

San Francisco, CA Freemont,

CA

Under the 2016 California Energy Code, new residential and nonresidential developments must be designed to be "Solar Ready" by providing for a solar zone and a solar pathway that will enable future solar installations. In order to expedite the adoption of solar technologies, the City of Fremont adopted an energy requirement that goes beyond the minimum provision of solar readiness to require the mandatory installation of solar photovoltaic (PV) systems in new residential developments. Prescriptive minimum solar PV system sizes are required for residential buildings with up to 4,499 sq. ft. of conditioned space. For buildings 4,500 sq. ft. or above, solar PV systems must be sized to meet a minimum percentage of total building "time dependent valuation (TDV)" energy use. Alternative renewable energy systems including ground-mounted or carport solar or wind energy systems may be considered. Developers may also achieve compliance with the ordinance by meeting the energy efficiency standards established under the CALGreen Building Standards Tier 1.In addition to meeting minimum system sizing requirements, developers must provide solar readiness beyond the minimum required system sizes. Developers must also offer expanded system sizes to potential buyers. Developers are encouraged to consider expandable solar technologies and to design for all-electric building energy systems.

Climate St	Retrofit Residential Retrofit Commercial Improve Industrial Efficiency Climate Shift 4: Renewable Revolution Reduce Waste Heat Pumps Geothermal Air-source Heat Pumps Solar PV Ground Mount Expanded District Energy Expanded Storage Wind Renewable Natural Gas Waste Heat Climate Shift 6: Negative Emissions Climate Shift 5: A Just and Equitable					
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Climate St. Climat	^					
Climate St.	Energy Stor					
Climate St.	Expanded District En					
Climate St.	Solar PV Ground Mount					
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Increa	Climate Shift 4: Renewable Revolution					
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Increa Increa	Retrofit Commerc					
Climate Str.	Retrofit Residential					
Climate 3	New Commercial					
Climate St.	New Residential					
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Climate S. Emission of the control o	Buildings					
	Increase Building Use Intensity					
Climate S Emission	Increase City Dens					
Climate & Emission	Electrify Municipal Fle					
Climate & Emission 1	Electrify Personal Vehicl					
Climate 3 Emission Increa	Electrify Commercial Vehicl					
Climate 8 Emission	Electrify Tran					
Climate Emission Increa	Enhanced Tran					1
Climate 3 Emission	Car Sha					
Climate S Emission 1	Car Free Zon					
Climate 8 Emission	Increase Cycling/ Walking Infrastructu					
Climate 8 Emission	Transportation Marketi					
Climate 8	Transportat					1
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City Paris,

France

Action Details Towards a reduction in aviation emissionsThe aviation industry alone represents 2% of worldwide CO2 emissions – if it were a country it would have the 10th highest emissions in the world. Because of strong growth (a 70% increase in 2020 as compared to 2005), this industry is one of the biggest contributors to climate disruption. In Paris, it was responsible for 23% of greenhouse gas emissions in 2014, which is close to one-quarter of all emissions in the city. Without government intervention, emissions from air travel are likely to increase and even triple by 2050. This will further magnify the impact of climate disruption and undermine contributions to the energy transition in other industries. On the international stage, the City of Paris will advocate for the inclusion of emissions from aviation fuels in the Paris Agreement. This is the only way to document these emissions, and will require operators to take responsibility for their impact. At the same time, by 2020, the City of Paris, in collaboration with the C40, will call on the International Civil Aviation Organisation (ICAO) to require airlines to make binding fuel efficiency commitments. They must become more ambitious than just committing to carbonneutral growth, such as introducing a universal carbon tax on airports. Given the importance of air traffic at the global level, Paris will call on manufacturers and suppliers of aeronautical equipment to improve the technical performance and fuel efficiency of engines and fuels by 2030.

Lahti

Lahti Energy is involved in cooperations with companies, e.g. with Fazer Mills, milling by-products (oats husks) are utilized as energy. Lahti Energy delivers hot water and steam to Polttimo, a malting company, from the steam plant built in 2016 on the Polttimo premises, which mainly uses woodchips.

San Francisco, CA • Improved public transportation information• Provide transit passes for all new development• Continue parking cash out program• Promote transit oriented development in priority development areas• Require hotel visitor transit passes• Expand participation in the SF's rideshare 511 program• Increase distribution of employee/students transit passes• Coordinate commuter shuttles• Develop neighborhood travel choice programs• Expand SFGO signal synchronization program• Expand SFPark meter demand pricing program• Implement variable road pricing in downtown

Point South Bronx Clean Truck Program (HPCTP)The nitral goal is to provide funding to accelerate the of vehicles which use low-carbon alternative fuels or particles of far, they have secured \$24 million through the ling / heating is forbidden Ip with Metrolinx, the City delivers Smart Commute rogram that engages businesses to promote commuting options such as carpooling, cycling and to their employees. By reducing single occupant and promoting sustainable alternatives, Smart elps to improve air quality, reduce greenhouse gas and reduce congestion across transportation modes cularly during peak periods. In 2016, Smart Commute nered with 52 major employers at 91 work sites, lover 265,000 commuters. Over 71.5 million litres of stormwater – equal to 8,850 and swimming pools – have been diverted from the City's may green roofs funded through the Eco-Roof orgram. Using fees paid by developers who pay cash-ining a green roof, the program funds the voluntary of green roofs and cool roofs. In addition to retaining eco-roofs mitigate the urban heat island effect, reduce umption and greenhouse gas emissions, improve air uality, enhance green space and biodiversity and tat for pollinators. Altogether, eco-roofs also make the sillent to climate change and flood risks. More than 270 e been completed, totalling over 6 million square feet of space, equal to 70 Canadian Football League fields. lese eco-roofs reduce energy consumption by an 167 mega-watt hours, avoid 218 tonnes of greenhouse as and divert 10.6 million litres of stormwater, of more than four Olympic-sized swimming pools. In 68 new projects were completed, totalling over 1.29 refect of retrofitted space. Each year, they will reduce temption by 247,900 kWh, avoid 46 tonnes of GHG and divert 88,680 litres of stormwater. See of more than 5 GWh heat or more than 0.5 GWh revear, there has to be done an analysis where energy d. It is expected, that 10% energy can be saved		ft 2: Low Carbon City a	anspor	Transportation Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity		L Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retrofit Residential	Retrofit Commercial	٦ Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy	Energy Storage	Wind	Renewable Natural Gas	Waste Heal	Climate Snit 6: Negative Emissions Climate Chiff E: A list and Equitable	Ollinate Ollin 9. A sust and Equitable
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Toronto

Basel.

Switzerland

City New York,

NY

Basel.

Switzerland Toronto

Climate Shift 5: A Just and Equitable
Climate Shift 6: Negative Emissions
Waste Heat
Renewable Natural Gas
Wind
Expanded District Energy
Solar PV Ground Mount
Solar PV Rooftop
Geothermal Air-source Heat Pumps
Heat Pumps
Reduce Waste
Climate Shift 4: Renewable Revolution
Improve Industrial Efficiency
Retrofit Commercial
Retrofit Residential
New Commercial
L Climate Shift 3: Emissions Neutral Buildings
Increase Building Use Intensity
Increase City Density
Electrify Personal Vernoes
Electrify Commercial Vehicles
Electrify Transit
Enhanced Transit
Car Free Zones
Increase Cycling/ Walking Infrastructure
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Transportation
Climate Shift 2: Low Carbon City and Zero
Climate Shift 1: Tools and Targets
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	Climate Shift 1: Tools and Targets
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	Transportation Marketing
	Increase Cycling/ Walking Infrastructure
	Car Free Zones
	Car Share
	Enhanced Transit
	Electrify Transit
	Electrify Commercial Vehicles
	Electrify Personal Vehicles
	Electrify Municipal Fleet
	Increase City Density
	Increase Building Use Intensity
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	New Residential
	New Commercial
	Retrofit Residential
	Retrofit Commercial
	Improve Industrial Efficiency
	Climate Shift 4: Renewable Revolution
	Reduce Waste
	Heat Pumps
	Geothermal
	Air-source Heat Pumps
	Solar PV Rooftop
	Solar PV Ground Mount
	Expanded District Energy
	Energy Storage
	Wind
	Renewable Natural Gas
	Waste Heat
	Climate Shift 6: Negative Emissions

Climate Shift 5: A Just and Equitable

City Action Details

Seattle, WA City Light Whole Building Pay for Performance (P4P) Programs Scale Pay for Performance efforts and pilot an innovative utility program exploring Energy Efficiency as a Service in up to 30 buildings to unlock greater levels of energy efficiency depth at scale. To address the "hard to reach" energy savings, Seattle City Light is developing programs specifically aimed at enabling greater levels of energy efficiency depth in buildings. Whole building programs, such as Pay for Performance and Energy Efficiency as a Service (EEaS) are two approaches to increase energy savings in commercial buildings. Incentive payments are made over time based on measured energy savings and allow participants to bundle multiple projects and measures, across capital, operational & maintenance, and behavioral improvements. Seattle City Light will pilot Energy Efficiency as a Service (EEaS), which is explicitly designed to help participants overcome the split incentive barrier in commercial buildings, where there is little motivation for a building owner or investor to finance deep energy retrofits whose benefits accrue to tenants. EEaS lets investors finance projects with a predictable return, owners generate a new revenue stream, and

tenants occupy productive and energy efficient spaces. The pilot will leverage the lessons learned from a prototype at the Bullitt

FutureBuilt is a ten-year program (2010-2020) with a vision of developing carbon neutral urban areas and high-quality

as well as individual buildings – with the lowest possible

construction by 50% towards business as usual.

architecture. The aim is to complete 50 pilot projects – urban areas

greenhouse gas emissions. Requirement to be a FutureBuilt project is a reduction of GHG emission from energy use, transport and

Oslo

Center.

Climate Shift 5: A .lust and Equitable	
Waste Heat	
Renewable Natural Gas	
Wind	
Energy Storage	
Expanded District Energy	
Solar PV Ground Mount	
Solar PV Rooftop	
Air-source Heat Pumps	
Geothermal	
Heat Pumps	
Reduce Waste	
Climate Shift 4: Renewable Revolution	
Improve Industrial Efficiency	
Retrofit Commercial	
Retrofit Residential	
New Commercial	
New Residential	
Climate Shift 3: Emissions Neutral Buildings	
Buildings	
Increase Building Use Intensity	
Increase City Density	
Electrify Municipal Fleet	
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Electrify Commercial Vehicles	
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Climate Shift 1: Tools and Targets	
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DC

Action Details

Washington, With a target of reducing energy consumption per vehicle mile by 15% through improving the energy efficiency of its operations, WMATA has begun piloting wayside energy storage to store and reuse energy captured by Metrorail braking. WMATA has been upgrading train signals with energy efficient LED bulbs, which also improved safety and visibility to train operators, as well as replacing existing lighting with new LED technology as the standard for station lighting. These enhancements, which provide better visibility and improve accessibility, are underway throughout the system. To date, more than 55 (of 61) station mezzanines have been upgraded and work has begun to replace lighting for interior stations. Metro is also accelerating the retirement of the oldest and most unreliable cars, commissioning a total of 30 new trains, and implementing the Railcar Get Well Plan to reduce passenger offloads and cut delays due to train car issues by 25%. Finally, WMATA's newest 7000 series of metrorail cars have LCD map displays to allow customers to easily track their location and LED screens that provide current and upcoming station information. The DC Streetcar launched service in February 2016, and in 2017, added Sunday service and decreased headways. In 2017, the streetcar carried more than 1.1 million riders. In January 2018, DDOT continued its work to advance the necessary environmental assessments for the 3.3 mile Union Station to Georgetown (USGT) extension, by releasing the environmental assessment and holding public meetings to discuss potential storage and maintenance sites that have been identified for the new USGT streetcar vehicles. (http: //unionstationtogeorgetown.com/)

New York. NY

Over the past two decades, the City of New York more than quadrupled the size of the bicycle network, growing it from less than 250 lane miles* in 1996 to over 1,100 lane miles in 2016. As laid out in OneNYC, Mayor de Blasio's plan for a vibrant, sustainable, resilient, and equitable city, NYC DOT aims to install or enhance 50 bicycle lane miles, including 10 lane miles of protected lanes each year.

Memphis, TN

We currently have a Transportation Demand Management program that targets major employers in the area and encourages the use of other commute modes besides single occupancy vehicles.

Action Details	Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential
Clean Power SF - supply GHG free electricity to 100% of all residential customers and 80% of all commercial customers by 2030. 90% of all new residental units will be inside the current urban area borders to increase the close-proximity of public services and to reduce travel needs. Tune Ups Adopted in 2016, the Building Tune-Ups Ordinance (SMC 22.930) requires commercial buildings 50,000 square feet or larger to identifying low- or no-cost building operations and maintenance improvements to improve energy and water efficiency. Compliance deadlines will be phased in by building size, beginning in early 2019.A Qualified Tune-Ups Specialist is required to complete the assessment, report to the City, and monitor implementation of operational and maintenance improvements. Examples of operational fixes include changes to thermostat set points, or adjusting lighting or irrigation schedules. Tune-ups also review HVAC, lighting, and water systems to identify needed maintenance, cleaning or repairs. These types of improvements typically reduce individual building energy use an estimated 10-15 percent. Across the entire commercial building sector, the tune-up mandate is expected to reduce energy use 5-8 percent and GHG emissions by 6-9 percent. To demonstrate leadership, build capacity in the industry, and help reduce compliance costs, the city has committed (Resolution 31652) to meeting the Building Tune-Ups deadline one year earlier than required for private owners. In 2006, the City released itsComprehensive Solid Waste Management Plan (SWMP), which requires the City to switch from atruck based system for exporting solid waste to one that uses a combination of marine barges andfreight rail. Because rail is far more efficient than trucks per ton-mile, this plan has already reducedannual GHG emissions from solid waste export by more than 52,000 tCO2e.		1	1										1		1	1	

New Commercial Retrofit Residential

Retrofit Commercia

Improve Industrial Efficie

Air-source Heat Pumps

Heat Pumps

Solar PV Rooftop

Expanded District Energy

Solar PV Ground Mount

Renewable Natural Gas

Climate Shift 6: Negative Emissions Climate Shift 5: A Just and Equitable

New York,

NY

City

San

CA Reykjavik

Francisco,

Seattle, WA Tune Ups Adopted in 2016, the Building Tune-Ups Ordinance

City Paris

Action Details A platform for carbon offsetting projects in ParisThe biggest challenge for local carbon offsetting is to ensure funding for energy transition projects throughout Paris, as well as in partnership and solidarity at the Metropolitan, national, and international level. The City will therefore 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. The local preference that is included in Paris' carbon offsetting scheme will make it possible to internally offset emissions (called in-setting) to attain zero emissions by 2050. This practice, which needs to be created at the municipal level, presents the advantages of reinvesting carbon offsetting funds locally, better monitoring funded projects, and boosting the visibility of financial contributions from citizens and stakeholders. While voluntary carbon offsetting mechanisms are mainly geared towards companies, the City of Paris will launch a feasibility study on creating a local carbon-offsetting platform for Paris. The goal is to design a tool to mobilise all of the city's stakeholders to encourage and allow them to reduce their carbon footprint. The main purpose of the study will be to collect suggestions for a wide variety of projects from citizens, city stakeholders, the Metropolitan Area, and the City of Paris, using the same format as the participatory budget. The Greater Paris Metropolitan Area wishes to be involved in this initiative. This participatory financing tool is designed to accelerate energy and ecological transition projects in Paris and in partnership with rural areas in France, from carbon reduction (energy renovation, renewables) to sequestration (creating green spaces, agriculture, afforestation). Over time, and consistent with future carbon offsetting mechanisms that will be defined in the Paris Agreement protocol, the platform will make it possible to identify and finance low-carbon development projects in other countries, according to

climate solidarity principles.

Transportation Marketing

Increase Cycling/ Walking Infrastructure

Car Free Zones

Electrify Commercial Vehicles

Electrify Personal Vehicles

Enhanced Transit

Electrify Transit

Electrify Municipal Fleet Increase City Density

Increase Building Use Intensity

New Residential Climate Shift 3: Emissions Neutral Buildings

New Commercial Retrofit Residential

Retrofit Commercia

Shift 4: Renewable Revoluti

Improve Industrial Efficien

Heat Pumps Geotherma

Air-source Heat Pumps Solar PV Rooftop

Solar PV Ground Mount Expanded District Energy

Energy Storage

Renewable Natural Gas Waste Heat

Climate Shift 6: Negative Emissions

Climate Shift 5: A Just and Equitable

	Climate Shift 1: Tools and Targets	bon City a	Transportation	Transportation Marketing	Cycling/ Walkin	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrity Commercial Vehicles	Electrity Personal Venicles Flectrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Ground Mount	Expanded District Energy	Energy Storage	Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City Washington, DC Starting in 2012, the Clean and Affordable Energy Act of 2008 required all buildings (residential and commercial) over 50,000 square feet to report energy and water use annually using the EPA Energy Star Portfolio Manager tool. The data is publicly disclosed by DOEE.To facilitate benchmarking, the District of Columbia mandated (in the Sustainable DC Act of 2014) that both electric and gas utilities provide aggregated whole-building data upon request to a building owner, and make that data available as a download and though automated upload to ENERGY STAR® Portfolio Manager®. The District was the first jurisdiction in the U.S. to put such a requirement into law.The law is now fully phased in and the data disclosure now captures more than 1,500 buildings.Between 2013- 2016, the weather-normalized Site Energy Use Intensity (EUI) of private buildings that reported their energy use fell 4.5%. Specifically, the EUI of office buildings decreased 5.7% and multifamily housing buildings decreased 5%.		Climate			Increase									1	1 Climate			1		Cli											
West Palm Beach, FL The City currently has 42 kW of potential solar energy installed on the roof of the Lake Pavilion and the adjacent solar trellises , which are located on the Waterfront, near the Visitor's Center. The City is also working on a solar site assessment to examine the feasibility of installing solar panels on its most energy intensive properties. The City was also awarded a SolSmart Gold designation in January 2018, by becoming the first city in the state of Florida to have a one-day solar permit application approval process.																				1					1						
Seattle, WA Establish new 2030 Challenge pilot for 20 upgraded, high performing projects by 2025 Create pilot program offering additional height and floor area incentives for significant upgrades in energy and water use, and transportation efficiency. A new pilot will offer additional height and floor area incentives for up to 20 major renovations in urban centers outside the International District. Projects would receive the incentives in exchange for cutting energy and water use well below code, including no use of fossil fuels for heating. The plan additionally calls for increasing the incentives for the existing Living Building Pilot, and adjusts penalties in line with the 2030 Challenge. Mexico City Remove from circulation polluting vehicles program			1											1	1			1 1	l												

Electrify Municipal Fleet Increase Building Use Intensity Increase Building Use Intensity Buildings Climate Shift 3: Emissions Neutral Buildings New Residential New Commercial Improve Industrial Efficiency Retrofit Commercial Improve Industrial Efficiency Retrofit Commercial Improve Industrial Efficiency Retrofit Commercial Air-source Heat Pumps Solar PV Ground Mount Expanded District Energy Energy Storage Wind Renewable Natural Gas Waste Heat Climate Shift 6: Negative Emissions Climate Shift 5: A Just and Equitable			
ion Details ough The City of Calgary's Climate Program, electric vehicle	ption was identified as one of the largest and cost effective hods of reducing community GHG emissions. The resulting ctric Vehicle Strategy identifies seven action areas, including allation of public charging infrastructure, public awareness and cation, and increasing access to home & workplace charging. Idementation of two public charging projects, including a regional of them Alberta Fast Charging Network, is currently underway. Mayor's London Plan requires major new housing elopments to achieve zero carbon. The same target will be lied to non-residential major developments from 2019. Planning dications considered by the Mayor in 2016 are expected to seve reductions in regulated CO2 emission of 35 per cent above to L requirements of 2013 Building Regulations. This is estimated averover 48,000 tonnes CO2 per annum against the Part L celine and deliver over £150m investment in heat network astructure, £12m in solar PV panels and additional investment in the energy technologies to assist the transition to zero carbon, at notably heat pumps.	nning and financing of a Metro System (s-Bahn) in the trinational a of Basel Participatory Budget to finance the Climate PlanThrough the ticipatory Budget, Parisians can suggest investment projects for rown district and/or for all of Paris. Currently, 5% of the City's estment budget, or close to half a billion euros until 2020, is set le for these projects. In 2017, the Participatory Budget was e than €100 million. In order to support citizen-driven climate actives, the City has set a target for 20% of Participatory Budget ects to have a climate action component by 2020. CS Mitigation ActionsATCS is a system that aims to increase the ctiveness of traffic lights. This system uses sensors to measure number of vehicle queues at each intersection and uses sting data as a basis for determining the duration of red-green ic lights. The use of this system is able to reduce the level of gestion which causes a decrease in vehicle fuel consumption.	city acts to reduce road traffic by implementing measures like lanes, bus lanes, increased parking fees, increased congestion rge (national tax), various mobility measures like car sharing green parking norms
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Calgary

London

Basel.

Jakarta

Stockholm

Switzerland Paris

New Residential
New Commercial
Retrofit Residential
Retrofit Commercial

Heat Pumps

Improve Industrial Efficie

Geotherma

Air-source Heat Pumps

Solar PV Rooftop

Solar PV Ground Mount Expanded District Energy

Renewable Natural Gas

Climate Shift 5: A Just and Equitable

Climate Shift 6: Negative Emissions

City Action Details
Paris A City that enco

A City that encourages low-carbon road freight transportHeavy goods vehicles account for only 5% of the distance travelled in Îlede-France, but they are responsible for 31% of the nitrogen oxide emissions generated by road transport. To reduce the impact of road freight transportation on air quality, the City, in consultation with the Îlede-France region, will be campaigning for the implementation of a dissuasive kilometre-based price scale for HGVs travelling in Île-de-France by 2030. This scheme would enable carriers to be taxed according to the number of kilometres travelled and the type of vehicle. The goal would be to reduce road haulage in Île-de-France, while also cutting the number of unladen journeys.

Malmo

The project "Delad energi är dubbel energi" is focusing on creating urban and industrial symbioses to make better of use of rest products in primarily the industry sector.

Houston, Texas Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.Water metering system is a real-time ability for residence to see water usage, and monitor and reduce consumption rates.

City Paris

Action Details Financing energy renovationOne of the keys to attaining ambitious building energy renovation targets consists of encouraging the emergence of financing solutions for projects adapted to meet the needs of different types of property owners (households, residents in jointly owned properties, landlords and housing bodies, institutions and companies). One of the options chosen by the City of Paris is to encourage third party financing. This system designates an overall support solution for the energy renovation of jointly owned properties, which includes the performance of studies, the selection of service providers, the financing of the operation and post-renovation monitoring. The third-party financing body advances the sum required by property owners to finance their projects. The reimbursement of this sum is facilitated by the savings made on energy bills. In 2013, the City of Paris supported and participated in the creation of a mixedownership company – Energies Posit'lf – for this purpose. After four years of campaigning for a change in the national regulations to authorise the use of this type of financial arrangement, the mixed-ownership company was authorised to offer its third-party financing solution to residents in jointly owned properties in 2017. The City will continue its active involvement with this operator and may participate in the recapitalisation of the company in 2018 in order to support its development. At the same time, the City and the Metropolitan Area will examine the expediency of creating an operational public fund for financing energy renovation. This would enable the provision of direct financial support for inhabitants by capitalising on feedback from different actions carried out19 by the City and its partners on this subject. This scheme would also enable work to be carried out in partnership with financial operators in order to encourage them to finance the renovation of buildings in the metropolitan area.

Electrify Commercial Vehicles

Electrify Municipal Fleet

Improve Industrial Efficiency

Retrofit Commercia

Retrofit Residential

Electrify Personal Vehicles

Increase Cycling/ Walking Infrastructure

Transportation Marketing

Car Free Zones

Enhanced Transit

Electrify Transit

Increase City Density

Increase Building Use Intensity

Climate Shift 3: Emissions Neutral Buildings

New Residential

New Commercial

Shift 4: Renewable Revoluti

Heat Pumps

Geotherma

Air-source Heat Pumps Solar PV Rooftop

Solar PV Ground Mount **Expanded District Energy** Energy Storage

Renewable Natural Gas

Waste Heat

Climate Shift 6: Negative Emissions

Climate Shift 5: A Just and Equitable

Climate Shift 6: Negative Emissions Climate Shift 5: A Just and Equitable								
Waste Heat								
Renewable Natural Gas								
Wind								
Energy Storage								
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Solar PV Ground Mount								
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Climate Shift 1: Tools and Targets								
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City Paris

Action Details

A Municipal Investment Programme that incorporates the carbonneutral trajectory The Climate Plan's acceleration measures for 2020 have been included in the current municipal programme and will boost Paris' transition towards carbon neutrality. In future government mandates, the Municipal Investment Programme (PIM) will include the carbonneutral trajectory to anticipate the investments that will be needed to attain the Climate Plan's objectives. While maintaining a high rate of self-financing, the City will seek out innovative financing and look for partners to co-finance projects that meet its environmental equirements. This funding will come from a variety of sources, calling on institutional aid (Europe, State, Region) as well as private investment capital. In particular, the City's Resilience Strategy will involve the insurance industry, which has an economic interest in investing in this topic. The City of Paris will ensure that the specifications for selecting partners and co-funders for various loans, funds, and green sponsorship will reject candidates that have been convicted of tax fraud. These specifications will also exclude funds from industries that produce the most greenhouse gas emissions and are based on the extraction of fossil fuels. Additionally, the objectives of the transition fund and the co-funding partnerships must be defined and incorporate the creation of local and sustainable jobs, financing for research, and training on environmental issues.

Oslo

Oslo has been working towards the national authoritites to be able to establish low-emission zones, and has got the authority. A study is now being done on the design of it.

Tokyo

Tokyo Carbon Reduction Reporting Program for small and medium-sized facilities This reporting program covers around 63,000 small and medium sized facilities that aren't covered by the Tokyo Capand-Trade Program. This is a mandatory reporting and disclosure program for business operators whose facilities' energy consumption is above a certain amount. Business operators in each facility have to report the previous fiscal year's CO2 emissions, measures for energy efficiency, targets and so on. TMG publish the "Low Carbon Benchmark", which shows each facility's CO2 emissions level from one of 30 building-use categories. Additionally, TMG provides the "Carbon Report", which shows energy efficiency levels in an understandable way, using the "Low Carbon Benchmark".

Climate Shift 1: Tools and Targets

Transportation Marketing

Car Free Zones

Electrify Transit

Electrify Commercial Vehicles

Electrify Personal Vehicles

Increase City Density

New Residential

Climate Shift 3: Emissions Neutral Buildings

New Commercial

Retrofit Residential

Retrofit Commercial

Improve Industrial Efficiency

Climate Shift 4: Renewable Revolutio

Reduce Waste

Heat Pumps Geothermal Solar PV Ground Mount

Expanded District Energy

Energy Storage

Renewable Natural Gas

Waste Heat

Climate Shift 6: Negative Emissions Climate Shift 5: A Just and Equitable

Solar PV Rooftop

Air-source Heat Pumps

Increase Building Use Intensity

Electrify Municipal Fleet

Enhanced Transit

Car Share

Increase Cycling/ Walking Infrastructure

Action Details The amount of varnished private ground is relevant for the billing

City

Basel, Switzerland

Action Details A city that develops its competencies and its operational resources for the public energy serviceTo ensure the implementation of its policies, the City of Paris intends to establish a local energy governance system and consolidate its operational resources.Paris will be advocating a decentralised energy model, including at the national and European levels, which will allow cities to regain direct control of networks and grids and favours the inclusion of renewable energy in the local energy mix with a policy of solidarity between territories via energy grids and networks. Key issues also apply at the metropolitan area level, e.g. to ensure the optimal management of the different networks and grids, promote exchanges of energy and information between different areas, develop innovative solutions and pool costs. Managing the energy transition requires the production and management of substantial amounts of data. Data management is therefore a strategic challenge to ensure the reliability of analyses, share the key issues among the stakeholders and provide guidance for decisions. Consequently, the City of Paris will be establishing a public Energy Data Service to enable the general public and the energy transition process to benefit from the new opportunities arising from the digital revolution: free access to their data for users, assistance with controlling energy consumption and managing energy grids and networks, in addition to support for public policies. It will be run by the Paris Climate Agency. The organisation of this public service will also address data management issues, including maintaining the confidentiality of personal data, on the one hand, and accessing reliable and anonymous data in open data format, on the other, to prevent the de facto privatisation of their exploitation. This public data service will also contribute to the personalised advice given to users who request it via the Paris Climate Agency, and will also produce in-depth analyses intended to facilitate the efficient management of public policies and provide guidance for different stakeholders (e.g. monitoring of fuel poverty, observation of data relating to the consumption of buildings, or the mapping of energy resources on the smallest possible scale). This public service will be developed in association with the existing stakeholders and schemes, such as the project to supervise local government energy consumption which is currently being rolled out - whose data will be hosted on the City of Paris's Data Centre and shared with the partners concerned -, the provision of metering data by energy distributors, the Paris Urbanism Agency (Atelier Parisien d'

Urbanisme), etc.

Transportation Marketing

Increase Cycling/ Walking Infrastructure

Enhanced Transit

Electrify Personal Vehicles

Electrify Transit

Electrify Commercial Vehicles

Car Free Zones

Electrify Municipal Fleet

Increase City Density

Increase Building Use Intensity

Climate Shift 3: Emissions Neutral Buildings

New Residential

New Commercial

Retrofit Residential

Retrofit Commercia

Improve Industrial Efficien

Shift 4: Renewable Revoluti

Heat Pumps

Geotherma

Air-source Heat Pumps

Solar PV Rooftop

Solar PV Ground Mount

Expanded District Energy Energy Storage Renewable Natural Gas

Waste Hear

Climate Shift 6: Negative Emissions

Climate Shift 5: A Just and Equitable

	Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation		Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings Climate Chiff 2: Emissions Northal Buildings		New Commercial	Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Glouid Mouli	Expanded District Energy Storage	Wind	Renewable Natural Gas	Waste Heat	Shift 6: Negat	Climate Shift 5: A Just and Equitable
Nashville, Nashville, Metro Government, NES, and TVA are collaborating to launch a home weatherization project called NES Home Energy Uplift for 125 limited income families who own homes in Davidson County. Energy upgrades may include weatherization, air sealing, highefficiency heat pumps, high-efficiency air conditioners, duct replacement/repairs, ENERGY STAR windows, building envelope insulation, high-efficiency lighting, crawl space and attic insulation, heat pump water heaters, ENERGY STAR appliances, and/or whole-house ventilation.															1	1		1															
CA Under the 2016 California Energy Code, maximum allowable wattages are established for various non-residential outdoor lighting applications. To promote the use of high-efficiency LED lighting in these types of applications, the City of Fremont adopted a requirement that further reduces the maximum allowable wattages of outdoor lighting fixtures in new commercial construction projects and major retrofits. The requirement specifically pertains to the following commercial usage types: - Primary Entrances to Senior Care - Facilities, Police Stations, Hospitals, Fire Stations, and Emergency Vehicle Facilities - Drive Up Windows - Outdoor Sales Frontage - Outdoor Sales Lots - Vehicle Service Station Hardscape - Non-Sales Canopies and Tunnels - Outdoor Dining																																	
Paris Territorial investment funds for the ecological transitionIn the summer of 2017, in order to meet its carbon neutrality objective and accelerate the ecological transition, the City of Paris launched a municipal investment fund for the ecological transition, under the competences obtained through the law on Paris' status. Paris' Green Venture Capital Fund was launched with the February 2018' s Paris Council. As a unique legal and financial tool, this Investment Fund for the Ecological Transition will mobilise private financing to support innovative solutions, notably in the Paris area, in the fields of climate protection, air quality, energy and improved energy efficiency, waste recovery, and the development of renewable energy and sustainable transport modes.																																	
Basel, The fees of parking space of commuters is collected in a fund: Switzerland Basel finances Park&Ride infrastructure inside and outside the city- , cantonsboundaries and even France and Germany (trinational area of Basel)			1																														

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Venicles Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial Retrofit Residential	Retrofit Commercial	Improve Industrial Efficiency	Climate Shift 4: Renewable Revolution	Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop	Solar PV Ground Mount	Expanded District Energy	Energy Storage Wind	Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City Tacoma, WA Rio de Janeiro Santa Fe County, New Mexico	Action Details Tacoma Power offers a seven-year, zero-interest loan to qualifying owners of residential properties (includes rentals up to 4 units) for select energy efficiency programs installed by a contractor that has an active Trade Ally Agreement with Tacoma Power. Incomequalified, energy-efficiency grants may be available for owner-occupied properties to replace windows and upgrade insulation that could cover the majority of the costs of making energy efficiency improvements. Grant recipients are not eligible for rebates or zero-interest loans. Partial exemption of IPTU (Municipal Urban Property Tax) collection based on the adoption of sustainability actions in existing buildings - GREEN IPTU Mandatory recycling at County convenience centers;Initiating a backyard composting pilot project (Co installs 35 systems for free)		<u> </u>													1 1			1 1 1		1	1											1
Paris	Social housing at the heart of an ambitious renovation programmeWith over 230,000 housing units on 1st January 2016, the housing stock belonging to Paris's social housing providers represents a key challenge for this renovation policy. The City of Paris will continue to support social housing providers in their efforts to renovate their stock on a massive scale. The target is to reduce energy consumption by 35% in all social housing stock by 2030 and 50% by 2050 in relation to 2004, taking account of all improvements made. To achieve these targets, the City will continue to finance the renovation of 4,500 housing units per year in compliance with the low consumption standard. The average savings target will be increased to 60%17 for all of the operations submitted by social housing providers from 2018 onwards, maintaining the maximum target of 80 kWh m²/year and the requirement of the best performance standards through an energy qualification. The number of renovations will be increased to 5,000 housing units per year as of 2020, which, in particular, will require the housing providers' investment capacities to be guaranteed by the State.														1	1			1														

City

Action Details

Chula Vista,

The City has worked to leverage building codes to reduce emissions where possible. From 2009 to 2014 buildings we required to be 10% or 15% more energy efficient than CA additionally we also enacted codes that are still applicable require pre-wire for solar PV and pre-plumb for solar hot v

Paris

Buildings that are comfortable in the summerBy 2020, the support the creation of construction guidelines that are ad climate change, particularly relating to summer temperatu address the key ways of making buildings comfortable in summer: bioclimatic design, adding greenery to buildings, protection, light-coloured materials, effective ventilation, a the temperature to 26°C before an environmentally friendly system is activated. As for existing buildings, the City will insulation, solar protection, and ventilation by adding a "su comfort" component to all energy renovations conducted of Paris or submitted for authorisation. With the future exte the urban cooling network, specific communication campa be carried out to increase the number of buildings that are connected to the network, and in this way reduce the use individual air conditioning. This approach will also be used and renovated municipal facilities in line with the Resilience Strategy.

Manhattan Beach, NY

Community Choice Aggregation through the Clean Power

Cleveland, ОН

The City of Cleveland's community aggregation program residential and small commercial Cleveland Electric Illumi (CEI) customers the opportunity to save money on their elbills. Since June 2018, about 50,000 customers have rece competitive fixed rate and 100% of their electricity was ba renewable energy certificate (REC) purchases. The previous aggregation was 50% renewable, with an option to "opt-ir renewable.

Oakland, CA In 2017, the City of Oakland adopted an ordinance requiri vehicle charging infrastructure in new construction of mult and non-residential buildings. The work supports the ador EVs to reduce local carbon emissions and combat climate

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	Reduce Waste								
	Climate Shift 4: Renewable Revolution								
	Improve Industrial Efficiency								
	Retrofit Commercial								
	Retrofit Residential								
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City Buffalo, NY

Action Details

Buffalo's Energy Master Planspearheads the growth of a green economy by introducing and supporting the development of SolarCity, a 1 million-square-foot site for a solar panel manufacturing facility in South Buffalo. It will be the largest solar panel production facility in the Western Hemisphere, creating more than 3,000 jobs in Western New York and nearly 5,000 jobs in the state. The facility, once it has reached full production, will have more than 1 gigawatt of annual solar capacity. Educational initiatives in Buffalo Public Schools are educating youth in solar technology to prepare the next generation of the community workforce for green jobs. The goals of the Buffalo Energy Plan strengthen the city's long-term competitiveness and economic development by creating a framework that decreases energy costs to residents and businesses, and improves infrastructure and

services. Washington, As of January 1, 2016, DC employers with 20 or more employees are required to offer pre-tax or subsidized commuter benefits for use on Metro, buses, vanpools and other forms of mass transit as part of the DC Commuter Benefits Law. The DC Commuter Benefits Law expanded access to transportation benefits to those who work in the District and, through pre-tax transportation benefit, offered an incentive in the form of up to 40% tax savings on commuting. Additionally, the District's Kids Ride Free program allows students ages 5-21 to ride for free on Metrobus, the DC Circulator, and Metrorail within the District to get to school and school-related activities. There are currently several major car sharing operators in the District, which the city has supported by providing curbside parking permits to operators.

Paris

Pollution-free streets and areas By 2020, the City of Paris will implement a large restricted traffic zone (1st, 2nd, 3rd, and 4th districts) that will not hinder public transport, emergency vehicles, waste collection and cleaning vehicles, residents, and bicycles. This initial experiment may then be duplicated in other Paris neighbourhoods starting in 2020. Ultra-Low Emissions Routes (AUBE) will also be introduced in several Paris neighbourhoods, in which a traffic lane will be permanently reserved in one direction fo clean vehicles that run either on Natural Gas for Vehicles (NGV) or electricity. The objective is to reduce overall traffic on that road while encouraging users to adopt low- carbon vehicles. The goal is to introduce these ultra-low emissions routes by 2024.

		Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Tr	Increase Cycling/ Walking Infrastructure	Car Free Zones Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase Building Hee Intensity	increase building Use intensity Buildings	Climate Shift 3: Emissions Neutral Buildings	New Commercial	Retrofit Residential Retrofit Commercial	Improve Industrial Efficiency		Reduce Waste	Heat Pumps	Geothermal	Air-source Heat Pumps	Solar PV Rooftop Solar PV Ground Mount	Expanded District Energy	Energy Storage	Willia Renewable Natural Gas	Waste Heat	Climate Shift 6: Negative Emissions	Climate Shift 5: A Just and Equitable
City Washington, DC	Action Details The Clean Energy DC plan calls for providing the Standard Offer Service (SOS), the default supply option for customers who do not choose their own electricity supplier,through long-term power purchase agreements with renewable electricity suppliers. In 2015, approximately 24% of electricity in the District was consumed under the SOS, largely by residential ratepayers, and the fuel mix report showed that 59.9% of that electricity came from fossil-fuel generation. The plan recommends the District set a target to supply at least 70% of the SOS through renewable purchase agreements. Connecting 50000 (all type of) buildings to residual heat from the industry																		1									1		
Eugene, OR	Love Food not waste provides commercial food waste collection to businesses in Eugene.9200 tons of wastewas converted to date to compost and biogas.																		1	1								1		
Basel, Switzerland	Ecological fee for motorized vehicles		1	1						1	1																			
Tokyo	Tokyo Cap-and-Trade ProgramThe Tokyo Cap-and-Trade Program is the world's first urban cap-and-trade program targeting urban facilities, including office buildings and commercial facilities. This is a mandatory emission reduction and emissions trading program launched in April 2010, and it covers approximately 1,400 large facilities that consume energy of 1,500kL crude oil equivalent or more per year. It has an absolute cap of 6% for the first compliance period (FY2010-FY2014) and will have a 17% cap for the second compliance period (FY2015-FY2019). During the first compliance period, the reduction obligation rate was 8% for the commercial sector, including office buildings, and 6% for the industrial sector, including factories. Facilities can reduce emissions by themselves or acquire credits by trading to accomplish their obligations. Facility owners are required to submit their reduction plan and emissions report verified by third-party verification agencies every year. This program has seen significant success when compared to the Japan national average, and the program achieved a 26% reduction in emissions in FY2015* Project periods: The first and second compliance periods (2010-2019)Emissions reduction is estimated, assuming the same level of reduction as FY 2016 compared with base-year emissions (3 years average value between 2002-2007) will continue.														1 1		1 1	∖ 1												

	Climate Shift 1: Tools and Targets	Climate Shift 2: Low Carbon City and Zero Emissions Transportation	Transportation	Transportation Marketing	Increase Cycling/ Walking Infrastructure	Car Free Zones	Car Share	Enhanced Transit	Electrify Transit	Electrify Commercial Vehicles	Electrify Personal Vehicles	Electrify Municipal Fleet	Increase City Density	Increase Building Use Intensity	Buildings	Climate Shift 3: Emissions Neutral Buildings	New Residential	New Commercial	Retrofit Residential		Climate Shift 4: Renewable Revolution		Neuroe Waste	Heat Pumps	Air-source Heat Pumps	Solar	Solar PV Ground Mount	Expanded District Energy	Energy Storage	Wind	Kenewabie Natural Gas	Climate Shift 6: Negative Emissions	Climate Chilf 5. A lust and Equitable	Cilliate Silit 5. A sust and Equitable
Action Details Tolls for fossil-fuel cars to enter the city. 95% of the Income from the toll road goes to finance public transit and bike infrastructure. Tolls price is based on time and environment, as of 2017.		1	1		1			1		1	1	1																					 	1
Electric cars can drive in bus lanes		1	1							1	1	1										П												
Lower national taxes for electric cars.		1	1							1	1	1																						
Public transit fares have been reduced.		1	1					1																									1	1
Enhanced transit service outside the toll ring road.		1	1					1																									1	1
Thousands of EV chargers have been installed on public land. And between 2018 and 2020 they will install 1500 more. As of 2015, private cars have been banned from the city centre.		1	1			1				1	1	1										ı												1
Reduce parking spaces		1	1																															
Phase out fossil fuel heating in homes and offices by 2020.															1	1	1	1	1	1														
Change transit to renewable fuels		1	1					1																										
Build more bike lanes		1	1		1																												1	1
At the time of their development, city-wide and area plans should make provisions to advance near zero emissions. This could include considerations such as articulating access to sunlight for neighbouring buildings at the block scale, allowances for simplified low-carbon building forms, and roof alignment and design allowances to enable solar energy.																								1		1								
Reduce the permit fee and an online permitting system where feasible allowing heat pumps to be installed in front yards, and publishing a list of heat pumps that meet the City's noise limits. The applicability of successful solutions to other key zero emissions technologies such as EV charging and solar panels will also be considered. Solar PV panels are installed on nearly all rooftops by 2050, providing an average of 25% of the building's electric load.											1											1		1		1								
Support the implementation of energy step codes for new buildings																1	1	1																
Prepare Calgary for the implementation of a retrofit building code																1			1	1														
Develop a residential building labelling program for Calgary																1			1															
Develop a commercial building labelling program for Calgary.																1				1														

Oslo

Vancouver

Vancouver

Toronto

Calgary

Calgary

Calgary

Calgary

Climate Shift 5: A Just and Equitable	1 1 1	
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Renewable Natural Gas		
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Reduce Waste		
Climate Shift 4: Renewable Revolution	1	
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Retrofit Commercial		
Retrofit Residential		
New Commercial		
New Residential		
Climate Shift 3: Emissions Neutral Buildings		
Buildings		
Increase Building Use Intensity		
Increase City Density		
Electrify Municipal Fleet		
Electrify Personal Vehicles		
Electrify Commercial Vehicles		
Electrify Transit		
Enhanced Transit		
Car Share		
Car Free Zones		
Increase Cycling/ Walking Infrastructure		
Transportation Marketing	1 1 1	
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Climate Shift 2: Low Carbon City and Zero Emissions Transportation	1 1 1	

Calgary

Calgary

Calgary

Calgary

Perth

Goteburg

Viernheim

Action Details

Support the implementation of solar photovoltaics

Personalized Transportation Marketing

Personalized Transportation Marketing

Personalized Transportation Marketing

Support the implementation of district energy systems

Support the implementation of combined heat and power

Support community ownership of renewable energy generation