City of Windsor - Cities 2019

Introduction

(0.1) Please give a general description and introduction to your city including your city's reporting boundary in the table below.

	Administrative boundary	Description of city
City boundary	City / Municipality	The City of Windsor is the southernmost city in Canada, located across the Detroit River from Detroit, Michigan. Windsor has a humid continental climate with a mean annual temperature of 10.7°C, with hot, humid summers and mild winters compared to the Canadian average. The City receives average annual precipitation of 934.6mm. Windsor has a population of 233,763 as of 2017, which swells slightly during the day as a result of commuting populations from the surrounding municipalities. Windsor is a diverse city, with approximately 28% of its population being foreign born. Based on the 2016 Census, the median age is 41, and residents over 65 make up 18% of the population. Windsor retains a strong industrial base, and is a central node of the Canadian automotive sector. The primary pillars of Windsor's economy are manufacturing, tourism, education and government services. American Cities of the Future, in its 2011/2012 publication, listed Windsor as the #2 city in North America for economic potential. The population of Windsor shrunk by 2.6% between 2006 and 2011, and is projected to grow by as much as 18% by 2031. The most significant area within the City of Windsor slated for future development is the neighbourhood of Sandwich South; the building of a large regional hospital is expected to draw development to the currently sparsely developed area.Changes in planning policy are being considered for implementation of the City's Community Energy Plan. The City of Windsor is a single-tier municipality. Windsor is governed under the Council-Manager form of local government and includes the elected City Council, mayor, and an appointed Chief Administrative Officer. The city is divided into ten wards, with one councillor representing each ward. The mayor serves as the chief executive officer of the city and functions as its ceremonial head. Day-to-day operations of the government are carried out by the Chief Administrative Officer. The City works in collaboration with the Government of Essex County on pertinent matters, and is delegated its governing authority under the Provincial Municipal Act.

(0.2) If you have not previously submitted your Letter of Commitment to the Global Covenant of Mayors, either through the relevant regional covenant or through the Global Covenant secretariat, please attach the letter signed by an appropriately mandated official (e.g. Mayor, City Council) to this question.

Compact of Mayors 2015.pdf

City Details

(0.3) Please provide information about your city's Mayor or equivalent legal representative authority in the table below:

	Leader title	Leader name	Current term end month	Current term end year
Please complete	Mayor	Drew Dilkens	October	2022

(0.4) Please select the currency used for all financial information disclosed throughout your response.

CAD Canadian Dollar

(0.5) Please provide details of your city's current population. Report the population in the year of your reported inventory, if possible.

	Current population	Current population year	Projected population	Projected population year
Please complete	233763	2018	250206	2030

(0.6) Please provide further details about the geography of your city.

	Land area of the city boundary as defined in question 0.1 (in square km)
Please complete	146.3

Governance and Data Management

Governance

(1.0) Does your city incorporate sustainability goals and targets (e.g. GHG reductions) into the master planning for the city?

Yes

(1.0a) Please detail which goals and targets are incorporated in your city's master plan and describe how these goals are addressed in the table below.

Goal type	How are these goals/targets addressed in the city master plan?
Emissions reduction targets	Community Energy Plan calls for 40% reduction by 2041 and Corporate Emissions reduction by 40% by 2041
Renewable energy targets	The Community Energy Plan calls for 90MW of installed solar by 2041

(1.1) Has the Mayor or city council committed to climate adaptation and/or mitigation across the geographical area of the city?

Yes

(1.1a) Please select any commitments to climate adaptation and/or mitigation your city has signed and attach evidence.

Name of commitment and attach document

Global Covenant of Mayors for Climate & Energy
Compact of Mayors 2015.pdf

Type of commitment

Both

Comments

Mayor Drew Dilkens committed to the Compact of Mayors in 2015.

Climate Hazards & Vulnerability

Risk and Vulnerability Assessment

(2.0) Has a climate change risk and vulnerability assessment been undertaken for the city area?

Yes

(2.0a) Please select the primary process or methodology used to undertake the risk and vulnerability assessment of your city.

	Primary methodology	Description
Risk assessment methodology	Building Adaptive and Resilient Cities (BARC) toolkit (regional – Canada)	This was completed in 2011 and we are currently updating the Risk Assessment for our updated Climate Change Adaptation Plan expected for December 2019.

(2.0b) Please attach and provide details on your climate change risk and vulnerability assessment. Please provide details on the boundary of your assessment, and where this differs from your city's boundary, please provide an explanation.

Publication title and attach the document

Update on Climate Change Adaptation Initiative - Milestone 2
Council Report Vulnerability and Risks 2012.pdf

Year of adoption from local government

2012

Web link

http://www.citywindsor.ca/cityhall/committeesofcouncil/Standing-Committees/Environment-Transportation-and-Public-Safety-Standing-Committee/Documents/ETSC%20rpt%2035_20120301095541.pdf

Boundary of assessment relative to city boundary (reported in 0.1)

Same – covers entire city and nothing else

Explanation of boundary choice where the assessment boundary differs from the city boundary
The original plan was to address the impacts on City of Windsor assets. However, discussion is taking place across the region at what is required from a regional perspective. Though these conversations are underway no formal documents have been created to date.

Areas/sectors covered by the risk and vulnerability assessment
Energy
Water Supply & Sanitation
Transport
Environment, Biodiversity and Forestry
Industrial
Commercial
Residential
Public health
Community & Culture
Emergency Management
Land use planning

Primary author of assessment
Dedicated city team

Does the assessment identify vulnerable populations?
Yes

Publication title and attach the document
Climate Change Adaptation Report to Council
Appendix B Expanded Risk Assessment.docx
Agenda_Item_C_64_2019_3606.pdf
Appendix C Impact Summary Pages.pdf
Appendix A Climate infographic Windsor.pdf

Year of adoption from local government
2019

Web link

Boundary of assessment relative to city boundary (reported in 0.1)
Larger – covers the whole city and adjoining areas

Explanation of boundary choice where the assessment boundary differs from the city boundary
Though the boundary is focused on the City of Windsor, a number of City agencies (Public Health, Conservation Authority) also provide services to the neighbouring municipalities.

Areas/sectors covered by the risk and vulnerability assessment
Energy
Water Supply & Sanitation
Transport
Food and agriculture
Waste Management
Environment, Biodiversity and Forestry
Industrial
Commercial
Residential
Education
Public health
Community & Culture
Emergency Management
Land use planning
Tourism

Primary author of assessment
Dedicated city team

Does the assessment identify vulnerable populations?
Yes

Climate Hazards

(2.1) Please list the most significant climate hazards faced by your city and indicate the probability and consequence of these hazards, as well as the expected future change in frequency and intensity. Please also select the most relevant assets or services that are affected by the climate hazard and provide a description of the impact.

Climate Hazards
Extreme Precipitation > Rain storm

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard
High

Current consequence of hazard
Medium High

Social impact of hazard overall
Fluctuating socio-economic conditions
Increased risk to already vulnerable populations
Increased resource demand

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Water supply & sanitation
Transport
Waste management
Industrial
Commercial
Residential
Society / community & culture
Emergency services

Please identify which vulnerable populations are affected
Elderly
Persons with disabilities
Low-income households
Persons living in sub-standard housing

Magnitude of expected future impact
High

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
The City of Windsor has experienced a number of significant rainfall events in particular in 2016 and 2017 which resulted in 2,850 and 5,982 reports of basement flooding respectively. Flooding resulted in $108 million and $125 million in insured losses respectively. Based on a voluntary survey, only 45% of the population that flooded had losses covered by insurance. Flooding response cost the City of Windsor over $280,000 in 2016 and over $1,690,000 in 2017. The City's Community Development department worked alongside social housing providers to relocate residents from buildings that flooded. Two of the City of Windsor libraries flooded and were closed for 3 days in order to complete repairs.

Climate Hazards
Extreme hot temperature > Extreme hot days

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard

High

Current consequence of hazard
Medium

Social impact of hazard overall
Increased incidence and prevalence of disease and illness
Increased demand for public services
Increased demand for healthcare services
Increased risk to already vulnerable populations
Increased conflict and/or crime

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Energy
Transport
Public health
Emergency services

Please identify which vulnerable populations are affected
Children & youth
Elderly
Persons with disabilities
Persons with chronic diseases
Low-income households
Persons living in sub-standard housing

Magnitude of expected future impact
High

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
The City of Windsor along with Health Canada has identified a strong association between temperature and excess mortality. At approximately 29C excess mortality begins to increase as ambient temperatures increase. The total number of days where the City of Windsor was under a Heat Warning were 23 (2016), 12 (2017) and 22 (2018). A Heat Warning is issued when the daytime high temperature is expected to be greater than or equal to 31C and a nighttime temperature greater than or equal to 21C or a humidex greater than 42. Heat related health issues are not readily available in Ontario. The Windsor-Essex County Health Unit is currently undertaking research to determine the impact from the extreme heat wave from 2018.

Climate Hazards
Storm and wind > Severe wind

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard
High

Current consequence of hazard
Medium

Social impact of hazard overall
Other (Impact to Nature Areas and Urban Tree Canopy, Damage to Property)

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Environment, biodiversity, forestry
Tourism

Please identify which vulnerable populations are affected
Other (No vulnerable populations identified)

Magnitude of expected future impact
Medium

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
The most recent event occurred on August 6, 2018. The City of Windsor experienced an intense and damaging thunderstorm. Temperatures that day reached 31C and this particular storm produced wind gust of 67 km/hr wreaking havoc on trees through the City. The City's Forestry department is responsible for leading the charge with the clean up of downed trees, limbs and debris after each storm event. On a yearly basis, Forestry routinely allocates between 4 and 8 weeks per year, cleaning up damaged trees and limbs throughout the City. However, this particular storm had a significant impact on the City owned trees along the public right-of-way and in City parks. This storm had the largest negative impact on our trees and resources than all other previous storms recorded over the last 5 years. In fact, this one storm generated twice as many service requests than all of August 2017 alone. Forestry received 1,187 service requests for tree maintenance for this storm event. For additional perspective, the intense windstorm that the region experienced on March 8th 2017 generated only 329 service requests and the 2016 tornado generated only 250. This storm was widespread and damages to the City's trees were significant. As a result, 130 required removal and 270 trees required tree trimming to restore their health. This storm cost the City of Windsor over $250,000 in response costs. A number of City maintained trails were also closed for a significant period of time while maintenance was completed.

Climate Hazards
Biological hazards > Vector-borne disease

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard
High

Current consequence of hazard
Medium Low

Social impact of hazard overall
Increased incidence and prevalence of disease and illness
Increased demand for healthcare services
Increased risk to already vulnerable populations

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Tourism
Public health

Please identify which vulnerable populations are affected
Elderly
Persons with disabilities
Persons with chronic diseases

Magnitude of expected future impact
High

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
The City of Windsor has been working with the Windsor Essex County Health Unit to larvicide for mosquitos since 2003 after West Nile was raised as a concern. The following lists the number of human cases of West Nile in Windsor and Essex County since 2012. 2012-22 2013-5 2014-1 2015-4 2016-4 2017-20 2018-13 In the last couple of years, mosquitos new to the area have been located. These include: Ae. Albopictus and Ae. aegypti, which are known carriers of zika, chikungunya virus, dengue virus; fortunately to date, the captured mosquitos do not carry the virus. Another vector borne virus of concern in the area is lyme disease.

The number of cases of lyme disease in the area are as follows: 2012--0 2013-3 2014-5 2015-6 2016-2 2017-7 2018-9 The distribution of black legged ticks are increasing geographically in the area. In addition a lone star tick was capture in Windsor/Essex in 2017.

Climate Hazards
Biological hazards > Water-borne disease

Did this hazard significantly impact your city before 2019?
No

Current probability of hazard
Medium High

Current consequence of hazard
Medium Low

Social impact of hazard overall
Increased incidence and prevalence of disease and illness

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Short-term (by 2025)

Most relevant assets / services affected overall
Water supply & sanitation
Food & agriculture
Environment, biodiversity, forestry
Tourism
Public health

Please identify which vulnerable populations are affected
Low-income households

Magnitude of expected future impact
Medium

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
Due to higher temperatures and precipitation there is an increasing risk of blue-green algae. To date, in the City of Windsor temporary and unconfirmed occurrences have occurred in storm water management ponds only. The local water intake is located deep within the fast moving waters of the Detroit River. However, this is becoming an increasing problem in the neighbouring municipalities particularly those located along Lake Erie. This risk is also identified under the Water Security Section of this report.

Climate Hazards
Flood and sea level rise > River flood

Did this hazard significantly impact your city before 2019?
No

Current probability of hazard
High

Current consequence of hazard
Medium Low

Social impact of hazard overall
Increased demand for public services

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?

Immediately

Most relevant assets / services affected overall
Residential
Tourism
Society / community & culture
Emergency services

Please identify which vulnerable populations are affected
Other (Residents located immediately adjacent to the water)

Magnitude of expected future impact
High

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
The US Army Corps of Engineers have been monitoring the Great Lakes levels in coordination with Canada since 1918. For the last couple of years both Lake St.Clair and Lake Erie are above the long-term average. The US Army Corps of Engineers also forecasts water levels for the area. These projections show the probability that the water levels in Lake Erie and Lake St. Clair will be higher in 2019 than 2018. This has occurred. The Essex Region Conservation Authority issues flood messages for the region. The number of flood messages for the region are as follows: Year/Flood Watch/Flood Warning 2016/7/3 2017/11/4 2018/20/8 In 2018, Severe flooding in Essex County (not within the City of Windsor boundary) resulted in ten homes being put under an Order to Remedy (not habitable until fixed) and five under an Order to Prohibit Use (not-habitable). In May of 2019, The City of Windsor has been providing sand bags to residents located in identifies vulnerable areas along Lake St. Claire and the Detroit River. In June 2019, the Essex Region Conservation Authority issued a 'long-term' flood watch for all shoreline areas within Essex Region and Pelee Island. An additional consequence has been flooding of the City owned marina. Due to continuing high water levels the marina has been closed for the 2019 season. City Council has approved a budget of up to $3 million to replace the current docks with a floating dock system to address this concern.

Climate Hazards
Biological hazards > Insect infestation

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard
Medium High

Current consequence of hazard
Medium Low

Social impact of hazard overall
Other (Impacts to Natural Environment)

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Environment, biodiversity, forestry
Tourism

Please identify which vulnerable populations are affected
Other (Citizens as a whole)

Magnitude of expected future impact
Medium

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
Windsor/Essex County lost over 1 million Ash trees to the Emerald Ash Borer. This included losing our local population of very rare Pumpkin Ash. Blue Ash populations (listed as Threatened), while showing some signs of resistance, have also been negatively affected. The loss of Ash in our riparian areas have now become vulnerable as some of these areas are being dominated by other invasive species like Phragmites. This has resulted in a loss of biodiversity in these areas/wetlands and their storm water retention capabilities have now been negatively affected. Ash trees also had a major role to play in the integrity of the City's Urban Forest. A

very popular shade tree, Ash were widely planted for their fast growing attributes and attractiveness. The City lost 7,000 Ash trees along the public Right-of-Way and in City Parks at a removal and replacement costs of over $4 million dollars. Ash once made up 10% of our Street Tree Inventory. Oak Wilt has recently been found on Belle Isle in the Detroit River. Rare and Endangered Black Oak/Pin Oak Savana are at risk (1,000 acres). Natural areas typically consist of 10-20% Oak Species. Shumard Oak which are listed as Special Concern are also at risk. The City's street tree inventory consists of 3% Oak Trees. Asian Long Horned Beetle. This destructive beetle prefers Maple, Poplar and Elm trees among a few others. Maples comprise of approximately 18% of our street tree inventory alone (~12,500 trees). Bag Worm prefers Honeylocust, Maples and conifers. Mild winters promote the survival of overwintering larvae in bags. Hard cold winters will kill these off and help keep populations in check. Due to mild winters these are increasing in numbers.

Climate Hazards
Extreme hot temperature > Heat wave

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard
High

Current consequence of hazard
Medium Low

Social impact of hazard overall
Increased demand for healthcare services

Future change in frequency
Do not know

Future change in intensity
Do not know

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Public health
Emergency services

Please identify which vulnerable populations are affected
Children & youth
Elderly
Persons with chronic diseases

Magnitude of expected future impact
Medium

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
This hazard speaks to air quality. Over the past few decades, the air in Canada has been getting steadily cleaner, as considerable efforts have been made to reduce air pollution. In many parts of Canada, including Windsor, we often have days with clean air followed by heavy smog, and then a return to clean air. Hot sunny days in the summer may be accompanied by smog. The intense summer sun causes chemical reactions among the pollutants that are already in the air, leading to the formation of ground-level ozone a major component of smog. In 2007, Windsor reported almost 40 smog days, this number has dropped considerably to 0 in 2013 and 2014. 2015, the measurements for air quality changed in Ontario with 1 Special Air Quality statement being issued in 2015 and 2016. The question that remains is with increasing hot days and drier summers will this produce more poor air quality days or will technology improvements (i.e. cleaner electrical system, EV vehicles, etc.) keep air quality in the area steady. Because of Windsor's past concerns regarding Air Quality it continues to be a topic to monitor.

Climate Hazards
Extreme Precipitation > Heavy snow

Did this hazard significantly impact your city before 2019?
Yes

Current probability of hazard
High

Current consequence of hazard
Medium Low

Social impact of hazard overall
Increased demand for public services

Future change in frequency
Increasing

Future change in intensity
Increasing

When do you first expect to experience those changes?
Immediately

Most relevant assets / services affected overall
Transport
Public health
Emergency services

Please identify which vulnerable populations are affected
Persons with disabilities

Magnitude of expected future impact
Medium

Please describe the impacts experienced so far, and how you expect the hazard to impact in the future
Our climate projections indicate an increase in winter precipitation as well as an increase in winter temperatures. This may cause more freezing rain events and surface freeze/thaw cycles. The risk for motor vehicle accidents and slip and falls increase with freezing conditions.

(2.2) Please identify and describe the factors that most greatly affect your city's ability to adapt to climate change and indicate how those factors either support or challenge this ability.

Factors that affect ability to adapt	Support / Challenge	Please describe the factor and the degree to which it supports or challenges the adaptive capacity of your city
Other (Partnerships with organizations)	Support	Windsor has strong partnerships with various organizations and programs such as FCM, ICLEI, the International Urban Cooperation. These partnerships have allowed for further learning but also provided valuable tools and resources.
Resource availability	Challenge	As of now, the environmental sustainability and climate change department only has two full time staff. One additional temporary full time person was added in 2018. Staff/time limitation makes it very difficult to implement aspects of the plans as quickly as may be desired.
Community engagement	Challenge	Community members are not very engaged, and many don't know about the City's climate change strategies. This is something we are currently working on, so that the plans are out in the public a lot more and we can instill a sense of value for environmental/climate change issues into the Windsor Community.
Environmental conditions	Challenge	The environmental impacts are being seen and experienced at a faster rate then expected, making preparation more difficult to do.
Infrastructure conditions / maintenance	Challenge	Aging infrastructure makes it harder to withstand or answer to the added stress put on by climatic impacts.
Access to quality / relevant data	Challenge	There is a need to obtain more specific information on the Great Lakes (ie. water levels). Additionally, in our process to update the adaptation plan, we had to choose to use older data due to the climate projections not being Windsor specific (rather based off of Chatham).
Poverty	Challenge	The City of Windsor offers a number of incentive programs to help homeowners prepare for extreme events, unfortunately even with subsidies some homeowners still find the costs a challenge.
Infrastructure conditions / maintenance	Support	The City's new Asset Management Framework includes considerations for Climate Change.

Adaptation

Adaptation Actions

(3.0) Please describe the main actions you are taking to reduce the risk to, and vulnerability of, your city's infrastructure, services, citizens, and businesses from climate change as identified in the Climate Hazards section.

Climate hazards
Extreme Precipitation > Rain storm

Action
Resilience and resistance measures for buildings

Action title
Downspout Disconnection Program

Status of action
Operation

Co-benefit area
Enhanced resilience

Action description and implementation progress
The City of Windsor offers a free downspout disconnection process. The resident calls in a service request and the City will inspect the property to ensure the downspout disconnection will not cause other problems (i.e. to a neighbour's residence or slip and falls, etc.). The City will then schedule to have all appropriate disconnects performed. The program is currently voluntary but discussion is underway to make disconnecting downspouts mandatory.

Finance status
Finance secured

Total cost of the project
3930000

Total cost provided by the local government
3930000

Primary fund source
Local

Web link
https://www.citywindsor.ca/residents/maintenanceandfieldservices/Sewers-/Pages/Downspout-Disconnection.aspx

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Climate hazards
Extreme hot temperature > Extreme hot days

Action
Heat mapping and thermal imaging

Action title
Urban Heat Island Study

Status of action
Monitoring and reporting

Co-benefit area
Shift to more sustainable behaviours

Action description and implementation progress
The Urban Heat Island Study was completed to provide guidance to other policies, programs and engineering studies. Recommendations from this study are being implemented across various programs. Three follow up studies have been conducted to address Thermal Comfort in City Parks and in the Downtown core. Presentations have been completed at a number of conferences including ICLEI's Livable Cities conference. The City's work on Thermal Comfort have been featured in a number of case studies, including: Here are some links to papers we've included a case study of our collaborative work with Windsor: • Helping Canadian communities reduce urban heat islands (Richardson & Storfer 2017). (http://haznet.ca/helping-canadian-communities-reduce-urban-heat-islands) • Approaches for Building Community Resilience to Extreme Heat (Berry & Richardson 2016) https://convergence.unc.edu/files/2017/03/ExtremeWeather_Health_Communities.pdf#page=367 • Health Canada Urban Heat Island Bulletin: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/climate-change-health-adaptation-bulletin-number-6.html • Richardson et al. 2015. Conference paper.

Finance status
Finance secured

Total cost of the project
10000

Total cost provided by the local government
0

Primary fund source
(Sub)national

Web link
https://www.citywindsor.ca/residents/environment/Environmental-Master-Plan/topics-of-interest/Pages/Urban-Heat-Island.aspx Case study links: http://haznet.ca/helping-canadian-communities-reduce-urban-heat-islands https://convergence.unc.edu/files/2017/03/ExtremeWeather_Health_Communities.pdf#page=367 https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/climate-change-health-adaptation-bulletin-number-6.html

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Climate hazards
Extreme Precipitation > Rain storm

Action
Resilience and resistance measures for buildings

Action title
Basement Flooding Subsidy Program

Status of action
Operation

Co-benefit area
Enhanced resilience

Action description and implementation progress
The Basement Flooding Subsidy Program was introduced in July of 2011 to encourage retrofits of existing homes. The program includes the retrofit of sump pits and pumps to existing homes with no pre-existing sump pit or pump and the installation of a backwater valve. In 2017, the City of Windsor increased the subsidy from 80% to 100% of the cost up to $2800.

Finance status
Finance secured

Total cost of the project
6392000

Total cost provided by the local government
6392000

Primary fund source
Local

Web link
https://www.citywindsor.ca/residents/maintenanceandfieldservices/Sewers-/Pages/Basement-Flooding-Protection-Subsidy-Program-(BFP).aspx

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Climate hazards
Extreme Precipitation > Rain storm

Action
Flood defences – development and operation & storage

Action title
Enhanced Sewer Maintenance & CCTV Program

Status of action
Operation

Co-benefit area
Enhanced resilience

Action description and implementation progress
Funding was increased to accelerate CCTV inspections. The results of the CCTV inspections allow City staff to determine where

repairs, rehabilitation or replacement is needed. These results are also needed to enhance the asset management plan.

Finance status
Finance secured

Total cost of the project
600000

Total cost provided by the local government
600000

Primary fund source
Local

Web link

Climate hazards
Mass movement > Vector-borne disease

Action
Community engagement/education

Action title
West Nile Larviciding

Status of action
Operation

Co-benefit area
Improved public health

Action description and implementation progress
Community education (i.e. how and when to use insect repellents). West Nile Larviciding Program in place. Enhanced surveillance started in 2018. Tick monitoring in place.

Finance status
Finance secured

Total cost of the project
160000

Total cost provided by the local government
40000

Primary fund source
(Sub)national

Web link
West Nile https://www.wechu.org/your-environment/west-nile-virus Lyme Disease https://www.wechu.org/your-environment/ticks-and-lyme-disease

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Climate hazards
Biological hazards > Water-borne disease

Action
Community engagement/education

Action title
Surface Water Monitoring

Status of action
Operation

Co-benefit area
Improved resource quality (e.g. air, water)

Action description and implementation progress
Surface Water monitoring is completed by the Windsor-Essex County Health Unit, Essex Region Conservation Authority and Municipalities. Policies and public outreach to limit nutrient loading into at risk surface water features. Beach closures issued as needed.

Finance status
Finance secured

Total cost of the project
110000

Total cost provided by the local government
53849.88

Primary fund source
Local

Web link
https://www.wechu.org/drinking-water-small-drinking-water-systems-beaches-pools-and-spas/blue-green-algae-bloom

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Climate hazards
Flood and sea level rise > River flood

Action
Restrict development in at risk areas

Action title
Flood Plain Mapping for Little River

Status of action
Pre-implementation

Co-benefit area
Disaster Risk Reduction
Improved access to data for informed decision-making

Action description and implementation progress
Updating flood plain mapping for Little River planned to begin 2019. This is one phase of a more comprehensive flooding program for the East End of Windsor.

Finance status
Finance secured

Total cost of the project
500000

Total cost provided by the local government
500000

Primary fund source
Local

Web link
http://dashboard.corp.windsor/CorporateNews/Pages/Flood-Mitigation-Funding.aspx

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Climate hazards
Extreme Precipitation > Rain storm

Action
Flood mapping

Action title
Sewer Master Plan

Status of action
Pre-implementation

Co-benefit area
Disaster Risk Reduction
Enhanced resilience
Enhanced climate change adaptation
Improved access to data for informed decision-making

Action description and implementation progress

The development of the Sewer Master Plan has included modeling of the sewer network and overland flow routes. A climate change stress test is being applied to the modeling to understand the impacts of increased rain events. The final plan is expected in December 2019.

Finance status
Finance secured

Total cost of the project
4745900

Total cost provided by the local government
4745900

Primary fund source
Local

Web link
https://weatheringthestorm.ca/

Climate hazards
Flood and sea level rise > River flood

Action
Flood defences – development and operation & storage

Action title
Rain Catchers in Manholes

Status of action
Implementation

Co-benefit area
Disaster Risk Reduction
Enhanced resilience

Action description and implementation progress
In the event of overland flooding stormwater may enter into the sanitary sewer through openings in manholes. At risk sanitary sewer manholes are currently being equipped with rain catchers to reduce the impact on the sanitary system from overland flooding.

Finance status
Feasibility finalized, and finance partially secured

Total cost of the project
13000

Total cost provided by the local government
13000

Primary fund source
Local

Web link
https://weatheringthestorm.ca/about

Climate hazards
Extreme Precipitation > Rain storm

Action
Other (Downscaling/Modeling of precipitation data)

Action title
Update of the rainfall intensity duration frequency (IDF) curves

Status of action
Monitoring and reporting

Co-benefit area
Enhanced climate change adaptation

Action description and implementation progress
The Essex Region Conservation Authority on behalf of the City of Windsor and the municipalities of Essex County worked with researchers to predict a range of future IDF curves under a variety of climate change scenarios. These updated curves were considered in the recently approved Windsor/Essex Region Stormwater Management Standards Manual.

Finance status
Finance secured

Total cost of the project
91588

Total cost provided by the local government
50000

Primary fund source
Local

Web link
https://essexregionconservation.ca/wp-content/uploads/2018/12/WE-Region-SWM-Standards-Manual.pdf

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Climate hazards
Extreme Precipitation > Rain storm

Action
Community engagement/education

Action title
Public Education on Sewer Use, Waste Water Treatment

Status of action
Operation

Co-benefit area
Enhanced resilience
Disaster preparedness
Enhanced climate change adaptation

Action description and implementation progress
The main goal of this action is to help ensure that the sewers are operating under their design capacity. Improper use of the sewer system (i.e. disposal of materials not intended in a sewer) can decrease capacity along the sewer by creating blockages or contribute to pump failures at pump stations. Educating residents that toilets are not garbage cans is one way to help reduce these issues in the sewers. In 2011, the City of Windsor partnered with EWSWA to design an EnviroTips 'It's all Connected' to help educate residents that toilets are not garbage cans and the impact of flushing materials in the toilet. In 2012 a video "Wastewater: Where Does It Go?" was developed in collaboration with the Detroit River Canadian Clean-Up. The video educates about the City's sewer system (sanitary, storm and combined) and the wastewater treatment system. The video also tries to encourage individuals to take small actions (like downspout disconnection) to help alleviate flooding issues. The video has over 80,000 views between the City of Windsor and DRCC YouTube channels. The DVD has also been distributed as requested. Open houses have been hosted at both the Lou Romano Water Reclamation Plant (2015) and the Little River Pollution Control Plant (2016 & 2019). Over 410 individuals have toured the facilities. Tours are provided as requested at both wastewater treatment facilities. A toilet on wheels has also been constructed to help educate residents on the issues around 'Flushable' Wipes. This toilet is used at public events such as Earth Day and the Children's Water Festival. In 2016, ERCA also used the toilet in their Earth Day road show. Additional advertising about the hazards of 'Flushable' Wipes have also been developed including ads in the Activity Guide, brochures and signage for public washrooms at City facilities. In 2016, the City of Windsor launched the F.O.G. Cups (Fat, Oil and Grease Cups) to educate to residents proper disposal of F.O.G. The cups have been distributed at various public events and as requested. Cups may also be delivered to areas in the City were fat blockages have been a problem. Staff has also developed programs to provide in schools to educate students on wastewater and climate change.

Finance status
Finance secured

Total cost of the project
27000

Total cost provided by the local government
27000

Primary fund source
Local

Web link
Wastewater video https://www.youtube.com/watch?v=oaXth88i7rk F.O.G.
https://www.citywindsor.ca/residents/environment/Pollution-Control/Pages/Your-Turn-FOG-Cups.aspx

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Climate hazards
Extreme Precipitation > Rain storm

Action
Flood defences – development and operation & storage

Action title
Targeted Education towards homeowners

Status of action
Monitoring and reporting

Co-benefit area
Enhanced resilience
Enhanced climate change adaptation

Action description and implementation progress
694 km of sewers have been smoke tested. These tests have identified more broken clean outs than actual cross-connections. Broken cleanouts allow for infiltration into the sewer. The entire City except combined sewers in the core and over/under sections are completed. Nothing further to be tested at this time.

Finance status
Finance secured

Total cost of the project
220000

Total cost provided by the local government
220000

Primary fund source
Local

Web link

Climate hazards
Extreme Precipitation > Rain storm

Action
Nature based solutions for water

Action title
Rain Garden Pilots

Status of action
Operation

Co-benefit area
Enhanced resilience
Enhanced climate change adaptation
Ecosystem preservation and biodiversity improvement
Shift to more sustainable behaviours
Improved access to data for informed decision-making

Action description and implementation progress
Pilot rain gardens have been installed at various sites to provide education for the public on their benefits. Presentations have also be provided at a local library for education.

Finance status
Finance secured

Total cost of the project
5000

Total cost provided by the local government

2500

Primary fund source
Local

Web link
https://www.citywindsor.ca/residents/environment/climate-change-adaptation/climate-resilient-home/Pages/Rain-Gardens.aspx

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Climate hazards
Extreme Precipitation > Rain storm

Action
Nature based solutions for water

Action title
Improvement and Enhancement of Green Space to improve rain water retention

Status of action
Pre-implementation

Co-benefit area
Enhanced resilience
Ecosystem preservation and biodiversity improvement

Action description and implementation progress
Natural heritage and open space systems present opportunities to enhance and integrate stormwater management facilities. Trees and forests reduce stormwater runoff by capturing and storing rainfall in the canopy and releasing water into the atmosphere through evaportranspiration. In addition, tree roots and leaf litter create soil conditions that promote the infiltration of rainwater into the soil. The presence of trees also helps to slow down and temporarily store runoff, which further promotes infiltration, and decreases flooding and erosion downstream. The Parks Master Plan approved in 2016 listed several recommendations that support the improvement and enhancement of Green Space to improve rain water retention. The following is a list of the recommendation numbers as provided in the Parks Master Plan; 4.01, 4.02, 4.03, 4.04, 4.07, 4.09, 4.11 Tranby Park will be the first comprehensive design and construction. Cost estimates below.

Finance status
Feasibility undertaken

Total cost of the project
1250000

Total cost provided by the local government
712500

Primary fund source
Local

Web link

Climate hazards
Extreme hot temperature > Heat wave

Action
Tree planting and/or creation of green space

Action title
Increase Tree Planting

Status of action
Pre-implementation

Co-benefit area
Enhanced resilience
Improved resource quality (e.g. air, water)
Improved public health
Resource conservation (e.g. soil, water)
Ecosystem preservation and biodiversity improvement

Action description and implementation progress
In 2014, a report titled ‘Designing City of Windsor Parks to improve Thermal Comfort in Summer’ was completed. A portion of this

study reviewed the current canopy (shade) coverage in City parks. In previous years, steps have been taken to increase the survival rate of City trees. For example, the introduction of tree root systems to give trees in commercial areas a better chance of surviving the stresses related to road salts, significant amounts of impermeable surfaces, and heat as a result of adjacent concrete and asphalt surfaces. In addition, Forestry has introduced the use of water gators for all newly planted trees to help with survival. During the public consultation process for the Parks Master Plan, groups identified the need for shade. Health factors related to climate change and the adverse effects of excessive UV exposure are the driving forces behind this growing concern. Reducing Risks associated with increasing temperatures In 2018/2019, the City Forestry department will be undertaking a tree inventory. Following its completion, an Urban Forestry Management Plan will be undertaken. The Urban Forestry Management Plan will serve as a 20-year strategic document guiding urban forestry priorities. At this time a long list of recommendations will be considered ranging from canopy coverage, strategic planting initiatives and heritage tree protection.

Finance status
Pre-feasibility study status

Total cost of the project
350000

Total cost provided by the local government
350000

Primary fund source
Local

Web link
https://www.citywindsor.ca/cityhall/City-Council-Meetings/CouncilReports/Documents/Urban%20Forestry%20Plan%20to%20Reduce%20the%20Backlog%20in%20Forestry%20Services%20and%20a%20Return%20to%20Preventative%20Maintenance%20Program.pdf

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Climate hazards
Extreme hot temperature > Heat wave

Action
Shading in public spaces, markets

Action title
Shade Structures

Status of action
Operation

Co-benefit area
Enhanced resilience
Improved public health

Action description and implementation progress
Shade Structures 1. Captain Wilson Community Park 12m x 20m 2. Ford Test Track Regional Park 12m x 20m 3. Optimist Memorial Community Park 12m x 20m 4. Wigle Neighbourhood Park 12m x 15m 5. Mic Mac Regional Park 12m x 20m 6. Jackson Regional Park 12m x 20m 7. Rotary Centennial Plaza Riverfront Park – Trellis 15m x 15m 8. Bruce Avenue Neighbourhood Park 10m x10m (2019 Installation) 9. South Windsor Recreation Complex – Playground Shade Sails (2019 Installation) Shaded Seating 1. Kishkon Community Park 2. Realtor Neighbourhood Park 3. Rotary Centennial Park We have also strategically planted trees at all 27 new playgrounds to provide future shade.

Finance status
Finance secured

Total cost of the project
2400000

Total cost provided by the local government
2400000

Primary fund source
Local

Web link

Climate hazards
Extreme hot temperature > Heat wave

Action
Cooling centers, pools, water parks/plazas

Action title
Increase in Splash Pad and Water Features

Status of action
Operation

Co-benefit area
Improved public health

Action description and implementation progress
New water features installed since the publication of the 2013 Thermal Comfort Study. Splash Pads 1. Captain Wilson Community Park 2. Jackson Regional Park 3. Realtor Regional Park Drinking Fountains 1. Water bottle fill stations (2) – Central Riverfront

Finance status
Finance secured

Total cost of the project
1000000

Total cost provided by the local government
1000000

Primary fund source
Local

Web link

Climate hazards
Extreme hot temperature > Heat wave

Action
Community engagement/education

Action title
Stay Cool Windsor-Essex

Status of action
Operation

Co-benefit area
Enhanced resilience
Improved public health

Action description and implementation progress
The Stay Cool Windsor Campaign developed in partnership with the Windsor Essex County Health Unit and Health Canada launched in 2011. The campaign continues to focus on heat health education messages and each year expands it reach. Public education brochures are distributed to the City community centres and Ontario Early Years Centres. In 2013, signage was also developed to be used at all local outdoor pools. This campaign was featured in a Case Study produced by Health Canada.

Finance status
Finance secured

Total cost of the project
22000

Total cost provided by the local government
0

Primary fund source
(Sub)national

Web link
Local website https://www.wechu.org/your-environment/heat-warnings-and-extended-heat-warnings Health Canada's publication "Heat Alert and Response Systems to Protect Health: Best Practices Guidebook" Case Study 5 https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/climate-change-health/heat-alert-response-systems-protect-health-best-practices-guidebook.html

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Climate hazards
Extreme hot temperature > Heat wave

Action
Projects and policies targeted at those most vulnerable

Action title
Assessment of Vulnerability to the Impacts of Extreme Heat in the City of Windsor

Status of action
Monitoring and reporting

Co-benefit area
Disaster preparedness
Social inclusion, social justice
Improved public health

Action description and implementation progress
Working with Health Canada an "Assessment of Vulnerability to the Impacts of Extreme Heat in the City of Windsor" was completed. This study has provided guidance for a number of follow-up studies completed including the Urban Heat Island Study and the Thermal Comfort Studies

Finance status
Finance secured

Total cost of the project
0

Total cost provided by the local government
0

Primary fund source
(Sub)national

Web link
Case Study completed by ICLR (page 82): https://www.iclr.org/wp-content/uploads/PDFS/cities-adapt-to-extreme-heat.pdf

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Climate hazards
Extreme Precipitation > Rain storm

Action
Incorporating climate change into long-term planning documents

Action title
Asset Management Planning

Status of action
Operation

Co-benefit area
Enhanced resilience
Enhanced climate change adaptation
Improved access to and quality of mobility services and infrastructure
Improved access to data for informed decision-making

Action description and implementation progress
In, 2017 the City of Windsor updated the City's Asset Management Policy and Framework to include Climate Change considerations. This was undertaken through collaboration with Federation of Canadian Municipalities through a partnership grant called Leaders in Asset Management (LAMP). The City's inclusion of Climate Change and environmental sustainability have been presented a the Canadian Network of Asset Managers (CNAM) - 2017, Asset Management East Conference - 2017, and the Federation of Canadian Municipalities Conference - 2017.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government
62500

Primary fund source
(Sub)national

Web link
https://www.citywindsor.ca/cityhall/City-Council-Meetings/CouncilReports/Documents/FCM%20-%20Leadership%20in%20Asset%20Management%20Program%20(LAMP).pdf

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Climate hazards
Extreme Precipitation > Rain storm

Action
Flood defences – development and operation & storage

Action title
City of Windsor Disaster Mitigation and Infrastructure Enhancement Initiative

Status of action
Pre-implementation

Co-benefit area
Disaster Risk Reduction
Enhanced resilience
Enhanced climate change adaptation
Improved access to and quality of mobility services and infrastructure
Shift to more sustainable behaviours
Improved access to data for informed decision-making

Action description and implementation progress
The main project objectives are to reduce existing levels of surface and basement flooding and the susceptibility of urban/residential areas to flooding. The project aims to build resilience to current and future natural hazards and increase the ability of the storm sewer infrastructure to manage large storms. Improvements to minor and major stormwater conveyance systems of 9.7 km of sewers and roadway, construction of LID features, and upgrades to 3 stormwater pumping stations will build resiliency in the system in this vulnerable area and reduce the impacts on critical infrastructure during extreme storm events.

Finance status
Feasibility finalized, and finance partially secured

Total cost of the project
80226727

Total cost provided by the local government
45723167

Primary fund source
Local

Web link
https://www.citywindsor.ca/Newsroom/Pages/Flood-Mitigation-Funding.aspx

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Climate hazards
Flood and sea level rise > River flood

Action
Flood defences – development and operation & storage

Action title
Flood Risk Study

Status of action
Pre-implementation

Co-benefit area
Disaster Risk Reduction
Enhanced resilience
Disaster preparedness
Enhanced climate change adaptation

Action description and implementation progress

This study covers the area in Windsor from St Rose Beach to municipal boundary with the Town of Tecumseh. The project is to look at current and future vulnerabilities with rising water levels and the existing dike system.

Finance status
Finance secured

Total cost of the project
200000

Total cost provided by the local government
75000

Primary fund source
(Sub)national

Web link
https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/East-Riverside-Flood-Risk-Assessment.aspx

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Climate hazards
Flood and sea level rise > River flood

Action
Soil retention strategies

Action title
Peche Island Shoreline stabilization

Status of action
Pre-implementation

Co-benefit area
Resource conservation (e.g. soil, water)
Ecosystem preservation and biodiversity improvement

Action description and implementation progress
Due to high water levels, the shoreline along Peche Island (Natural Heritage Site) is being eroded away. This project is being designed to stabilize the shoreline.

Finance status
Feasibility finalized, and finance partially secured

Total cost of the project
2500000

Total cost provided by the local government
2500000

Primary fund source
Local

Web link
https://www.citywindsor.ca/residents/parksandforestry/City-Parks/Pages/Peche-Island-.aspx https://www.youtube.com/watch?v=abuWYJDhEIY&feature=youtu.be

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Adaptation Planning

(3.1) Does your city council have a published plan that addresses climate change adaptation?
Yes

(3.1a) Please provide more information on your plan that addresses climate change adaptation and attach the document. Please provide details on the boundary of your plan, and where this differs from your city's boundary, please provide an explanation.

Publication title and attach the document
City of Windsor Climate Change Adaptation Plan
Windsor Climate Change Adaptation Plan.pdf

Areas covered by adaptation plan
Building and Infrastructure
Agriculture and Forestry
Water
Public Health and Safety
Social Services

Year of adoption from local government
2012

Boundary of plan relative to city boundary (reported in 0.1)
Same - covers entire city and nothing else

If the city boundary is different from the plan boundary, please explain why and any areas/other cities excluded or included
The plan covers the City of Windsor's boundary. However, discussion has begun about addressing regional issues.

Stage of implementation
Plan update in progress

Type of plan
Standalone

Has your local government assessed the synergies, trade-offs, and co-benefits, if any, of the main mitigation and adaptation actions you identified?
Yes

Comment or describe the synergies, trade-offs, and co-benefits of this interaction
The current 2012 Climate Change Adaptation Plan includes consideration for co-benefits with mitigation especially on the extreme heat goals for example, increasing tree canopies. The update underway will further identify co-benefits and trade-offs that may be unavoidable.

Primary author of plan
Dedicated city team

Description of the stakeholder engagement processes
The 2012 plan was developed by internal staff with consultation with some key agencies. The current redevelopment has considerably more consultation. The updated plan will include two sub-plans (Corporate and Community) The Corporate sub-plan is being developed internally with key agencies similar to the 2012 plan. The Community Plan is being completed with a Community Task Force that consists of representatives from University of Windsor, St. Clair College, Windsor Essex Catholic District School Board, Greater Essex County Public School Board, Windsor Regional Hospital, County of Essex, Windsor Port Authority, Walpole Island First Nations, Citizens Environment Alliance, Canada Red Cross, Union Gas, Essex County Field Naturalists and Windsor Essex Community Housing. In addition, representatives from the Windsor Essex County Health Unit (WECHU) and Essex Region Conservation Authority (ERCA) also attend the Community Task Force meetings. These agencies have also been included in departmental meetings to better inform the Corporate Adaptation Plan. This Task Force is a dynamic working group and we continue to invite others as needed to fill identified representation gaps. In addition a number of pop-up community events have been completed in 2019 including at the Windsor Home and Garden Show, Earth Day Windsor-Essex, Little River Pollution Control Plant Open House and others to be determined. The final plan will be tabled for public comment prior to City Council Approval.

Web link
https://www.citywindsor.ca/residents/environment/climate-change-adaptation/Pages/default.aspx

Adaptation Goals

(3.2) Please describe the main goals of your city's adaptation efforts and the metrics / KPIs for each goal.

Adaptation goal
Reduce risks associated with increased precipitation

Target year
2030

Metrics / indicators
-Flooding reduction (ie. number of basement floods) -Reduction in the number of treatment plant overflows -Improved storm water quality -Improved drainage during extreme runoff events -Lower maintenance costs

Percentage of target achieved so far
10

Does this target align with a requirement from a higher level of government?
No

Adaptation goal
Reducing risks associated with increase precipitation and temperatures

Target year
2030

Metrics / indicators
-Improved storm water quality -Improved air quality -Lower urban temperatures -Reduced water runoff -Lower energy usage during the summer months -

Percentage of target achieved so far
15

Does this target align with a requirement from a higher level of government?
No

Adaptation goal
Reducing risks associated with increasing temperatures

Target year
2030

Metrics / indicators
-Reduced number of reported heat illnesses -Ability of departments to respond to major weather events -Reduced impact to annual operating budgets

Percentage of target achieved so far
20

Does this target align with a requirement from a higher level of government?
No

Adaptation goal
Incorporate climate change adaptation into city policies and high level plans

Target year
2025

Metrics / indicators
-Number of policies that considered climate adaptation

Percentage of target achieved so far
75

Does this target align with a requirement from a higher level of government?
No

Adaptation goal
Create internal mechanisms to 'ask the climate question' for new major infrastructure projects

Target year
2017

Metrics / indicators
- Inclusion into Asset Management Policies and Framework

Percentage of target achieved so far
100

Does this target align with a requirement from a higher level of government?
Yes

Adaptation goal
Monitor climate change, evaluate the effectiveness of adaptation strategies and adjust as needed (adaptive management)

Target year
2020

Metrics / indicators
Biennial status reports to City Council

Percentage of target achieved so far
75

Does this target align with a requirement from a higher level of government?
No

Adaptation goal
Use best available science to analyze how the climate is changing locally and how this may impact the community

Target year
2019

Metrics / indicators
Review of possible impacts.

Percentage of target achieved so far
90

Does this target align with a requirement from a higher level of government?
Do not know

Adaptation goal
Routinely review the City of Windsor's vulnerability to climate change

Target year
2019

Metrics / indicators
Using the updated science above, review and update vulnerability and risk assessments as needed.

Percentage of target achieved so far
75

Does this target align with a requirement from a higher level of government?
Do not know

Adaptation goal
Engage the public, business, and other stakeholder groups

Target year
2019

Metrics / indicators
Number of individuals and businesses involved in stakeholder working group.

Percentage of target achieved so far
50

Does this target align with a requirement from a higher level of government?
Do not know

City Wide Emissions

City-wide GHG Emissions Data

(4.0) Does your city have a city-wide emissions inventory to report?

Yes

(4.1) Please state the dates of the accounting year or 12-month period for which you are reporting your latest city-wide GHG emissions inventory.

	From	To
Accounting year dates	January 1 2014	December 31 2014

(4.2) Please indicate the category that best describes the boundary of your city-wide GHG emissions inventory.

	Boundary of inventory relative to city boundary (reported in 0.1)	Excluded sources / areas	Explanation of boundary choice where the inventory boundary differs from the city boundary (include inventory boundary, GDP and population)
Please explain	Same – covers entire city and nothing else		

(4.3) Please give the name of the primary protocol, standard, or methodology you have used to calculate your city's city-wide GHG emissions.

	Primary protocol	Comment
Emissions methodology	Global Protocol for Community Greenhouse Gas Emissions Inventories (GPC)	The 2014 baseline inventory for

(4.3a) The Global Covenant of Mayors requires committed cities to report their inventories in the format of the new Common Reporting Framework, to encourage standard reporting of emissions data. If your city is reporting an updated inventory, we encourage reporting this in the CRF format, for which guidance can be found in the link below. Would you like to report your inventory in the CRF format or continue to report in the GPC format? Please ensure you respond to this question in order for the correct emissions breakdown questions to be displayed.

No – continue to use the GPC format

Is the new ICLEI PCP/GPC reporting tool in accordance with the CRF format? We are currently building out the new tool but have noticed technical inconsistencies with the program and not comfortable using the numbers to report this year.

(4.4) Which gases are included in your city-wide emissions inventory? Select all that apply.

CO2
CH4
N20

(4.5) Please attach your city-wide inventory in Excel or other spreadsheet format and provide additional details on the inventory calculation methods in the table below.

Emissions inventory format
Custom or older GPC format

Document title and attachment
Windsor GPC Baseline
Windsor GPC Baseline.xlsx

Emissions factors used
Other (Combination of IPCC and National reported emission factors)

Global Warming Potential (select relevant IPCC Assessment Report)
IPCC 5th AR (2013)

Please select which additional sectors are included in the inventory
Industrial process and/or product use

Population in inventory year
210891

Overall Level of confidence
Medium

Comment on level of confidence
In 2014, the same year the GPC inventory was being completed the local community energy and emissions inventory was being completed for the development of the Community Energy Plan. A number of sections (i.e. scope 1 emissions for residential, commercial, transportation etc.) are closely aligned between the two plans. There is low confidence on items like aviation, water transport, rail and off road vehicles.

(4.6b) Please provide a summary of emissions by sector and scope as defined in the Global Protocol for Community Greenhouse Gas Emissions Inventories (GPC) in the table below.

	Emissions (metric tonnes CO2e)	Where data is not available, please explain why
Stationary Energy: energy use – Scope 1 (I.X.1)	1074018	
Stationary Energy: energy use – Scope 2 (I.X.2)	109459	
Stationary Energy: energy use – Scope 3 (I.X.3)		
Stationary Energy: energy generation supplied to the grid – Scope 1 (I.4.4)	812826	
Transportation – Scope 1 (II.X.1)	681924	
Transportation – Scope 2 (II.X.2)	68	
Transportation – Scope 3 (II.X.3)	139539	
Waste: waste generated within the city boundary – Scope 1 (III.X.1)	19889	
Waste: waste generated within the city boundary – Scope 3 (III.X.2)	13355	
Waste: waste generated outside the city boundary – Scope 1 (III.X.3)	4652	
Industrial Processes and Product Use – Scope 1 (IV)		
Agriculture, Forestry and Land Use – Scope 1 (V)		
TOTAL Scope 1 (Territorial) emissions	2593309	
TOTAL Scope 2 emissions	109527	
TOTAL Scope 3 emissions		
TOTAL BASIC emissions	1898713	
TOTAL BASIC+ emissions	2038252	

(4.8) Please indicate if your city-wide emissions have increased, decreased, or stayed the same since your last emissions inventory, and describe why.

	Change in emissions	Primary reason for change	Please explain and quantify changes in emissions
Please explain	Stayed the same	Emissions have not changed	Though updated GPC inventory is not finalized, all indications from our internal inventories show negligible changes in emissions on a per capita basis.

(4.9) Does your city have a consumption-based inventory to measure emissions from consumption of goods and services by your residents?

	Response	Provide an overview and attach your consumption-based inventory if relevant
Please complete	Not intending to undertake	

City-wide external verification

(4.11) Has the city-wide GHG emissions data you are currently reporting been externally verified or audited in part or in whole?

Not intending to undertake

(4.11b) Please explain why your city-wide emissions inventory is not verified and describe any plans to verify your city-wide emissions in the future.

	Reason	Comments
Please explain	Lack of funding / resources	There are no current plans to have the City's greenhouse gas inventory verified or audited by an external agency. There is currently no funding to perform verification of the inventory. There is no legal requirement for external verification. Staff prioritize are focused on implementing mitigation strategies identified in the CEP.

Historical emissions inventories

(4.12) Please provide details on any historical and base year city-wide emissions inventories your city has, in order to allow assessment of targets in the table below.

Inventory date from
January 1 2005

Inventory date to
December 31 2005

Scopes / boundary covered
Scope 1 (direct)

Previous emissions (metric tonnes CO2e)
3690224

Is this inventory used as the base year inventory?
No

Methodology
City specific methodology

File name and attach your inventory
GHG inventory 2005
GHG-inventory2005final for printing.xlsx

Comments
This inventory was completed to fulfill the requirements of the Federation of Canadian Municipalities Partners for Climate Protection framework.

Re-stating previous emissions inventories

(4.13) Since your last submission, have you needed to recalculate any past city-wide GHG emission inventories previously reported to CDP?

No

Emissions Reduction

Mitigation Target setting

(5.0) Do you have a GHG emissions reduction target in place at the city-wide level? Select all that apply.

Base year intensity target

(5.0c) Please provide details of your total city-wide base year intensity target. An intensity target is usually measured per capita or per unit GDP. If you have an absolute emissions reduction target, please select "Base year emissions (absolute) target" in question 5.0.

Sector
Other (Total City-wide emissions)

Where sources differ from the inventory, identify and explain these additions / exclusion

Boundary of target relative to city boundary (reported in 0.1)
Same – covers entire city and nothing else

Base year
2014

Year of target implementation
2018

Intensity unit (Emissions per)
Metric tonnes of CO2e per capita

Base year emissions per intensity unit (metric tonnes CO2e per denominator)
8.8

Base year absolute emissions (metric tonnes CO2e)
1900000

Percentage reduction target in emissions intensity
40

Target year
2041

Target year absolute emissions (metric tonnes CO2e)
1140000

Percentage of target achieved
0

Does this target align with the global 1.5 - 2 °C pathway set out in the Paris agreement?
Yes - 1.5 °C

Please indicate to which sector(s) the target applies
Heating and cooling supply
Commercial buildings
Residential buildings
Public facility
Industrial facilities
Transport

Does this target correspond to a requirement from a higher level of government?
No

Please describe your target. If your country has an NDC and your city's target is less ambitious than the NDC, please explain why.
Reduce GHG emissions by 40 per cent by 2041 from 8.8t CO2e per capita in 2014. The federal and provincial governments do not require the municipality to set an emission target. However, the emissions target set met the targets identified in the 2016 Ontario Climate Action Plan and the 2018 Made in Ontario plan.

(5.1) Please describe how the target(s) reported above align with the global 1.5 - 2 °C pathway set out in the Paris agreement.

In 2016, the Canadian Parliament voted to support the ratification of the Paris Agreement and participated in COP22 in Marrakesh. In December 2016, the Pan Canadian Framework on Clean Growth and Climate Change was released. The plan outlines the pathways to meeting Canada's 2030 target.

In 2015, the Government of Ontario released its detailed 5-year Climate Change Action Plan (since been repealed) to support the implementation of the province's climate change strategy (November 2015). The Climate Change Strategy identifies a new interim target of reducing GHG emissions by 15 percent below 1990 by 2020, 37 percent below 1990 levels by 2030 and committed to the long-term target of reducing emission by 80 percent below 1990 levels by 2050.

By advancing all strategies identified in the City's Community Energy Plan, Windsor is able to reduce its total energy use by 29 percent and total GHG emissions by 24 percent below 2014 and 43 percent below 1990. This brings the Windsor community close to achieving the 2015 Ontario Climate Action Plan target of 40 percent GHG emission reduction by 2030, but also suggests the Windsor Community would still require significant effort to achieve the 80 percent GHG emission reduction target identified by the Province for 2050.

(5.2) Is your city-wide emissions reduction target(s) conditional on the success of an externality or component of policy outside of your control?

No

The District Energy System infrastructure is not owned or operated by the City of Windsor. The growth of the system is dependent on an outside agency and partner. The City's Community Energy Plan (CEP) assumes that by 2028, the 70 percent of targeted existing buildings will be connected to the heating network in the City Centre/South Central area, and 50 percent in the Walker Corridor. This assumption accounts for about 10 percent of the total heating needs of the City. Though the City of Windsor has tools to support the expansion, ultimately, the owners and operators have care and control of the system and may wish to expand or not.

(5.3) Does your city-wide emissions reduction target(s) account for the use of transferable emissions units?

No

Mitigation Actions

(5.4) Describe the anticipated outcomes of the most impactful mitigation actions your city is currently undertaking; the total cost of the action and how much is being funded by the local government.

Mitigation action

Private Transport > Infrastructure for non-motorized transport

Action title

Supporting Infrastructure for Active Transportation and Commuting via no emissions methods

Means of implementation

Awareness raising program or campaign
Infrastructure development

Implementation status

Implementation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production

Projected lifetime

Co-benefit area

Reduced GHG emissions
Social inclusion, social justice
Improved resource quality (e.g. air, water)

Improved public health
Improved access to and quality of mobility services and infrastructure
Shift to more sustainable behaviours

Action description
End of trip facilities for active transportation (includes showering facilities, secure bike parking, connections to transit, maintenance stations). Emission reductions are not estimated for this single action but will be included in the overall Active Transportation numbers. This is an enabling action to support Active Transportation - total emissions reductions are counted under that action.

Finance status
Feasibility undertaken

Total cost of the project

Total cost provided by the local government

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Community-Scale Development > Brownfield redevelopment programs

Action title
Brownfield Redevelopment STrategy

Means of implementation
Policy and regulation

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Reduced GHG emissions
Economic growth
Job creation
Improved resource security (e.g. food, water, energy)
Resource conservation (e.g. soil, water)

Action description
Brownfield Redevelopment Strategy and Community Improvement Plan. The brownfield redevelopment strategy's goal is to promote better land use planning through densification and revitalization of neighbourhoods with environmental sustainability focus. Some brownfield sites are being leased to establish community gardens. The emissions reduction number is not available at this time.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government

Primary fund source
Local

Web link to action website
https://www.citywindsor.ca/residents/planning/Land-Development/Planning-Policy/Documents/Brownfield%20Redevelopment%20Strategy.pdf

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Buildings > Building codes and standards

Action title
Ontario Building Code compliance

Means of implementation
Monitor activities
Verification activities

Implementation status
Implementation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Enhanced resilience
Reduced GHG emissions
Shift to more sustainable behaviours
Improved access to data for informed decision-making

Action description
Continue to ensure compliance with the Ontario Building Code for New Residential and Commercial developments. Focus on reducing the performance gap between modelled and actual performance measurements.

Finance status
Pre-feasibility study status

Total cost of the project
0

Total cost provided by the local government
0

Primary fund source

Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Energy Supply > Low or zero carbon energy supply generation

Action title
Solar PV generation

Means of implementation
Infrastructure development

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)
138

Energy savings (MWh)

Renewable energy production (MWh)
1.35

Timescale of reduction / savings / energy production
Per year

Co-benefit area
Reduced GHG emissions

Action description
Installation of PV on City owned roofs continues with installations at a number of locations including Transit Windsor Facility and the Windsor International Aquatic and Training Centre. The emissions reduction number is not available at this time and would contribute to a greening of the Ontario electricity grid. The City installed capacity cost $4,000,000, however as the PV is supplying the provincial grid the City of Windsor receives annual payments for electricity generated. The City has also leased some of the Windsor airport lands for the development of a 50MW solar farm by Samsung, these MW are not included in this total but in the Community Renewable Energy totals.

Finance status
Finance secured

Total cost of the project
4000000

Total cost provided by the local government
4000000

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program

<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Community-Scale Development > Urban agriculture

Action title
Community Gardens Policy

Means of implementation
Awareness raising program or campaign
Stakeholder engagement
Policy and regulation

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Enhanced resilience
Enhanced climate change adaptation
Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)
Poverty reduction / eradication
Improved public health
Improved resource security (e.g. food, water, energy)
Shift to more sustainable behaviours

Action description
Community Gardens Policy. The policy is designed to encourage local food production by reducing GHG emissions from transportation. The emissions reduction number is not available at this time.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government

Primary fund source
Local

Web link to action website
https://www.citywindsor.ca/residents/environment/Pages/Community-Gardens.aspx

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Buildings > Building performance rating and reporting

Action title
Performance Labelling

Means of implementation
Education
Awareness raising program or campaign
Monitor activities
Verification activities

Implementation status
Pre-implementation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Reduced GHG emissions

Action description
Performance labelling for Homes and Building. Currently the City is testing the NRCan portfolio manager for labelling and tracking tool for Corporate buildings with intent to expand to private buildings in 2020. Education and awareness of the tool is already underway.

Finance status
Pre-feasibility study status

Total cost of the project

Total cost provided by the local government

Primary fund source

Web link to action website
https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Buildings > Energy efficiency/ retrofit measures

Action title
DEER - Deep Energy Efficiency Retrofit Business Case Development

Means of implementation
Awareness raising program or campaign
Stakeholder engagement
Development and implementation of action plan
Policy and regulation
Financial mechanism

Implementation status
Pre-feasibility study

Estimated emissions reduction (metric tonnes CO2e)
145000

Energy savings (MWh)
888889

Renewable energy production (MWh)
0

Timescale of reduction / savings / energy production
Projected lifetime

Co-benefit area
Enhanced resilience
Disaster preparedness
Reduced GHG emissions
Social inclusion, social justice
Greening the economy
Economic growth
Job creation
Shift to more sustainable behaviours

Action description
Detailed business case underway to determine strategy to obtain Deep Energy Retrofit for 80% of Windsor homes by 2041

Finance status
Pre-feasibility study status

Total cost of the project
235000

Total cost provided by the local government
110000

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Private Transport > Improve fuel economy and reduce CO2 from motorized vehicles

Action title
Greening the Fleet Plan

Means of implementation
Education
Awareness raising program or campaign
Monitor activities
Verification activities
Sustainable public procurement

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)
750

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Other (Since Baseline year 2014)

Co-benefit area
Reduced GHG emissions
Shift to more sustainable behaviours

Action description
The City has an approved Greening the City Fleet Manual to reduce the environmental footprint of the City's fleet. The City has updated the municipal Anti-Idling Bylaw. Traffic Signal timings are being optimized.

Finance status
Finance secured

Total cost of the project
0

Total cost provided by the local government
0

Primary fund source
Local

Web link to action website
https://www.citywindsor.ca/residents/environment/Documents/Greening%20the%20City%20Fleet%20Manual%20-%20Oct%2010%202012.pdf

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Mass Transit > Improve fuel economy and reduce CO2 from bus and/or light rail

Action title
Procurement of New Transit Buses

Means of implementation
Sustainable public procurement

Implementation status
Implementation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Enhanced resilience
Reduced GHG emissions
Poverty reduction / eradication
Improved access to and quality of mobility services and infrastructure
Shift to more sustainable behaviours

Action description
Transit Windsor is purchasing new more efficient buses.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government

Primary fund source

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Buildings > Building codes and standards

Action title
Asset Management Policy - Climate Change inclusion

Means of implementation
Policy and regulation

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Enhanced resilience
Enhanced climate change adaptation
Reduced GHG emissions
Shift to more sustainable behaviours

Action description
In 2017, the City of Windsor approved an updated Asset Management Policy and Framework with the inclusion of climate change considerations. Life Cycle Costing shall include energy and carbon costs as part of the decision making tool. This is an enabling action.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government
62500

Primary fund source
(Sub)national

Web link to action website
https://www.citywindsor.ca/residents/environment/Environmental-Master-Plan/Goal-D-Use-Resources-Efficiently/Pages/Environmental-Sustainability-and-Climate-Change-in-Asset-Management.aspx

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Outdoor Lighting > LED / CFL / other luminaire technologies

Action title
Conversion to LED street lighting and traffic signals

Means of implementation
Infrastructure development

Implementation status
Monitoring and reporting

Estimated emissions reduction (metric tonnes CO2e)
350

Energy savings (MWh)
8333.3

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Per year

Co-benefit area
Reduced GHG emissions
Shift to more sustainable behaviours

Action description
The City has been replacing traffic signal lights and street lights with LEDs as part of its LED Street Light Conversion Project. The LED conversion for street lighting has been completed with the exception of some decorative lighting and some parks lighting.

Finance status
Finance secured

Total cost of the project
12935705

Total cost provided by the local government
10826398

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Buildings > On-site renewable energy generation

Action title
Solar PV for transit shelters at bus stops

Means of implementation
Infrastructure development

Implementation status
Implementation complete

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)
2.86

Timescale of reduction / savings / energy production
Per year

Co-benefit area
Reduced GHG emissions
Poverty reduction / eradication
Social inclusion, social justice

Action description
New shelters at bus stops have integrated solar PV panels for generation of energy required to provide lighting at the bus stops

Finance status
Finance secured

Total cost of the project
1000000

Total cost provided by the local government
500000

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program

<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Mass Transit > Improve bus infrastructure, services, and operations

Action title
UPASS - Universal Transit pass for students at University of Windsor

Means of implementation
Infrastructure development

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)
4000

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Per year

Co-benefit area
Reduced GHG emissions
Poverty reduction / eradication
Social inclusion, social justice

Action description
University students now have a transit pass included in their tuition. This supports the sustainable growth of the University area as students now have a low-carbon and free means of transport to and from school campuses 11,579 students have access to the UPASS, resulting in 4.5 million student rides.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government

Primary fund source
Public-private partnership

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action

Waste > Improve the efficiency of waste collection

Action title
Waste Diversion Rate Improvement

Means of implementation
Education
Monitor activities
Policy and regulation

Implementation status
Implementation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Improved resource efficiency (e.g. food, water, energy)
Ecosystem preservation and biodiversity improvement
Shift to more sustainable behaviours

Action description
The City of Windsor is working to increase waste diversion rates within municipal operations. The emissions reduction number is not available at this time.

Finance status
Finance secured

Total cost of the project

Total cost provided by the local government

Primary fund source

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Private Transport > Infrastructure for non-motorized transport

Action title
Active Transportation Master Plan

Means of implementation
Education
Infrastructure development
Policy and regulation

Implementation status
Implementation

Estimated emissions reduction (metric tonnes CO2e)
100000

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Per year

Co-benefit area
Reduced GHG emissions
Social inclusion, social justice
Improved public health
Shift to more sustainable behaviours

Action description
The City has recently completed an Active transportation masterplan with the goal of drastically improving the modal split for transport resulting in decreased GHG emissions and improved public health. The Active Transportation Master Plan target is to double the proportion of trips made by walking, cycling and transit by 2031, with a longer term target of 25% of all trips in Windsor made using sustainable transportation by 2041.

Finance status
Feasibility undertaken

Total cost of the project
338795

Total cost provided by the local government
213795

Primary fund source
Local

Web link to action website
https://www.citywindsor.ca/residents/Construction/Environmental-Assessments-Master-Plans/Pages/Active-Transportation-Master-Plan.aspx

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Water > Wastewater to energy initiatives

Action title
Integrated Site Energy Plan for Wastewater facilities

Means of implementation
Infrastructure development

Implementation status
Pre-feasibility study

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Enhanced resilience
Reduced GHG emissions
Improved resource security (e.g. food, water, energy)
Resource conservation (e.g. soil, water)

Action description
The City is currently undergoing a feasibility study into carbon-neutral operation of the two wastewater treatment plants in Windsor. Investigation into the use of wastewater sludge with an anaerobic digester for the generation of renewable natural gas.

Finance status
Pre-feasibility study status

Total cost of the project
218750

Total cost provided by the local government
93750

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Mass Transit > Improve bus infrastructure, services, and operations

Action title
Transit Service Delivery Review

Means of implementation
Infrastructure development

Implementation status
Pre-feasibility study

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Reduced GHG emissions
Poverty reduction / eradication
Social inclusion, social justice

Action description
City is undergoing a transit service delivery review with the intent to make the transit system more resource efficient, improve convenience for riders. and increase ridership. Stakeholder engagement is underway with 9 pop-up engagements and 1

community stakeholder meeting completed.

Finance status
Feasibility undertaken

Total cost of the project
353508

Total cost provided by the local government
176754

Primary fund source
Local

Web link to action website
Morethantransit.ca

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Private Transport > Improve fuel economy and reduce CO2 from motorized vehicles

Action title
Electric Vehicle Infrastructure

Means of implementation
Infrastructure development

Implementation status
Pre-feasibility study

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Reduced GHG emissions
Improved resource efficiency (e.g. food, water, energy)

Action description
City is currently investigating options for installation of electric vehicle charging stations at high traffic destinations throughout the city.

Finance status
Pre-feasibility study status

Total cost of the project

Total cost provided by the local government

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Energy Supply > Low or zero carbon energy supply generation

Action title
District Energy Expansion Planning

Means of implementation
Infrastructure development

Implementation status
Scoping

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Reduced GHG emissions

Action description
City is currently working with local utility company to develop a plan for the expansion of the existing district energy network

Finance status
Pre-feasibility study status

Total cost of the project

Total cost provided by the local government

Primary fund source
Please select

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Buildings > Energy efficiency/ retrofit measures

Action title
Public Education

Means of implementation
Education
Capacity building and training activities
Awareness raising program or campaign

Implementation status
Operation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Reduced GHG emissions

Action description
Public education and engagement. Presentations have been presented to various groups including University classes, Architects, Builders, etc.

Finance status
Finance secured

Total cost of the project
0

Total cost provided by the local government
0

Primary fund source
Local

Web link to action website

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation action
Private Transport > Awareness and education for non-motorized transport

Action title
International Urban Cooperation Programme (IUC)

Means of implementation
Capacity building and training activities

Implementation status
Implementation

Estimated emissions reduction (metric tonnes CO2e)

Energy savings (MWh)

Renewable energy production (MWh)

Timescale of reduction / savings / energy production
Please select

Co-benefit area
Enhanced resilience

Action description
Through the IUC programme, the City of Windsor was paired with the City of Vitoria-Gasteiz, Spain. This approximately 2 year partnership has identified 3 Thematic Areas of Cooperation: Low-Carbon Transportation, including Active Transportation and Public Transit; Community Energy Planning and Retrofits; and Brownfield Remediation and Redevelopment. This partnership was designed to be a technical and capacity building program. The two Cities are currently working on redeveloping plans, programs, policies through this sharing we are able to further advance our programs. No emissions reductions are directly related to this partnership, however improvements to plans and policies will likely see high results in other actions previously described.

Finance status
Finance secured

Total cost of the project
88000

Total cost provided by the local government
0

Primary fund source
International (ODA)

Web link to action website
http://www.iuc.eu/city-pairings/

Name of the stakeholder group
<Not Applicable>

Role in the GCC program
<Not Applicable>

Name of the engagement activities
<Not Applicable>

Aim of the engagement activities
<Not Applicable>

Attach reference document
<Not Applicable>

Mitigation Planning

(5.5) Does your city have a climate change mitigation or energy access plan for reducing city-wide GHG emissions?
Yes

(5.5a) Please attach your city's climate change mitigation plan below. If your city has both action and energy access plans, please make sure to attach all relevant documents below.

Publication title and attach document
Windsor's Community Energy Plan and Corporate Climate Action Plan
Windsor Community Energy Plan -FINAL - July 17-2017.pdf

Year of adoption from local government
2017

Web link
https://www.citywindsor.ca/residents/environment/climate-change-mitigation/Pages/default.aspx

Areas covered by action plan
Energy
Transport (Mobility)
Building and Infrastructure
Industry
Spatial Planning
Water
Waste

Boundary of plan relative to city boundary (reported in 0.1)
Same – covers entire city and nothing else

If the city boundary is different from the plan boundary, please explain why and any areas/other cities excluded or included

Stage of implementation
Plan in implementation

Has your local government assessed the synergies, trade-offs, and co-benefits, if any, of the main mitigation and adaptation actions you identified?
In progress

Comment or describe the synergies, trade-offs, and co-benefits of this interaction
More energy efficient buildings, improving the resilience of the buildings. Tree plantings improving thermal comfort, reduction of urban heat island can lead to a reduction in energy use if planted appropriately. Trade-off - installation of CHP and back-up generators to provide resiliency to critical buildings but increase corporate emissions (but can also benefit the Provincial grid by reducing the need for Natural Gas peak generation). Improved public health through improved local air quality, active transportation infrastructure,

Has there been a stakeholder engagement plan to develop the plan?
The development of the Community Energy Plan included a Community Stakeholder Advisory Team. This team continues to meet to discuss implementation of the plan. Windsor-Essex Catholic District School Board Citizens Environment Alliance District Energy Windsor, a division of the Windsor Utilities Commission Windsor Essex Community Housing Corporation Walpole Island First Nation Union Gas Limited Ford Motor Company Greater Essex County District School Board Ministry of Energy Green Sun Rising Inc. Enwin Utilities WindsorEssex Economic Development Corporation Hiram Walker & Sons Limited University of Windsor Windsor Port Authority Downtown Windsor Business Improvement Association ENGIE - West Windsor Power Caesar's Windsor Hotel and Casino Windsor Regional Hospital

Primary author of plan
Consultant

Opportunities

Opportunities

(6.0) Please indicate the opportunities your city has identified as a result of addressing climate change and describe how the city is positioning itself to take advantage of these opportunities.

Opportunity	Describe how the city is maximizing this opportunity
Increased energy security	Decrease in summer precipitation and cloud cover will increase PV efficiency
Increased attention to other environmental concerns	Greenhouse gas mitigation is one of the rationale pillars for initiatives such as the Community Energy Plan and amending the City's Anti-Idling Bylaw
Additional funding opportunities	- Windsor's leading experience in asset management and valuation suggests the City is well-placed to work within the new funding framework of the provincial and federal governments- By more efficiently managing energy use within Windsor, the City aims to

(6.1) Does your city collaborate in voluntary partnership with businesses in your city on sustainability projects?

Yes

(6.1a) Please provide some key examples of how your city collaborates with business in the table below.

Collaboration area	Description of collaboration
Energy	For the City's Community Energy Plan, which will form the crux of Windsor's climate change mitigation strategy, a Community Task Force has been assembled. Representative from business and industry sit on the task force and are integral to the development of the community portion of the strategy.

(6.2) List any emission reduction, adaptation, water related or resilience projects you have planned within your city for which you hope to attract financing and provide details on the estimated costs and status of the project. If your city does not have any relevant projects, please select No relevant projects under Project Area.

Project area

No relevant projects

Project title

Stage of project development

Please select

Status of financing

Please select

Project description

Total cost of project

Total investment cost needed

Local Government Emissions

Local Government Operations GHG Emissions Data

(7.0) Do you have an emissions inventory for your local government operations to report? Reporting a Local Government Operations emissions inventory is optional.

Yes

(7.1) Please state the dates of the accounting year or 12-month period for which you are reporting an emissions inventory for your local government operations.

	From	To
Accounting year dates	January 1 2014	December 31 2014

(7.2) Please indicate the category that best describes the boundary of your local government operations emissions inventory.

Departments, entities or companies over which operational control is exercised

(7.3) Please give the name of the primary protocol, standard, or methodology used to calculate your local government operations emissions inventory and attach your inventory using the attachment function.

	Primary protocol and attach inventory	Comment
Emissions methodology	International Emissions Analysis Protocol (ICLEI)	

(7.4) Which gases are included in your emissions inventory? Select all that apply.

CO2
CH4

(7.5) Please give the total amount of fuel (refers to Scope 1 emissions) that your local government has consumed this year.

Source	Fuel	Amount	Units	Emissions (tonnes CO2e)
Buildings	Natural gas	4212230	Please select	
Buses	Motor gasoline (petrol)	53891	L	
Buses	Diesel/Gas oil	2942893	L	
Municipal vehicle fleet	Motor gasoline (petrol)	38949	GJ	
Wastewater treatment	Natural gas	316800	Please select	
Water supply	Natural gas	470917	Please select	
Municipal vehicle fleet	Propane	33	GJ	
Municipal vehicle fleet	Diesel/Gas oil	14744	GJ	

(7.6) Please provide total (Scope 1 + Scope 2) GHG emissions for your local government operations, in metric tonnes CO2e. Scopes are a common categorization method.

Local government emissions breakdown

Total Scope 1 + Scope 2 emissions (metric tonnes CO2e)

35230

Total Scope 1 emissions (metric tonnes CO2e)

21936

Total Scope 2 emissions (metric tonnes CO2e)

13294

Comment

(7.7) Do you measure local government Scope 3 emissions?

Not intending to undertake

(7.7b) Please explain why not and detail your plans to do so in the future, if any.

	Reasoning	Explanation
Please explain	Lack of funding / resources	The limited staff is prioritizing the implementation of actions. No funding to measure scope 3 externally.

(7.8) Please indicate if your local government operations emissions have increased, decreased, or stayed the same since your last emissions inventory, and please describe why.

	Change in emissions	Primary reason for change	Please explain
Please explain	Decreased	Behavioural change	Corporate decisions are beginning to include considerations for energy conservation and GHG reductions. The result of these considerations have driven large projects to reduce energy consumption, for example LED Streetlight conversion.

Local Government Emissions Verification

(7.9) Has the GHG emissions data you are currently reporting been externally verified or audited in part or in whole?
Not intending to undertake

(7.9b) Please explain why your local government operations inventory is not verified and describe any future plans for verification.

	Reason	Explanation
Please explain	Lack of funding / resources	There are no current plans to have the City's greenhouse gas inventory verified or audited by an external agency. Lack of funding and resource. Staff has prioritized implementing actions over validation.

Energy

(8.0) Does your city have a renewable energy or electricity target?
Yes

(8.0a) Please provide details of your renewable energy or electricity target and how the city plans to meet those targets.

Scale
City-wide

Energy / electricity types covered by target
Total installed capacity of renewable electricity (in MW)

Base year
2014

Total renewable energy / electricity covered by target in base year (in unit specified in column 2)
11

Percentage renewable energy / electricity of total energy or electricity in base year
0

Target year
2041

Total renewable energy / electricity covered by target in target year (in unit specified in column 2)
90

Percentage renewable energy / electricity of total energy or electricity in target year
35

Percentage of target achieved
68.6

Plans to meet target (include details on types of energy/electricity)
This target is only for solar, however the plan encourages other sources but does not specify targets. The City of Windsor supports the installation of solar PV on private and public buildings. The City is looking at a number of larger installations on City buildings which will be net metered. City of Windsor leased property on the City airport lands for the installation of a 50MW solar farm which began operation in 2016.

(8.1) Does your city have energy consumption data to report?
Yes

(8.2) Please indicate the energy mix of electricity consumed in your city.

Percent

Coal
0

Gas
28

Oil
0

Nuclear
35

Hydro
23

Biomass
1

Wind
12

Geothermal
0

Solar
1

Other sources
0

Total - please ensure this equals 100%
100

(8.3) What scale is the energy mix data reported above?

Other (Province-wide current installed energy capacity)

(8.5) How much (in MW capacity) renewable energy is installed within the city boundary in the following categories?

	MW capacity	Please describe the scale of the energy source
Renewable district heat/cooling	0	
Solar PV	71.88	
Solar thermal	0	Solar thermal is being used within the City Boundary but is not tracked by utilities
Ground or water source	0	Solar thermal is being used within the City Boundary but is not tracked by utilities
Wind	0	
Other: (please specify)	0	

(8.6) Does your city have a target to increase energy efficiency?

Yes

(8.6a) Please provide details on your city's energy efficiency targets.

Scale
City-wide

Energy efficiency type covered by target
Other (Energy intensity (energy per capita))

Base year
2014

Total energy consumed/produced covered by target in base year (in unit specified in column 2)
182

Target year
2041

Total energy consumed/produced covered by target in target year (in unit specified in column 2)
109.2

Percentage of energy efficiency improvement in target year compared to base year levels
40

Percentage of target achieved
0

Plans to meet target (include details on types of energy in thermal /electricity)
The Community Energy Plan provides strategies for both energy conservation and greenhouse gas emissions reductions. Most of the strategies listed in mitigation action section also apply here. The numbers provided above is the GJ/capita baseline and target.

Please indicate to which energy sector(s) the target applies (Multiple choice)
Heating and cooling supply
Commercial buildings
Residential buildings
Public facility
Industrial facilities
Transport

Transport

(10.0) Do you have mode share information available to report for the following transport types? Select all that apply.
Passenger transport

(10.1) What is the mode share of each transport mode in your city for passenger transport?

	Private motorized transport	Rail/Metro/Tram	Buses (including BRT)	Ferries/ River boats	Walking	Cycling	Taxis or For Hire Vehicles	Other
Please complete	82	0	5	0	4	1	0	8

(10.5) Please provide the total fleet size and number of vehicle types for the following modes of transport:

	Number of private cars	Number of buses	Number of municipal fleet (excluding buses)	Number of freight vehicles	Number of taxis	Transport Network Companies (e.g. Uber, Lyft) fleet size	Customer-drive carshares (e.g. Car2Go, Drivenow) fleet size
Total fleet size	134183	114	344		224	260	0
Electric	14	0	5				
Hybrid		29	1		25		
Plug in hybrid	459	0	1				
Hydrogen	0	0	0				

The number of private cars is based on 2014 data. Hybrid vehicles not tracked in Ministry of Transportation registration numbers. The City of Windsor currently does not have any ride share. Limited access to information from Uber/Lyft operating in the City. Do not have access to freight vehicles.

(10.7) Do you have a low or zero-emission zone in your city? (i.e. an area that disincentivises fossil fuel vehicles)

No

Food

(12.0) How many meals per year are served through programs managed by your city? (this includes schools, canteens, hospitals etc.)

278523

(12.4) Does your city have any policies relating to food consumption within your city? If so, please describe the expected outcome of the policy.

	Response	Please describe the expected outcome of the policy
Please complete	No	

Water Security

Water Supply

(14.0) What are the sources of your city's water supply? Select all that apply.

Surface water

(14.1) Where does the water used to supply your city come from?

From a river basin within the city boundary

(14.2) What percentage of your city's population has access to potable water supply service?

100

(14.3) Are you aware of any substantive current or future risks to your city's water supply?

Yes

(14.3a) Please identify the risks to your city's water supply as well as the timescale and level of risk.

Risks	Estimated timescale	Estimated magnitude	Risk description
Increased water stress	Long-term	Please select	Potential for decreasing water levels in the Great Lakes, which could stress the regional water transportation system (ie. freighter shipping, recreational boating)
Declining water quality	Long-term	Serious	The Windsor Utilities Commission has identified that a second raw water or connection to an adjacent potable water supply is required in case of emergencies that affect the ability for our treatment facilities to treat water from the Detroit River. Currently exploring options via interconnection with other municipalities or seeking another Raw water source.
Declining water quality	Medium-term	Serious	The precense of Blue-Green Algae in Raw Water in the Great lakes is an issue for many municipalities. WUC currently does measure this in the summer months but not to a significant amount that would stress the Water Treatment plant.
Declining water quality	Medium-term	Less Serious	Microplastics have begun to be discussed at many water quality events and through the Ministry communications. Although there is no regulation on the issue this could become part of a future treatment requirement.

Water Supply Management

(14.4) Please select the actions you are taking to reduce the risks to your city's water supply.

Risks
Declining water quality

Adaptation action
Stormwater management (natural or man-made infrastructure)

Status of action
Implementation

Action description and implementation progress
Through education as well as infrastructure improvements, the City of Windsor is looking to reduce the negative impacts of stormwater into the Detroit River through addressing combined sewer overflows. The City has installed a Retention Treatment Basin to manage a large portion of the combined sewer overflows to the Detroit River, the City also continues to separate sewers.

Risks
Increased water stress

Adaptation action
Stormwater management (natural or man-made infrastructure)

Status of action
Pre-implementation

Action description and implementation progress
The City of Windsor is investigating the use of green infrastructure to manage rainwater where it falls. This addresses declining water quality as well as maintains the water balance in our natural spaces and across the City.

Risks
Declining water quality

Adaptation action
Conservation awareness and education

Status of action
Implementation

Action description and implementation progress
Awareness campaigns are used to educate the public about the use of the sewer system. Provided here are some (but not all) of the public education/engagement activities underway. 1) Yellow Fish Road program (rain water only in catchbasins) 2) Children's Water Fest. The last week in May, first week in June the City of Windsor partners with other organizations to bring approximately 1,000 grade 3/4 students a day to the Children's Water Fest from across Windsor/Essex. At the event the kids visit over 40 different water activities to learn about municipal drinking water, stormwater, wastewater and water conservation. 3) Various advertisements on wastewater or stormwater in the local Activity guide. 4) Where it goes when I go. Wastewater video

Risks
Declining water quality

Adaptation action
Watershed preservation

Status of action
Monitoring and reporting

Action description and implementation progress
The City of Windsor is a municipal partner with the Detroit River Canadian Clean Up. The City of Windsor has completed numerous projects including monitoring of water quality conditions in support of the DRCC with the goal to delist the Detroit River as an Area of Concern on the Great Lakes Water Quality Agreement. Background Detroit River Area of Concern The Detroit River is a 51 km-long connecting channel that links Lake St. Clair to the western basin of Lake Erie. Its width varies considerably from 600 m at the Ambassador Bridge to over 6 km where it empties into Lake Erie. Water depths range from an average of 9-15 m in the upper river to 3-9 m in the lower river). The Detroit River Canadian AOC refers to the Canadian portion of the Detroit River proper. Issues facing the Detroit River are combined sewer overflows, urbanization and land use (degradation of habitat), and toxic contaminants (e.g., mercury, PCBs, PAHs, and metals) in water and sediment. These environmental issues have been identified as being related to, or the cause of, the impairment of several beneficial uses. http://detroitriver.ca/

Risks
Declining water quality

Adaptation action
Watershed preservation

Status of action
Operation

Action description and implementation progress
Source water protection plans are also in place to protect drinking water supplies.

Risks
Declining water quality

Adaptation action
Diversifying water supply (including new sources)

Status of action
Scoping

Action description and implementation progress
The Windsor Utilities Commission has identified that a second raw water or connection to an adjacent potable water supply is required in case of emergencies that affect the ability for our treatment facilities to treat water from the Detroit River.

Risks
Declining water quality

Adaptation action
Investment in existing water supply infrastructure

Status of action
Monitoring and reporting

Action description and implementation progress
The presence of Blue-Green Algae in Raw Water in the Great lakes is an issue for many municipalities. WUC currently does measure this in the summer months but not to a significant amount that would stress the Water Treatment plant. WUC also employs Ozone, one of the top recommended treatment methods for Blue Green Algae which neutralizes the toxin during the treatment process. We continue to monitor and report results to the Ministry.

Risks
Declining water quality

Adaptation action
Investment in existing water supply infrastructure

Status of action
Scoping

Action description and implementation progress
Microplastics have begun to be discussed at many water quality events and through the Ministry communications. Although there is no regulation on the issue this could become part of a future treatment requirement.

(14.5) Does your city have a publicly available Water Resource Management strategy?
Yes

(14.5a) Please provide more information on your city's public Water Resource Management strategy.

Publication title and attach document
Source Water Protection Plan

Year of adoption from local government
2015

Web link
https://essexregionconservation.ca/source-water-protection/

Does this strategy include Sanitation services?
Yes

Stage of implementation
Plan in implementation

Submit your response

What language are you submitting your response in?
English

Please read and accept our Terms and Conditions
I have read and accept the Terms and Conditions

Please confirm how your response should be handled by CDP.

	Public or non-public submission
I am submitting my response	Publicly (recommended)