



Climate Centre for Cities



CITY CLIMATE ALLIANCE

State of Cities

Towards Low Carbon and
Resilient Pathways

ICLEI South Asia:

The South Asian arm of ICLEI – Local Governments for Sustainability, is a regional network of local governments that aims to achieve tangible improvements in regional and global sustainability through local initiatives. With a current membership base of over 100 local and regional governments, ICLEI South Asia has been supporting cities in the region as well as in other Asian countries on multiple aspects of sustainable urban development over the past 18 years.

Climate Centre for Cities (C-Cube):

The Climate Centre for Cities has been established at NIUA to create synergy across all climate actions undertaken in Indian cities by various stakeholders. The Centre works with a range of stakeholders and partners to focus on strengthening capacities of cities to understand, implement and monitor and actions needed for addressing climate change impacts in their locally.



State of Cities

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Foreword

India's phase of demographic dividend, a period when its working age population is higher than its dependent population, is estimated to span from 2018 to 2055. Similar phases in the past have accounted for rapid economic development in other countries. The Government's reforms have started to show perceptible change in emerging economic data. These underpinnings provide the perfect setting for rapid growth of the Indian economy in the coming two to three decades.

Rapid economic growth has been correlated with high degrees of urbanisation. The benefits of agglomeration bring people together into dense habitations, that we call cities, in order to increase productivity of their endeavours. Much of that can therefore be expected to happen in our country going forward. It is estimated that India's urban population may almost double in the next 25 years and it would not be an exaggeration to expect 1 billion Indians living in its urban areas by 2050. That means our urban areas will add 38 residents every minute from now on till 2050, a staggering growth by any metric.

Managing this urbanisation well, thus, becomes a hugely critical endeavour in the overall scheme of things. If India has to achieve its Amrit Kaal goal of becoming a developed country by 2047 with a per capita income of 20,000 US dollars then its cities will have to do much of the heavy lifting. It is fair to assume that high amount of investments will flow into city development over the next few decades. It is here that the nature of this investment becomes critical.

In the last nine years, the government has taken many concrete steps in pushing the sustainability agenda forward. At COP26 in Glasgow, the PM announced India's aggressive agenda on climate change through the Panchamrit action plan which envisages India becoming a net zero emission country by 2070 among other commitments. Indian cities are the core of this challenge.

The attempt made by the National Institute of Urban Affairs and ICLEI South Asia to capture the state of cities and highlight climate pathways and challenges in a unique graphical format through the 'The State of Cities: Towards Low Carbon and Resilient Pathways' report is laudable. I congratulate the team that has worked together to speak the language of climate change in cities that is understood by everyone.

This report is a pleasant visual delight and makes a successful effort to highlight the climate extremities that cities face globally through a simple yet visually appealing format champion. And finally it brings forth the measures being taken by Indian cities on climate change adaptation and mitigation. My best wishes to its readers!



Kunal Kumar

Joint Secretary, Ministry of Housing and Urban Affairs
Mission Director, Smart Cities Mission

Reflections

'State of Cities: Towards Low Carbon and Resilient Pathways' report comes at a critical juncture when there is a growing demand for Indian cities to adopt resilient climate actions to attract investments for low carbon transitions. Drawn through our work with ICLEI South Asia, the report gives us an insight into 15 of India's smart cities, and their future challenges and pathways. NIUA's role as the U20 secretariat is to help cities understand their commitments and develop sustainable solutions to achieve inclusive prosperity.



Hitesh Vaidya

Director,
National Institute of Urban Affairs

ICLEI South Asia promotes local action for global sustainability and supports cities towards becoming sustainable, resilient, resource-efficient, biodiverse, low-carbon, productive and eco-mobile. This report showcases the efforts of 15 cities at the forefront of local climate initiatives, which have come through our collaboration with the Climate Centre for Cities (C-Cube) at NIUA and backed by the European Commission, GIZ, and the Swiss Agency for Development and Cooperation. Supporting cities' transition towards net zero economies is our ongoing journey.



Emani Kumar

Executive Director,
ICLEI South Asia

At C-Cube, we intend to foster climate action in cities and help them reduce their carbon emissions. This, we achieve through a policy, programmes, projects and partnerships approach to climate action. This report is important for understanding where cities stand on GHG emissions, which sectors contribute to them, and how we can draw up climate action plans that support sustainable transitions in these cities. Our long-standing common partnership with ICLEI reinforces this commitment of moving towards just futures.



Victor Shinde

Head,
Climate Centre for Cities (C-Cube),
National Institute of Urban Affairs

India's ambition of transitioning to a net zero emissions development pathway is not possible without concerted and ambitious action from urban India. This report has brought forth comprehensive and insightful analyses of climate actions in select cities, shining light on the success stories and exemplary initiatives undertaken thus far. We hope the report encourages other cities and urban centres to embark on and accelerate their climate journeys; for meeting our global and national climate ambitions is possible only through cumulative transformative local climate action. It has been a humbling and incredible journey partnering with these pioneering cities and as ICLEI - South Asia, we will continue to be part of urban India's climate-compatible development.



Soumya Chaturvedula

Deputy Director,
ICLEI South Asia

This Report

When we started thinking of this report, all we wanted to tell was **A SIMPLE STORY**. A story of Indian cities, its climate challenges, risks and solutions in the global context. One that talks to everyone and makes one ponder.

The best way of coming around a complicated concept is to understand it visually, we think. And therefore, we concluded that the language of climate change is a complex one, but when told through graphics could be fascinating.

This graphical report takes you through the story of cities globally, further looking through the Indian lens flowing to the current state of 15 Indian cities with their climate interventions. A first-of-its-kind attempt, each page explains the 'whats', 'whys' and 'hows' in a minimalist way.

This report is not a prescriptive one, but one that makes you stop, think, and understand the story of cities in the climate crisis. This is one that goes beyond the realm of policymakers and city officials to all of the urban stakeholders who own their cities.

We hope you enjoy absorbing this visual story as much as we did putting it together.



Sayli Mankikar

Director - Policy and Partnerships,
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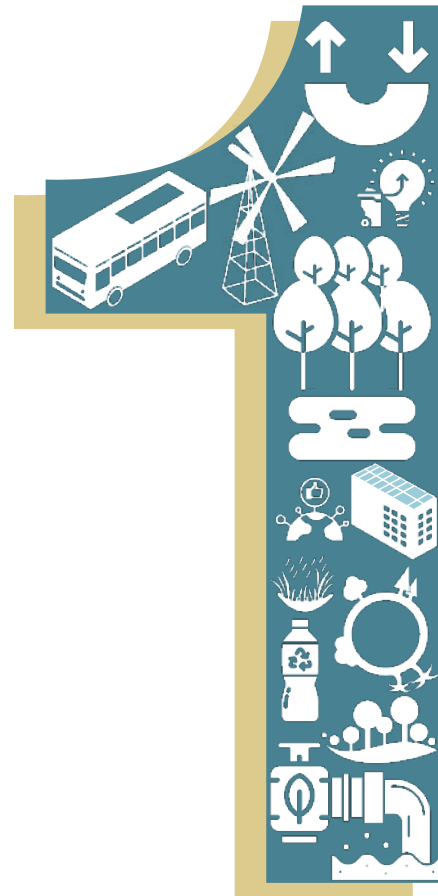
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The Global View

City climate action plans not only drive local change but also have a profound impact on a global scale. As urban areas around the world adopt ambitious sustainability targets and implement innovative strategies, they become powerful catalysts for transformative action. By reducing greenhouse gas emissions, enhancing energy efficiency, and promoting sustainable practices, cities set an inspiring example for others to follow. Moreover, successful city initiatives influence national policies and international commitments, accelerating the global transition towards resilience. As the ripple effect spreads, city climate action plans become instrumental in shaping a more sustainable and resilient planet for generations to come.

Units Simplified

Mt CO₂	Metric tonnes of carbon dioxide A metric measure used to represent carbon dioxide emissions.
tCO₂e	Tonnes of carbon dioxide equivalent 'Carbon dioxide equivalent' is a standard unit for counting any greenhouse gas (GHG) emission to that of one unit mass of carbon dioxide (CO ₂), based on the global warming potential.
GJ	Gigajoule Joule is a measurement of energy or work. One gigajoule is the energy consumption equal to one billion joules.
KWh	Kilowatt hour One kilowatt hour is the electric consumption of one thousand watts per hour.
ha	Hectare A metric unit of square measure, equal to 10,000 square metres.
MW	Megawatt Watt is a measure of the rate of energy transfer over a unit of time where, 1 Watt = 1 Joule/second. Megawatt describes power capacities on large scales equalling one million Watts.
TPD	Tonnes per day A unit of mass equal to 1000 kilograms is produced on a given day.
Sq. Km	Square kilometre A metric unit of area equal to a square that is one kilometre long on each side.

Terms Simplified

Greenhouse Gas (GHG)	Water vapour (H ₂ O), carbon dioxide (CO ₂), nitrous oxide (N ₂ O), methane (CH ₄), and ozone (O ₃) are GHGs present in the earth's atmosphere. An increased concentration of these causes global warming.
Net zero	Net zero is the balance between the amount of GHGs produced and the amount removed from the atmosphere.
Adaptation	Taking action to prepare for and adjust to both the current effects of climate change and predicted future impacts.
Mitigation	A human intervention to reduce emissions or enhance the sinks of greenhouse gases.
Resilience	The capacity to prepare, respond, and recover from the impacts of hazardous climatic events with minimal damage to societal well-being, the economy and environment.
Low-carbon transitions	A shift from an economy heavily dependent on fossil fuels to a sustainable, low-carbon economy.
Gross Domestic Product	Gross Domestic Product (GDP) is the measure of the total market value of the goods and services produced by a country's economy during a specified period.
Internet of Things (IoT)	The Internet of Things (IoT) refers to the billions of physical devices around the world that are now connected to the internet, all collecting and sharing data.
Intermediate Public Transport	Intermediate Public Transport (IPT) refers to road vehicles used on hire for flexible passenger transportation, which does not follow a fixed time schedule.
Carbon sequestration	A natural process of capturing and securing storage of carbon that would otherwise be emitted to, or remain in the atmosphere.
Energy audit	An inspection of energy flows in a system to reduce the energy input without negatively affecting the output.
Urban biodiversity	It refers to the variety of life that can be found in cities.

CITIES AT CROSSROADS

When Nature Tests the Urban Jungle: How Climate Change Impacts Cities Globally

With almost 68 percent of the global population residing in cities by 2050, urban areas find themselves on the frontline of climate risks. Soaring temperatures, devastating droughts, raging forest fires, and encroaching sea levels pose a grave threat to city infrastructure, livelihoods, and economies. Moreover, cities' heavy reliance on fossil fuels intensifies greenhouse gas emissions, exacerbating the very climate change they face. Additionally, micro-regional challenges such as urban heat islands, water scarcity, food insecurity, air pollution, and mental health strains from vector-borne diseases burden city dwellers worldwide. To combat these challenges, empowering cities with policies, funds, and inclusive governance structures becomes imperative, placing cities at the heart of the conversation and driving climate resilience and action.

Floods in Pakistan in 2022 killed 1,739 people, and caused INR 1.23 trillion (USD 14.9 billion) of damage and INR 1.26 trillion (USD 15.2 billion) of economic losses.

In 2022, Somalia experienced an extreme drought with one million people internally displaced.

In 2019, Cyclone Idai and Kenneth across Zimbabwe, Malawi and Mozambique in Southern Africa left millions without food or basic services.

In 2022, nearly 1.5 million people were without power across several US states as a powerful Arctic winter storm swept through.

Australia lost 24.7 million acres of land to a wild fire in 2020 affecting millions of people with hazardous smoke haze.

70% of the cities are already dealing with the effects of climate change and nearly all are at risk

Aggressive climate action can bring city emissions to net zero by 2050, but failing to act would double urban emissions in the same period

In Florida, the sea level rise is already exacerbating saltwater intrusion and impacting groundwater supplies for the city.

THIRSTY TERRAINS

Climate change parches the earth, triggering droughts that devastate ecosystems and drying out the waters.

Sources: Refer to page 70

CATASTROPHIC DOWNPOURS

Heavy rains and flooding come hand in hand with climate change, causing extreme loss of life and devastation of property.

SWIRLING STORMS

Climate change intensifies windy fury, unleashing catastrophic cyclones with high frequency and ferocity, causing destruction.

THE ICY GRIP

Climate change's paradoxical twist chills the world as extreme cold events become more frequent, disrupting seasonal norms.

SCORCHING EARTH

Climate change fuels a blazing inferno as rising temperatures push the boundaries of extreme heat, unleashing conditions that threaten ecosystems.

SOARING TIDES

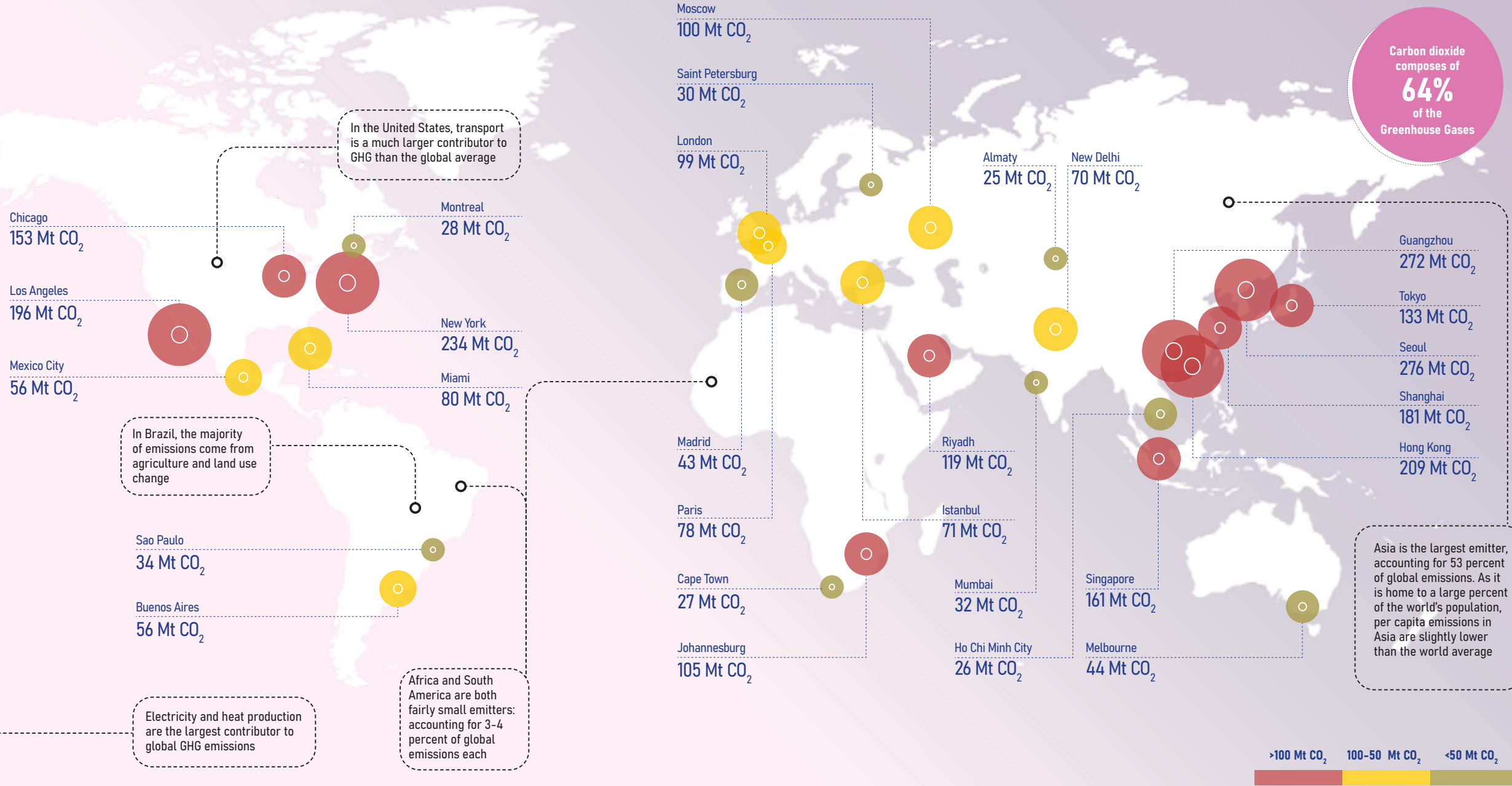
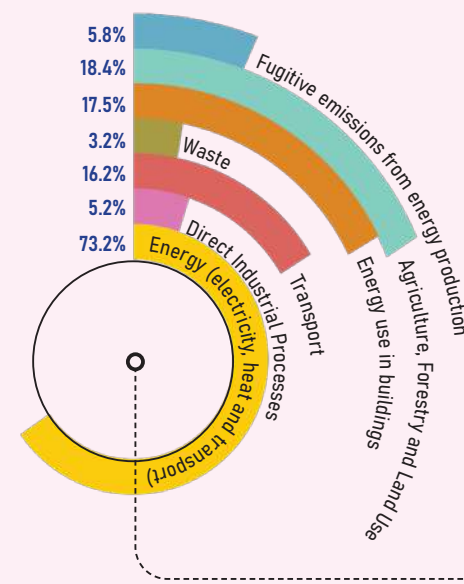
Climate change swells sea levels, unlocking a watery menace that erodes coastlines and threatens coastal communities worldwide.

TRACKING EMISSIONS

Urban Blaze: Cities Combat Climate Change

Cities around the world find themselves at the heart of the climate challenge. With rapid urbanisation, these bustling hubs become epicentres of energy consumption, waste generation, and greenhouse gas emissions. As populations grow, so does the strain on resources, exacerbating environmental issues and climate change. From towering carbon footprints to intensified air pollution, cities play a significant role in the global climate equation. Urgent action is needed to shift towards sustainable urban practices, harness renewable energy, and embrace eco-friendly policies. Only then can we douse the urban blaze and forge a path to a greener, more resilient futures.

GLOBAL GHG EMISSIONS BY SECTORS



GLOBAL GOALS

Unite for Change: Rallying Together Towards a Global 2050 Target

With the urgency of climate change, the world is uniting in a collective endeavour to combat it. Nations, organisations, and individuals join forces for a common goal: achieving net zero emissions by 2050. This ambitious mission requires unprecedented cooperation, innovation, and determination. Governments must enact policies, industries must embrace sustainable practices, and we must make conscious choices. By harnessing the power of collaboration, we can overcome barriers, drive transformative change, and secure a sustainable future for generations to come.

ROLE OF CITIES



Cities account for more than 50 percent of global population



80 percent of global GDP and 2/3rd of global energy consumption



75 percent of global GHG are derived from cities

RISING URBANISATION



High built density



High population density



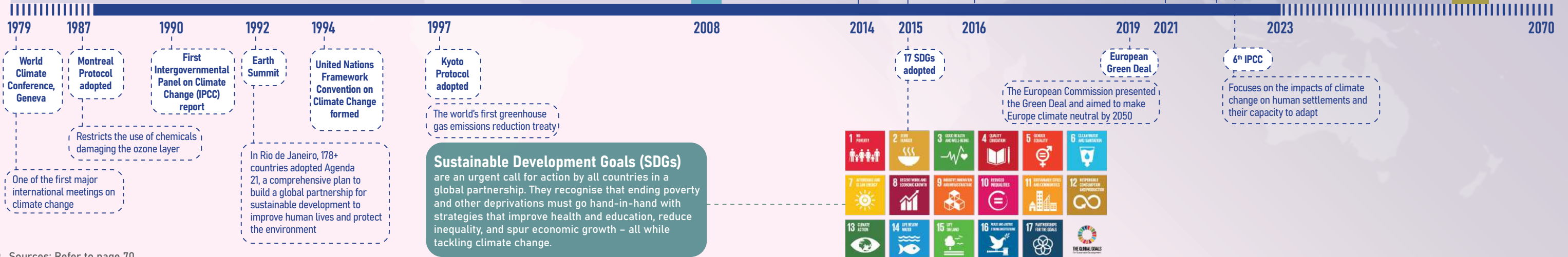
Increase in urban infrastructure



Hub of economic activities

INDIA'S FIRST CLIMATE STRATEGY

CLIMATE ACTION MILESTONES GLOBALLY



UN figures indicate that
80%
of people displaced by
climate change
are women

Women are not only resilient in the face of adversity but instrumental in driving sustainable solutions bringing invaluable perspectives, knowledge, and innovative approaches to climate action



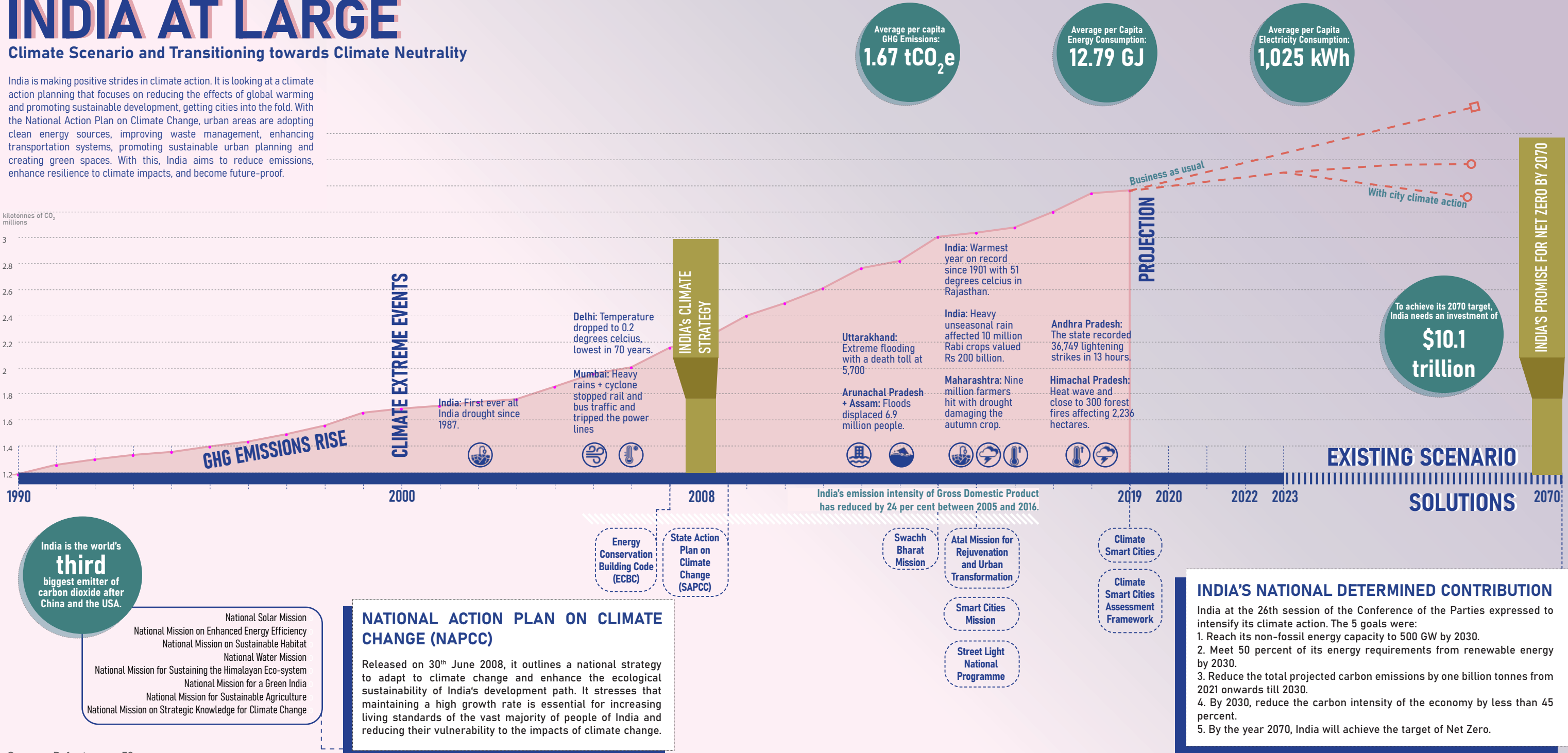
The National Lens

India has made significant strides in its action against climate change, positioning itself as a key global player in this issue. The country has committed to ambitious renewable energy targets, aiming to achieve 450 GW of renewable capacity by 2030. India's efforts have resulted in a substantial increase in renewable energy deployment, with solar and wind power leading the way. Additionally, the government has implemented various policies and initiatives to promote energy efficiency and sustainable development. However, challenges remain, including the need for further investment in clean technologies and infrastructure. India's commitment to addressing climate change is evident, but continued efforts and international collaboration are crucial to achieving a sustainable future.

INDIA AT LARGE

Climate Scenario and Transitioning towards Climate Neutrality

India is making positive strides in climate action. It is looking at a climate action planning that focuses on reducing the effects of global warming and promoting sustainable development, getting cities into the fold. With the National Action Plan on Climate Change, urban areas are adopting clean energy sources, improving waste management, enhancing transportation systems, promoting sustainable urban planning and creating green spaces. With this, India aims to reduce emissions, enhance resilience to climate impacts, and become future-proof.



NUDGING CITY ACTION

Creating frameworks, tools, capacity building and financial support for cities

To unlock cities' pivotal role in combating climate change, we must first gauge our position and identify gaps within sectors. This requires dynamic toolkits, comprehensive frameworks, and capacity-building initiatives. By up-skilling stakeholders and offering vital financial support, we can enhance understanding and drive meaningful transition. Enter the Climate Smart Cities Assessment Framework (CSCAF) — a visionary guide diagnosing climate action gaps specific to Indian cities. Armed with knowledge and resources gained from CSCAF 1.0 and CSCAF 2.0, the CSCAF 3.0 unleashes urban potential and propels a collective sustainable journey.

CSCAF 2.0

In the quest for sustainable urban planning and climate-responsive development, a ground breaking self-assessment framework emerged—the Climate Smart Cities Assessment Framework (CSCAF). Developed by the Climate Centre for Cities (C-Cube) at the National Institute of Urban Affairs (NIUA), under the Ministry of Housing and Urban Affairs (MoHUA), CSCAF has reached its third iteration (CSCAF 3.0). Its stunning accomplishments include:

- o Capturing cities' climate preparedness
- o Institutionalising climate actions
- o Providing a vital climate action roadmap tailor-made for Indian cities
- o Propelling cities towards low-carbon transitions

CLIMATE PERFORMANCE ASSESSMENT



1 STAR
Early stages of development, yet to consider climate actions



2 STAR
Initiated data analysis, established committees, etc



3 STAR
Have institutional mechanisms or are developing action plans



4 STAR
Allocated budgets and initiated implementation of projects



5 STAR
Have showcased successful implementation

THE CSCAF 2.0 FINDINGS



Urban Planning, Green Cover and Biodiversity

Assessments need to be conducted to understand the status of water bodies and open areas

Need to prioritise biodiversity management and initiate plans to safeguard increasing local biodiversity



Energy and Green Buildings

Need to switch to renewable sources of energy for total energy needs to champion sustainable energy sourcing

Significant measures are needed to promote green buildings



Mobility and Air Quality

Need to create non-motorised facilities for walking, bicycling and small-wheeled transport

Cities need to harness the availability of efficient public transport systems



Waste Management

Cities need to have landfills scientifically remediated

Need to address the lack of scientific land availability and adopt relevant measures



Water Management

Cities need to conduct energy audits for water supply pumping stations and treatment plants

Need to conduct energy audits for wastewater pumping stations and treatment plants

BRIDGING THE GAPS

Ahmedabad

A holistic Solid Waste Management Plan with a 2,000 TDP waste to energy plant, a 200 TDP plastic treatment facility, and a 500 TDP bio-CNG plant

Rajkot

Public bicycling sharing system at 40 locations to promote NMT and enhance last-mile connections

Thane

Deployed Solar PV and solar water heating systems at hotels and hospitals across the city

Panaji

Implemented an automated SCADA based monitoring system for real time monitoring of the water supply system

KEY



Urban Planning, Green Cover and Biodiversity



Energy and Green Buildings



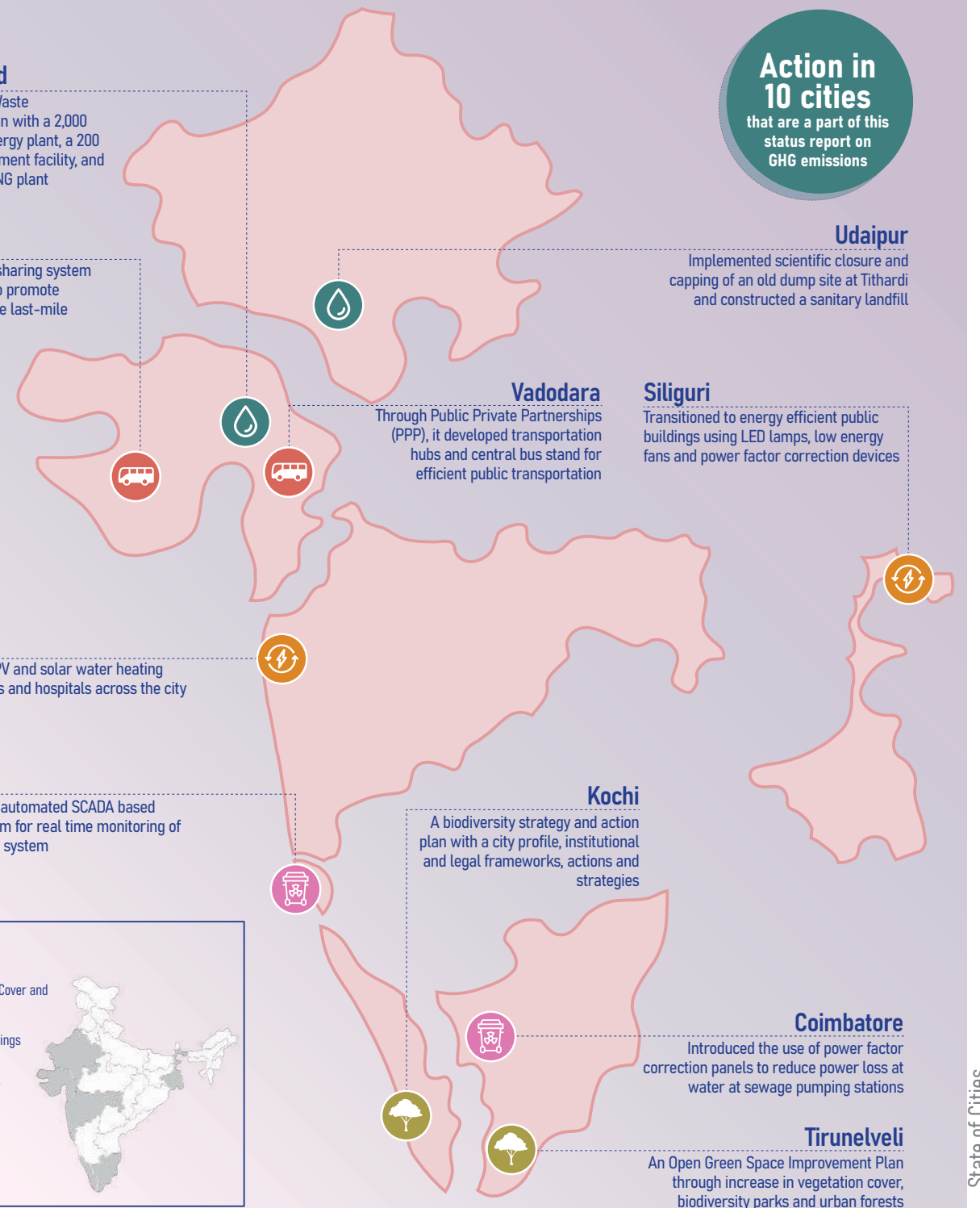
Mobility and Air Quality



Waste Management



Water Management



Action in
10 cities
that are a part of this
status report on
GHG emissions



What's ahead?

15 cities

24 million people

246 million GJ
energy use

38 million tCO₂e
GHG emissions

27,973 million KWh
electricity consumption

147 adaptation actions

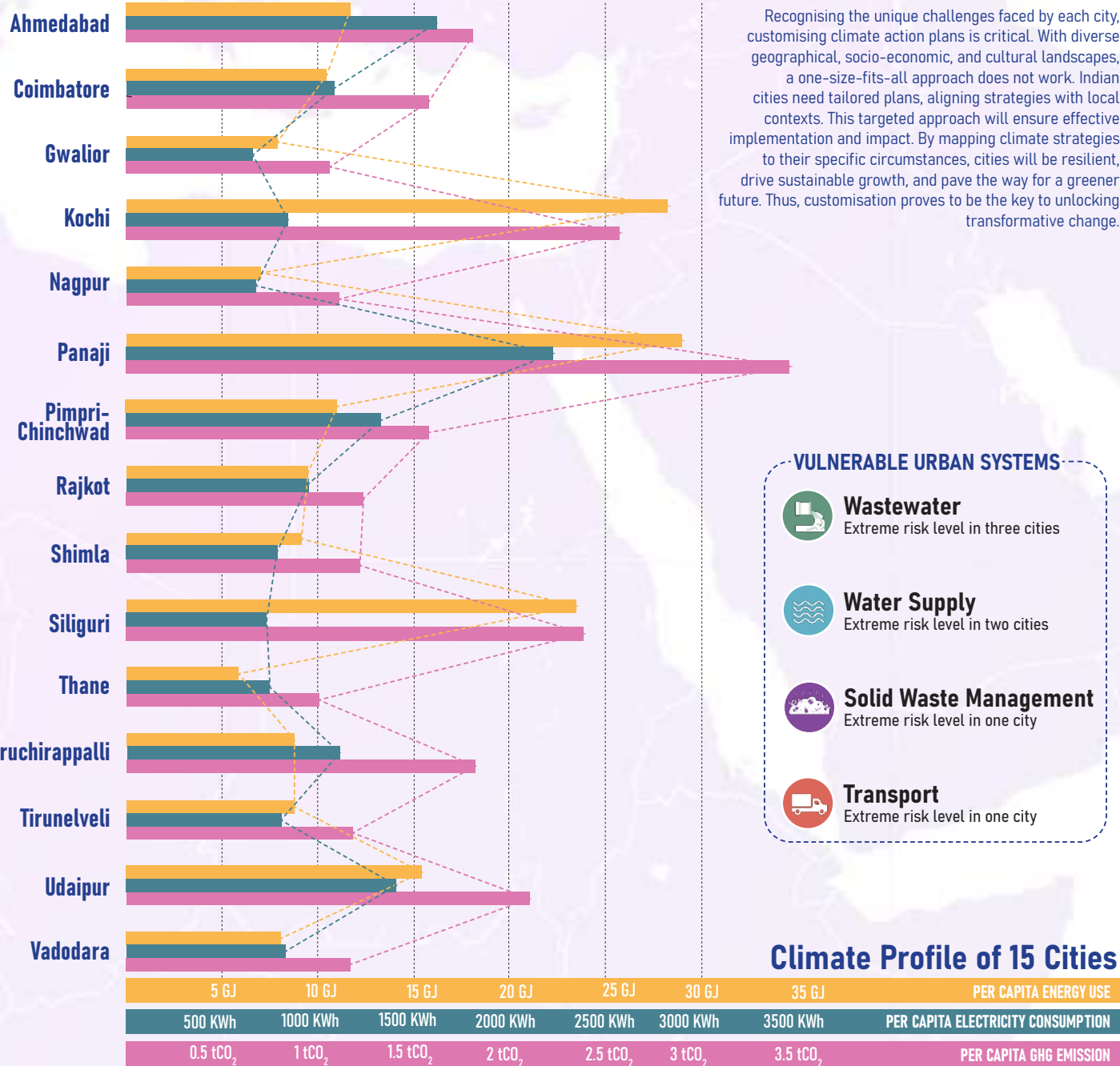
172 mitigation actions

City View

The climate challenge in India's metro cities is unique. The growing GHG emissions add to the existing climate challenges in these urban agglomerates. These cities are witnessing the adverse impacts of rising temperatures, air pollution, water scarcity, and extreme weather events. While some cities have taken commendable steps towards sustainability, such as adopting renewable energy and implementing waste management systems, there is an urgent need for collaborative efforts and policy reforms to mitigate climate risks. Building resilience, enhancing green infrastructure, and promoting community engagement is vital for ensuring a sustainable and climate-resilient future for these cities.

WHERE CITIES STAND

Customising Action: Mapping Climate Strategy in Cities and Importance of Tailored Plans



CLIMATE HAZARDS

Increasing temperature

Heat Waves estimated to increase in India by 75 percent in a business-as-usual scenario

Cyclones

77 cities in the coastal region of India are prone to frequent cyclone

Landslides

Over 12% of landmass in India prone to landslides

Flooding

Over 140 cities in India are prone to high risk of flooding

PREPARING CITIES AHEAD

While CSCAF 2.0 exhibits the level of city preparedness, ICLEI South Asia supported 15 Indian cities through donor-funded projects in real-time preparation of city-level greenhouse gas emission inventories. These inventories have provided valuable insights for local governments and communities, enabling them to identify targeted mitigation interventions and set emission reduction objectives.

The GHG inventories have allowed local governments and communities to define emission reduction objectives and improve and reinforce the integration of climate change initiatives at the city level.

Prominent energy consumers and GHG emitters in local government operations:

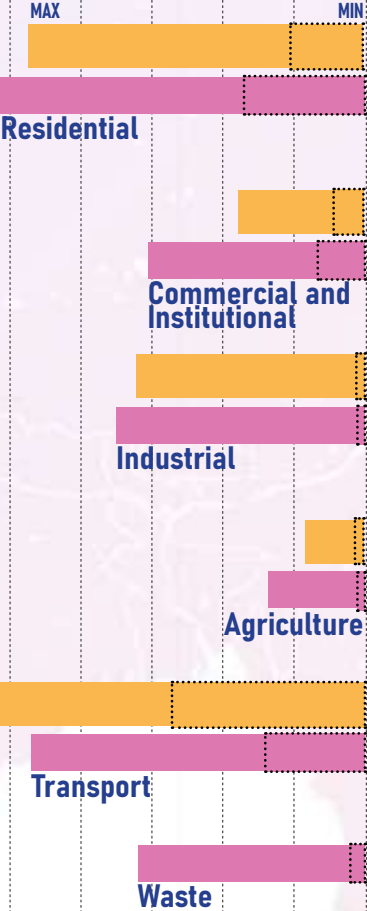
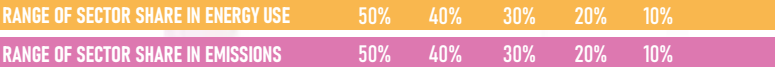
Water Supply
Street-lighting

Prominent energy sources:

Electricity
Diesel

Prominent energy consumers and GHG emitters at city-scale:

Transport
Residential Buildings
Industries



RANGE OF SECTOR-WISE EMISSIONS AND ENERGY USE IN 15 CITIES

State of Cities

In Ahmedabad, a city bustling with economic activity and industrial prowess, climate action can safeguard the environment and future generations. By harnessing the potential of renewable energy sources, promoting sustainable manufacturing practices, and implementing efficient waste management systems, we can reduce carbon emissions and protect our air and water resources. Additionally, integrating green infrastructure into ambitious projects like GIFT City and the metro rail will create a sustainable urban environment. Together, we can ensure Ahmedabad leads the way towards a greener, cleaner, and more resilient future.

CITY PROFILE

City area: 480.88 sq. km
Total population est.(2021): 7.18 million
Population density est.(2021): 14,934 persons/sq. km
Total households est.(2021): 1,179,823 households
Climatic condition: Hot and semi-arid
Economic activities: Trade, commerce and industries

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Ahmedabad city has allocated budgets and initiated the implementation of projects.

CLIMATE PROJECTIONS

Increasing temperature

Leads to extreme weather events such as floods, droughts and storms

Increased rainfall

Leads to flash floods

CITY TARGET

Ahmedabad is in the process of preparing its **Climate Resilient Action Plan** and setting its climate resilience targets.

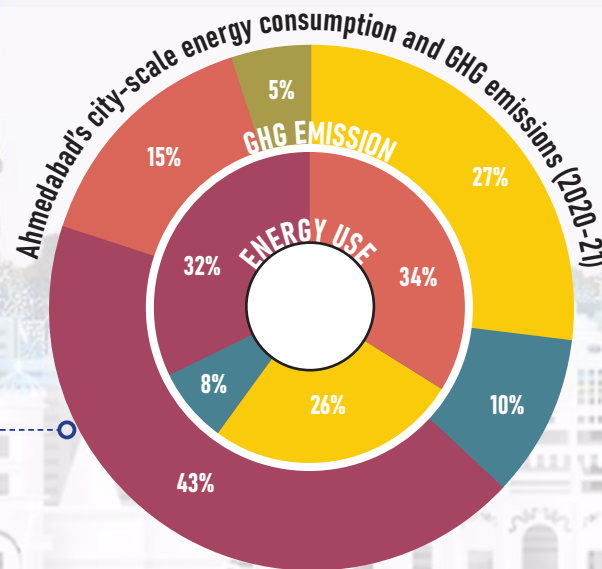
CITY SCALE CONSUMPTION (2020-21)

Energy
84.2 million GJ city-wide
11.73 GJ per capita

GHG emission
13.1 million tCO₂e city-wide
1.83 tCO₂e per capita

Electricity
11,690 million kWh city-wide
1,628 kWh per capita

- Transport
- Residential
- Waste
- Commercial
- Industry

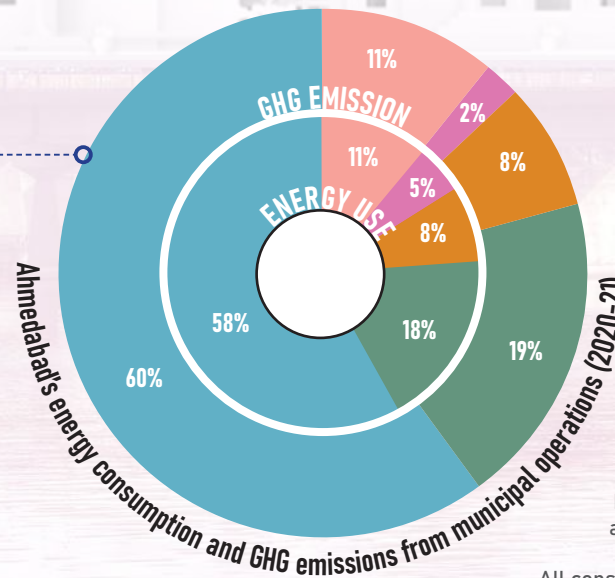


City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (34%)

Highest GHG emitting sector: Industry (43%)

City-scale



Highest Energy Consuming Sector: Water supply (58%)

Highest GHG Emitting Sector: Water supply (60%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21
Reference: ICLEI South Asia

MEASURES IN THE PIPELINE

ADAPTATION

Water and Wastewater

- Strengthening of wastewater reuse and septage management
- Conducting water augmentation & ground water recharge study for improved decision making
- Development of channels for creation and rejuvenation of lakes through wastewater reuse

MITIGATION

- Development of water meter policy for efficiency and conservation
- Adopt energy conservation measures at treatment and pumping plants

Transport

- Utilisation of renewable energy to charge electric public buses
- Parking demand assessment
- Identification of prioritised routes for NMT infrastructure
- Preparation of Intermediate Public Transport Policy

Stormwater Drainage

- Improved stormwater management-enhanced percolation and channelising strategies to minimise water logging and run-off

Biodiversity

- Develop a Local Biodiversity Strategy and Action Plan (LBSAP)
- Plantation of 1 million trees to increase the city's tree cover
- Implementation of urban forest and biodiversity parks

Building

- 5 MW solar PV installation for municipal buildings
- Installation of 8.4 MW wind power plant at Jamjodhpur
- Promote renewable energy and energy efficiency through social media campaigns

Waste

- Preparation of holistic Solid Waste Management Action Plan
- Implement waste to energy plants of 2000 TPD
- Installation of 200 TPD plastic waste treatment facility
- Installation of 500 TPD bio-CNG plant

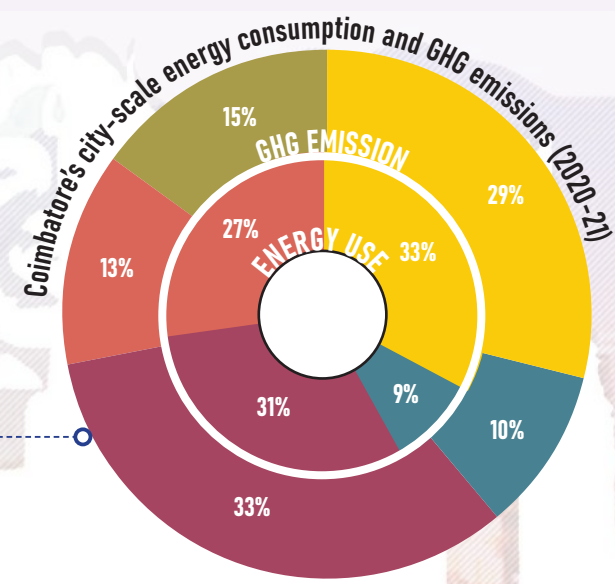
In Coimbatore, a vibrant city nestled amidst the Western Ghats and the Noyyal River, climate change demands our immediate attention. As a hub for manufacturing, education, and healthcare, we have the power to drive sustainable change. By embracing renewable energy sources, promoting eco-friendly industries, and implementing robust waste management practices, we can reduce the carbon footprint and protect natural resources like the Noyyal river. Emphasizing green spaces, implementing cycling lanes, and investing in public transportation will create a cleaner and healthier environment for all.

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Residential (33%)

Highest GHG emitting sector: Industry (33%)

City-scale



CITY PROFILE

City area: 257.04 sq. km
 Total population est.(2021): 1.89 million
 Population density est.(2021): 7,339 persons/ sq. km
 Total households est.(2021): 431,547 households
 Climatic condition: Hot and Dry
 Economic activities: Trade, Medical, IT, Commerce & Industries

CITY SCALE CONSUMPTION (2020-21)

Energy
 21.13 million GJ city-wide
 10.48 GJ per capita

GHG emission
 3.22 million tCO₂e city-wide
 1.60 tCO₂e per capita

Electricity
 2,192 million kWh city-wide
 1,088 kWh per capita

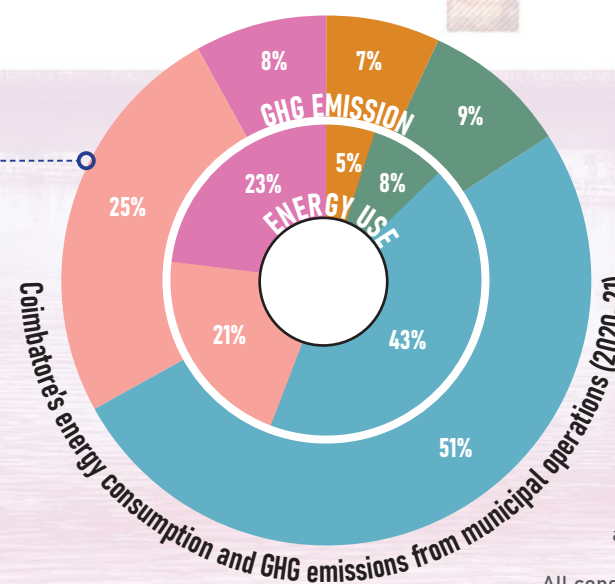
- Transport
- Residential
- Waste
- Commercial
- Industry

Highest Energy Consuming Sector: Water supply (43%)

Highest GHG Emitting Sector: Water supply (51%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.



- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21
 Reference: ICLEI South Asia

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Coimbatore city has established institutional mechanisms in place and is developing climate action plans.

CLIMATE PROJECTIONS

Slight increase in precipitation with increased frequency and intensity of rainfall

Increased maximum and daily minimum temperatures

CITY TARGET

25% reduction in annual GHG emissions by 2022-23 from the 2015-16 baseline.

Coimbatore is in the process of updating its **Climate Resilient Action Plan** (2nd generation) and setting climate resilience targets.

RISK STATUS

- Transport
- Solid waste
- Land use
- Water
- Wastewater

MEASURES IN THE PIPELINE

ADAPTATION

Water and Wastewater

- Develop aquifer maps and analysis of available water sources through for planning
- Restoration and rejuvenation of lake
- Adopt integrated urban water management
- Connecting wastewater treatment plants to create a network for dual supply

Biodiversity

- Develop and maintain reserved sites as urban green spaces
- Development of policy to guide placement of utilities on roads in order to reserve space and integrate tree plantation

Land use

- Identification of reserved municipal sites for development of green areas

Health

- Strengthening integrated disease surveillance program by instituting rapid response cell

MITIGATION

- Use of power factor correction panel to reduce power loss at water treatment plants and sewage pumping stations

Buildings

- Installation of energy efficient fixtures i.e. LED lamps, fans, power factor correction on municipal buildings
- Promote energy efficient pumps and motors in industries
- Increased uptake of Rooftop Solar PV on municipal buildings
- Deployment of floating solar PV and scaling up to 18 MW

Waste

- 4 bio-methanation plants of 200 tonnes per day (TPD) capacity
- Waste incineration facility of capacity of 215 TPD
- Establish zone wise waste collection and processing centres
- Bio-mining of legacy waste
- DPR for a 200 TPD waste to bio-CNG
- Encourage community driven private start-ups to manage solid waste in the city

Transport

- Electrification of public transportation by replacing 500 diesel buses by E-buses
- 6 MW captive solar PV for charging of electric buses
- Public Bicycle Sharing System to promote non-motorized transit for improving last-mile connectivity

In Gwalior, a city rich in history and industrial development, the presence of three industrial belts and diverse industries such as dairy, textiles, and chemicals, calls for immediate prioritisation of sustainable practices. By promoting energy efficiency, encouraging renewable energy adoption, and implementing green initiatives in our industries, we can significantly reduce greenhouse gas emissions. Additionally, preserving our historical sites and promoting sustainable tourism will contribute to a greener Gwalior.

CITY PROFILE

City area: 289.85 sq. km
Total population(2011): 1.11 million
Population density(2011): 2,853 persons/ sq. km
Total households(2011): 264,000 households
Climatic condition: Sub-tropical
Economic activities: Tourism and industries (dairy, textile & chemical)

CLIMATE PERFORMANCE

★★★★★
Climate Smart Cities Assessment Framework (CSCAF 2.0)
Gwalior city has initiated data analysis, established committees for climate action.

MEASURES IN THE PIPELINE

ADAPTATION

MITIGATION

Transport



Promotion of NMT by creating pedestrian friendly street and cycling infrastructure



Transition to cleaner fuels in private vehicles



Promotion of shared mobility by streamlining intermediate public transport modes



Switching to electric public bus fleet

Water and Wastewater



Reduce water losses through regular monitoring



Updation of water resource management plan



Increased wastewater reuse through septage management strategies



Retrofit and procure energy efficient equipment for water and wastewater facilities



Street Lighting

Switching to efficient and smart street lighting systems



Efficiency and effectiveness of wastewater treatment plan to be enhanced through monitoring

Solid Waste



Implementation of 3R principles: reuse and recycling of waste at source through awareness, incentives and penalties



Construction of sanitary landfill for safe disposal of treated waste



Adopt decentralized waste management systems and bio-methanation plants by targeting bulk waste generators

Biodiversity



Rejuvenation and conservation of water bodies and open spaces through blue green infrastructure interventions



Improve native vegetation by conducting a study on the same



Increase green cover through urban forests and open green spaces

Buildings



Public buildings to be Green buildings



Augment use of renewables in buildings

Storm Water



Departmental rapid risk assessment report and action plan to tackle floods through channelising water to reduce water runoff

CITY SCALE CONSUMPTION (2013-14)

Energy
8.76 million GJ
city-wide
7.89 GJ
per capita

GHG emission
1.19 million tCO₂e
city-wide
1.08 tCO₂e
per capita

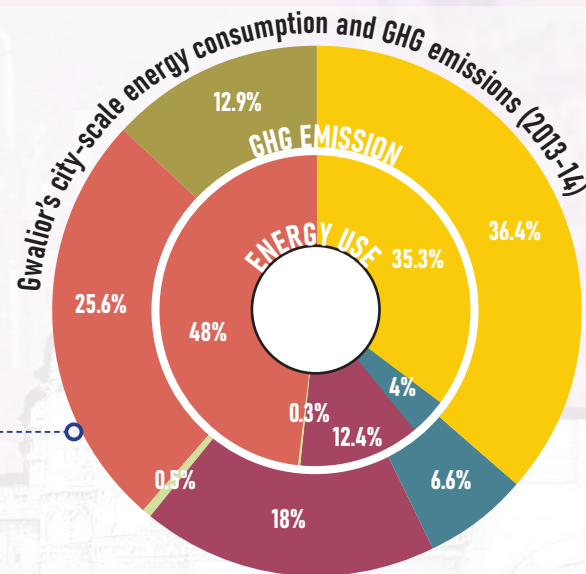
Electricity
735 million kWh
city-wide
662 kWh
per capita

- Transport
- Residential
- Waste
- Commercial
- Industry
- Agriculture

- Municipal facilities: Wastewater treatment
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2013-14
Reference: ICLEI South Asia

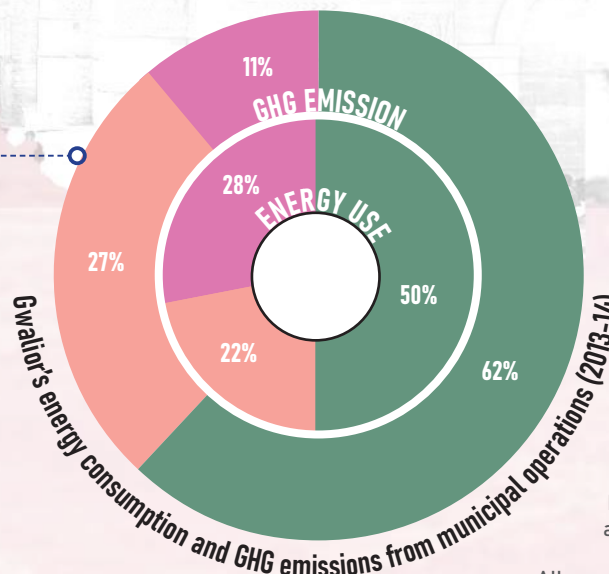


City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (48%)

Highest GHG emitting sector: Residential (36.4%)

City-scale



Highest Energy Consuming Sector: Wastewater treatment (50%)

Highest GHG Emitting Sector: Wastewater treatment (62%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

Kochi, a popular tourist destination and the financial and commercial capital of the state commands that responsible climate action takes place in the many adjoining industries that support tourism here. We need to promote sustainable practices in ship-building, seafood processing, chemical manufacturing, and IT industries to reduce our carbon footprint. Embracing renewable energy sources, implementing efficient waste management systems, and safeguarding our coastal ecosystem will contribute to a more resilient and environmentally conscious Kochi.

CITY PROFILE

City area: 107.13 sq. km
Total population(2011): 0.6 million
Population density(2011): 5,615 persons/sq. km
Total households(2011): 150,511 households
Climatic condition: Mixed humid (tropical)
Economic activities: Trade and commerce

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Kochi city has initiated data analysis, established committees for climate action.

CLIMATE PROJECTIONS

Increased short duration high intensity rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

Rising sea levels
Leads to increased erosion, flooding, saltwater intrusion impended drainage

RISK STATUS

MEASURES IN THE PIPELINE

ADAPTATION

Housing

Flood resistant housing for urban poor and coastal communities

Transport

Promotion of non-motorised transport (NMT) to enhance last mile connectivity

Waste

Strategising C&D waste management (reuse and recycling)

Enforcement of waste segregation at source

Storm water Drainage

Preparation of city-wide drainage and canal master plan

Installation of flood control pumps

Water and Wastewater

Septage management system for wastewater reuse

Decentralised sewage treatment system as an alternative system

Water

SCADA in water management for real time data visualisation

Desalination of sea water for water source enhancement

Prepare Integrated Urban Water Management Plan

Biodiversity

Increase green cover in residential areas through fiscal incentives

Mangrove restoration and conservation activities

MITIGATION

Implement energy efficiency retrofits

Deploy renewable energy in affordable housing

Transition to e-buses in public transport

Deploy solar PV for powering electric mobility

Introduction of electric loaders in the prominent market centres and develop charging infrastructure

Development of Low Carbon Urban Freight Action Plan

Waste

Bio-methanation plants for waste processing

Composting facilities for processing of wet waste

Municipal Buildings

Install solar PV to meet 10% electricity demand in municipal buildings

Energy efficient pumps for water treatment and water supply

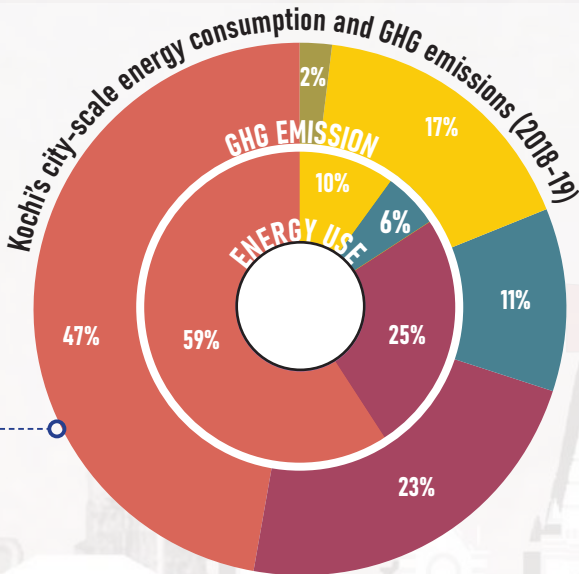
Use of solar PV for water treatment plants

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (59%)

Highest GHG emitting sector: Transport (47%)

City-scale



CITY SCALE CONSUMPTION (2018-19)

Energy
1.74 million GJ city-wide
28.29 GJ per capita

GHG emission
1.61 million tCO₂e city-wide
2.62 tCO₂e per capita

Electricity
523 million kWh city-wide
847 kWh per capita

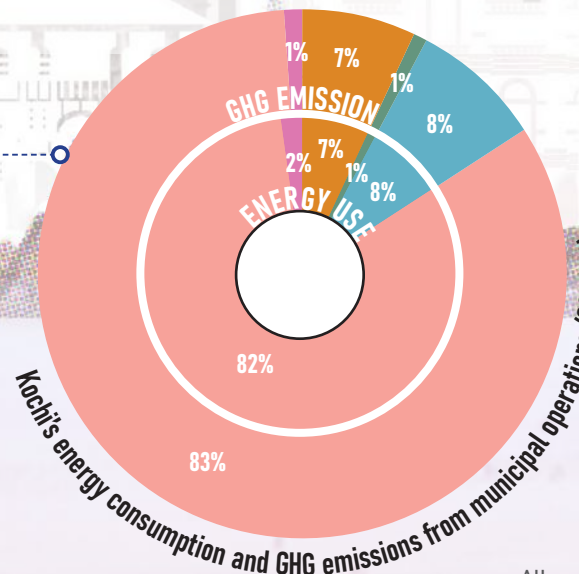
- Transport
- Residential
- Waste
- Commercial
- Industry

Highest Energy Consuming Sector: Street-lighting (82%)

Highest GHG Emitting Sector: Street-lighting (83%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.



- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2018-19
Reference: ICLEI South Asia

Storm water drainage

Solid-waste

Wastewater

Water

Housing

Urban biodiversity



HIGH

EXTREME

With a strong manufacturing base encompassing industries such as chemicals, cement, electronics, textiles, and more, Nagpur must prioritize sustainable practices. Implementing energy-efficient measures, promoting renewable energy adoption, and reducing emissions in industries are crucial steps. Additionally, encouraging sustainable agriculture and protecting natural resources are essential. By fostering a green economy, Nagpur can lead the way in positive climate change impacts and building a sustainable future for all of Maharashtra.

CITY PROFILE

City area: 227.40 sq. km
Total population(2011): 2.4 million
Population density(2011): 10,579 persons/ sq. km
Total households(2011): 527,558 households
Climatic condition: Mixed humid (tropical)
Economic activities: Industry

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)
Nagpur city has established institutional mechanisms in place and is developing climate action plans.

RISK STATUS

MEASURES IN THE PIPELINE

ADAPTATION

MITIGATION

- Waste

Strengthen 3R implementation with Internet-of-things

Measures to minimise unscientific processing of plastic and electronic waste

Waste to compost and RDF plant for waste processing

Promote decentralised bio-methanation

Scientific closure of landfill
- Transport

Promote and develop non-motorised transit facilities

Encourage use of e-mobility

Public bicycle sharing in identified pilot areas
- Storm Water

IoT based stormwater smart grid

Strengthening the storm water coverage network to avoid mixing of stormwater & sewage within the network

Municipal Buildings

Design and construct all new public buildings as green buildings

Installation of net-metered rooftop solar PV systems

Building

Adopt and implement existing guidelines for Climate Responsive Homes

Optimise energy efficiency of homes and apartments

Expand benchmarking of energy consumption in commercial and public buildings

Map rooftop solar PV potential and scale-up implementation through demand aggregation

Cool roof programme and promote adoption of evaporative coolers

Wastewater Treatment

Grey water reuse in large residential, commercial and institutional properties

Decentralised wastewater treatment systems as an alternate system with reuse methods

Faecal sludge management policy

Urban Biodiversity

Implementation of Local Biodiversity Strategy Action Plan

Lake Rejuvenation Plan through water sensitive design strategies

Street Lighting

Expansion of on-going LED street lighting retrofits

Solar PV systems at water supply facilities

Water Supply

Conduct water audits

Installation of automated water ATMs

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Residential (43%)
Highest GHG emitting sector: Residential (38%)

City-scale

Category	Energy Use (%)	GHG Emission (%)
Transport	18%	21%
Residential	43%	38%
Waste	5%	5%
Commercial	15%	18%
Industry	18%	5%

CITY SCALE CONSUMPTION (2017-18)

Energy
19.04 million GJ city-wide
7.03 GJ per capita

GHG emission
3.03 million tCO₂e city-wide
1.13 tCO₂e per capita

Electricity
1,822 million kWh city-wide
678 kWh per capita

- Transport
 - Residential
 - Waste
 - Commercial
 - Industry

Highest Energy Consuming Sector: Water supply (55%)
Highest GHG Emitting Sector: Water supply (57%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

Category	Energy Use (%)	GHG Emission (%)
Municipal facilities: Wastewater treatment	2%	1%
Municipal facilities: Water supply	55%	57%
Municipal buildings	9%	9%
Municipal vehicle fleet	1%	1%
Municipal facilities: Street-lighting	30%	31%

- Municipal facilities: Wastewater treatment
 - Municipal facilities: Water supply
 - Municipal buildings
 - Municipal vehicle fleet
 - Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2017-18
Reference: ICLEI South Asia

CLIMATE PROJECTIONS

Increased short duration high intensity rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

CITY TARGET

20% reduction in annual GHG emissions by 2025-26 from the 2017-18 baseline.

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State of Cities 43

A climate action plan for Panaji is essential, thanks to its coastal location and abundant mangroves on the backwaters entering the Querem Creek, St. Inez Creek, Mandovi River and Zuari River, which are paying the price for climate change. Preserving and restoring these vital ecosystems is important. Implementing sustainable tourism practices, promoting renewable energy sources, and adopting climate-resilient agricultural techniques are necessary steps. Additionally, awareness about the importance of environmental conservation and reducing emissions will contribute to a sustainable future.

CITY PROFILE

City area: 8.12 sq. km
Total population(2011): 0.04 million
Population density(2011): 5,066 persons/ sq. km
Total households(2011): 10,548 households
Climatic condition: Tropical
Economic activities: Tourism and agriculture

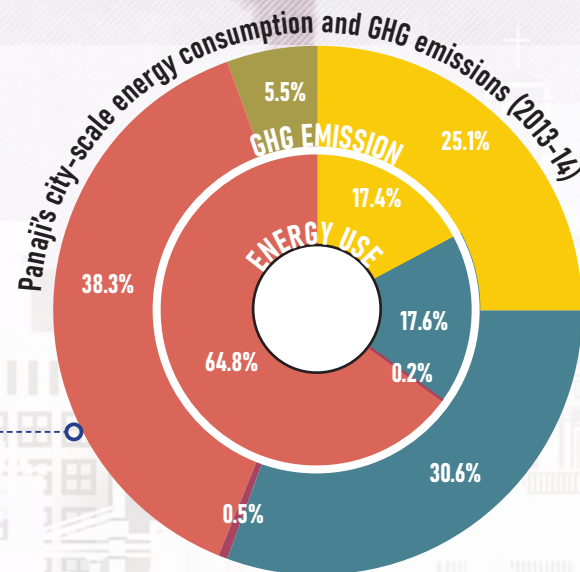
CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Panaji city has initiated data analysis, established committees for climate action.

CITY SCALE CONSUMPTION (2013-14)



- Transport
- Residential
- Waste
- Commercial
- Industry

Energy
1.19 million GJ
city-wide
29.05 GJ
per capita

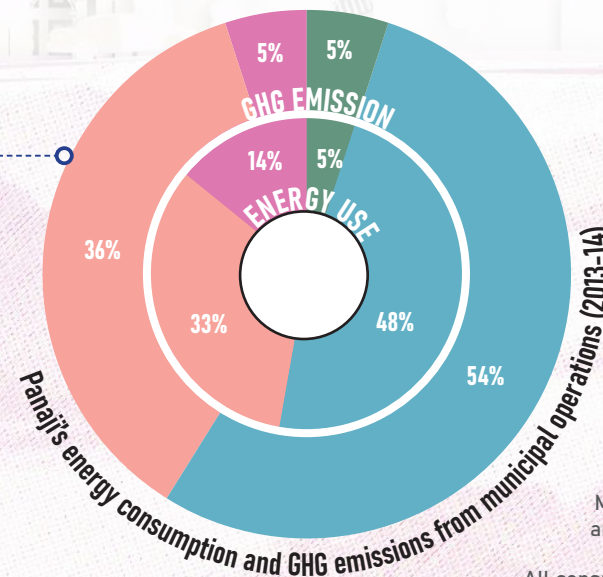
GHG emission
0.14 million tCO₂e
city-wide
3.52 tCO₂e
per capita

Electricity
92 million kWh
city-wide
2,232 kWh
per capita

CLIMATE PROJECTIONS

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

Increased annual average rainfall
Leads to flash floods



- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2013-14
Reference: ICLEI South Asia

RISK STATUS

MEASURES IN THE PIPELINE

ADAPTATION

Transport

- Clean fuel alternatives for all modes of transport
- Provision of smaller/eco-friendly public transport services (bus service)

Storm Water Drainage

- Revamping of storm water drainage system with planning for reduced water retention, and increased percolation and runoff
- Installation of water level gauges to mark sea level rise

Water

- Automated SCADA based monitoring for real time monitoring of the system
- Rainwater harvesting in residential buildings and public institutions through awareness and incentives
- Reuse of treated wastewater for other municipal purposes of lake rejuvenation, road washing, energy plants, etc.

Waste

- In-situ composting of organic waste at building level through incentivisation

Sanitation

- Decentralised Sewage Treatment Plants (STPs) as alternate means of treatment and wastewater reuse

Health

- Awareness generation on health issues and safety, and developing a public alert system on expected hazards

Biodiversity

- Maintenance of sand dunes by enhancing vegetation
- Revitalisation of water sources by implementing retention methods and cleaning the existing surface water

Land

- Bunding system to prevent water inflow and salinisation of land
- Increase Green cover (mangroves) through afforestation on vacant lands

MITIGATION

- Procurement of electric buses for public transport
- Increased share of alternative fuel-based vehicles
- Promotion of collaborative last mile delivery (load pooling) through electric freight vehicles
- Development of Low Carbon Urban Freight Action Plan

Building

- Renewable energy to meet power demand in buildings

Street-lighting

- Renewable based smart street lights

Water and Wastewater

- Use of renewable energy sources in waste and wastewater systems with technological interventions for energy efficiency

Waste

- Establishment of Material Recovery Facility for segregation and processing of dry waste
- Setting up decentralised wet waste processing units

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (64.8%)

Highest GHG emitting sector: Transport (38.3%)

City-scale

Highest Energy Consuming Sector: Water supply (48%)

Highest GHG Emitting Sector: Water supply (54%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

Pimpri-Chinchwad is a key industrial belt with engineering, automobile, pharmaceutical, and biotechnology industries in Maharashtra. This shows the amount of emissions produced by the town regularly. So, implementing energy-efficient technologies, encouraging renewable energy adoption, and reducing emissions in industries are vital steps. Investing in green infrastructure, improving public transportation, and enhancing waste management systems will contribute to a greener and more resilient city.

CITY PROFILE

City area: 177.3 sq. km
Total population(2011): 1.7 million
Population density(2011): 9,770 persons/ sq. km
Total households(2011): 410,858 households
Climatic condition: Sub-tropical
Economic activities: IT and heavy industry

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Pimpri-Chinchwad has allocated budgets and initiated the implementation of projects.

CLIMATE PROJECTIONS

Increased annual average rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

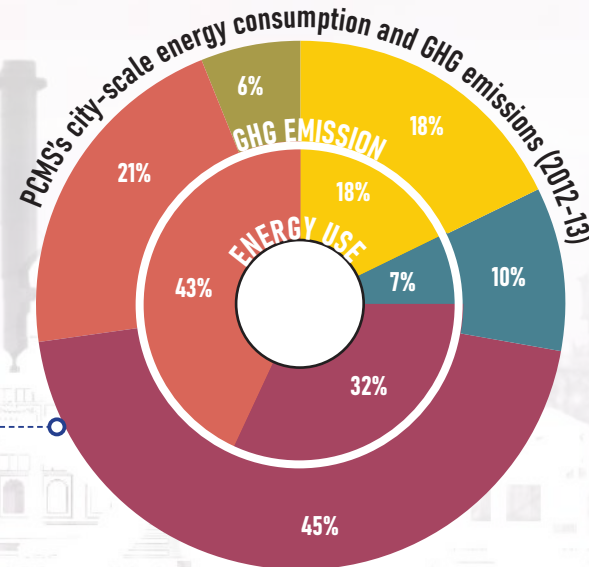
CITY SCALE CONSUMPTION (2012-13)

Energy
21.9 million GJ
city-wide
11.08 GJ
per capita

GHG emission
3.18 million tCO₂e
city-wide
1.61 tCO₂e
per capita

Electricity
2,641 million kWh
city-wide
1,335 kWh
per capita

- Transport
- Residential
- Waste
- Commercial
- Industry

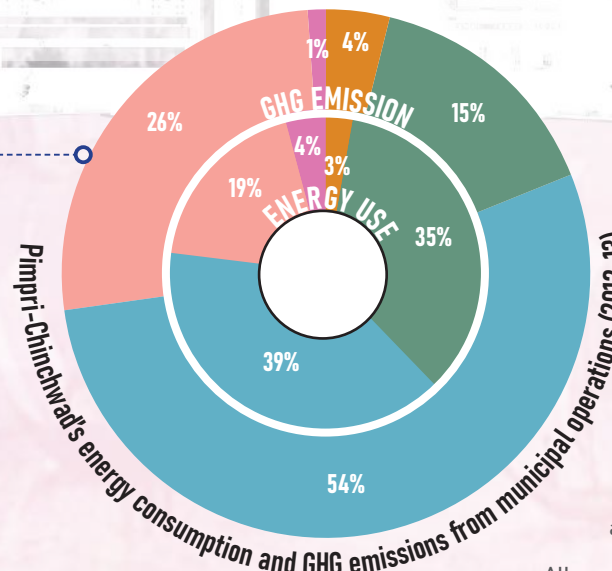


City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (43%)

Highest GHG emitting sector: Industry (45%)

City-scale



Highest Energy Consuming Sector: Water supply (39%)

Highest GHG Emitting Sector: Water supply (54%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2012-13
Reference: ICLEI South Asia

MEASURES IN THE PIPELINE

ADAPTATION

Water

- Update of existing water resource management plan as per climatic events and building resilience
- Reuse of water from wastewater for municipal purposes

Transport

- Promotion of NMT through pedestrian friendly streets
- Promotion of public transport by expanding network

Stormwater Drainage

- Alignment and integration of drainage management plan with flood management plan

Urban Biodiversity

- Streamlining the biodiversity park and creation of biodiversity information centre
- Creation of an Ecological Network
- Incorporating ecological measures in development projects

MITIGATION

Waste

- Installation of waste to energy plant for waste processing
- Implementation of bio-methanation plant to convert hotel waste to biogas

- Installation of electric vehicle charging stations

Municipal Buildings

- Installation of rooftop solar plants of 10 MW on all government buildings
- Implementation of green building incentives for public buildings

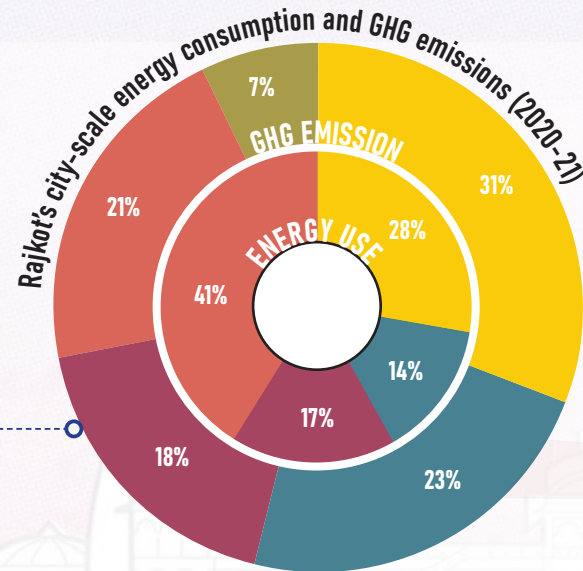
As a significant industrial town with a strong manufacturing base, Rajkot could be a poster child on how promoting sustainable practices is crucial in tier-2 cities. Implementing energy-efficient technologies, encouraging renewable energy adoption, and reducing emissions in industries is vital. Enhancing waste management systems, preserving and restoring the Aji and Nyari rivers, and sustaining its vast green spaces will contribute to a more resilient and sustainable Rajkot

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (41%)

Highest GHG emitting sector: Residential (31%)

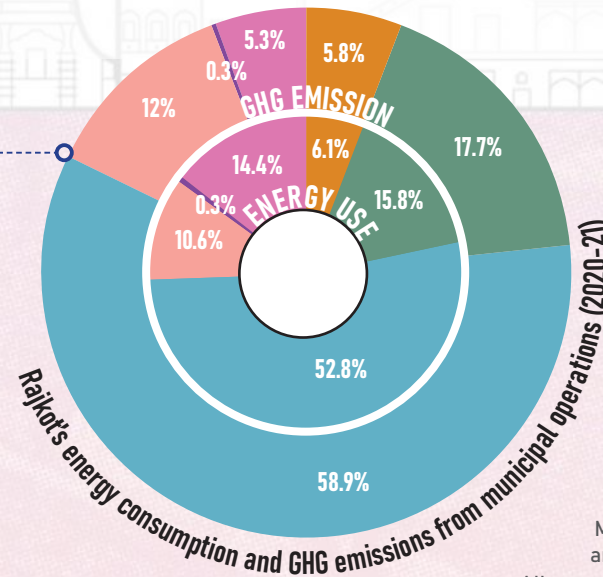
City-scale



Highest Energy Consuming Sector: Water supply (52.75%)

Highest GHG Emitting Sector: Water supply (58.84%)

Municipal operations



CITY PROFILE

City area: 161.86 sq. km

Total population est.(2021): 1.79 million

Population density est.(2021): 11,105 persons/ sq. km

Total households est.(2021): 384,138 households

Climatic condition: Hot and Dry

Economic activities: Trade, commerce and industries (foundry, metal - based and machine tools)

CITY SCALE CONSUMPTION (2020-21)

Energy
17 million GJ city-wide
9.5 GJ per capita

GHG emission
2.27 million tCO₂e city-wide
1.26 tCO₂e per capita

Electricity
1,712 million kWh city-wide
953 kWh per capita

- Transport
- Residential
- Waste
- Commercial
- Industry

- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting
- Municipal facilities: Solid Waste Management

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21

Reference: ICLEI South Asia

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Rajkot city has allocated budgets and initiated the implementation of projects.

CLIMATE PROJECTIONS

Increased high intensity rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

CITY TARGET

14% reduction in annual GHG emissions by 2022-23 from the 2015-16 baseline.

Rajkot is in the process of updating its **Climate Resilient Action Plan** (3rd generation) and setting climate resilience targets.

RISK STATUS

Wastewater
Storm water drainage
Solid waste

MEDIUM

Transport
Water
Health

HIGH

MEASURES IN THE PIPELINE

ADAPTATION

Water and Wastewater

- Rainwater Harvesting System in municipal buildings and low lying areas
- Reuse of treated wastewater to fill Atal Lake in Raiya Smart City area

Storm Water

- Rejuvenation of existing 19 natural drains through percolation strategies

Biodiversity

- Preparation of Local Biodiversity Strategy and Action Plan
- Development of Urban Forest in 47-acre area

Health

- Emergency response plans for extreme weather event management
- Proper design and site selection of health centres for easy accessibility during climatic hazards

Urban Heat Island

- Planning and adoption of Urban Cooling guidelines and actions

MITIGATION

- Integrating energy efficient equipment and solar PV for treatment plants and pumping stations

Waste

- Waste to composting plant for processing of organic waste
- 600 TPD Waste to Energy plant
- Material recovery facility for channelising dry waste
- Scientific capping of landfill at Nakrawadi

Buildings

- Adoption and implementation of Green Building Policy
- Solar Park in Smart city area and installation of rooftop solar PV on government buildings and affordable housing schemes
- Promoting energy efficient retrofits for lamps and tube lights

Transport

- Deployment of 150 E-buses for the electrification of public transport
- Solar PV based EV charging
- Introduce public bicycle sharing system at 40 locations to promote non-motorized transit and improve last-mile connectivity

Street Lighting

- Achieving 100% energy efficient street-lighting

The capital town of Himachal Pradesh, Shimla, nestled in the majestic Himalayan ranges, is blessed with the catchment areas of the rivers Sutlej, Pabbar, and Giri. The city heavily relies on tourism as a major economic sector, alongside small-scale manufacturing industries. To combat climate change, Shimla must prioritize sustainable tourism practices, promote renewable energy adoption, implement efficient waste management systems, and protect its pristine natural resources.

CITY PROFILE

City area: 19.99 sq. km
Total population(2011): 0.14 million
Population density(2011): 4,197 persons/ sq. km
Total households(2011): 27,000 households
Climatic condition: Sub-tropical
Economic activities: Tourism

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

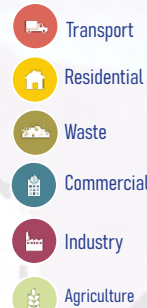
Shimla city has established institutional mechanisms in place and is developing climate action plans.

CITY SCALE CONSUMPTION (2013-14)

Energy
1.64 million GJ
city-wide
9.14 GJ
per capita

GHG emission
0.21 million tCO₂e
city-wide
1.24 tCO₂e
per capita

Electricity
139 million kWh
city-wide
790 kWh
per capita



City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (67.2%)

Highest GHG emitting sector: Residential (35.9%)

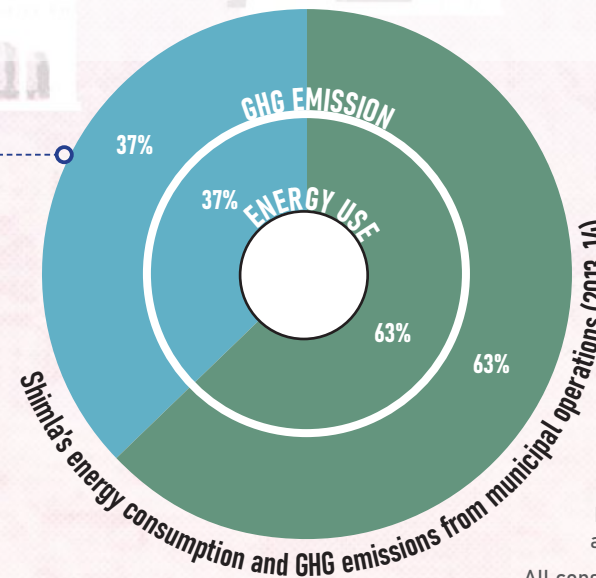
City-scale

Highest Energy Consuming Sector: Wastewater treatment (63%)

Highest GHG Emitting Sector: Wastewater treatment (63%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.



Note: The local government energy consumption and GHG emissions for Shimla is available only for municipal facilities and excludes buildings and municipal vehicles

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2013-14
Reference: ICLEI South Asia

CLIMATE PROJECTIONS

Increased short duration high intensity rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

RISK STATUS

Water
Transport
Tourism



HIGH

MEASURES IN THE PIPELINE

ADAPTATION

Transport

- Augmentation of existing public transport system
- Development of anti-skid pathways for safety

Water and Wastewater

- Rainwater harvesting for residential buildings and public institutions
- Plan for immediate identification and action on freezing of water pipes
- Implementation decentralized wastewater treatment plants in the city
- Septage management system constituting of wastewater and sludge reuse

Solid Waste

- Application of 3R Principles: reuse and recycling of waste at source through public sensitisation on the same
- Processing facilities for processing of C&D waste
- Construction of sanitary landfill for safe waste disposal

Storm Water

- Early warning systems for heavy precipitation

Tourism

- Urban forestry initiatives
- Construction of sky buses
- Green tax for tourist cars

MITIGATION

- Procurement of low carbon electric buses
- Introduction of mass rapid transport system

Introduction of freight parking and loading zones

Development of Low Carbon Urban Freight Action Plan

Minimise energy consumption for water and wastewater treatment through energy efficiency solutions

Decentralised wet waste processing units for processing of organic waste

Material recovery facility for dry waste management

Street Lighting

Implementation of RE based street lights

Building

Increasing share of renewable energy utilization

Implementation of green building incentives through awareness and incentives across all sectors

Siliguri, the third largest urban agglomeration in West Bengal, is situated on the floodplains of the Mahananda River and surrounded by dense forests at the foothills of the Eastern Himalayas in Darjeeling. The town faces the dual challenge of floods and deforestation. As a vital transport and tourism transit hub known for its tea industry, the city must prioritize sustainable practices, including flood management strategies, afforestation efforts, and promotion of eco-friendly tourism.

CITY PROFILE

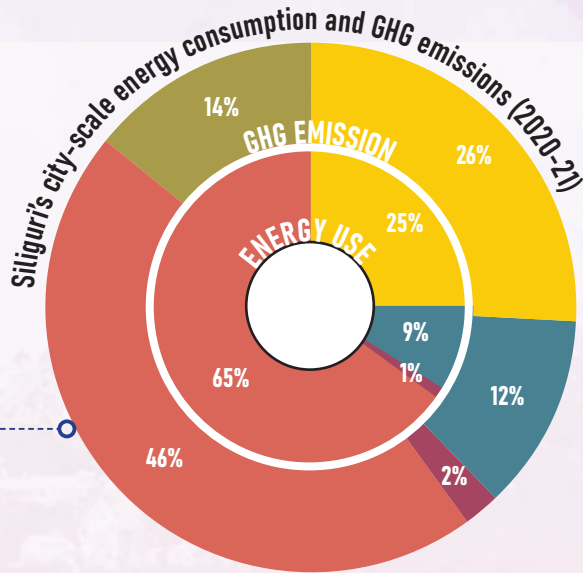
City area: 41.9 sq. km
Total population est.(2021): 0.69 million
Population density est.(2021): 16,460 persons/sq. km
Total households est.(2021): 155,332 households
Climatic condition: Subtropical humid
Economic activities: Trade, logistics, healthcare, tourism

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)
Siliguri city has initiated data analysis, established committees for climate action.

CITY SCALE CONSUMPTION (2020-21)



City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (65%)

Highest GHG emitting sector: Transport (46%)

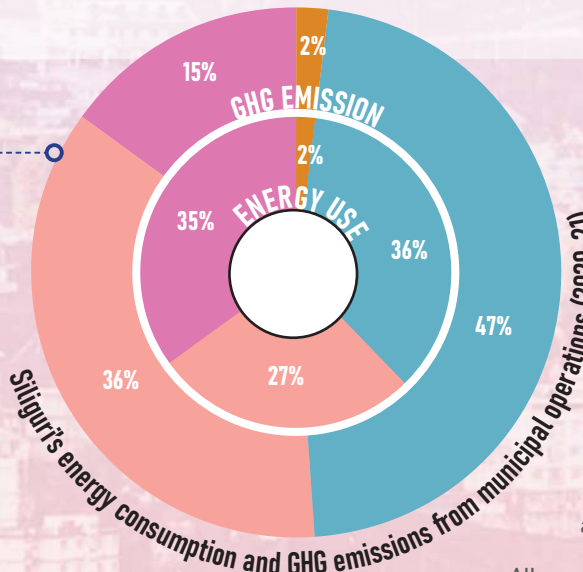
City-scale

- Transport
- Residential
- Waste
- Commercial
- Industry

Energy
16.22 million GJ city-wide
23.52 GJ per capita

GHG emission
1.67 million tCO₂e city-wide
2.43 tCO₂e per capita

Electricity
507 million kWh city-wide
735 kWh per capita



Highest Energy Consuming Sector: Water supply (36%)

Highest GHG Emitting Sector: Water supply (47%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21
Reference: ICLEI South Asia

CLIMATE PROJECTIONS

Increased short duration high intensity rainfall
Leads to flash floods

Increased maximum and daily minimum temperatures

CITY TARGET

14.6% reduction in annual GHG emissions by 2022-23 from the 2015-16 baseline.

Siliguri is in the process of updating its Climate Resilient Action Plan (2nd generation) and setting climate resilience targets.

RISK STATUS

MEASURES IN THE PIPELINE

ADAPTATION

Water and Wastewater

- Augmentation of water supply to meet the city's current and future needs
- Installation of water ATMs

Waste

- Ward-wise collection centres, with material recovery facilities for dry waste and composting for decentralised treatment of wet waste
- 100% source segregation and collection
- Mandates and incentives for in-situ composting facilities in large residential and commercial units

Transport

- Infrastructure development for traffic decongestion through design interventions

Storm Water

- Augmentation of flowing capacity of the existing drainage network
- Installation of portable pumping units in a decentralized model
- Restoration of degraded rivers for stormwater runoff collection

Sewerage

- Augmentation of sewerage network
- Strategic planning of sewage management for the city with actions for wastewater reuse
- Implementation of three decentralised sewage treatment plants on the left bank of River Mahananda

Biodiversity

- Development of Local Biodiversity Strategy and Action Plan (LBSAP)
- Preparation of People's Biodiversity Register
- Development of urban forest through Miyawaki method
- Development of biodiversity park Mahananda floodplain

MITIGATION

- Implement measures to reduce Non-Revenue Water (NRW) to 20%
- Installation of captive Solar PV Plants at water supply pumping stations
- Ward-wise collection centres, with centralised material recovery facilities for dry waste and composting for wet waste
- Deployment of 200 TPD vermicomposting facility
- Processing of legacy waste and construction of scientific landfill site
- Improve waste processing at end point through composting, recycling and RDF palletisation activities

- Implementation of traffic decongestion measures through infrastructure design and policy guidelines

Buildings

- Promotion of green buildings
- Transition to energy efficient public buildings using solutions such LED lamps, low-energy fans and power factor correction devices

Street Lighting

- Installation of automatic switching panels and powering through renewable energy

Thane, a major city in Maharashtra, relies heavily on consumer-related services, including the hospitality and IT industries for its economical development. However, rapid urbanization and industrialization have impacted its environment. To address this, Thane needs to prioritize sustainable practices, such as reducing carbon emissions, promoting renewable energy adoption, implementing efficient waste management systems, and preserving its natural resources.

CITY PROFILE

City area: 128.23 sq. km
Total population(2011): 1.84 million
Population density(2011): 14,361 persons/ sq. km
Total households(2011): 390,974 households
Climatic condition: Mixed humid (tropical)
Economic activities: IT industries and commercial services

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Thane city has established institutional mechanisms in place and is developing climate action plans.

CLIMATE PROJECTIONS

Increased annual average rainfall
Leads to flash floods

Increasing minimum temperature
Leads to extreme weather events such as floods, droughts and storms

CITY SCALE CONSUMPTION (2017-18)

Energy
13.06 million GJ city-wide
5.83 GJ per capita

GHG emission
2.29 million tCO₂e city-wide
1.02 tCO₂e per capita

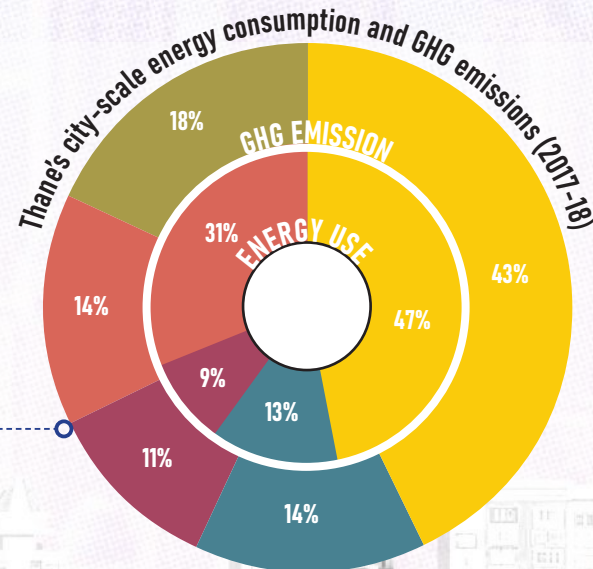
Electricity
1,677 million kWh city-wide
749 kWh per capita

- Transport
- Residential
- Waste
- Commercial
- Industry

- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting
- Municipal facilities: Crematorium

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2017-18
Reference: ICLEI South Asia

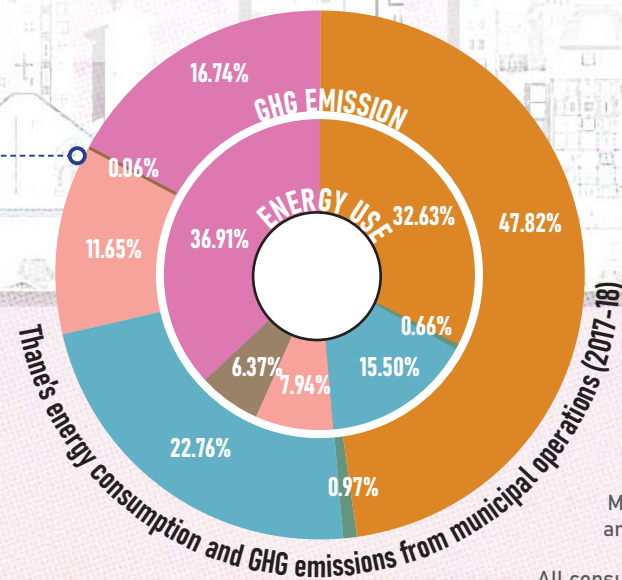


City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Residential (47%)

Highest GHG emitting sector: Residential (43%)

City-scale



Highest Energy Consuming Sector: Transport (36.91%)

Highest GHG Emitting Sector: Buildings (47.82%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

RISK STATUS

Health



LOW

Water supply

Transport

Urban biodiversity

MEDIUM

Solid waste management

Storm water management

Wastewater treatment

HIGH

MEASURES IN THE PIPELINE

ADAPTATION

Biodiversity, Disaster Management, Pollution and Health

- Increase carbon sequestration potential of urban forests
- Preparation of Heat Action Plan and generate urban heat island maps
- Implementation of Clean Air Action Plan

Transport

- Pedestrian friendly walkways to promote NMT

Storm Water

- Internet of things-based storm water grid
- Rainwater harvesting with regular monitoring and incentives
- Early warning system and flood lines for hazard alerts

Solid Waste

- Preparation of a Holistic Waste Management Plan
- Scaling up GIS enabled smart waste management services for bins and vehicles

Wastewater Treatment

- Faecal sludge management policy with reuse methods
- Dual plumbing

Water Supply

- Integrated groundwater management through increased recharge efficiency
- Catchment Management Plan and Integrated Urban Water Management

MITIGATION

Buildings

- Conduct of energy audits for retrofits and green building design for high-rise buildings
- Deploy solar PV and solar water heating system at hotels and hospitals
- Enhanced use of rooftop solar and solar water heaters
- Evaluate integration of District Cooling Systems

- Development of electric mobility framework

- Introduce electric buses with solar PV charging facilities at depot

- Replacement of existing diesel bus fleet with CNG buses

- Application of EV for IPT modes of transport

Street Lighting

- City-wide scale-up of energy efficient street-lighting

- 600 TPD waste to energy and 2 TPD plastic waste to fuel plant

- Scientific closure of landfill and development of a solar farm

- Decentralised bio-methanation and composting plants for organic waste processing

Municipal Buildings

- Reduction of heat ingress through urban cooling measures

- Implement solar PV systems to meet energy demand

- Adoption of renewable energy systems at water supply and sewage treatment facilities

- Conduct of energy audits for retrofit implementation

Tiruchirappalli, the fourth largest city and urban agglomeration in Tamil Nadu, has a thriving economy centred around engineering equipment manufacturing and fabrication. With the resultant, rampant environmental challenges, Tiruchirappalli needs to prioritize sustainable practices, including promoting energy efficiency in industries, adopting renewable energy sources, and implementing waste management systems.

CITY PROFILE

City area: 167.23 sq. km
Total population est.(2021): 1.02 million
Population density est.(2021): 6,134 persons/ sq. km
Total households est.(2021): 256,456 households
Climatic condition: Hot and dry
Economic activities: Trade, commerce, industries and transport hub

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

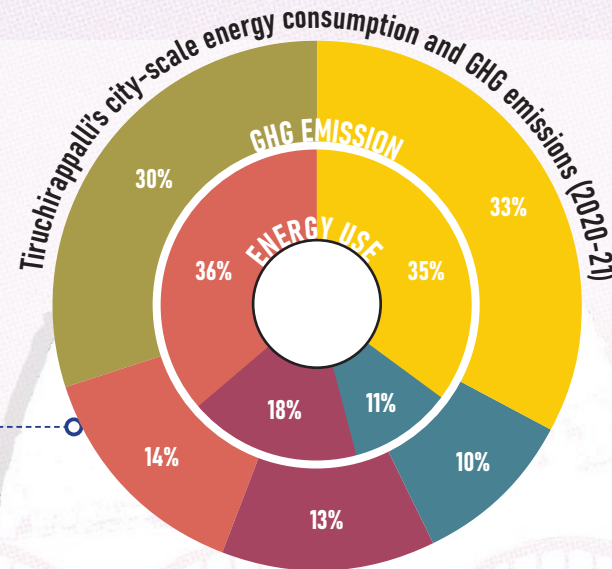
Tiruchirappalli city has initiated data analysis, established committees for climate action.

CLIMATE PROJECTIONS

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

Increased rainfall
Leads to flash floods

CITY SCALE CONSUMPTION (2020-21)



Energy
9.18 million GJ city-wide
8.95 GJ per capita

GHG emission
1.88 million tCO₂e city-wide
1.84 tCO₂e per capita

Electricity
1,155 million kWh city-wide
1,125 kWh per capita

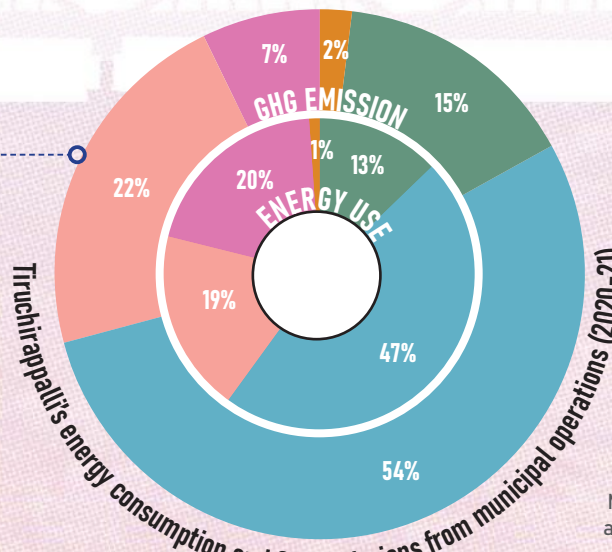
- Transport
- Residential
- Waste
- Commercial
- Industry

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (36%)

Highest GHG emitting sector: Residential (33%)

City-scale



- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21
Reference: ICLEI South Asia

Highest Energy Consuming Sector: Water supply (47%)

Highest GHG Emitting Sector: Water supply (54%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

MEASURES IN THE PIPELINE

ADAPTATION

Water and Wastewater

- Water augmentation and ground water recharge study for improved decision making
- Integration of wastewater reuse and channelising the water for lake rejuvenation and development

Storm Water

- Optimisation of stormwater drainage to minimise water logging
- Watershed Management Assessment Studies
- Preparation of Storm Water Network Map

Biodiversity

- Preparation of Local Biodiversity Strategy and Action Plan (LBSAP)
- Prepare detailed Natural Asset Map for informed decision-making process to increase green and blue cover
- Development of urban forest and biodiversity parks in available vacant lands

MITIGATION

- SCADA for improving efficiency of water supply through regular monitoring provisions
- Implementation of additional 100 MLD - Wastewater Treatment Plan (Energy Efficiency with SCADA)

Waste

- Preparation of holistic solid waste management action plan with sustainable segregation and processing methods
- 370 TPD legacy waste treatment
- 25 TPD plastic waste treatment facility through RRC (Resource Recovery Centre)
- 100 TPD bio-gas plant for fuel generation from waste
- 50 TPD C&D Plant using the DBFOT concession framework
- Biomining of legacy waste

Buildings

- 9.6 MW ground mounted Solar PV plant at Pajjappur
- 1 MW rooftop solar PV installation on municipal buildings
- Upgradation of public library into green building (IGBC standard)

Transport

- Develop an integrated bus terminal at Panjappur using Green Building measures
- Preparation of action plan to promote electric mobility in private vehicles
- Identify and develop NMT routes
- Parking demand assessment to optimise space usage

Air Quality

- Preparation of micro action plan for clean air under National Clean Air Programme

Green Cover

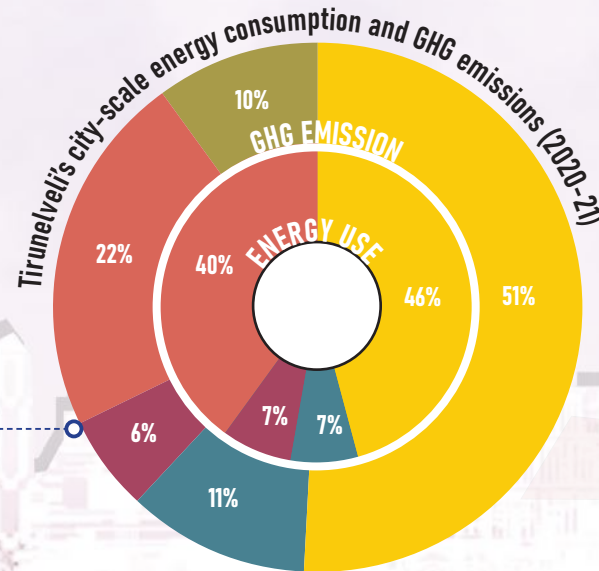
- Estimation of carbon sequestration potential for existing Miyawaki forests in four locations

Tirunelveli, the sixth-largest city in Tamil Nadu, boasts of diverse service-sector activities, including cement manufacturing, agricultural trading, banking, tourism, agro-machinery, and information technology. So, the city's environmental footprint is substantial. To address this, Tirunelveli needs to prioritize sustainable practices, such as promoting green technologies, adopting renewable energy sources, and implementing efficient waste management systems.

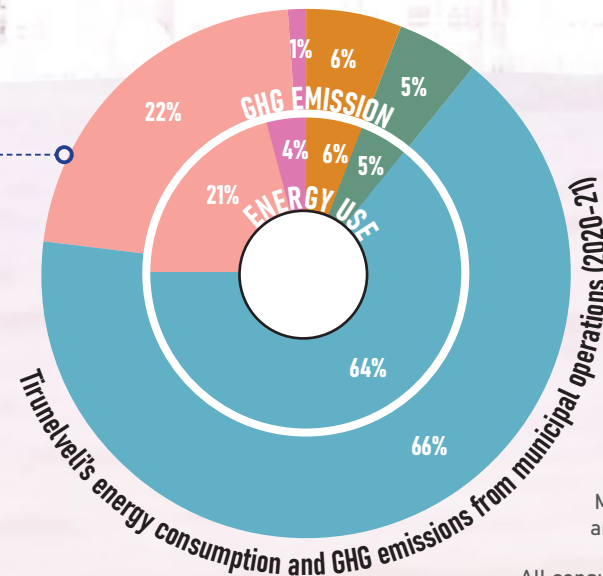
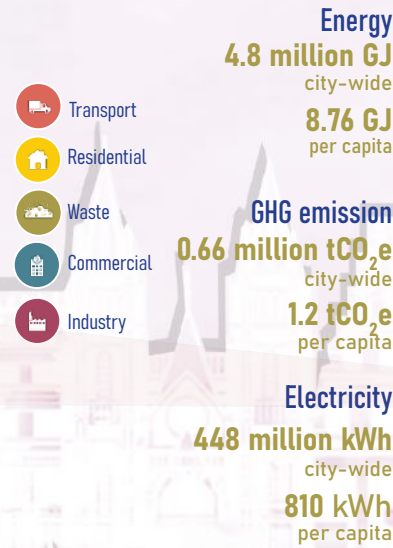
City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Residential (46%)
Highest GHG emitting sector: Residential (51%)

City-scale



CITY SCALE CONSUMPTION (2020-21)



Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21
Reference: ICLEI South Asia

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Tirunelveli city has initiated data analysis, established committees for climate action.

CLIMATE PROJECTIONS

Increased rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

CITY TARGET

Tirunelveli is in the process of preparing its **Climate Resilient Action Plan** and setting climate resilience targets.

MEASURES IN THE PIPELINE

ADAPTATION

Water and Wastewater

- Implement rejuvenation of lakes within city owned by corporation through water cleansing and retention methods
- Water supply augmentation under Tirunelveli Water Supply Improvement Scheme, implementation of 24x7 water supply

Storm Water

- Storm water drainage network improvements to minimise water logging issues
- Early Flood Warning System for Thamirabharani River
- Preparation of Watershed Management Plan

Urban Biodiversity

- Enhance the vegetation cover through native tree plantations existing parks with less vegetation
- Development of urban forest and biodiversity parks on available vacant lands

MITIGATION

- SCADA for improving efficiency of water supply through real time data
- Technology up-gradation for existing infrastructure and improved sewage management to minimise operational costs
- Underground Sewerage Network to improve coverage area of city

Transport

- Preparation of Comprehensive Mobility Plan
- Identification of routes for NMT with provision of supporting infrastructure
- Promote electric mobility in the city for private vehicles and integrate battery operated vehicles for municipal use

Waste

- Preparation of holistic solid waste management action plan with incorporated principles of reduce, reuse and recycle
- Promote source segregation to improve operational efficiency of underutilised micro-composting centres

Buildings

- Installation of 5 MW Solar PV plant at Ramayanpatti for captive consumption by municipal facilities

Udaipur, a major tourist destination in the western part of India, has inter-connected lake systems and a rich cultural history, making the city's environmental challenges significant. Udaipur has a diversified economic base, with tourism, education, commerce and mining industries playing major roles. However, these activities contribute to environmental issues. To address this, Udaipur needs to prioritize sustainable tourism practices, promote eco-friendly agriculture, implement responsible mining practices, and adopt renewable energy sources.

CITY PROFILE

City area: 64 sq. km
 Total population est.(2021): 0.53 million
 Population density est.(2021): 8,294 persons/ sq. km
 Total households est.(2021): 110,591 households
 Climatic condition: Semi-arid with a hot dry summer and bracing cold winter
 Economic activities: Marble industry, tourism

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Udaipur city has established institutional mechanisms in place and is developing climate action plans.

CLIMATE PROJECTIONS

Increasing temperature
 Leads to extreme weather events such as floods, droughts and storms

Increased short duration high intensity rainfall
 Leads to flash floods

CITY TARGET

18% reduction in annual GHG emissions by 2022-23 from the 2016-17 baseline

Udaipur is in the process of updating its **Climate Resilient Action Plan** (2nd generation) and setting climate resilience targets.

CITY SCALE CONSUMPTION (2020-21)

Energy
 8.18 million GJ city-wide
 15.40 GJ per capita

GHG emission
 1.16 million tCO₂e city-wide
 2.19 tCO₂e per capita

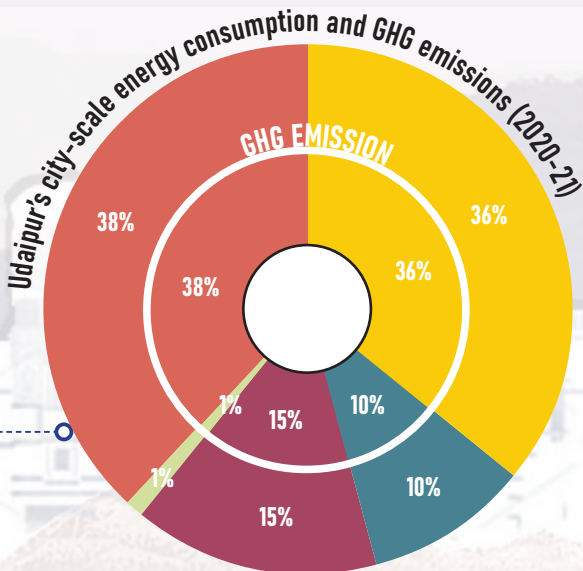
Electricity
 775 million kWh city-wide
 1460 kWh per capita

- Transport
- Residential
- Commercial
- Industry
- Agriculture

- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

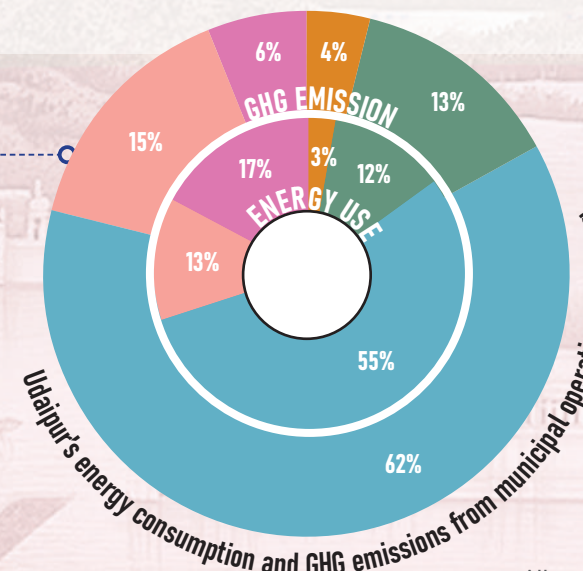
All consumption and emission data from 2020-21
 Reference: ICLEI South Asia



City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (38%)
 Highest GHG emitting sector: Transport (38%)

City-scale



Highest Energy Consuming Sector: Water supply (55%)
 Highest GHG Emitting Sector: Water supply (62%)

Municipal operations

Municipal government operations' information reflects the energy consumption and GHG emissions from all facilities and operations that the city government owns or controls, such as municipal buildings, and municipal vehicle fleet.

RISK STATUS

MEASURES IN THE PIPELINE

ADAPTATION

Water & Wastewater

- Rain water harvesting in residences and institutions connected to selected channels for restoration of catchment areas
- Mandate for rooftop water harvesting and water recycling for state owned buildings of plot size 300 sq. m
- Rejuvenation of traditional water bodies and sources along with water quality check of natural bodies
- Analysis of available water sources to identify alternate sources for the city
- Strategic planning for septic sludge management through setting up treatment plants in the city

Waste

- Zero waste strategies in 100% municipal wards

Stormwater Drainage

- Mapping of water logging areas and geo-tagging to propose interventions with regular monitoring mechanisms
- Conservation and restoration of natural drainage patterns in the city

Biodiversity

- Preparation of Local Biodiversity Strategy and Action Plan (LBSAP)
- Development of Miyawaki based urban forest

MITIGATION

- Rooftop solar PV installation on pumping stations and water treatment plant for power
- Faecal sludge management and anaerobic digestion - Biogas to generate electricity with reuse strategies
- Replacement of all water supply and wastewater pumps with energy efficient pumps + implementation of SCADA system
- Implement measures to reduce Non-Revenue Water (NRW) to 30%

Waste

- Construction of waste to composting and RDF plant with a capacity of 150 TPD
- Material recovery facility along with 60 TPD waste to composting plant for dry and wet waste processing

- Installation of Waste to bio-methanation plant
- Scientific closure and capping of old dump site at Tithardi and construction of sanitary landfill

- 20 TPD biomethanation plant producing compressed bio-gas to replace LPG

Transport

- Installation of 500 cycles with 50 docking stations
- Transition to electric waste collection vehicles
- Replacement of traditional auto-rickshaws across the city by electric powered IPT
- Replace existing diesel bus fleet with electric buses
- Green Mobility Zone Program in old city area

Buildings

- Encourage rooftop solar PV adoption in residential, commercial, institutional and industrial buildings
- Promotion of solar water heaters in households
- Adoption of energy efficient devices and appliances in municipal buildings

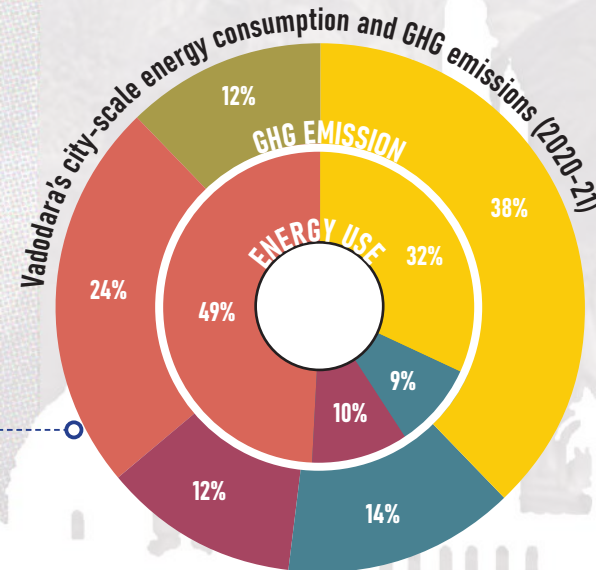
Situated on the banks of the Vishwamitri River, Gujarat's second largest city Vadodara's major economic base comprises large-scale public-sector industries and private enterprises. To combat climate change, Vadodara can focus on promoting renewable energy sources, implementing energy-efficient technologies, and encouraging sustainable practices in industries. Additionally, investing in green infrastructure, preserving natural resources, and raising awareness about climate change among its residents can contribute to building a resilient and environmentally conscious city.

City-scale information reflects the energy consumption and GHG emissions from residential buildings, commercial buildings, public facilities, transportation and waste

Highest energy consuming sector: Transport (49%)

Highest GHG emitting sector: Residential (38%)

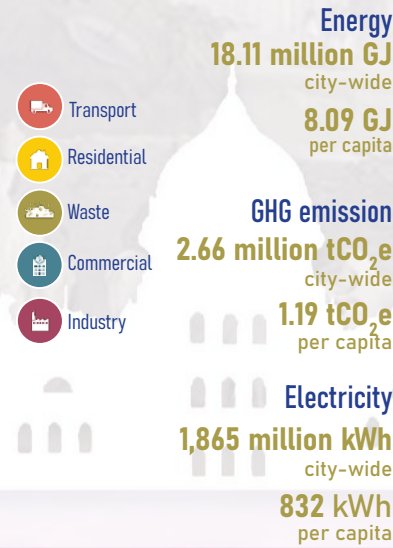
City-scale



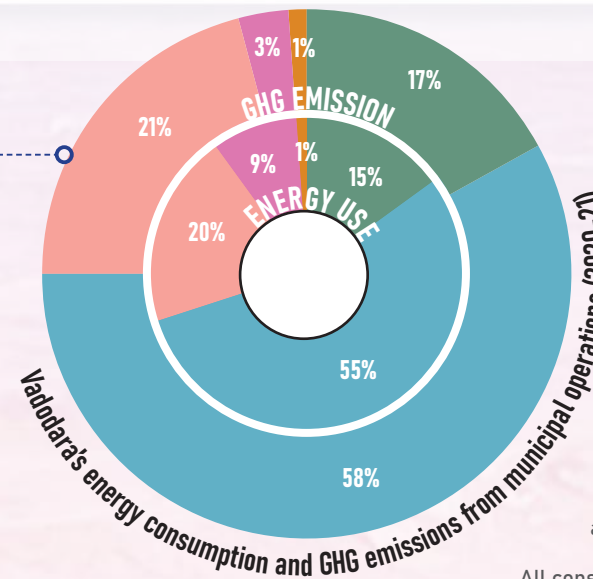
CITY PROFILE

City area: 220.33 sq. km
Total population est.(2021): 2.24 million
Population density est.(2021): 11,502 persons/ sq. km
Total households est.(2021): 613,682 households
Climatic condition: Hot and dry
Economic activities: Producer of dolomite and fluorspar, various large-scale industries

CITY SCALE CONSUMPTION (2020-21)



- Transport
- Residential
- Waste
- Commercial
- Industry



- Municipal facilities: Wastewater treatment
- Municipal facilities: Water supply
- Municipal buildings
- Municipal vehicle fleet
- Municipal facilities: Street-lighting

Municipal operations are included-in and are a subset of the city-scale information

All consumption and emission data from 2020-21
Reference: ICLEI South Asia

CLIMATE PERFORMANCE



Climate Smart Cities Assessment Framework (CSCAF 2.0)

Vadodara city has allocated budgets and initiated the implementation of projects.

CLIMATE PROJECTIONS

Increased rainfall
Leads to flash floods

Increasing temperature
Leads to extreme weather events such as floods, droughts and storms

CITY TARGET

Vadodara is in the process of preparing its **Climate Resilient Action Plan** and setting climate resilience targets.

MEASURES IN THE PIPELINE

ADAPTATION

Biodiversity

- Preparation of Local Biodiversity Strategy and Action Plan (LBSAP)
- Development of Biodiversity Park at Govindnagar, Kareli Baug
- Development of Miyawaki based urban forest at 75 locations through afforestation techniques

Water and Wastewater

- Preparation of water management action plan for efficient resource allocation
- Development of water source for the southern zone of the city from Rameshara main canal
- Construction of New STPs and operationalise Faecal Sludge Treatment Plant (FSTP)

MITIGATION

Buildings

- Installation of solar plants on municipal buildings
- Promote green building concepts through awareness campaign targeting local architects, engineers and builders
- Certified green buildings in affordable housing

- Water audit and energy audit under smart water management project for SCADA Phase II
- Replacement of old water supply network with MDPE pipeline network in all four zones to reduce leakage and O&M cost
- Upgradation of water and wastewater pumping stations

Transport

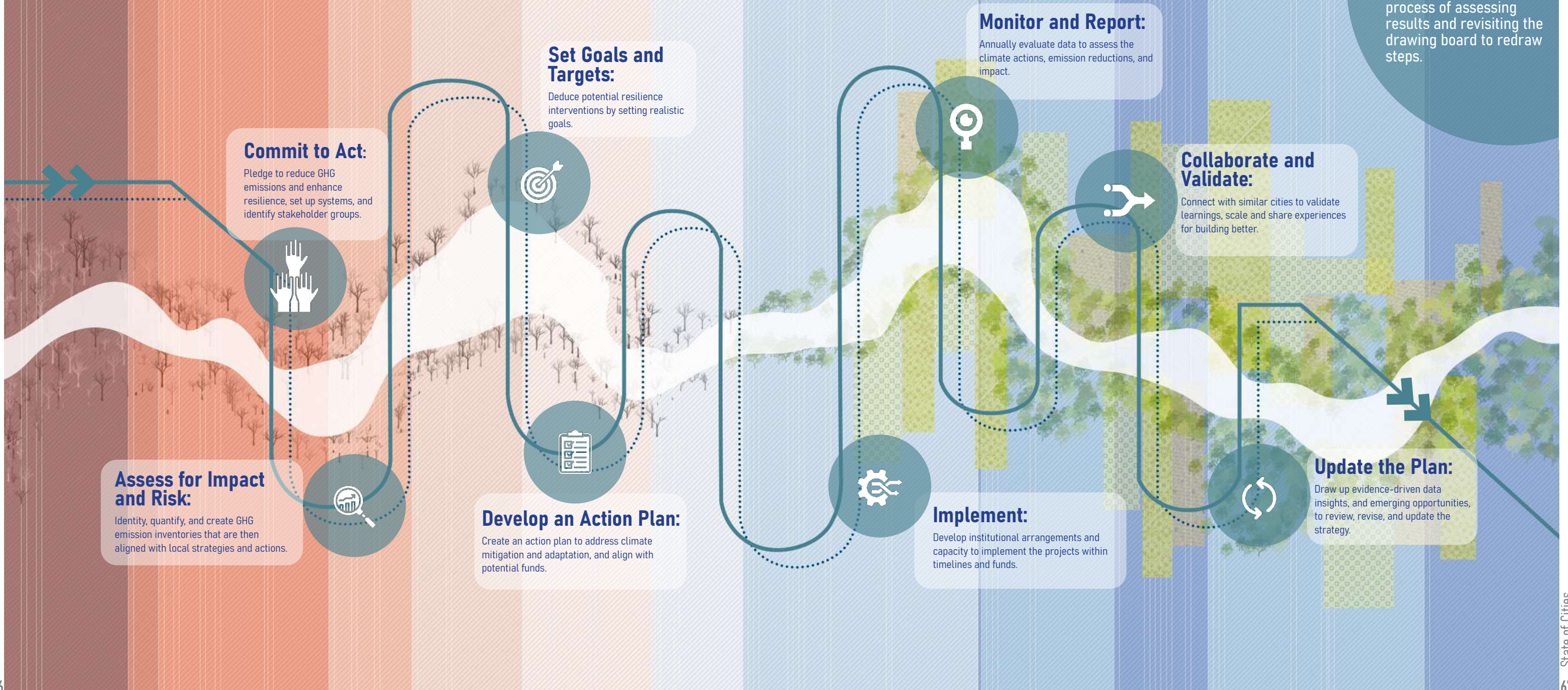
- Preparation of comprehensive transport and mobility plan
- Development of transport hub in the north zone and at central bus stand on PPP mode for city and state transportation
- Development of multi-level parking near key locations
- Development of electric charging stations within the city limit and transitioning to electric bus fleet

Waste

- Preparation of holistic solid waste management action plan including Information, Education and Communication (IEC) and capacity building activities
- Construction of 50 TPD plastic waste processing plant
- Construction of 50 TPD C&D waste processing plant
- Construction of 1000 TPD Waste to Energy plant (10 MW)
- Construction of new landfill site at Makarpura

PLANNING CLIMATE ACTION

Enabling cities to walk on greener pathways



Abbreviations

3R's	Reduce, Reuse, Recycle
C&D	Construction and Demolition
CNG	Compressed Natural Gas
COP	Conference of the Parties
CSCAF	Climate Smart Cities Assessment Framework
DBFOT	Design, Build, Finance, Operate and Transfer
ECBC	Energy Conservation Building Code
ESCO	Energy Service Company
EVs	Electric Vehicles
FSTP	Faecal Sludge Treatment Plant
GCoM	Global Covenant of Mayors
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
IEC	Information, Education and Communication
IoT	Internet of Things
IPT	Intermediate Public Transport
IT	Information Technology
LBSAP	Local Biodiversity Strategy and Action Plan
LED	Light Emitting Diode
MDPE	Medium-Density Polyethylene
NAPCC	National Action Plan on Climate Change
NbS	Nature-based Solutions
NMT	Non-Motorised Transport
NRW	Non-Revenue Water
O&M	Operation and Maintenance
PPP	Public Private Partnership
RDF	Refuse Derived Fuel
RE	Renewable Energy
RESCO	Renewable Energy Service Company
RRC	Resource Recovery Centre
SAPCC	State Action Plan on Climate Change
SCADA	Supervisory Control and Data Acquisition
STP	Sewage Treatment Plant

References

CITIES AT CROSSROADS

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City Climate Alliance:
The City Climate Alliance is a coalition of partners committed to climate action. The alliance is an aggregator for capturing climate actions, innovations and transitions. The coalition aims at building a partner community for climate action through knowledge sharing and exchange on national and international platforms. The alliance also contributes to policy acceleration, creating repositories of climate action and supporting capacity building for just climate transitions.

Want to Collaborate with City Climate Alliance?

Reach out to us at cityclimatealliance@niua.org

We sit within NIUA as a cross sectoral umbrella bringing all ideas, systems, projects, and institutions together for climate action in cities.

