

On behalf of

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

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USER GUIDE FOR ClimateSMART CITIES

Self Assessment Tool



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The Framework

The Ministry of Housing and Urban Affairs (MoHUA) launched "ClimateSmart Cities Assessment Framework" (CSCAF), to incentivize holistic, climate responsive development. The framework serves as a tool for cities to assess their present situation and provides a roadmap for cities to adopt and implement relevant climate actions. The objective is to enable cities to assess their preparedness to tackle climate change and help them with a roadmap to achieve sustainable climate actions on ground.

The CSCAF is first-of-its-kind city assessment framework on climate relevant parameters. It consists of 28 diverse indicators across 5 sectors namely:

- Energy and Green Buildings,
- Urban Planning, Green Cover and Biodiversity,
- Mobility and Air Quality,
- Water Management, and
- Waste Management.

The framework will help cities to improve their performance standards and in creating green, sustainable and resilient urban habitats.



The Tool

The CSC – Self Assessment Tool is an emissions assessment tool that is based on the CSC Assessment Framework. It uses activity data, already being collated in the framework to estimate greenhouse gas emissions from activities mentioned under indicators across the five sectors. The tool follows the 'Global Protocol for Community-Scale Greenhouse Gas Emission Inventories' (GPC) to estimate indicator-wise GHG emissions and further provides mitigation potential for the interventions mentioned in the framework. The mitigation potential is estimated based on the progression levels mentioned in the framework, thereby providing cities with quantifiable, emission-based evidence to identify low-hanging fruits.

Based on the emission numbers, the tool gives cities focused actions to prioritise categories and indicators. Under the Urban Planning, Green Cover & Biodiversity category, the tool estimates the amount of carbon sequestration of green cover and the sequestration potential of increasing the existing green cover. Thus, the tool would help design and locate climate solutions within the Smart Cities Mission.

To access the tool one can simply login to the link: <u>https://niua.org/c-cube/csc-sat</u>

> By creating a username and password, one can easily access the dashboard.

Steps for Using the Tool

3.1. CSC Assessment Tool Dashboard



Once we login the tool using username and password the tool opens and the above 'Home Page' appears on the screen. This page has 6 function tabs include: About the Tool, Data Entry, Emission & Analysis, Potential Emission Reduction, Generate Report, Notes.

The users can logout anytime from the tool, with 'Log Out' Option given on right hand side.

3.2. Data Entry



The above page is visible on clicking the Data Entry button on the Home Page of the tool.

The data entry tab includes 6 thematic areas that are already being captured in the framework, along with some additional parameters to analyse emissions.

If the city do not have any information in any of the sectors, then they must enter '0' or just leave blank.

3.3. City Information

Click on the tab 'City Information' and enter appropriate information as indicated by the tool. The tool has pre-filled basic information about all cities in India and the users will be asked to enter additional details of the city.

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City Information	
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Administrative information	
Name of the City *	
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City Statistics	
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Map of the city is required to be uploaded in JPEG or PNG format only

3.4. Energy and Green Building

Under Energy and Green Buildings tab, the tool estimates emissions for Indicators 1, 2, 3, 4, 6.

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Home / Data Entry / Energy and Green Buildings				
Energy and Green Buildings				
Name of the City				
- None -				¥
Indicator 1: Electricity Consumption in the City (Focu	used on Municipal Services)			
Total Electricity Consumption for Municipal Services				
kWh				
Total Electricity Consumption for Public Park & Garden	ŝ			
0				
kWh				
Total Electricity Consumption for community halls				
0 W/b				
Total Electricity Consumption for Municipal Buildings				
0				
kWh				
Total Electricity Consumption for Municipal Schools				
0				
kWh				
Total Electricity Consumption for community clinics & I	nospitals			
0				
KWR Total Electricity Consumption for Municipal Fire Service	16			
0				
kWh				

Indicator 1 Energy and Green Building, the city is required to enter data related to 'Total electricity consumption in the City focussing on the Municipal Services (Total electricity consumption in Public Park & Gardens, Community Halls, Municipal Buildings, Municipal Schools, Community Clinics & Hospitals, Municipal Fire Services).

Indicator 2 focuses on the 'Total Electrical Energy in City Derived from Renewable Sources.

Indicator 3 focuses on Fossil Fuel Consumption in the City (focussed on Municipal Services) and city is required to enter consumption data related to diesel, petrol, LPG, CNG and PNG.

Indicator 2: Total electrical energy in city der	ved from renewable sources (Annual)
Total electrical energy generated from all grid	connected renewable energy sources within the city
UU	
Total electricity consumption in the city	
NU	
fotal number of unit lost due to AT&C loss	
NU	
Note: 1MU = 1 Million Unit = 10,00,000 kWh	
Indicator 3: Fossil Fuel Consumption in the	Xiy (Focused on Municipal Services) (Annual)
Total diesel consumption	
d.	
Total petrol consumption	
d.	
Total LPG consumption	
d.	
Total CNG consumption	
d.	
Indicator 4: Energy efficient street lighting in	the city
fotal number of street lights in the city	
number	
Total number of energy efficient street lights in	the city
	•
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For Indicator 4, cities are required to enter data of Energy efficient street lighting in the city.

Indicator 6 focuses on Green Building Adoption. The cities are required to add information of existing built-up area of green building, built up area of all buildings that are approved for occupancy for the assessment, Total electricity consumption of green buildings certified and total electricity consumption of all buildings

The data entered in the fields must be according to the units specified in the tool for a city.

3.5. Urban Planning, Green Cover and Biodiversity

Under Urban Planning, Green Cover & Biodiversity tab, cities are required to enter information for the Indicators 2 i.e. Proportion of Green Cover.

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Home / Data Entry / Urban Planning, Green Cover & Biodiver	sity			
Jrban Planning, Green Cover & Biodiversity				
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- Select a value -				
Indicator 2: Proportion of green cover				
City Green Cover Area *				
Sg. km				
Moderately Dense Forests				
0				
Sq. km				
Open Forests				
0 Sa km				
Scrub/Grasslend Vegetation				
0				
Sq. km				
Mangrove Ecosystem				
0				
sq. xm				
Sg. km				

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Mangrove Ecosystem					
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Wetlands					
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Urban & Peri-urban areas (including institutional fands)					
Sq. km					
Agro-Forestry & Social Forestry -Improved					
0					
Sq. km					
Agro-Forestry & Social Forestry -New					
0					
Sq. km					
Note: All "City Green Cover Arear" is by default categorised under "Urban & Peri-urban areas (including institutional lands)" unless Otherwise specified by the oty					
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Firstly, enter the Total Green Cover Area of a city, which by default gets classified under the 'Urban & Peri-Urban Areas (including institutional lands)' subcategory. Further the data must be entered to the Green Cover Area classification that includes Moderately Dense Forests, Scrub/Grassland Vegetation, Mangrove Ecosystem, Wetlands.

For any help to understand detailed definitions of Green Cover Area Subcategories click (?) button.

The data entered in the fields must be according to the units specified in the tool for a city.

3.6. Mobility and Air Quality

Click on 'Mobility and Air Quality' tab to enter information for the Indicator-1 i.e. 'Clean Technologies Shared Vehicles'. The tool estimate emissions based on Vehicle Kilometers Travelled by shared bases, shared taxis (4-wheelers), shared auto (3- wheelers), shared bikes (2-wheelers) and shared ferries.

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Vehicle Kilomel Single Fuel Bus	ters Travelled (VKTs) by shared buses es Number of Buses	Total VKTs in a year	Default	Mileage Override	Unit
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Vehicle Kilomet Single Fuel Bus CNG LPG Electric Biodiesel	Hers Travelled (VKTs) by shared buses	Total VKTs in a year	Dufuuli 3.51 2.41 1 4.47	Missge Overnie 0 0 0	Unit breakfore kreakfore kreakfore kreakfore
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Vehicle Kilomet Bingle Fuel Buss CNG LPG Electric Biodiesel Diesel Number of Hybri Hybrid buses	tern Travelled (DVCIa by shared bases # # Hundes of Buses	Total VETs is a year	Duhun 3.83 2.45 4.67 8.85	Misse Oversite 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unit bunkture bunkture bunkture bunkture bunkture

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hared Auto					
	Number Of Auto	Total VKTs in a year	Default	Mileage Override	Unit
2NG			20	0	kmtitre
РО			20	0	kmtitre
lectric			19.23	•	km/kWh
Xesel			20	•	km1itre
Ithanol			20	0	kmtitre
*etrol			29	0	kmfiltre
etrol s (2-Wheeler shicle Kilome	rs) blors Travelled (VKTs) by shared bikes		20	0	kontilee
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The tool estimates emissions based on the Activity, Share, Intensity, Fuel (ASIF) Framework, and Vehicle Kilometers Travelled (VKTs).

Enter VKTs for the following 5 vehicle types – Buses, 4, 3 and 2- wheelers, and ferries according to type of fuel that is being consumed.

Default Mileage for vehicles is specified for every fuel type. However, users can override city-specific mileage values for more accurate emission estimation

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Electric			30.03	0	km/kWh
Ethanol			27.85	0	kmtitro
Petrol			41.48	0	kmititro
Ferries					
Vahicla Kilometer	s Traveller (VICTs) by shared Ferries				
Shared Ferries	a mananal (incluy by analou norma				
	Number of Ferries	Total VKTs in a year	Default	Mileage override	Unit
CNG			0.041	0	km/litre
LPG			0.03	0	km/litre
Bicdiesel			0.04	0	km/litre
Diesel			0.04	0	km/litre
te 1: Piease Enter Info	rmation on number of vehicles and VKTs for mobility needs of p	ople, in accordance with CSC-AF			
te 2: Enter O(zero) if da te 3: Enter city specific	ata for any of the above parameters is not applicable or available mileage to override default value				
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In case cities do not have information on VKTs for shared vehicles, the help button (/) mentions different methods to calculate annual VKTs.

The data entered in the fields must be according to the units specified in the tool for a city.

3.7. Water Management

Click on the Water Management tab to enter details for Indicators 2, 5 and 6 i.e., Extent of Non-Revenue Water, Energy Efficient Water Supply System, Energy Efficient Wastewater Management System of the City respectively.

Indicator 2 - Non-Revenue Water, electricity required to supply 1000 Litres of water by municipal authorities is assumed to be 2.33 kWh.

However, for more accurate estimation of emissions, users can enter cityspecific information on electricity consumption for municipal water supply.

Cities should refer to their respective water audit reports to enter data for input parameters under Indicator 5 Energy Efficient Water Supply System in the City and Indicator 6 Energy Efficient Wastewater Management System in the City.

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Home / Data Entry / Water Resources Management					
Water Resoures Management					
Name of the City					
- None -					,
Indicator 2: Extent of Non-Revenue Water					
Total Water produced and put into the transmission and dist	ribution system				
Million Litres Per Day Total Water Sold					
Millions Litres Per Day					
Electricity required to supply 1000 litres of water by municip	al authorities				
		Default		Override	
Electricity required to supply 1000 litres of water by municipal ar	athorities	2.33		0	
Note: Default "Electricity Required" is used to estimate NRW emi	ssion. Enter city specific value to override default value				
Indicator 5: Energy Efficient water supply system in the c	ity				
Reduction of energy consumed Per MLD					
5					
Annual electricity consumption of water supply managemen					
KWD					

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Indicator 5: Energy Efficient water supply system	em in the city							
Reduction of energy consumed Per MLD								
۱ ۹۷								
Annual electricity consumption of water supply n	ranagement							
Wb								
Total Water Supplied								
Millions Litres Per Day								
Note: Refer to Water Audit Report to enter data for th	e parameters mentioned above							
Indicator 6: Energy Efficient wastewater mana	gement system in the city							
Reduction of energy consumed per MLD of waste	ewater generation and treatment							
5								
Annual electricity consumption of wastewater ma	anagement							
KWb								
Total wastewater treated								
Millions Litros Por Dav								
Note: Refer to Water Audit Report to enter data for th	e parameters manifored above							
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The data entered in the fields must be according to the units specified in the tool for a city.

3.8. Waste Management

Click on the 'Waste Management' tab to enter information regarding the city's waste management.

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Balance for Lands for Land	Constant of Hard Maximy Mark Marker And Marker And Marker	Winner of States of Case	Smart City	Climate Centre for Cities
Home / Data Entry / Waste Management				
Waste Management				
Name of the City				
- None -				~
Indicator 4: Extent of Wet Waste Processed (GHG En	nission Reduced)			
	,			
MSW sent to landfill / Dumpsite				
Total Quantum of MSW sent to Landfill / Dumpsite in In	ventory Year (Data For Last 12 Months)			
Tonnes per annum				
Type of Landfill				7
- None -				~
Methane Recovered at the Landfill (flared or energy re	covered)			
- None -				~
Fraction of Methane Recovered at the Landfill (flared o	r energy recovered)			
Fraction of Solid Waste by type in the total waste				
Food Waste				
0				
% Graden & Park Waste				
0				
5				
Sanitary Waste				

Waste emissions are estimated from Municipal Solid Waste (MSW) sent to Landfill/Dumpsites, Biologically Treated and Incinerated.

The tool estimates emissions for Indicator 4 where cities are required to fill the data related to total quantum of MSW sent to landfill/dumpsite, type of landfill, methane recovered at the landfill.

Click on the help (?) button for more information on the different types of landfills.

For MSW sent to landfill/dumpsite, waste composition must be entered in percentage by the user. Users are required to fill following categories of waste composition of the city i.e., 'Food Waste, Garden & Park Waste, Sanitary Waste, Paper & Cardboard, Rubber & Leather, Wood Waste, Textiles and Other Waste'.

Coogle Calendar - Week of Ju X ClimateSmart Cities X Waste Management (CSC As: X +	Q	16	£°≡	(A)	۲	
Biological Processes				-		
Biological treatment of Solid Waste						
Quantum of Waste Treated through Biological Processes like Composting, bio-methanisation (Data for Last 12 Months)						
Tonnes per annum						
Composting Amount						
Tornes per annum						
Dry Waste Composition						
5						
Wet Waste Composition						
% Assarshin Tileattion Amount						
Tornes per annum Dry Waste Composition						
N State Stat						
Wet Waste Composition						
5 5						
Indineration Processes						
Waste incineration						
Quantum of Waste Treated through incineration Processes like Waste to energy (Data for Last 12 Months)						
Tornos per annum						
Type of incineration Premises					ý	

For biological treatment of solid waste, user must provide data for Quantum of Waste Treated through Biological Processes like Composting - Bio-Methanisation in the unit 'tonnes per annum', 'Composting Amount', 'Dry waste Composition' and 'Wet Waste Composition' (in percentage). With regards to 'Anaerobic Digestion the user is required to provide Digestion's Amount (in tonnes per annum) and Composition of Wet waste and dry waste in percentage.

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Torono and an or a							
torrisos per annum							
bry waste composition							
-							
Wet Waste Composition							
%							
cineration Processes							
Waste incineration							
Quantum of Waste Treated through inc	ineration Processes like Waste to energy (Data	for Last 12 Months)					
torrion per annum							
Type of incineration Premises							
- NO18 -							
Type of Incineration / Technology							
- None -							
A Davis on dash							
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It is suggested to write city-specific information for accurate emission estimation. For waste incineration, users must enter quantity, type of incineration premises and type of incineration technology.

The data entered in the fields must be according to the units specified in the tool for a city.

3.9. Emissions and Analysis View

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Overall Emission	City Information	Energy & Green Buildin	gs Mobili	y à Air Quality
Urban Planning, Green Cover & Blodiversity	Water Resource Manageme	nt Waste Management	Pri	ority Areas
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The above page is visible on clicking the Emissions and Analysis tab in the Home Page.

Based on information entered in the data entry tabs, the tool estimates emissions of the specified city and gives a detailed analysis of the emissions under every sector according to information filled earlier.

3.10. Priorities Areas

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Cons France 0.0		
Open Foresis B85.00		
reen Cover 0.0 0.0 0.5		
Agro-Forestry & Social Forestry - New 0.00 0.4		
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This tab helps to prioritize actions based on emissions estimated for all sectors and their individual indicators. It helps cities identify sectors and activities that cities should focus and initiate action on, based on the emission numbers. It helps the city to take immediate actions against the emissions that will pollute the environment.

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Indicator 1 of the Urban Planning, Green	Cover & Biodiversity category is abou	it Climate Action Planning - the 'Priorit	y Areas' tab should help cities plan a	t the city-level and prioritise categori	es and indicators based on emission r	sumbers.		
Indicator-wise Priority List			Emissions t0	22e by Priority				
Indicator 4: Greenhouse Gases (CHCb) emission due to Manicipal Waste processing and treatment facilities								
indicator 6: Total electrical energy consurrection by water supply management system in the oily								
Indicator 2: Per capite and Per area electricity consumption for municipal services								
Indicator 5: Total electrical energy consumption by wastewater management system in the city								
Indicator 2: Shared Vehicles								
Indicator 3: Per capita fossil fuel (Seee, Petro, CHO, LPO) consumption for municipal services								
Indicator 4: Total electrical energy consumption for street lights								
Indicator 6: Total electrical energy consumption for green and other buildings								
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Enter Performance Evaluation Levels		Energy & Green Buildings		Urban Planning, Green Cover & Biodiversity	
Mobility & Alr Quality		Water Resource Management		Waste Management	
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For the Low Carbon Shared Vehicles indicator, the prioritization for the 5 different vehicle categories is done based on the emission estimations per 1000 km according to type of fuel. The calculation uses default mileage and emissions factors, however, on entering city-specific mileage values in the data entry tab, cities will be able to prioritize least emitting fuels for the given vehicle categories.

3.11. Potential Emission Reduction

The above page is visible in clicking 'Potential Emission Reduction' button on the Home page. This page is designed in line with indicator specific performance evaluation levels mentioned in the ClimateSmart Assessment Framework.

To enter Performance Evaluation Levels, users will have to refer to last assessment cycle city's diagnostic report on SmartNet.

For every indicator, cities would need to input their current performance evaluation levels, followed by the desired performance evaluation levels they want to attain.

Based on performance evaluation levels of the selected city, the tool will estimate emission reduction potential for indicators being captured in the tool for all indicators based on the framework.

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Potential Emission Reduction					
- None -					~
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Indicator Description	Lovel #	Current Level	Level #	Desired Level	
1 Electricity Consumption in the City (Focused on Municipal Services)	- None - 🗸	4	- None - 🗸	h	
2 Total Electric Power in the City derived from Renewable Energy Source	- None - 🗸	_	- None - 🗸		
3 Fossil Fuel Consumption in the City (Focused on Municipal Services)	- None - 🗸		- None - 🗸		
4 Energy Efficient Street Lighting In the City	- None - 🗸		- None - 🗸		
6 Green Building adoption	- None - 🗸		- None - 🗸	h	
Urabn Planning Green Cover and Biodiversity					
Indicator Description Prenation of Green Cover	Level #	Current Level	Level #	Desired Level	
	- None - 🗸		- None - 🗸		
Mobility and Air					
Indicator Description Clean Technologies Shared Vehicles	Level #	Current Level	Level #	Desired Level	
	¥		· · · · · ·		
Water Resource Management - Recommendation input					
# Indicator Description	Lovel#	Current Level	Level #	Desired Level	

The above page is a view of the performance evaluation level tab. Current and Desired Performance Level tabs help users to specify the city's current level of performance for every indicator across all the categories. Default performance level is 1 for all the indicators. Users are expected to go through every sector and select appropriate performance levels between 1 to 5.

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Click Here For Edit				Indicator4: P	ropotion of Green Cover							
Current	Level	Level 4	12% to < 20% Green Cov	er								
(Ste Recom	mendation Level	level 2	Level 2: 5% to < 9% Gree	n Cover								
Mar.			Potential increase in Carb	on Sequestration moving from	Level 1 to Level 2 is between 382250 ar	nd 688050 tCO2e						
Desired	I Level	Level 5	≥ 20% Green Cover									
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Current Level is based on city's current performance in the assessment framework and Desired levels in the performance level is the performance level which the city is aiming to achieve. Description of each performance level for respective indicator is shown in the text box next to the indicator level (Above image).

•	🕒 Energy and Green Buildings ${}_{\bigcirc}$ $ imes$ $+$									
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Home /	Potential Emission Reduction / Energy and Green Buildin	igs								
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			Indicator 1: Per Capita and Per Area Electricity Consumption for Muncipal Service							
	Current Level	Level 3	Above 2X & upto 4X as compared to the city with the lowest per capita consumption (amongst Tier I, II & III)							
×	Potential Emission Reduction Level	Level 4	Level 4: Above 1.11X & upto 2X as compared to the city with the lowest per capita consumption (amongst Tier I, II & III)							
'œ'			Potential Emission Reduction moving from Level 3 to Level 4 is 30040.14 tCO2e							
	Desired Level Level 4 Above 1.11X & uplo 2X as compared to the sity with the lowest per capita consumption (amongst Tar I, II & III)									
	Indicator 2: Total Electric Power In the City derived from Renewable Energy Source									
	Current Level	Level 3	5 - < 10% of the city power demand is from renewable energy							
എല			Level 4: 10 - < 25% of the city power demand is from renewable energy							
99999	Potential Emission Reduction Level	Level 4	Potential Emission Reduction moving from Level 3 to Level 4 is between 491180 and 982360 ICO2e							
	Desired Level	Level 4	10 - < 15% of the city power demand is from renewable energy							
			Indicator 2: Par Canita Ecceli Euel (Discal Patrol, CNG, LRG) Consumption for Nuncioal Service							
	Current Level	Lough 2	About 27.5 unto 47 as compared to the city with the lowest per conta consumption (amount Tex L II.6.10)							
	outen botor	Levelo	There are a spectral and employed to the only must be remain per capital contraction (and gat the r, it is in)							
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	Desired Level	Level 4	Puternal Emission resource inverse in Level a to Level a to Sever Automation (amonos) Ter L II & IID							
			Indicator 4: Energy Efficient Street Lighting in the City							
	Current Level	Lovel 3	Upto 50% streets lights in the city are energy efficient							
_⊕°	Potential Emission Beduction Level	Level 4	Level 4: Upto 75% streets lights in the city are energy efficient							
<u> </u>			Potential Emission Reduction moving from Level 3 to Level 4 is upto 13562.88 tCO2e							
	Desired Level	Lovel 4	Upto 75% streets lights in the city are energy efficient							
			ndicator 6: Percentage of Buildings Securing green building compliance, pre-certification and final certification							

Performance Evaluation levels are automatically generated as the user enters the data for all indicators. This will show details for 3 Levels – Current Level, Recommended Level, which is auto defined as the level after the current level.

3.12. Generate Report



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'Generate Report' tab on Homepage creates a consolidated PDF report which includes:

- Methodology
- Data
- Emissions and Analysis
- Priority Areas and
- Potential Emission Reduction

User should ensure all parameters has been filled before clicking on the Generate Report tab.

User can 'Download/Print' individual theme base assessment report, as well as compiled report from the tab. By clicking the button creates a PDF File names "ClimateSmart Cities Self-Assessment Report".

Kindly note: User should enable 'Print Backgrounds' setting option before saving the assessment report as PDF, or printing it.



Notes

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The Notes tab, in the image above should be used to enter any additional information or calculations that the tool does not capture, but might be helpful for a city to document or report.

Limitation of CSC-Self Assessment Tool

The tool uses the Global Protocol for Community-scale Greenhouse Gas Emission Inventories to estimate emissions. It is important to note that the tool does not provide any city-level inventory, it only gives an estimation of emissions and emission reduction potential for activities mentioned in the framework that can be quantified in terms of GHG emissions. The emission reduction potential numbers are "potential" reduction numbers estimated using information existing in the tool and framework; for more accurate estimations, the tool would need to capture several additional parameters.

To contextualize and simplify calculations, the tool uses India-specific studies, reports and documents for the Non-Revenue Water, Low Carbon Shared Vehicles & Proportion of Green Cover indicators. Wherever possible, the tool uses India-specific emission factors, otherwise it uses global default factors to estimate emissions.

Project Name : Climate Smart Cities

Commissioned by:

German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU)

Partner Organisation:

Ministry of Housing and Urban Affairs (MoHUA), Government of India

Lead Executive Agency:

Deutsche Gesellschaft fiir Internationale Zusammenarbeit (GIZ) GmbH

Developed by:

GIZ in association with World Resource Institute India, and National Institute of Urban Affairs