USER GUIDE FOR
ClimateSMART CITIES
Self Assessment Tool

Ministry of Housing & Urban Affairs
2020

The Framework

Ministry of Housing and Urban Affairs has initiated the "ClimateSMART Cities Assessment Framework" (CSC-AF) to incentivize holistic, climate responsive development.

The framework is a first-of-its-kind public assessment framework on climate relevant parameters. It has 30 indicators across 5 sectors, which are not only functional, but also doable in the current context of Indian Smart Cities. The 5 sectors include:

- Energy and GreenBuildings;
- Urban Planning, Green Cover and Biodiversity
- Mobility and AirQuality;
- Water ResourceManagement
- Waste Management

The Tool

The ClimateSmart Cities – Self Assessment Tool (CSC – SA Tool) is an Excel-based, 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 for 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. It also 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 focus actions to prioritise categories and indicators. Under the Urban Planning, Green Cover & Biodiversity category, the tool estimates the amount of carbon sequestered by green cover and the sequestration potential of increasing the existing green cover. Thus, the tool seeks to help design and locate climate solutions within the Smart Cities Mission.

To use the tool, Excel's Macros must be enabled. This can be done by choosing the option when the file is opened, or by clicking Options at the top of the screen (in Excel 2007, 2010) and choosing Enable, or by using Excel's security settings.
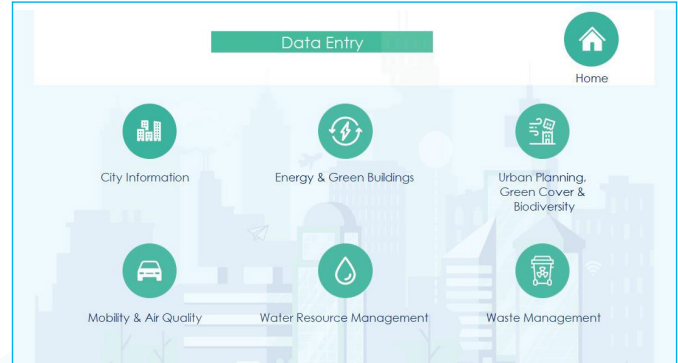
Steps for Using the Tool:

Opening View

When the tool opens, the above Home page is visible.

This page has 8 function buttons. The main function buttons include Data Entry, Emissions and Analysis, Recommendations and Generate Report. Supporting function buttons include About CSC-AF, About the Tool, Notes and Quit.

Data Entry View

The above tab is visible on clicking the Data Entry button on the Home page.

The data entry tab includes parameters already being captured in the framework, along with some additional parameters to estimate emissions. In case cities do not have information for certain parameters, they must enter '0'.

City Information

Click on the 'City Information' button and enter appropriate information as indicated by the tool. All input fields in this tab are mandatory

City Name lists all the 100 Smart Cities across India, and the 'State' & 'Climatic Zone' fields are auto populated once the 'City Name' is selected. Map of the City must also to be uploaded in .jpg format.

Energy and Green Buildings

Click on the 'Energy and Green Buildings' button to enter data related to energy consumption in the city, which includes electricity and fuel consumption.

The tool estimates emissions for Indicators 1, 2, 3, 4, & 6 under the Energy & Green Buildings sector. Data must be entered considering the respective units as specified for every input field.

Urban Planning, Green Cover and Biodiversity

The city can classify 'City green cover area' into other subcategories namely, Moderately Dense forests, Open forests, Scrub/Grassland vegetation, Mangrove ecosystem, Wetlands and Agro & Social forestry – Improved or New. Enter the Area of the respective green cover subcategory and the tool will automatically adjust the default area under Urban & Peri - Urban Areascategory.

Click on the help button (?) for detailed definitions of Green Cover area subcategories.

Click on the 'Urban Planning, Green Cover and Biodiversity' button to enter information for the 'Proportion of Green Cover' indicator.

Enter the Total City Green Cover area, which by default gets classified under the 'Urban & Peri - urban areas (including institutional lands)' subcategory. Further Green Cover Area classifications based on the subcategories mentioned in the tool, can be entered for more accurate estimation of carbon sequestered.

Mobility and Air Quality

Click on 'Mobility and Air Quality' button to enter information for the 'Low Carbon Shared Vehicles' indicator. The tool estimates emissions based on the ASIF (Activity, Share, Intensity, Fuel) Framework, which uses Vehicle Kilometers Travelled (VKTs) as activity data to estimate emissions.

Enter VKTs for the following 5 vehicle types – Buses, 4, 3 & 2- wheelers, and ferries, by type of fuel consumed. Fuels highlighted in green are 'low carbon' and are encouraged, and the ones in red are 'high carbon' and are discouraged.

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

In case cities do not have information on VKTs for shared vehicles, the help button (?) mentions different methods to calculate annual VKTs.

💧 Water Resource Management

Click on the 'Water Resource Management' button to enter details related to the Non-Revenue Water, Wastewater Management and Water Supply Management system indicators. The tool estimates emissions for the three indicators by capturing information on electricity consumed for each of the three activities.

Under Indicator 2 - Non-Revenue Water, electricity required to supply 1 kilo liter of water by municipal authorities is assumed to be 2.33 kWh. However, for more accurate estimation of emissions, users can override this by entering city-specific information on electricity consumption for municipal water supply.

Cities should refer to their respective water audit reports to enter data for input parameters under Indicators 5 & 6 - wastewater and water supply management systems.

🗑 Waste Management

Click on the 'Waste Management' button to enter information for city's wasteparameters.

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

For MSW sent to Landfill/Dumpsite, waste composition must be entered in percentage by the user. Total waste composition should add up to 100 percent. This classification is used to estimate degradable organic carbon. Click on the help (?) button for more information on the different types of landfill.

For biological treatment of solid waste, emissions are estimated using default values for 'composting on dry weight basis'. When user enters quantity of waste treated through biological processes, it gets auto populated as composting amount, with dry waste composition as 100 percent. Users can manually overwrite this with city-specific numbers for accurate emission estimation.

For waste incineration, users must enter quantity, type of incineration premises and type of incineration technology.

## Emissions and Analysis View

The above page is visible on clicking the Emissions and Analysis button on the Home page.

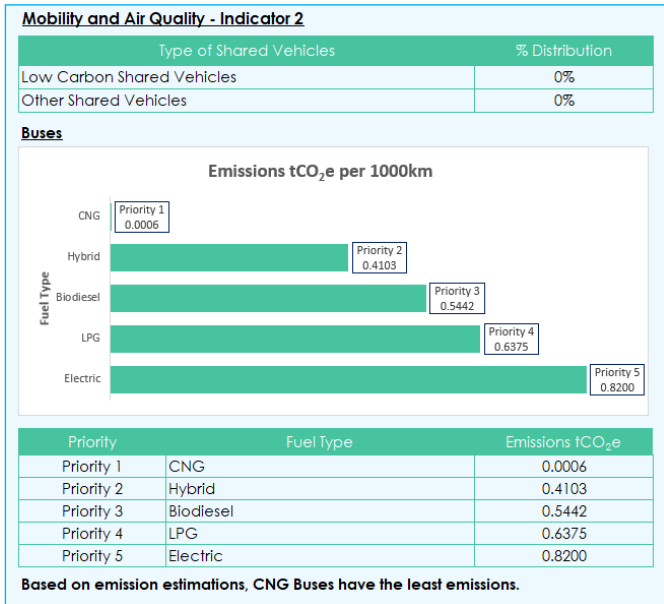Based on information entered in the data entry tabs, the tool estimates emissions. The emissions & analysis tab gives a summary of those emissions under the Overall Emissions tab, and sector-wise emissions under relevant sector specific tabs.

Priority Areas View
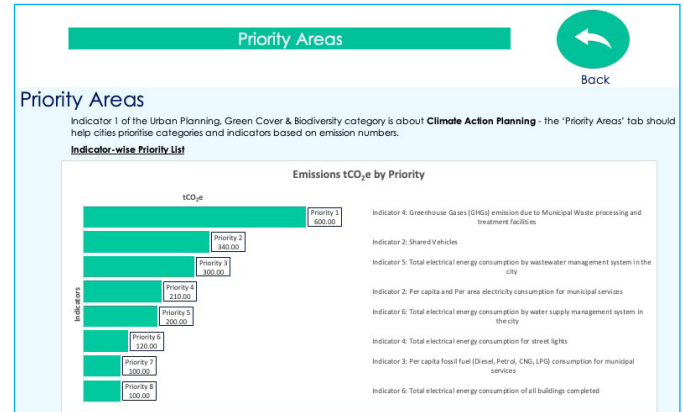
This tab helps prioritize actions based on emissions estimated across all sectors and indicators. It helps cities identify sectors and activities that cities should focus and initiate action on, based on emission numbers.

🎯 Priority Areas View

Mobility and Air Quality - Indicator 2

Type of Shared Vehicles	% Distribution
Low Carbon Shared Vehicles	0%
Other Shared Vehicles	0%

Buses

Emissions tCO_2e per 1000km

Fuel Type		
CNG	Priority 1	0.0006
Hybrid	Priority 2	0.4103
Biodiesel	Priority 3	0.5442
LPG	Priority 4	0.6375
Electric	Priority 5	0.8200

Priority	Fuel Type	Emissions tCO_2e
Priority 1	CNG	0.0006
Priority 2	Hybrid	0.4103
Priority 3	Biodiesel	0.5442
Priority 4	LPG	0.6375
Priority 5	Electric	0.8200

Based on emission estimations, CNG Buses have the least emissions.

Under the Low Carbon Shared Vehicles indicator, the prioritization for the 5 different vehicle categories is done based on emission estimations per 1000 km by fuel type. 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.

🧑 Recommendations View
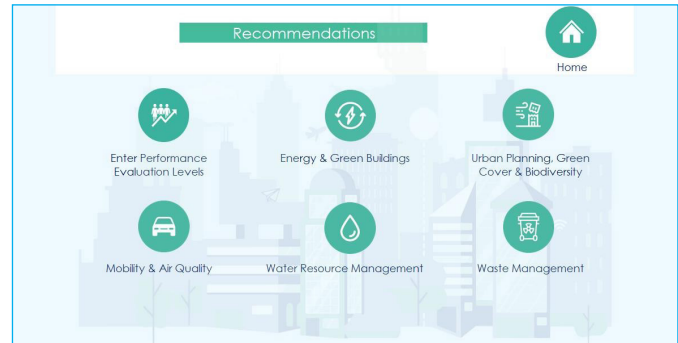
The above page is visible on clicking the Recommendations button on the Home page.

The Recommendations are designed in line with indicator-specific performance evaluation levels mentioned in the Climate Smart Cities Assessment Framework.

🧑 Recommendations View

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 selected by cities, the tool will estimate emission reduction potential for indicators being captured in the tool, and overall recommendations for all indicators based on the framework.

The above page is a view of the performance evaluation level tab. Current and Desired Performance Level buttons help users 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 sectoral tab and select appropriate performance levels between 1 to 5.

Recommendations View

Current Level is based on city's current performance in the assessment framework and Desired 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 indicatorlevel.

Once the user enters performance evaluation levels for all indicators, Recommendations are generated based on the

inputs provided by the user for current and desired levels. The Recommendations Report shows details for 3 levels – Current Level, Recommended Level, which is auto defined as the level after the current level and Desired Level.

📄 Generate Report

Generate Report button on the Home page creates a consolidated PDF report which includes:

• Methodology

• Data

• Emissions and Analysis,and

• Recommendations

User should ensure all parameters have been filled before clicking on the Generate Report button. Clicking the button creates a PDF file named "CSC-SAT Report Extract" at the same location where this tool .xls file is stored. Upon successful generation of the report, a message will be displayed.

Message: PDF File has been created successfully

✏️ Notes

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

Limitations of CSC-SA 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 a 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.