Terms of Reference

Development of a GHG Foot-printing Mobile app

1. Background

India's Nationally Determined Contribution (NDC) sets targets for 2030 to lower the Green House Gases (GHG) emissions intensity of GDP by between 33%–35% below 2005 levels. While the per capita emissions of many developed countries vary between 7 to15 metric tonnes, the per capita emissions in India were only about 1.56 metric tonnes in 2010. This is because Indians believe in nature friendly lifestyle and practices rather than its exploitation. There is a need to further create awareness regarding the GHG footprint of individuals, inform them about options for reducing GHG emissions, engage them to reduce emissions and potentially quantify and reward the citizens for their emission reduction contributions. In addition providing users with interesting information on climate change, initiatives of the government on climate change and best practices to reduce greenhouse gas emissions is also required through digital platforms. Therefore, Ministry of Environment, Forests and Climate Change (MoEFCC) in partnership with GIZ-India would like to develop a smart phone (Android and iOS) based application that is intended to target all age groups to create awareness and motivate users to contribute their share towards environment by knowing their carbon footprints and adopt ways to minimise them in their daily lives.

Global Carbon Markets project of GIZ India has the objective that public and private decision-makers have the necessary knowledge and skills to use existing and new carbon market instruments for the implementation of their national climate change mitigation actions. The project entitled "Supporting the Institutionalization of Capacities on Climate Change Studies and Actions (I-CCC) has been designed to support M//oEFCC, GoI in developing appropriate capacity building structures for climate change studies and action specifically in climate research and thereby support efficient knowledge management. The project will foster capacity development measures, establish networks with national and international research institutions and support the launch of a public climate information platform.
The project aims to deal with Government of India's priorities on climate change in developing an NDC implementation roadmap, conduct studies on sectoral best practices on both mitigation and adaptation and establishment of a climate competence centre. Complementary strengths of these projects will be used in the development of the App.

2. Assignment Objective

Determining GHG footprint and creating awareness regarding options for reducing the GHG footprint can serve as a step towards helping the country meet its target under Paris Agreement to reduce its greenhouse gas emissions by 33 to 35 percentage of the 2005 level by 2030. The App can also potentially serve as an initial step for development of market approaches that could be voluntary in nature.

The application will aim to engage individuals to know their carbon footprints and adopt ways to minimise them in their daily lives along with providing users with interesting information on climate

change, initiatives of the government on climate change and best practices to reduce greenhouse gas emissions.

The objective is to:

1. Develop a mobile application to determine GHG footprint and create awareness regarding options for reducing the GHG footprint
2. Ensuring continued engagement of the public with the App, maintain the app and align it to the existing government apps like MyGov

3. Explanation of the concept and the proposed processes to be included

a) On Boarding Process: This should involve registration of the users through their login credentials of My Gov/ Gmail/ Facebook or through a signup mechanism. After logging in the user will be asked to fill in a questionnaire consisting of questions related to the day-to-day activities of the user. The questionnaire will be divided under three categories namely, basic details, day-to-day activities and additional activities. Basic details would contain questions like occupation, gender, location, number of people in the household etc. Day-to-day activities will contain inputs on electricity consumption of the user per month (kWh), LPG consumption of the user per month (number of cylinders), fuel consumption of the user per month-petrol/diesel (litres), water consumption of the user per month (litres) and waste generation per month (kilogram). Additional activities would contain questions like frequency of travel by flight, usage of elevators, spending on goods and services, usage of paper etc.

Based on the inputs of the user, his/her carbon footprint for an entire year can be calculated. Standard formulas are available for the calculations. The inputs obtained from the user have to be applied in these formulas. Here, it is important to note that the inputs got from the users are in terms of monthly consumption. Hence, a conversion from months to year has to be done before the calculation of footprint for a year. The unit of carbon footprint will be - $kgCO_2$ equivalent. The idea here is that, any day-to-day activity of the user can be converted in terms of electricity consumption/fuel consumption/water consumption/waste generation. Hence the carbon footprint of the user for any activity can be calculated.

b) Calculation of Carbon Footprint: The user will be given a provision to add this activity to his carbon footprint which was earlier calculated through the questionnaire. The idea of calculation of carbon footprints for individual activities is to make the users aware that even the smallest of activities that he does has a considerable impact on the environment.

c) Carbon Emission Reductions: The app should have a feature to report carbon emission reduction where users will be able to input their contributions towards reducing GHG emissions. For example, if the user uses his cycle instead of a car for travelling 5 kms, then the fuel saved for travelling the 5 kms will be his carbon emission reduction. There will be a list of activities (in a drop down list) from which the user can choose his contribution. Sample list is mentioned below.

- ✓ Electricity - Here users will be asked to enter the units of electricity saved or number of hours of usage of the appliance; Switch to LED lamps; Use a table lamp while studying; Come out and play instead of using electronic gadgets; Switch from a desktop to a laptop; Turn off lights and fans when not in use; Use a BEE 5 Star rated fan; Use a BEE 5 Star rated frost free refrigerator; Use a BEE 5 Star rated split air-conditioner; Install solar water heater; Bathe in quick succession and switch off the geyser; Reduce the temperature setting on the geyser

from 60°C to 40°C; Eat together-heat food at one go; Use a cold cycle in the washing machine; Switch off appliances at the plug point etc.

- ✓ Trees and paper - Here users will be asked to enter the number of papers saved. use paper only when required; request for e-statements; do not use fresh paper for rough work; use and pass on textbooks; plant trees.
- ✓ Transportation - Here users will be asked to enter the number of kilometres travelled or litres of fuel saved. Carpool to work; Take a bus to school/work; Take a Metro to work; Walk for short distances; Switch off ignition at the traffic Red lights; Regularly inflate vehicle tyres
- ✓ In kitchens - Here users will be asked to enter the quantity of gas saved or kilograms of waste reduced. Use pressure cookers daily; Reduce gas usage by 20 minutes a day; Compost your kitchen waste at home
- ✓ Water - Here users will be asked to enter the number of litres saved. Conserve water - hundred litres per household per day; Fix leaky taps/showers/flush; Close the tap while brushing teeth; Wash only full loads in the washing machine; Change old flush cisterns to water efficient cisterns; Use recycled water for watering plants; Use a bucket and clothes to wash vehicles, instead of hosepipe; Harvest rainwater

The calculation of savings for GHG emission reduction activities is available in the publication named "Low Carbon Lifestyles" prepared by the CEE (Centre for environment education) and in scientific and technical publications. The user will be able to know his savings both in terms of carbon equivalents as well as monetary equivalents. For example, by bathing in quick succession, the user will be able to reduce his annual carbon emission by 344 kg. At the same time, the cut in the electricity bill for a year will be INR 1676. By expressing in terms of money, the motivation for the user to do a particular activity will be even more.

History of all the activities of the user will be maintained. Options will be given to the user for repeating activities or deleting activities. Once a threshold of savings is achieved by the user, some form of incentives can be designed. This can be in the form of the following, e-certificate of appreciation from the ministry; recognition in the social media. This needs to be discussed in detail with MoEFCC and agreed upon.

d) Take an Oath feature: In this feature, the user can take an oath to do an environment friendly activity. For example, taking a public transport system to work. The app will ask the user to set a reminder for the activity. The reminder can be every day/ weekdays /weekends/every Monday or even a specific date and time. On that specific date and time, the app will be sending reminder notifications to the user motivating him/her to complete the activity. The same list of activities that were used for the previous feature - "carbon emission reduction" can be used here.

Provision for the user to invite friends or challenge friends to join him/her in the activity will be given. This feature will facilitate group participation and thereby promote community mobilisation. The email ID or username can be used for inviting friends. This feature can also be used by the government for mass campaign. For example, the World Environment Day is coming up and the government plans for a tree plantation campaign throughout the country. Then, the ministry can create an activity through the app, set a deadline and push it to the users. The app will send a reminder notifications accordingly and motivate the users to

complete the activity. Hence, a pro-environment mass campaign every two or three months on different themes can be taken up by the government.

After the deadline, the user will be asked whether he has completed the activity or not. The user can reply with yes or no. The reply of the user will be saved by the app. If the user has completed the activity, it will be pushed to the history. If the user has not completed the activity, then an option to set a different reminder or to delete the activity will be given to the user. The user will be able to view the history of all the activities that he has completed/ yet to complete. An option will be given here to repeat an activity or delete an activity. The user will also be able to view the list of friends whom he has invited/challenged. The reduction in carbon emission of the user achieved by taking the oath will also be added to his savings-both in carbon equivalent and monetary equivalent.

e) **Did you know section:** This feature is a knowledge sharing page on interesting facts on climate change, the various initiatives taken by the government on climate change, the achievements of the government and the best practices in various fields for reduction of greenhouse gas emission. In addition, the existing information with the ministry can be shared to the users. For example, the science express train has eight coaches of information on climate change; "Parampara: India's culture of climate friendly sustainable practices"-a book prepared for the cop 21 has good collection of traditional practices; contributions by companies reducing their GHG emissions. List of 1200 such facts will be prepared. Every month the app will be displaying 100 facts. An entirely new set of 100 information can be displayed in the following month. The idea here is to keep the app updated thereby ensuring that the users get new information every time they open the app.

f) **Achievements and Engagement Page:** It is a summary of all the savings of the user as well as his carbon footprints. Here a provision for the user to enter any other contribution of his towards the environment will be given. One of the intention of the government is to create a record of all the good deeds of its citizens which it can later be consolidated, published and shared globally.

In order to ensure continuous usage of the app and retention of users, the idea of gamification of the app is being thought of. The app will be having the following, Levels; Gaming points for filling of the questionnaire, every activity taken up by the user, savings of the user, sharing achievements on social media, referring the app to friends etc; Badges and awards for achievements and leader board. Gamification of the app will create a competition among its users. This in itself will motivate users to set targets and accomplish them.

g) **Advance Features and Option for Linking with MyGov:** MyGov platform can be used for the development of the mobile application or can be linked to the GHG footprint app as an associated application. MyGov itself has a registered user base of over 49 lakh users. Hence it can be used for marketing and outreach activities of the app. The mobile application will be targeting all individuals having access to smartphones. Out of this, to begin with, let us assume that only 50 lakh users (which is the user base of My Gov) start using the app. This itself will lead to a minimum savings of 160 crore kg of CO2e or 160,000 tCO_2e emission reduction per year, based on a conservative estimate. The app will be able to create an environmental friendly community which will adopt a carbon neutral lifestyle. This will create a market for clean technologies and environmental friendly products among people.

4. Scope of the Assignment

The execution will have a two phased approach as phase 1 covering work package I and phase 2 covering work package II and work package III.

Phase I

Work package I – **Ideation and Design Module** (this will be an iterative process in consultation with MoEFCC officials)

The qualified consultant or app development company is therefore expected to do the following but is not limited to:

1. Ideate and design (in terms of SRS –Software Requirements Specification) of the multi-platform (android, ios) mobile application for calculating carbon footprint of individuals based on monthly or yearly data and for engaging them in activities for reducing their carbon footprint.
2. Carry out needs assessment (goal analysis) and competitive analysis of similar apps; will it be Database/API app; multi-feature app, etc. and identifying associated costs
3. Conduct background scoping and research work on at-least 5-6 Apps of similar nature and present their salient features and innovations as part of Inception Report
4. Stakeholder/Target audience analysis and their requirements, identifying platform preference, defining user profiles, audience pay for the app, want a free app, or expect it to be bundled into an existing service, etc.
5. User and System requirements - defining fields, features, functionality for the app including but not limited to taking an oath, gamification, inviting or challenging friends and creating awareness regarding reducing GHG emissions and develop the success criteria
6. Identify linkages to the existing web-based platforms of Government of India, such as the MyGov app and other environment related apps of government of India.
7. Develop a detailed SRS document including technical and economic feasibility of the proposed App development highlighting key milestones and time scale

Phase II

Work package II: **App Development Stage – iterative process**

This work package will be based on the work carried out in Work Package I and will entail the following but is not limited to:

1. Defining the registration of users through their login credentials of MyGov/ Gmail/ Facebook or through a signup mechanism.
2. Developing prototype screens permitting user interaction feedback – hardware considerations, account screen functionality, content layout, behaviour, and priority
3. Design or adjustments of data base, application architecture
4. Develops the module design for data collection for different activities that need to be entered for carbon footprint calculation

5. Generating Code in terms of API Usage, App store optimization, interoperability
6. Design report generating formats that can be downloaded for reporting
7. Data and App security issues clearly defined and adhered to
8. Option should be provided to calculate emission reductions of the users.
9. A Content Management System should be provided to enable MoEFCC staff to upload, update and tag new content like announcements, changes in emission factors, and addition of new recommendations for reducing GHG footprint.
10. Features such as notification system, specification for target devices and localization (Geo tagging) should be provided.
11. The mobile platform should enable practitioners to collaborate and gather knowledge.
12. The applications interface will be designed for English and Hindi but possibility of being expanded to other languages.

Work Package III: User testing, Launch, Promotion and Maintenance

This work package will be based on the work carried out in WP I and WP II and will entail the following but not limited to:

1. Issues (or the user experience) arising from the testing phase to iron out design or coding problems
2. Launching of the App by MoEFCC
3. Development of a user manual of the App and associated features
4. Conduct training of the officials (GIZ and MoEFCC) involved in managing the components of the App
5. Developing and proposing strategies for sustainability and increased engagement of the App users
6. Maintenance of the App for 1 year from the date of the launch of the App

The above-mentioned features are not exhaustive and additional features to improve adoption of the app could be proposed during the course of the project.

5. Deliverables

The deliverables shall include the following:

1. SRS document
2. A fully working app, easy to use, with clear navigation available for both Android and IOS platforms.
3. A fully working database, with user friendly GUI and a dashboard able to provide clear data analysis and reports.
4. All software codes for the app, database and website in a softcopy format.
5. A deck of slides on the App and database
6. A training manual for the app, database and website management.
7. Ongoing promotion and maintenance for the app, website and database. (At least for one year)

6. Timeline

Duration: 230 days spread over 18 months (5-6 months for designing, development and launching the App and the remaining 12 months for promotion, maintenance and other issues) from April 25, 2018 until October 24, 2019.

The assignment is expected to start by the end of April 2018. Consultants are requested to propose a work plan with duration of 18 months. It should lay out the expected timing of deliverables and other milestones, as per these terms of reference (an indicative timeline is proposed below).

Deliverables with timeline and format of delivery

S. No.	Task	Deliverable	Timeline	Indicative Number of person days
a.	Work Package 1 3 Weeks Stakeholder workshop with MoEFCC, GIZ and others to finalize design, data sourcing, gamification options, present pro and cons for development options: native, hybrid, web-app), options data sources, API, and design requirements. (Organizing the workshop with finalization of SRS -1 Week)	SRS Report Dummy app	1 Month	20-person days
b.	Work Package II Development of the mobile application as agreed with MoEFCC and GIZ considering the description provided and comments during the stakeholder consultation. Develop a database complimented with a user friendly dashboard that will be used to collect, store, and real time analysis of the data from the app as per above and various sources. The database shall allow viewing,	Mobile app (Android and iOS) Database with dashboard All software codes for the app, database and website in a softcopy format. A training manual for the app, database and website. Work report (Weekly progress reports and meetings if required)	5 Months	150-person days

	storing and printing reports. (In parallel to app development)			
4.	Work Package III Launch of the app, promotion activities and support in linking with MyGov and other apps of the Government of India. App to be hosted at NIC or server as agreed by MoEFCC. Maintenance of the app and technical support	GHG Footprint app launched linked to Mygov and hosting at NIC or server as agreed by MoEFCC Maintain app and ensuring availability at all times. Provide support to the GIZ and MoEFCC staff for changes in information, minor tweaking in features	12 Months	60-person days

7. Required qualification/ experience of the consulting agency

a. Agency should have following administrative and financial requirement in conducting the assignment:

- Average annual turnover for the last three financial years should be at least 80,000 Euro
- Number of employees as at 31.12.2017 should be at least 10 persons
- Agency must have handled at least 2 projects on Development of mobile application, MIS, websites in India in the last three years (with a minimum commission value of Euro 30,000)

b. Agency should have following experience in conducting the assignment:

- Technical experience (Development of SRS, Mobile application, working with government of India Apps)
- Substantial knowledge and experience in developing Mobile Applications (app/website development experience related to environmental issues will have an added value), maintaining mobile apps post development, promoting the use of mobile application
- Professionally qualified with experience (at least 5 years) on developing mobile application, database design in at least three different projects/Apps; monitoring and increased public engagement related app development.
- Professionally qualified on designing and facilitating, ironing out issues (or the user experience)/coding problems arising from the testing phase, experience in dealing with the Government of India apps like MyGov, etc.
- Prior experience of working with Central and State Level Government departments on developing mobile applications/websites would be preferred. Demonstrable experience of engagement on environmental apps will be preferred

8. Team Profile

For carrying out this consultancy, a firm, with expertise in creating, developing and maintaining mobile application for similar projects or database during the last 5 years, is required.
The team of consultants shall comprise at least the following:

1. **Team Leader**: A professional/Post Graduate in Information Technology with exposure to multimedia applications shouldering the overall responsibility of the project. 10 years of relevant experience.
2. **Software engineer**: A systems' graduate professional with experience exceeding 5 years in similar programs.
3. **Designer team (a team of two at least)**: A systems' graduate professional with experience exceeding 5 years, who has worked or participated in database design in at least three different projects/Apps. He/She should have extensive experience on app's navigation mechanics and creation basic wireframes
4. **Software Architect**: A systems' graduate professional with experience exceeding 3 years, who has worked or participated in the system architecture design and development in at least three similar projects/Apps.
5. **Programmers**: A group of 2 professionals will make adjustments to the source program to the degree the design and program implementation progress requires.