



**Carbon Emission Factors Database License, Carbon ERP Integration
and Carbon Footprinting of Royal Orange County Project for
Orange County Foundation**



July 2014

Introduction

The Orange County Foundation is a group of individuals who have experience in eco-friendly architecture and civil construction, and focus on sustainable urban development. The foundation has developed a self-sufficient green housing project at Pashan, Pune, the first of its kind, and is developing another green housing project 'Royal Orange County' at Rahatani Pune.

The Royal Orange County (ROC) Project involves eight multistoried buildings, consisting a total of 353 residential flats. The ROC has adopted a number of sustainable and environment-friendly options such as eco-friendly architectural design buildings, renewable energy, waste management, wastewater management and low-carbon embodied construction and building materials.

Project Objective

- A. Internal capacity building and skill development for the Orange County Foundation team to calculate the carbon footprint of their construction projects.
- B. License of authenticated database for India specific emission factors related to construction and building materials, electricity & energy, mobility, AFLOU, waste, and wastewater to map environmental performance and sustainability impact of Orange County Foundation's projects.
- C. Life-cycle process mapping of the ROC construction to develop a toolkit for carbon ERP integration into their system.
- D. Carbon Footprinting of the design and construction phase of the ROC project.

cBalance's Role

- A. **Annual Enterprise-Use License for cBalance Carbon Emission Factor Database (CEFD)** – cBalance authorized yearly subscription of the CEFD tool to the Orange County Foundation to map the carbon footprint of projects using India-specific emission factors of construction & building materials, energy, mobility, AFLOU, waste and wastewater.
- B. **Training to Orange County Foundation Team for Assessment of Carbon Footprint** – cBalance team provided 16 hours extensive training to the Orange County Foundation team on the topic of carbon footprinting, life-cycle of a construction project and introduction to common carbon metrics for building operations. In addition, cBalance provided training on the CEFD tool and instructed how the CEFD can be helpful to choose sustainable and low-carbon activity or material alternatives.
- C. **Life-cycle Process Mapping and Toolkit Development for Carbon Footprint** – The cBalance team visited the construction site and project office of the ROC. Through a site audit and interviews with project officers, cBalance mapped the activities related to the design and construction phase of the ROC. Thereafter, cBalance developed a toolkit, that integrated into their existing system, for mapping the life-cycle carbon footprint of the ROC and future projects.

- D. **Carbon Footprinting of Royal Orange County Residential Housing Project** – The cBalance team collected data from the ROC on deforestation, electricity, fuels, and construction & building materials consumption of the construction phase of the ROC and calculated the construction phase carbon footprint using India-specific GHG emission factors. Finally, the cBalance team presented the carbon footprint analysis to the board of the Orange County Foundation.

Results

- A. Subscription to the CEFD and in-person training empowered Orange County Foundation team:
- to calculate the carbon footprint of their projects using India-specific GHG emission factors
 - to assess life-cycle environmental performance and sustainable impact of their projects
 - to choose sustainable alternatives over conventional construction and building material
 - to compare environmental performances of two different construction projects
 - to create a baseline and frame future strategies to reduce the carbon footprint
- B. The Orange County Foundation team calculated the carbon footprint of the ROC construction phase and successfully achieved a 15% reduction in GHG emissions compared with previous projects.



