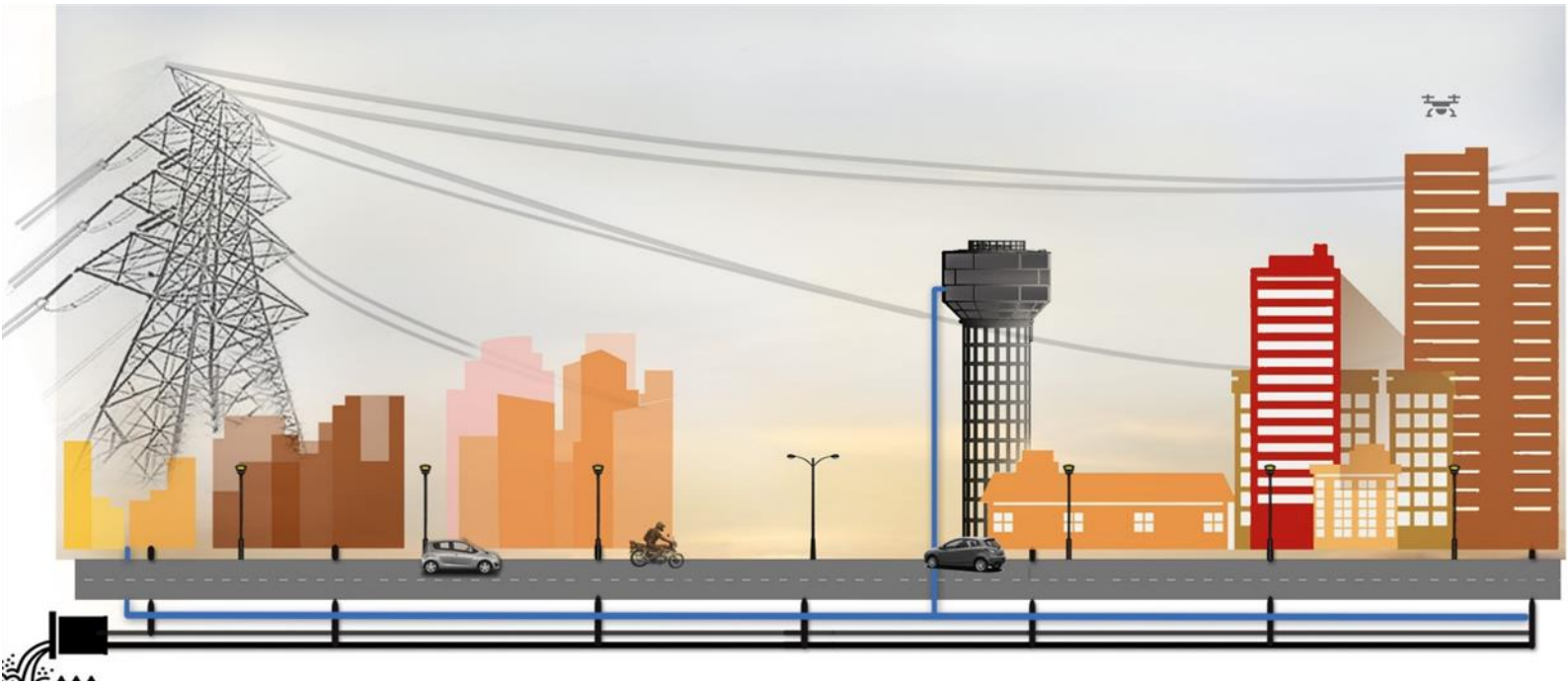

India-UK Joint

Integrated Urban Model for Built Environment Energy Research

(iNUMBER)

Executive Summary:
Incorporating Municipal Energy Services into the City Energy Model and Developing a Water-Energy Nexus

January 2019

Vidyadhar Phatak (Principal Investigator)

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Document No: Work Package 2 /17-21

India-UK Joint Integrated Urban Model for Built Environment Energy Research (iNUMBER)

Work Package 2 (WP2): Incorporate Municipal Energy Services

Executive Summary:
Incorporating Municipal Energy Services into the City Energy Model and Developing a Water-Energy Nexus

January 2019

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iNUMBER (iNtegrated Urban Model for Built Environment Energy Research) is a four-year (2017-2021) research project to help cities reduce their energy demand and improve their municipal services. This goal is led by CEPT University, Ahmedabad and supported in India by Indian Institute of Technology Bombay, Mumbai. It is led by University College London, London, and supported by the University of Oxford, Oxford.

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Executive Summary:

iNUMBER is an Indo-UK collaborative research project that was co-created to address the Newton research topic: "Integration of information, communication and renewable energy technologies at building, community and city level interventions". The project aims to address this research topic by developing a data-driven Intelligent Urban Model for Built Environment and Energy Research (iNUMBER). The primary focus of this tool is to support the Indian Municipalities to understand the variations in energy demand and thereby assist in providing clean and sustainable energy services to its citizens. iNUMBER being a four-year collaborative research project (2017-2021), Ahmedabad has been selected as the primary case city for the research. Further, the project could be extended by considering other cities as well.

The key objective of the project is to develop a City Energy Model that includes the 3D building stock and the municipal services energy model. The project aims to achieve the same by linking the existing and new data sets and testing the validity of the developed model for a range of scenarios in accordance with different data availabilities. To achieve this overarching objective, the project has been sorted into 3 work packages (WP) as mentioned below,

1. WP1: Create 3D Building Stock Model
2. WP2: Incorporate Municipal Energy Services
3. WP3: Improving Data Granularity

This executive summary provides a brief account of the activities carried out under the WP2: Incorporate Municipal Energy Services. This WP focuses on the activities of stakeholder organizations and institutions with a primary focus on Urban Local Bodies (ULBs). There are two major outcomes under the work package 2. The first outcome is, 'Feeder for City Energy Model'. This includes the integration of the energy data pertaining to the municipal services such as water supply, wastewater management, stormwater management and the lighting in public spaces into the City Energy Model. The second outcome is, 'Developing a framework for capturing energy consumption in delivering the municipal services'. This focusses to develop a Municipal services information system for Ahmedabad city to evaluate the municipal services based on their energy consumptions. Further, the framework will be tested by considering other cities as well.

Under outcome-1, the report provides a brief overview of the municipal services in the context of the Ahmedabad city. Further, the report also demonstrates a work plan for identifying and gathering the energy data pertaining to these above mentioned municipal services for incorporating the same into the City Energy Model.

Under outcome-2, the report comprises the documentation of a literature review of the information systems with respect to municipal services by considering the case studies from India and abroad.

Further, the report also provides details regarding the existing data collection methods followed by Ahmedabad Municipal Corporation and the current usages of the collected data sets in the decision making processes.

The integration of the outcomes from all 3 work packages will assist in understanding the energy demand of the entire city. Through a fourth work package, the activities under iNUMBER will further be integrated with other projects, related research in India, and across the world. Further, this integrated approach will develop new areas of inquiry related to future building stock and municipal services in India.

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