Transport Sector’s Study Plan

ALMEC CORPORATION

Inception Meeting
10/07/2013
1 Introduction of ALMEC

<table>
<thead>
<tr>
<th>Company name</th>
<th>ALMEC CORPORATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>October, 1971</td>
</tr>
<tr>
<td>Head office</td>
<td>5-5-3, Shinjuku-ku</td>
</tr>
<tr>
<td></td>
<td>Tokyo 160-0022</td>
</tr>
<tr>
<td>Branch office</td>
<td>Indonesia, Philippines, Vietnam, Ulaanbaatar</td>
</tr>
<tr>
<td>Organization</td>
<td>Domestic - Urban and Transport planning, Environment</td>
</tr>
<tr>
<td></td>
<td>Overseas - Urban and Transport planning, Environment</td>
</tr>
<tr>
<td></td>
<td>Public Policy</td>
</tr>
</tbody>
</table>

Jakarta, Indonesia office
Project Experiences of ALMEC

JCM/BOCM

- Improvement of Fuel Efficiency for Taxies in Vietnam (2012, GEC)
- Improvement of passenger transport efficiency with urban MRT network development in Thailand (2012, GEC)
- Basic Data Collection Study on Low-Emission Public Transport System in Lao PDR (2011-2012, JICA)

In Indonesia

- The Study on Formulation of Spatial Planning for GERBANGKERTOSUSILA (GKS) Zone in East Java Province in the Republic of Indonesia (2008-2010, JICA)
- Master Plan Study for Establishing Metropolitan Priority Area for Investment and Industry (MPA) in JABODETABEK Area (2011, JICA)
- Project for the Study on JABODETABEK Public Transportation Policy Implementation Strategy (2010-2012, JICA)
2 Scope of Works in the Transportation Sector

(1) Background and Objectives

Background

- Surabaya City is active for environmental improvement.
- Although the Indonesia government aims to introduce a low carbon urban transport system, there are only mid- and long-term measures and few short-term projects.

Objectives

- To identify short-term projects to reduce CO₂ emissions in transport sector in Surabaya City.
- To carry out FS on the above-identified project for calculation of GHG reduction, MRV development and PDD preparation.

<table>
<thead>
<tr>
<th>Year</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>Identification of potential projects</td>
</tr>
<tr>
<td></td>
<td>Carry out FS (GHG, MRV, PDD)</td>
</tr>
<tr>
<td>2014</td>
<td>Implementation of Feasible Projects</td>
</tr>
</tbody>
</table>
(2) Survey Activity

Potential environmental improvement and CO₂ emission reduction projects include [Introduction of low carbon vehicles] and [Improvement of operation efficiency].

Target vehicles
- Route Bus
- City taxi
- Intra-city public transport (angkot)
- Garbage collector

Applicable Technologies
- Introduction of low carbon vehicles
- Improvement of operation efficiency
(3) The Study Flow

Collection of operation data
- Method: use of GPS devices
- Target: 40 vehicles (4 types x 10 vehicles)
- Output: route, travel speed, time

Examination of operational situation
- Method: interview
- Target: 4 operators
- Output: Operation cost, Management organization

Evaluation: Implementability and economic impact of the potential emissions reduction projects in the transportation sector

Selection: Identification of target vehicles with applicable technology (identify one project for FS)

FS: Carry out FS on the above-selected project
(4) GPS devices (with communication function)

To install GPS devices to the target vehicles and collect traffic data for one week. (When the GPS devices are already installed, we will utilize them.)

To collect data through GPS devices
- Positioning information
- Time
- Speed

To analyze the collected data to identify the following:
- any inefficient operational route
- any traffic congestion on the operational route

85mm × 55mm × 29mm
500 g
### 3 Estimation of CO₂ Reductions

(1) CO₂ Reduction through Low-carbon Public Transport Vehicles (Example)

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Bus-CNG</th>
<th>Taxi-HV</th>
<th>Angkot-EV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Distance</td>
<td>km</td>
<td>60,000</td>
<td>58,400</td>
<td>60,000</td>
</tr>
<tr>
<td>Fuel Efficiency</td>
<td>km/L</td>
<td>4.1</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Emission Factor</td>
<td>kgCO₂/L</td>
<td>2.6</td>
<td>2.32</td>
<td>2.32</td>
</tr>
<tr>
<td>Number or Vehicles</td>
<td>vehicles</td>
<td>5,000</td>
<td>1,460</td>
<td>1,000</td>
</tr>
<tr>
<td>Reference Emissions</td>
<td>tCO₂/year</td>
<td>190,244</td>
<td>15,216</td>
<td>17,400</td>
</tr>
<tr>
<td>Reduction rate</td>
<td>%</td>
<td>7.9%</td>
<td>30%</td>
<td>39%</td>
</tr>
<tr>
<td>Project Emissions</td>
<td>tCO₂/year</td>
<td>175,196</td>
<td>10,651</td>
<td>10,692</td>
</tr>
<tr>
<td>Emission Reductions</td>
<td>tCO₂/year</td>
<td>15,048</td>
<td>4,565</td>
<td>6,708</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26,321</td>
</tr>
</tbody>
</table>

- **Low-carbon vehicles will be selected with the stakeholders (responsible city authorities and operators).**
(2) CO₂ reduction through operational efficiency improvement & low carbon garbage collectors (Example)

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>transport efficiency improvement</th>
<th>CNG</th>
<th>Composite activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Distance</td>
<td>km</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Fuel Efficiency</td>
<td>km/L</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>Emission Factor</td>
<td>kgCO₂/L</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Number or Vehicles</td>
<td>vehicles</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>Annual operation days</td>
<td>day/Year</td>
<td>312</td>
<td>312</td>
<td>312</td>
</tr>
<tr>
<td>Reference Emissions</td>
<td>tCO₂/year</td>
<td>3,957</td>
<td>3,957</td>
<td>3,957</td>
</tr>
<tr>
<td>Reduction rate</td>
<td>%</td>
<td>67%</td>
<td>7.9%</td>
<td>69.6%</td>
</tr>
<tr>
<td>Project Emissions</td>
<td>tCO₂/year</td>
<td>1,306</td>
<td>3,644</td>
<td>1,203</td>
</tr>
<tr>
<td>Emission Reductions</td>
<td>tCO₂/year</td>
<td>2,651</td>
<td>313</td>
<td>2,755</td>
</tr>
</tbody>
</table>
## 4 Study Schedule

<table>
<thead>
<tr>
<th>Item</th>
<th>Survey content</th>
</tr>
</thead>
</table>
| 1st Field survey (7/8–7/12)        | ■ 1st Project Meeting (Inception Meeting)  
                                 | ■ request for GPS devices installation                                       |
| GPS Installation and Collection/   | ■ GPS devices installation (19–22 August)  
                                 | ■ GPS devices collection (27–30 August)                                       |
| Office Work (in Japan)              |                                                                             |
| 2nd Field survey (9/2–9/6)         | ■ 2nd Project Meeting  
                                 | ■ interview for 4 operators (Possible vehicle investment and operational improvement measures) |
| 3rd Field survey (11/18–11/22)     | ■ 3rd Project Meeting (Interim Meeting)  
                                 | ■ Additional data collection for FS                                           |
| Office Work                         | ■ FS on the selected projects for JCM (Quantification of GHG reduction, MRV methodology) |
| 4th Field survey (1/27–1/31)       | ■ 4th Project Meeting (Project Finding Seminar)  
                                 | ■ Report of the Study Result                                                  |
5 Project Organization

Japan

Institute for Global Environmental Strategies (IGES) (Overall Management)

ALMEC Corporation (Transport Sector)

Local Coordination: ALMEC Indonesia office

Traffic Data Analysis: Japan Automobile Research Institute (JARI)

Indonesia

Surabaya BAPPEKO

Cooperation

BUS: Kota Dinas Perhubungan
TAXI: Blue Bird Taxi
ANGKOT: Kota Dinas Perhubungan
Garbage collector: Kota Dinas Kebersihan dan Pertamanan

GPS Installation and Recovery: TOYOTA TSUSHO ELECTRONICS Thailand (TTET)