Enhancing Stakeholders Matchmaking to Promote Low Carbon Technology Transfer

-Findings from “On the ground” Projects-

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Background: Technology Transfer: Still a hot topics and urgent issue

Discussion about TT has been carried since early 90s, but it is still considered a hot topic and urgent issue to be tackled.

There is still no consensus on what to do?, how to do it?, and who can play what role?
Background: Numerous schemes are available, but fragmented and uncoordinated
Joint Crediting Mechanism (JCM): Promising scheme to promote LCTT

- Facilitating diffusion of leading low carbon technologies, products, systems, services, and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries.
- Appropriately evaluating contributions from Japan to GHG emission reductions or removals in a quantitative manner, by applying measurement, reporting and verification (MRV) methodologies, and use them to achieve Japan’s emission reduction target.
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals, complementing the CDM.
Scheme of the JCM

Japan

Government
- Issuance of credits
- Reports issuance of credits
- Request registration of projects
- Submit PDD/monitoring report
- Inform results of validation/verification

Project Participants
- Implementation & monitoring of projects

Third party entities
- Validation of projects
- Verification of amount of GHG emission reductions or removals

Joint Committee (Secretariat)
- Development/revision of the rules, guidelines and methodologies
- Registration of projects
- Discusses the implementation of JCM

Conduct policy consultations

Host Country

Government
- Notifies registration of projects
- Request registration of projects
- Submit PDD/monitoring report
- Inform results of validation/verification
- Request issuance of credits

Project Participants
- Implementation & monitoring of projects

Third party entities
- Validation of projects
- Verification of amount of GHG emission reductions or removals

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Japan has held consultations for the JCM with developing countries since 2011 and has established the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Vietnam, Lao PDR, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia and Chile.

- **Mongolia**: Jan. 8, 2013 (Ulaanbaatar)
- **Bangladesh**: Mar. 19, 2013 (Dhaka)
- **Ethiopia**: May 27, 2013 (Addis Ababa)
- **Kenya**: Jun. 12, 2013 (Nairobi)
- **Maldives**: Jun. 29, 2013 (Okinawa)
- **Viet Nam**: Jul. 2, 2013 (Hanoi)
- **Lao PDR**: Aug. 7, 2013 (Vientiane)
- **Indonesia**: Aug. 26, 2013 (Jakarta)
- **Costa Rica**: Dec. 9, 2013 (Tokyo)
- **Palau**: Jan. 13, 2014 (Ngerulmud)
- **Cambodia**: Apr. 11, 2014 (Phnom Penh)
- **Mexico**: Jul. 25, 2014 (Mexico City)

- **Saudi Arabia**: May 13, 2015
- **Chile**: May 26, 2015 (Santiago)

3 JCM projects have been registered between Indonesia and Japan, 2 JCM projects have been registered between Mongolia and Japan, and 1 JCM project has been registered between Palau and Japan.
JCM: Model projects are on the ground

Thailand:
- Energy Saving at Convenience Stores with High Efficiency Air-Conditioning and Refrigerated Showcase
- Introduction of Solar PV System on Factory Rooftop
- Reducing GHG Emission at Textile Factory by Upgrading to Air-saving Loom (Samutprakarn)
- Energy Saving for Semiconductor Factory with High Efficiency Centrifugal Chiller and Compressor

Bangladesh:
- Energy Saving for Air Conditioning & Facility Cooling by High Efficiency Centrifugal Chiller (Suburbs of Dhaka)
- Installation of High Efficiency Loom at Weaving Factory
- Introduction of PV-diesel Hybrid System at Fastening Manufacturing Plant

Myanmar:
- Introduction of Waste to Energy Plant in Yangon City

Kenya:
- Solar Diesel Abatement Projects

Maldives:
- Solar Power on Rooftop of School Building Project
- Smart Micro-Grid System for POISED Project in Addu Atoll

Malaysia:
- PV power generation and relevant monitoring system for the office building
- Model project in FY 2013 (3 countries, 7 projects)
- Model project in FY 2014 (7 countries, 15 projects)
- ADB project in FY 2014 (1 country, 1 project)
- Model project in FY 2015 (7 countries, 18 projects)

Total 12 countries, 41 projects
- The underlined projects have been registered as the JCM projects (6 projects)
- These projects account for 2 registered JCM projects respectively, as they’re operating in different sites
Lessons learnt from on the ground projects

Case study 1: JCM Feasibility study in India (compressed air systems)

- Installation of new receiver and new air compressors (not inverter type)
- Reducing air leakage through installing foot switch
- Reconsider pipe size and design
- Start the use of efficient air gun
- Adjusting pressure setting

Benefits
- Energy Saving: 20% - 30%
Great potential has been identified; but could not be tapped using JCM in India

<table>
<thead>
<tr>
<th>Sites</th>
<th>Proposals for hardware/equipements installation</th>
<th>Estimated Energy saving (kWh/year)</th>
<th>Estimated emission reduction (Ton/year)</th>
<th>Estimated operation cost saving (Million JPY/year)</th>
<th>Initial cost (in Japan market) (1000JPY)</th>
<th>Estimated Pay back period (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mahindra Hinoday Co. Ltd</strong></td>
<td>Install Inverter A.C (NL-0)</td>
<td>308,160</td>
<td>302</td>
<td>3,513,024</td>
<td>7,000</td>
<td>2.0</td>
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<td></td>
<td>Install Inverter A.C (NL-1)</td>
<td>308,160</td>
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<td></td>
<td>Install Inverter A.C (NL-2)</td>
<td>256,543</td>
<td>251</td>
<td>2,924,592</td>
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<td></td>
<td>Install two stages A.C</td>
<td>391,500</td>
<td>384</td>
<td>4,463,100</td>
<td>30,000</td>
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<tr>
<td></td>
<td>Install Booster</td>
<td>108,864</td>
<td>106</td>
<td>1,241,050</td>
<td>3,000</td>
<td>2.4</td>
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<tr>
<td><strong>Ahmednagar Forging Co. Ltd.</strong></td>
<td>Install Inverter A.C</td>
<td>350,000</td>
<td>343</td>
<td>3,990,000</td>
<td>10,000</td>
<td>2.5</td>
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<tr>
<td></td>
<td>Install 2 stage A.C</td>
<td>130,500</td>
<td>128</td>
<td>1,487,700</td>
<td>10,000</td>
<td>6.7</td>
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<td><strong>Bombay Dyeing Co. Ltd.</strong></td>
<td>Install Inverter A.C</td>
<td>60,830</td>
<td>56</td>
<td>693,462</td>
<td>3,000</td>
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<tr>
<td><strong>Arvind Textile Co. Ltd.</strong></td>
<td>Install Inverter A.C</td>
<td>660,200</td>
<td>647</td>
<td>7,526,280</td>
<td>12,000</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Install high-efficiency drain trap</td>
<td>158,000</td>
<td>155</td>
<td>1,801,200</td>
<td>4500</td>
<td>2.5</td>
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<td><strong>Morarjee Textile Co. Ltd.</strong></td>
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<td></td>
<td>Install Booster</td>
<td>109,000</td>
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<td>1,242,600</td>
<td>1,400</td>
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<td><strong>Raymond UCO textile</strong></td>
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<td>647</td>
<td>7,526,280</td>
<td>12,000</td>
<td>1.6</td>
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<tr>
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<td>Install high-efficiency drain trap</td>
<td>63,200</td>
<td>62</td>
<td>720,480</td>
<td>1,800</td>
<td>2.5</td>
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</tbody>
</table>
Case study 2: Model Project to demonstrate Electric Heat Pump (EHP) under SATREPS scheme

- **Benefits**
  - Reduction in fuel consumption of boiler and electricity consumption of chiller
  - **Energy savings: 30%-40%**
Successful model project, but not enough for follow up and upscaling

Follow up activities to SATREPS project were extremely important to ensure the continues operation of the implemented projects.

1) Selection of site
2) Sign of MoU
3) Procurement of Equipments (customization)
4) Pre-measurement (baseline measurement)
5) Shipping of equipments
6) On-site installation work
7) Operation of pilot project
8) Post-measurement (impact measurement)
9) Follow-up & capacity building
10) Evaluation and recommendations

Successful model project, but not enough for follow up and upscaling

Follow up activities to SATREPS project were extremely important to ensure the continues operation of the implemented projects.
Engaging more/new stakeholders for follow up and upscaling

Japan-India Environmental Technology Gateway

Ministry of Environment Japan (MOEJ)

Financial support

Shakti Sustainable Energy Foundation

Financial support (modest) and Assistance

Institute For Global Environmental Strategies (IGES)

Collaboration

The Energy and Resources Institute (TERI)

Facilitators

Provision of sites for investigations

Japanese Companies (e.g.: Hitachi IES, Mayekawa, Yanmar, Shinto, etc.)

Indian SME and Large industries

Technical support (dispatching experts)

B2B
Follow up regarding pilot projects
On site monitoring, evaluation and capacity building

Scaling Up and moving beyond SATREPS Project

<table>
<thead>
<tr>
<th></th>
<th>EHP</th>
<th>GHP</th>
<th>CA + FEMS</th>
<th>IF</th>
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</thead>
<tbody>
<tr>
<td>FS/DS &amp; capacity</td>
<td>3 sites (Dairy Industry)</td>
<td>5 sites (Food processing, Hotels)</td>
<td>6 sites (Textile, Forging, Casting)</td>
<td>3 sites (Foundry)</td>
</tr>
<tr>
<td>Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

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<thead>
<tr>
<th></th>
<th>Local Gov.</th>
<th>Business associations</th>
<th>ESCO</th>
<th>Research Institutions</th>
<th>Funding Agencies</th>
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<tbody>
<tr>
<td>Networking</td>
<td>MEDA</td>
<td>REA, IAFI, JFA</td>
<td>Enfragy Solution</td>
<td>IIF, SSEF, CFER</td>
<td>SIDBI/ISTSL, JICA, NEDO</td>
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</table>

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<thead>
<tr>
<th></th>
<th>At IGES workshops</th>
<th>At Other workshops</th>
<th>Media Coverage</th>
<th>Working Papers</th>
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</thead>
<tbody>
<tr>
<td>Dissemination</td>
<td>Awareness workshop (Bangalore)</td>
<td>ECCJ (Delhi)</td>
<td>SAMEEUKSHA News letters and websites, etc.</td>
<td>-Submitted and presented at SSEC</td>
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<tr>
<td></td>
<td>Awareness workshop (Pune)</td>
<td>UNESCOAP (Seoul)</td>
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<tr>
<td></td>
<td>CTCN workshop (Delhi)</td>
<td>Shakti Dialogue (Delhi)</td>
<td></td>
<td>-Submitted and presented at IIF</td>
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<tr>
<td></td>
<td>CTCN workshop (Bangkok)</td>
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</table>
LCTT process should be wholly addressed rather than partially. Single scheme may not be sufficient to address the whole process.

- **Step 1**
  Identify “Seeds” & “Needs”

- **Step 2**
  Match seeds & needs

- **Step 3**
  Upscale technology diffusion

**Funding under SATREP (JICA/JST programme) (2010-2013)**

**Funding under JCM scheme (2014)**

**Funding under credit lines (ADB, GFC, JICA, JBIC, etc.) (2015 - ..)**
Financial schemes are already available, but matching them with promising projects is missing.
Summary

-The issue is not the availability of schemes, but rather the availability of promising projects/proposals.

-Technology transfer process should be addressed wholly rather than partially: (i) identification of needs and availability, (ii) matching and testing, and (iii) up scaling and diffusion.

-JCM scheme should be effectively utilized as complementary with other existing schemes.