APEC International Workshop and Training on
The Role of Business Incubators in Developing Green Technology-Based SMEs
Yogyakarta, Indonesia, 27 - 29 September 2011

Annex B

Annex B. PRESENTATIONS FROM SPEAKERS
How Does ITRI Assist SME to Develop Green Technologies

Ren-Chain (Joseph) Wang
Green Energy and Environment Research Laboratories (GEL)
Industrial Technology Research Institute (ITRI)

Sept 27, 2011

International Workshop and Training on The Role of Business Incubators in Developing Green Technology-Based SME (APEC SME 04 2011A)
Outline

- Overview of ITRI’s Roles in Helping Green Technology Development
- ITRI’s Approaches to Promote Green Technology Development
- Examples of Green Technologies Transferred to SME
- Conclusions
Overview of ITRI’s Roles in Helping Green Technology Development

- ITRI’s Approaches to Promote Green Technology Development
- Examples of Green Technologies Transferred to SME
- Conclusions
ITRI’s Role in Technology Development for SME – A Two Way Process

Pay back 50% ➔ R&D Funding

License Fee ➔ Tech transfer

ITRI

SME ➔ SME

Ministry of Economic Affairs, R.O.C.
ITRI Overview

**Staff** : 5,625
- Ph. D. : 1,219
- M.S. : 3,059

**Patents** : 15,847

**Spin-off**
- Tech transfer : 70
- Incubation : 167

**Service (2010)**
- Company : 15,139
- Licensing : 695

(2011.8.1)
GEL Organization and Human Resources

Focus Areas
- Energy: 58%
- Environment: 20%
- Resource: 15%
- Logistics: 7%

Education
- Doctorates: 27%
- Masters: 48%
- Bachelors: 13%
- Others: 12%

GEL (733)
- New Energy Technology Division (85)
- Intelligent Energy-Saving Systems Division (112)
- Natural Resources Technology Division (111)
- Environmental and Safety Technology Division (75)
- Water Technology Division (71)
- Electric Energy Technology Division (62)
- Photovoltaic Technology Division (81)
- Green Industry Development and Promotion Division (70)
- Planning and Business Development Division (35)
- Industrial Safety and Quality Office (7)
Three Types of Tenants in CIS Open Lab

- Age < 18 months
- Initial Capital < NT$80 million
- Period = 3 + 1 years
- Now: 17

- Joint R&D Contract with Labs/Centers
- Foreign Entity Allowed
- Now: 39

- IP/ Industry Association/ ID
- Now: 11
Overview of ITRI’s Roles in Helping Green Technology Development

ITRI’s Approaches to Promote Green Technology Development

Examples of Green Technologies Transferred to SME

Conclusions
ITRI’s Green Tech Promotion and Development Activities

**Promotion:**
- Cooperation, Alliance, and Symposium
- Exhibition & Promotion
- e-Journal & News

**Technology Collaboration:**
- Early stage participation
- Collaborated R&D
- Exclusive licensing
- Contracted service and non-exclusive licensing
- New business investment
- Others

**IP:**
- Licensing of Patent Combination
- Foreign Patent Acquiring and Licensing
Cooperation, Alliance, and Symposium

Zero Energy Building Technology Alliance (ZEBTA)
2011.6.24 Taipei Chinese Taipei

International Symposium on Smart Grids
2010.9.14 Taipei Chinese Taipei

2010 Cross-strait Renewable Industry Cooperation and Exchanges
2010.7.27 Nanjing China
Exhibition & Promotion

Energy Technology Exhibition (2010)

Green Industry Exhibition (2010)

Annual R & D Accomplishment Presentation (2010)

Green Technology Promotion (2010)
EPA’s 3R Web


Renewable Energy Web

http://www.re.org.tw/RE2/

Bureau of Energy/ Ministry of Economic Affairs

## Technology Collaboration - 1

<table>
<thead>
<tr>
<th>Model</th>
<th>Early stage participation</th>
<th>Collaborated R&amp;D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target</strong></td>
<td>Current MOEA projects and potential IP</td>
<td>Current MOEA projects and potential IP</td>
</tr>
<tr>
<td><strong>Funding</strong></td>
<td>Less than 10% of MOEA funding from each participating companies</td>
<td>Higher than 10% of MOEA funding from each participating company</td>
</tr>
<tr>
<td><strong>IP</strong></td>
<td>Belong to ITRI</td>
<td>Shared based on funding percentage</td>
</tr>
</tbody>
</table>
| **Benefit** | • No need to go through R&D topic screening  
• Lower R&D risk and lower cost in technology feasibility evaluation | • R&D topics can be adjusted to meet participants’ needs  
• Participating companies can send researchers to join the R&D activities  
• Exclusive right to participants and ITRI |
| **Note** | ITRI has the whole licensing right | Need to be approved by MOEA |
## Technology Collaboration - 2

<table>
<thead>
<tr>
<th>Model</th>
<th>Exclusive licensing</th>
<th>Contracted service and non-exclusive licensing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Target</strong></td>
<td>Patents granted or in application</td>
<td>Specific R&amp;D target or IP</td>
</tr>
<tr>
<td><strong>Funding</strong></td>
<td>From interested companies through bidding process</td>
<td>From interested companies</td>
</tr>
<tr>
<td><strong>IP</strong></td>
<td>ITRI keeps the IP ownership; the licensee may relicense the IP</td>
<td>Funding company has the IP rights; Co-sharing can be negotiated</td>
</tr>
<tr>
<td><strong>Benefit</strong></td>
<td>• Licensee share the IP right  &lt;br&gt; • Licensee can use the IP right to relicense, cross license, use on negotiation and litigation etc</td>
<td>• Target specific and shorter R&amp;D duration  &lt;br&gt; • Lower risk and cost due to possible stepwise R&amp;D investment</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>Need to be approved by MOEA panel</td>
<td>Follow ITRI's existing procedures</td>
</tr>
</tbody>
</table>
## Technology Collaboration - 3

<table>
<thead>
<tr>
<th>Model</th>
<th>New business investment</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>Using IP or know-how to invest in new business/company</td>
<td>1. Consulting service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Contract experiments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Analysis and certification</td>
</tr>
<tr>
<td>Funding</td>
<td>Usually, IP and/or know-how is below 20% of the initial capital</td>
<td>From interested companies</td>
</tr>
<tr>
<td>IP</td>
<td>In form of right transfer and exclusive or non-exclusive licensing</td>
<td>In principle, ITRI has the IP rights; Co-sharing can be negotiated</td>
</tr>
<tr>
<td>Benefit</td>
<td>• Both IP/know-how and technical experts can be transferred</td>
<td>• High flexibility</td>
</tr>
<tr>
<td></td>
<td>• Provide best use of capital</td>
<td>• Simple process</td>
</tr>
<tr>
<td></td>
<td>• Quick team formation</td>
<td></td>
</tr>
<tr>
<td>Note</td>
<td>Need to be approved by MOEA panel</td>
<td>Follow ITRI’s existing procedures</td>
</tr>
</tbody>
</table>
Licensing of Patent Combination

Innovative Model

- Enhanced IP strength, effectiveness, and value through licensing of patent combination
- Strategically exclusive licensing with sub-licensing option

Benefits

- Licensee can acquire more complete patent package for better position in IP competition and litigation
- Through patent combination, individual patent’s value can be greatly enhanced
- Industry needs can be better met by strategic planning and considering the uniqueness of each industry
Foreign Patent Acquiring

CT IP Needs
- IP litigation threat
- High licensing fees
- Entering new market

Foreign Patents
- IP Service
  - Industry connection
  - IP appraisal
  - IP Due Diligence

Evaluation and acquiring

CT Companies
- Strengthening IP position
- Speed up the entering of new industry

Win-win Benefit
- Foreign IP owners can dispose off ‘idled’ patents
- Chinese Taipei industry can reach better IP position and perform better in new industry/market
Overview of ITRI’s Roles in Helping Green Technology Development

ITRI’s Approaches to Promote Green Technology Development

Examples of Green Technologies Transferred to SME

Conclusions
Mobile Recharger

➢ Unique technology
  • Solid NaBH4 can be formed to various shapes with electricity density of 150Wh/kg、150Wh/L
  • Higher than 7wt% usable hydrogen with 10~300 sccm controllable and stable releasing rate
  • Stable and low cost nano-size base metal catalyst and recyclable NaBO2 by-product

➢ Applications
  • Mobile recharging system
  • Stationary recharging system

➢ Technology transfer
  • 36 patent applications
  • Technology licensed to YGE Co.
  • Continued R&D collaboration and support

Solid hydrogen source with various shapes

Mobile recharger prototype
High Efficiency Refrigerated Display Cases

➢ Technology advantage

• Integrating inverter, defog, and LED lighting systems to increase higher than 40% electricity saving
• 10~15% superior to imported products in energy saving

➢ Applications

• Tested in HL Convenient Store for more than 2 years
• Used in 120 HL Convenient Stores in 2010 and plan to expand to 1,200 store in 1~2 years
• Negotiating with SE Convenient Store for a full scale of 9,300 store application. The annual electricity saving can reach 5 millions USD

➢ Technology transfer

• 5 patent application and 1 granted
• Licensed the technology to PC Co.
• Collaborating with MT Co. to develop larger refrigerated display cases for supermarkets
Environmentally Friendly Packaging Foam

➤ **Technology advantage**
  • Starch based, no chemical foaming agents and organic solvent needed. Has great potential replacing expanded PE or expanded PS
  • Great impact damping effect. Meets ASTM D5276-98 standards; Biodegradable with higher than 90% degradation in 180 days

➤ **Applications**
  • All kinds of green packaging including electronics, hole appliances, auto parts etc.

➤ **Technology transfer**
  • Patents licensed to SJ Co.
  • Provided technical assistance to SJ Co. in commercial production
  • Collaborate with WT Co. through Early Stage Participation program
Waste Shell Utilization

➢ Technology
  • Formulation and analyses of anti-bacteria coatings derived from waste golden clam
  • Verification of anti-bacteria and anti-fungus effects of coatings derived from waste golden clam

➢ Potential benefits
  • Helped coating industry developing waste shell based anti-bacteria coatings which increase around 3 millions USD revenue annually
  • Eliminated around 5,800 tons/year of shell waste

➢ Technology transfer
  • Transferred the know-how to LC Aquafarm

Golden Clam

LC Aquafarm
Waste to Fuel: RDF-5

- Complex composition
- Non-uniform shape and size
- High water content (≈50%)
- Low heating value (≈1,800 kcal/kg)
- Easy to corrupt and produce odor

- Homogeneous composition
- Uniform shape and size
- Low water content (<10%)
- High heating value (≈4,000 kcal/kg)
- Easy to store and transport

<table>
<thead>
<tr>
<th>Process</th>
<th>LHV</th>
<th>Moisture</th>
<th>Heat rate</th>
<th>Steam pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incineration</td>
<td>1,500-2,500 kcal/kg</td>
<td>40-60%</td>
<td>15% @ 200-300°C</td>
<td>20-30 kg/cm²</td>
</tr>
<tr>
<td>RDF power gen.</td>
<td>3,000-4,000 kcal/kg</td>
<td>5-10%</td>
<td>35% @ 540°C</td>
<td>100 kg/cm²</td>
</tr>
</tbody>
</table>

Copyright 2011 ITRI Industrial Technology Research Institute
Treatment capacity: 1,000 kg/hr MSW

- Potential for RDF utilization in Chinese Taipei
  - 15% of MSW converted into the RDF can substitute for 350,000 tonnes of coal approximately.
  - The total electricity generation can reach about 145 MW with a carbon dioxide reduction of 980 thousand tonnes.

Opening ceremony, Jun 24, 2004

Fengbin, Hualien
Fluorescence Light Fixture Design

➢ Technology
  • Lighting optical simulation and design
  • Light fixture prototyping
  • Environmental stability testing, EMI design and testing

➢ Industry benefit
  • High efficiency fluorescence light fixture design and simulation platform
  • Light fixture system evaluation, environmental stability testing, EMI design and testing

➢ Technology transfer
  • Y Co.
  • YJ Co.
LED Lighting Laboratory

➢ Technology
  • Established the first LED lighting measurement laboratory and is certified by TAF
  • Completed the first international road lighting standard leading the standardization of LED lightings

➢ Applications
  • LED lighting design and testing
  • LED light fixture production

➢ Technology transfer
  • Transferred LED lighting measurement know-hows to 4 Chinese Taipei companies
  • Developed CNS 15233 LED road lighting national standard

Optical Integrating Sphere

Lighting effect comparison
Overview of ITRI’s Roles in Helping Green Technology Development

ITRI’s Approaches to Promote Green Technology Development

Examples of Green Technologies Transferred to SME

Conclusions
Conclusions

➢ Government’s support plays a very significant role in green technology development particularly for resource limited SME

➢ A wide span of program is needed to provide substantial assistance to SME in green technology development:
  • Promotion and alliance formation
  • Technology and IP
  • Standards, regulations and incentives

➢ In addition to innovative technologies, green technology development also heavily relies on:
  • Innovative combination of existing technologies
  • Creative ideas and design
  • Regulation and standards

➢ Platform facilities, expert services and pilot to commercialization assistance are particular needs for SME in successful green technology development
Thank you for your attention!
Adaptation of Green Business by Incubator Programme

September 27, 2011
Yogyakarta, Indonesia

by Dave Feldman
Executive Director, Bethesda Green & CEO, Livability Project
Today’s Agenda

- Video
- Introduction
- Clean (Green) Tech
- Business Incubators
- Bethesda Green
- Support Services
- Livability Project
- Questions
Dave Feldman

Background

“We can’t solve problems by using the same kind of thinking we used when we created them.”

~ Albert Einstein

- Tech Sector
  - Sales, Marketing, Partnerships
  - Telecom, Software
- Consul, UK Trade & Investment
  - Led Economic Development Team
  - NBIA speaker – International Incubation
  - Business Incubator Competition
- Launch of Livability Project
- Why I do this work
Green Business Incubation
Technology, products and services that generate superior commercial benefits to customers while addressing significant environmental concerns such as global warming, sustainability of natural resources and energy security.

Cleantech technologies include renewable energy generation, energy storage, energy efficiency, biofuels, cleaner fossil fuel processes, water purification and management, waste water treatment, recycling, pollution reduction and advanced materials (including nanotechnologies).
Demand for Green (Tech)

Sectors

• with existing green industrial strength
• that have related strengths in engineering, IT
• leveraging R & D strengths of universities
• where there is government policy commitment to build strength
1. **Austin, Texas** - The Clean Energy Incubator (CEI) formed within Austin Technology Incubator in 2001; managed by University of Texas.

2. **San Jose, California** (Silicon Valley) - Attracts Cleantech venture funding alongside Web 2.0, nanotechnology, semiconductor start-ups.

3. **Berkeley, California** - A $500 million center for biofuels and energy research to be co-located at Berkeley and the University of Illinois.

4. **Pasadena, California** - California Technical Institute of Technology (Caltech) leverages strong venture capital to create a Cleantech incubation cluster.

5. **Greater Boston, Massachusetts** - Supportive state policies for renewable energy and energy efficiency; strong Cleantech VC investments (after CA).

*From SustainLane.com*
Incubators - Common Themes

- Physical infrastructure
- Professional management
- Transparent guidelines for admission and progress
- Professional services
- Solid financial base
Differentiators – Green Incubators

1. Ties to local community; source of demand for products and services
2. Inclusion of government agencies of both economic development and environmental regulatory responsibility
3. Influence in policy making, but not political partisanship
4. Formulate incubator plans (sectors, company admission) based upon local economic and environmental priorities
5. Inclusion of advisors and counselors with green business and sustainability expertise
6. Diversified funding base from government, business and community support, as well as rent
Bethesda Green (BG)

- Public-Private Partnership
- Launched January 2008
- Not-for-profit
- Multiple Stakeholders
- Community Engagement = Market Demand
- Scale What Works; Identify Gaps
Bethesda Green Mission/Strategy

Our Purpose/Mission
At Bethesda Green, we bring business, government and community together through programs and services to promote a healthy economy and sustainable living practices in order to reduce our collective impact on the environment.

Strategies to Achieve Our Mission

<table>
<thead>
<tr>
<th>Incubate</th>
<th>Educate</th>
<th>Initiate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulate next generation green business models and solutions.</td>
<td>Raise awareness and inspire action through the programs, online tools, and education and resource center.</td>
<td>Develop, manage and promote programs that leverage community assets.</td>
</tr>
</tbody>
</table>
Bethesda Green Incubator

- SMEs are prime focus
- Integration with Education Center and programs
  - Common funding
  - Joint initiatives
- Culture of innovation
- Collaboration is key
- Launch space
  - Part-time, October 2009
  - Full-time, November 2010
1. Green, social responsible, sustainable
2. Start-up, early-stage, local
3. Large companies seeking local presence
4. For- and not-for-profit
5. Diverse sectors - IT, architecture, consulting, media, marketing and distribution
6. Products/Services - energy efficiency, transportation, environmental stewardship, planning, design, neighborhood revitalization and recycling
How Can Incubators Help…..

1. Bring government, business, university and community stakeholders together to create demand, incentives and opportunities (testing, prototyping, pilot programs)

2. Perform feasibility study to determine overall and specific areas of need

3. Develop business plans/strategy for implementation, including space, location, management, budget and financing

4. Establish broad-based advisory for mentoring, financing
1. Facility and Shared Resources
   - Furniture
   - Sustainable center design (in-kind contributions from supporters)
   - Broadband wireless internet
   - Phones (extra fee)
   - Utilities
   - Conference rooms
   - Full Kitchen
   - Copier, printer, A/V equipment

2. Facility management
   - Staffed reception and information area
   - Incoming mail and package handling
   - Security
1. Business plan development
2. Marketing, promotion through website and press
3. Access to professional services firms, including accounting, investing and legal
4. Networking, contacts, and events
5. Speakers bureaus, entrepreneurial presentations
6. Semi-annual progress reviews
7. Internships
8. Tech transfer, technical assistance, regulatory compliance
9. Introductions to potential strategic partners
Partnerships

1. State and Local Economic Development Agencies
2. Chamber of Commerce
3. Universities, Academic Institutions
4. Small Business Development Center (SBDC)
5. Research Institutes, Laboratories
6. Other
1. Where we are today:
   - MOU with Bethesda Green
   - Consulting Services
   - Building Toolkits

2. Where we are going:
   - Replicating framework in other Cities
   - Education/Workshops
“We can’t solve problems by using the same kind of thinking we used when we created them.”

~ Albert Einstein

Contact Dave Feldman

Web:
www.BethesdaGreen.org
www.LivabilityProject.com

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dave@livabilityproject.com
301-949-0414
Progress on CDM and Voluntary Offset Projects and Future Prospects

September 28, 2011
Jun Ichihara, Ph. D.
Institute for Global Environmental Strategies
Introduction

- Smart utilization of carbon markets could aid further introduction of green technologies which lead to emission reduction of greenhouse gases (GHGs)

![Carbon Market at Glance, Market Value, 2005-10 ($ Billion)](chart)

*Source: World Bank, Thomson Reuters Point Carbon, Bloomberg New Energy Finance, and Ecosystem Marketplace*
## Introduction: Carbon markets

<table>
<thead>
<tr>
<th></th>
<th>Compliance Markets</th>
<th>Voluntary Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What are the markets?</strong></td>
<td>- Compliance markets provide credits for the needs for the entities to comply regulations.</td>
<td>- Voluntary markets cater for the need of the entity voluntarily to reduce emissions by providing credits</td>
</tr>
<tr>
<td><strong>Why do the markets exist?</strong></td>
<td>- Under the regulation, entities (companies, governments) need to meet standard on emission reduction.</td>
<td>- Entities (companies) voluntarily set target to reduce emission.</td>
</tr>
<tr>
<td></td>
<td>- for CSR</td>
<td>- for anticipating future regulations</td>
</tr>
<tr>
<td><strong>Typical markets</strong></td>
<td>- Kyoto Market (CDM, JI)</td>
<td>- VCS</td>
</tr>
<tr>
<td></td>
<td>- EU ETS</td>
<td>- CCX</td>
</tr>
<tr>
<td></td>
<td>- CAR</td>
<td>- CAR</td>
</tr>
</tbody>
</table>
Presentation Flow

1. Introduction
2. What is CDM?
3. Progress of CDM and Small Scale CDM
4. Barriers to CDM Development and CDM Reforms
5. Progress of Voluntary Offsets
6. Current Discussion on New Market Mechanisms and Climate Financing
7. Conclusion
What is CDM?

- What is CDM (Clean Development Mechanism)?
- CDM reduces Greenhouse gas emission by introducing additional measures for projects in developing countries.
- Then CDM generates carbon credits (called CERs) based on emission reduction.
- Also CDM aims to contribute to sustainable development in host countries of CDM projects.

- CDM provides an opportunity for new investment, new technology and additional revenue from carbon credits.
What is CDM?

Host country
A project activity site in a host country

Developed country

Credits (CERs)

GHG emissions from the site
Baseline
CDM project

Assistance from developed country for implementation of the project activity

A total emission cap
# CDM Project Cycle

<table>
<thead>
<tr>
<th>Step</th>
<th>Conducted by</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Planning</td>
<td>Project participants</td>
<td>Plan a CDM project activity and prepare necessary document (project design document: PDD)</td>
</tr>
<tr>
<td>2: National Approval</td>
<td>Host and Developed Countries</td>
<td>Project participants shall get written approvals from the countries.</td>
</tr>
<tr>
<td>3: Validation</td>
<td>Auditor (called DOE)</td>
<td>Validation is the process of independent evaluation of a project activity</td>
</tr>
<tr>
<td>4: Registration</td>
<td>UN Entity</td>
<td>Registration is the formal acceptance of a validated projects.</td>
</tr>
<tr>
<td>5: Monitoring</td>
<td>Project participants</td>
<td>Collect and archive all relevant data</td>
</tr>
<tr>
<td>6: Verification</td>
<td>Auditor (called DOE)</td>
<td>Verification is the independent review of the achieved GHG emission reductions.</td>
</tr>
<tr>
<td>7: Issuance of CERs</td>
<td>UN Entity</td>
<td>Issue certified emission reductions (CERs)</td>
</tr>
</tbody>
</table>
Typical type of CDM projects (in Indonesia)

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biomass</td>
<td>Biomass Utilization in Power Generation (i.e. Rice Husk, Bagasse from sugar process, EFB from Palm, Wood chip)</td>
</tr>
<tr>
<td>Biogas</td>
<td>Waste water treatment (i.e. Palm oil process)</td>
</tr>
<tr>
<td></td>
<td>Animal waste treatment</td>
</tr>
<tr>
<td>Methane Recovery &amp; Utilization</td>
<td>Land fill gas collection</td>
</tr>
<tr>
<td>Methane Avoidance</td>
<td>Composting</td>
</tr>
<tr>
<td>Fuel Switch</td>
<td>Switch oil to natural gas / biomass in Power Generation</td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td>Energy Efficiency in Factory</td>
</tr>
</tbody>
</table>
Example: Biomass

• Current situation / Business as Usual
  – Using coal/diesel for heat/power in plant
    • Using coal/diesel emits amount of CO2

• Future situation / after CDM applied
  – Using rise husk for heat/power in plant
    • Reducing usage of coal
      → Reduction of CO2 emission
      → Credit generated from CDM: Additional Income
        – Using rise husk is no emission of CO2.
Example: Biogas

- Current situation / Business as Usual
  - No treatment of waste water from Palm Process: Open Lagoon
    - Waste water emits methane (one of GHGs).

- Future situation / after CDM applied
  - Adding digester / treatment process of waste water
    - Reduction of methane emission
    - Credit generated from CDM: Additional Income
Presentation Flow

1. Introduction
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4. Barriers to CDM Development and CDM Reforms
5. Progress of Voluntary Offsets
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7. Conclusion
Progress on CDM

Num of registered projects

Issued CERs (1,000tCO₂)

- China: 1,509
- India: 444
- Latin America: 540
- Other Asia: 705
- Africa/Middle and Near East: 105
- Others: 33

- China: 384,267
- India: 55,907
- Republic of Korea: 73,344
- Mexico: 100,711
- Argentina: 5,907
- Egypt: 73,344
- Viet Nam: 100,711
- Others: 33

Source: IGES CDM Project Database as of 1st Aug 2011
Progress on CDM

Num of registered projects by project type

- Hydro Power: 302
- Wind Power: 221
- Biogas: 347
- Biomass: 360
- Methane recovery & utilization: 708
- HFC reduction/avoidance: 80
- N2O decomposition: 106
- Waste gas/heat utilization: 205
- Energy efficiency: 1,007
- Fuel switch: 152
- Others: 13

Issued CERs (1,000tCO₂) by project type

- Hydro Power: 38,588
- Wind Power: 39,767
- Waste gas/heat utilization: 49,114
- Methane recovery & utilization: 152,282
- Energy efficiency: 17,215
- Fuel switch: 17,071
- Others: 17,071

Source: IGES CDM Project Database as of 1st Aug 2011
Progress on CDM

Num of registered projects in Asia-Pacific region

- Hydro Power: 262
- Wind Power: 91
- Biomass: 276
- Waste gas/heat utilization: 192
- Biogas: 181
- HFC reduction/avoidance: 110
- N2O decomposition: 878

Issued CERs (1,000tCO₂) in Asia-Pacific region

- Hydro Power: 8,568
- Wind Power: 15,175
- Biomass: 37,966
- Waste gas/heat utilization: 37,995
- Biogas: 39,223
- HFC reduction/avoidance: 307,039
- N2O decomposition: 109,850
- Others: 9,824

Source: IGES CDM Project Database as of 1st Aug 2011
Progress on CDM

Num of registered projects in Indonesia

- Biogas: 24
- Methane avoidance: 4
- Methane recovery & utilization: 5
- Biomass: 11
- Other renewable energies: 7
- Cement: 3
- Fuel switch: 4
- Energy efficiency: 3
- Others: 7

Issued CERs (1,000tCO₂) in Indonesia

- Other renewable energies: 1,331
- Waste gas/heat utilization: 17
- Cement: 1092
- Biogas: 187
- Fuel switch: 11
- Biomass: 5
- Methane avoidance: 9

Source: IGES CDM Project Database as of 1st Aug 2011
Demand for CDM

- Estimated demand for Kyoto Market in 2008-2012 is 1392 MtCO2e.
  - Major buyers are EU and Japan.

### Potential Demand from Industrialized Countries (MtCO2e)

<table>
<thead>
<tr>
<th></th>
<th>EU</th>
<th>Japan</th>
<th>Rest</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>315</td>
<td>100</td>
<td>22</td>
<td>437</td>
</tr>
<tr>
<td>Private Sector</td>
<td>750</td>
<td>200</td>
<td>5</td>
<td>955</td>
</tr>
<tr>
<td>Total</td>
<td>1065</td>
<td>300</td>
<td>27</td>
<td>1392</td>
</tr>
</tbody>
</table>

Source: World Bank (2011)
Small Scale CDM Projects

• Simplified modalities and procedures are applicable for the small scale CDM project to reduce transaction costs.
  – Simplified documents and simplified methodology for calculation and monitoring of emission reductions

• Small scale CDM project has clear definition:
  – Renewable energy projects: up to 15 MW
  – Energy efficient projects: reduced energy consumption less than 60 GWh/y
  – Other projects: emission reductions less than 60,000 tonnes of CO2 equivalent annually
Progress on Small Scale CDM

Num of registered projects

Issued CERs (1,000tCO₂)

India 397
China 162
Brazil 462
Mexico 31
Indonesia 40
Republic of Korea 162
Other countries 31

Source: IGES CDM Project Database as of 1st Aug 2011
Progress on Small Scale CDM

Num of registered projects by project type

- Hydro Power: 541
- Biogas: 43
- Biomass: 83
- Wind Power: 181
- Energy efficiency: 204
- Methane avoidance: 279
- Other renewable energies: 1,155
- Fuel switch: 854
- Waste gas/heat utilization: 85
- Methane recovery & utilization: 121
- Others: 19

Issued CERs (1,000tCO₂) by project type

- Hydro Power: 10,251
- Biogas: 9,589
- Biomass: 850
- Wind Power: 720
- Energy efficiency: 157
- Methane avoidance: 138
- Waste gas/heat utilization: 85
- Methane recovery & utilization: 121
- Fuel switch: 2,135
- Others: 19

Source: IGES CDM Project Database as of 1st Aug 2011
Progress on Small Scale CDM

Num of registered projects in Asia-Pacific region

Issued CERs (1,000tCO₂) in Asia-Pacific region

Source: IGES CDM Project Database as of 1st Aug 2011
### Progress on Small Scale CDM

#### Num of registered projects in Indonesia

- **Biogas**: 21 projects
- **Biomass**: 7 projects
- **Methane avoidance**: 3 projects
- **Energy efficiency**: 7 projects
- **Hydro Power**: 3 projects
- **Other renewable energies**: 1 project

#### Issued CERs (1,000tCO<sub>2</sub>) in Indonesia

- **Biogas**: 16 CERs
- **Biomass**: 11 CERs
- **Methane avoidance**: 2 CERs
- **Energy efficiency**: 1 CER
- **Hydro Power**: 1 CER
- **Other renewable energies**: 1 CER

Source: IGES CDM Project Database as of 1<sup>st</sup> Aug 2011
Presentation Flow

1. Introduction
2. What is CDM?
3. Progress of CDM and Small Scale CDM
4. Barriers to CDM Development and CDM Reforms
5. Progress of Voluntary Offsets
6. Current Discussion on New Market Mechanisms and Climate Financing
7. Conclusion
Barriers to CDM development

- CDM process is lengthy
- Transaction costs for CDM process is not low, esp. for projects generate small credit
  - consultant, auditor and registration fee
- Limited progress of Forestry CDM
- Uneven distribution of CDM projects among countries/regions, esp. LDC
  - some countries dominate the market
Barriers to CDM development

- Average days from the starting date of public comments to registration
- Average days from requesting registration to registration
- Avg days from the start of public comments till the first issuance
- Avg days from registration till the first issuance
CDM Reform

- New guidelines and rules have been introduced to make project development simplified and effective, for example:
  - Programmatic CDM
  - Microscale CDM
    - Positive trend toward an increase in CDM project development in LDC
  - Standardized Baseline
Programmatic CDM (pCDM)

- Programmatic CDM (pCDM) allows a group of similar activities to be implemented as CDM
  - Can take place in different locations (even multi-countries) over long period of time (some projects can join later)
  - Potentially expected to reduce transaction costs

- pCDM is suited to small-scale, dispersed activities
Progress on pCDM by countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>4</td>
</tr>
<tr>
<td>Mexico</td>
<td>3</td>
</tr>
<tr>
<td>Peru</td>
<td>2</td>
</tr>
<tr>
<td>El Salvador</td>
<td>1</td>
</tr>
<tr>
<td>Guatemala</td>
<td>1</td>
</tr>
<tr>
<td>Honduras</td>
<td>1</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>1</td>
</tr>
<tr>
<td>South Africa</td>
<td>7</td>
</tr>
<tr>
<td>Nigeria</td>
<td>2</td>
</tr>
<tr>
<td>Tanzania</td>
<td>1</td>
</tr>
<tr>
<td>Burkina Faso, Gambia,</td>
<td>1</td>
</tr>
<tr>
<td>Senegal, Togo</td>
<td>1</td>
</tr>
<tr>
<td>Burundi, Kenya, Rwanda,</td>
<td>1</td>
</tr>
<tr>
<td>Sudan, United Republic of</td>
<td>1</td>
</tr>
<tr>
<td>Tanzania, Uganda</td>
<td>1</td>
</tr>
<tr>
<td>Egypt</td>
<td>1</td>
</tr>
<tr>
<td>Kenya</td>
<td>1</td>
</tr>
<tr>
<td>Morocco</td>
<td>1</td>
</tr>
<tr>
<td>Senegal</td>
<td>1</td>
</tr>
<tr>
<td>Tunisia</td>
<td>1</td>
</tr>
<tr>
<td>Uganda</td>
<td>1</td>
</tr>
<tr>
<td>Zambia</td>
<td>1</td>
</tr>
<tr>
<td>Yemen</td>
<td>1</td>
</tr>
</tbody>
</table>

Dissemination of the PoAs seems wider than normal CDM though further uptake needs to be pursued.

<table>
<thead>
<tr>
<th>Country</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>10</td>
</tr>
<tr>
<td>India</td>
<td>10</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>6</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>4</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3</td>
</tr>
<tr>
<td>Philippines</td>
<td>3</td>
</tr>
<tr>
<td>Singapore</td>
<td>3</td>
</tr>
<tr>
<td>Malaysia</td>
<td>1</td>
</tr>
<tr>
<td>Nepal</td>
<td>1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>1</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>1</td>
</tr>
<tr>
<td>Thailand</td>
<td>1</td>
</tr>
<tr>
<td>Tunisia</td>
<td>1</td>
</tr>
<tr>
<td>United Republic of Tanzania, Uganda</td>
<td>1</td>
</tr>
</tbody>
</table>
Energy efficiency is the most popular project type with 38% of the total PoAs.

In Africa, more than 50% of the PoAs are “Energy Efficiency”
Standardized baselines

- Standardized baselines aim to provide simplified CDM methodologies
  - Standardized baselines can provide baseline and additionality determination as ex-ante
  - Standardized baselines allow project participants to demonstrate CDM eligibility and emission reductions in simplified manner

- Preparation of Standardized baselines is on-going
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# CDM and Voluntary Offsets

<table>
<thead>
<tr>
<th>CDM</th>
<th>Voluntary Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Why exists?</strong></td>
<td>Under the regulation, entities (companies, governments) need to meet standard on emission reduction.</td>
</tr>
<tr>
<td><strong>Governance</strong></td>
<td>Centralized system under UN</td>
</tr>
<tr>
<td><strong>Modality and procedure</strong></td>
<td>Transparent, reliable yet complicated</td>
</tr>
<tr>
<td><strong>Market share</strong></td>
<td>Medium 16% in volume in 2010</td>
</tr>
</tbody>
</table>
Progress on Voluntary Offsets

Hístoric Volume in Voluntary Carbon Markets (MtCO2e)

Transaction Volume by Project Locations (by Regions), 2010

Source: Ecosystem Marketplace and Bloomberg Energy Finance (2011)
Progress on Voluntary Offsets

**Transaction Volume by Project Type (tCO2e)**

- Forestry/Land Use: 1,812,067
- Methane: 6,586,007
- Renewable Energy: 27,636,211
- Energy Efficiency & Fuel-Switching: 12,547,401
- Other/Not specified: 12,559,093

• Forestry/Land Use sector occupies largest share in voluntary market, including REDD+ type of projects.

• CDM and Voluntary Markets have complimentary relationship in some aspects.

Source: Ecosystem Marketplace and Bloomberg Energy Finance (2011)
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New Market Mechanisms

• Consideration on New Market Mechanisms was decided COP meeting in Cancun (2010)

• Decided to consider the establishment of one or more market-based mechanisms
  – Maintain and build upon existing mechanisms, including those established under the Kyoto Protocol
  – Complementing other means of support for NAMAs by developing Parties
  – Ensuring a net decrease and/or avoidance of global GHG emissions

• Negotiation is still on-going.
New Market Mechanisms

- 22 Countries Submit their Views on New Market Mechanisms to UNFCCC by Feb. 11, 2011

- New Market Mechanism will target the expanded scope and activities
  - Many countries expect the market should be enlarged to sector or NAMA.
  - New approaches are also proposed.

Figure. Proposals for New Market Mechanisms (Number of countries mentioned in their submission)
New Market Mechanisms

• Many country expects the existing mechanism such as CDM will continue and co-exist with new mechanisms.

• How different mechanisms can co-exist will depend on the design of the system.

Existing Mechanisms
• Project/Programme-based

New Market Mechanisms
• Sector/NAMA based
• Project/Programme based
• Etc
**Bilateral Offset Credit Mechanism**

**Government of Japan purposes of the Bilateral Offset Credit Mechanism**

- Contribute to the ultimate objective of the UNFCCC through promotion of mitigation activities globally.
- Appropriately evaluate the contribution to GHG emission reductions or removals.
- Facilitate the bilateral cooperation in the field of climate change in such a way that best suits each country’s national circumstances.
- Contribute to the sustainable development of developing countries.
- Facilitate diffusion of low carbon technologies, products and services and enhance capabilities to utilize them.

![Diagram showing bilateral arrangement and processes](image-url)

Source: MOE-J (2011)
Broader financing issue: Green Climate Fund

• Cancun Conference (2010)
  – Commitment from developed countries to mobilize USD 100 billion a year by 2020 to address needs for tackling climate change in developing countries.
  – Decided to establish the Green Climate Fund, expected to manage a portion of the above.

• Funding sources are unclear. A portion of USD 100 billion will come from private sector.

• Negotiation to operationalize the fund is ongoing.
Conclusion

• Carbon market including has been expanding
• It may expand further or shrink
  – uncertainty of international climate regime after Kyoto Protocol
• Utilizing carbon market smartly could aid further introduction of green technologies
• It is recommended to follow the further development of:
  – CDM
  – Voluntary Carbon Markets
  – New market mechanism and climate financing
Thank you very much!

Terima kasih banyak!

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For further information