APEC WORKSHOP ON SME’s ACCESS TO TECHNOLOGY
Jakarta, Indonesia, 7-9 February 2012

APEC Small and Medium Enterprises Working Group

April 2012
FOREWORD

Small and Medium Enterprises (SMEs) have been recognized as a major contributor to economic growth in many economies of Asia-Pacific Economic Cooperation (APEC) including Indonesia. SMEs are also very important on stabilizing social economy and job creation. Therefore, SMEs should be given high attention to grow and develop. There are many aspects that become barriers to SME development, and lack of access to technology is one important aspect that must be considered.

Related to the above aspects, the Ministry of Cooperatives and SMEs in collaboration with APEC and Study Center for Industry, SMEs and Competition, University of Trisakti, organized APEC Workshop on SMEs' Access to Technology on 7-9 February 2012 at Bidakara Hotel, Jakarta. This workshop aims to share best experiences and knowledges to better access to technology for our SMEs by:

- Increasing the understanding of relevant stakeholders in APEC forum related to the needs of SMEs on technology in order to increase added value,
- Improving the understanding of stakeholders in APEC about the relationship between technological development policy that apply to the institution-existing institutions and how to overcome barriers to SME access to technology. Outcome of the workshop was to reduce the transaction costs faced by SMEs in accessing technology and improve competitiveness of SMEs in the APEC region.

The International Workshop was jointly funded by APEC and the government of Indonesia through the Ministry of Cooperative and SMEs, and was participated by fifty three (53) participants coming from APEC member economies namely China, Indonesia, Malaysia, Mexico, Papua New Guinea, Peru, Philippines, Thailand, Viet Nam and non-APEC economies such as Colombia. Eighteen (18) participants and 5 (five) speakers were funded by APEC. The speakers and participants came from the government officials, Association of SMEs, Universities, and Research Institutions.

A visit to Martha Tilaar Factory was a best-practice to learn the history and technological development of SMEs, and visit to LLP KUKM or SME Promotion Center/SPC was to determine the role of SPC to promote SMEs' products in Indonesia. Last but not least, this workshop was expected to generate further constructive recommendations regarding better access to technology for SMEs in the APEC region.
This report is intended to present a summary of the APEC Workshop, results of the evaluation as well as comments given by the speakers and participants. It is hoped that this report would serve as a reference for future similar activity.

May I also take this opportunity to express my sincere gratitude and appreciation to APEC economies, APEC Secretariat, and Study Center for Industry, SMEs and Competition, University of Trisakti, for extraordinary participating and contributing in realizing this workshop.

I Wayan Dipta
Deputy Minister of Research and Development for Cooperatives and SMEs
Ministry of Cooperatives and SMEs
Republic of Indonesia
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I. INTRODUCTION

There are many aspects becoming impediments to development of SMEs, and lack of access to technology is one of the important aspects that should be put into consideration in order to maintain the improvement of their role as an engine for APEC economic growth.

APEC Workshop on SME’s Access to Technology is intended to increase broader understanding among APEC economies of the current needs of SMEs’ to get into better access to technology. In order to do so, the workshop will improve knowledge of APEC economies of the relationships between current policies and existing institutions and the exiting access barriers. Internal constraints and limitations by technology and policies or regulations associated with improving SMEs’ capability for technology development and innovations and eliminating access barriers for SMEs’ to source of technologies, and creating/increasing cooperations between SMEs and universities. R&D institutes and Large Enterprises including multinational companies through interaction and information sharing (e.g. best practices and lessons learned) among roundtables participants and expert speakers.

KEY OBJECTIVE & OUTCOME EXPECTED

Key Objective of this workshop would be:

1. To increase broader understanding among APEC stakeholders of the current needs of SMEs for better access to technology.
2. To improve APEC stakeholder’s knowledge of the relationships between current policies and existing institutions and the exiting access barriers.

By creating better access to technology for SMEs, it is expected:

1. To reduce the SMEs’ transaction cost
2. To improve SMEs competitiveness
II. WORKSHOP

2.1. Program Implementation

The International Workshop on The SMEs’ Access to Technology commenced on 7-9 February 2012 was preceded by a short report on the preparation of the event, the participants and the speakers also the content of the program presented by Ir Martono Djohari, MABM, the head of organizing committee, while Mr. I Wayan Dipta the Deputy Minister for Resources Research and Development for Cooperative and small and medium enterprise who is the Project Overseer had officially opened the event. In his opening remarks. Mr. I Wayan Dipta expressed that governments can play an important role in strengthening the competitiveness of SMEs by supporting the development and adoption of better technologies for SMEs. Furthermore, this workshop was expected to be a tool to share policies and best practices between member economies on SME’s access to technology and if possible relate to recommendations of ABAC.

The workshop has been a forum consisting of three-day activities, namely: (i) one day roundtable on 7 February 2012, (ii) one-day seminar that organized parallel with the fieldtrip on 8 February 2012, and (iii) one-day panel discussion to produce policy recommendations on 9 February 2012. This workshop has been discussed four issues, namely:

1. How the government does develop technologies policy for SMEs and how to overcome obstacles of SMEs in access to technology. The keynote speakers were DR. Tulus Tambunan (University of Trisakti, Indonesia) and DR. Lewis Chen (Chinese-Taipei). This issue was presented on 7 February 2012.

2. The role of R & D Institutes and Universities in Technology and Innovation to support the development of SMEs including technology transfer to SMEs. The Speakers having addressed these issues are DR. Tatang A Taufik (BPPT, Indonesia) and Mr. Franz Gelbke (Germany). This issue was presented on 7 February 2012.

3. The factors that determine the success story behind the Technological Development of SMEs be addressed by Prof. Shigeo Kagami (Japan), Mr. Franz Gelbke (German), and Mr. Lucas T Prawira(CISCO, Indonesia). This issue was presented on 7 February 2012 and

4. Different experiences in the formulation and implementation of technology development of SMEs had been addressed by DR, Tatang A Taufik (BPPT, Indonesia), DR. Lewis Chen (Chinese-Taipei), Prof. Shigeo Kagami (Japan), Mr. Junghwa Lee (Korea), and Mr. Mike Orgill (Google). This issue was presented on 8 February 2012.

The third day of workshop, the forum of workshop had discussed the policy recommendations on better access to technology for APEC SMEs. The Workshop Program is attached as Annex A and presentation from speakers is
Attached as Annex B, and presentation from workshop participants is attached as Annex C. In second day of the workshop, a visit to Martha Tilaar factory and LLP KUKM or SME Promotion Center/SPC was carried out.

2.2. Participant

The APEC International Workshop on SMEs’ Access to Technology was attended by fifty-three participants (53) coming from nine (9) APEC economies namely China, Indonesia, Malaysia, Mexico, Papua New Guinea, Peru, Philippines, Thailand, and Vietnam and non-APEC economies such as Colombia. APEC had supported eighteen (18) participants to attend the workshop while thirty five (35) workshop participants were non-APEC sponsored participants. They came from the government officials, Association of SMEs, Universities, and Research Institutions. The list of the participants of the workshop is presented as Annexes D.

2.3. Speaker

There were four (4) APEC sponsored speakers from APEC member economies namely from Indonesia, Japan, Korea, and Chinese Taipei, and four (4) non APEC sponsored speakers from Germany, Indonesia, CISCO Indonesia and Google. The speakers were invited from Advisor for Business and Technology Transfer, Ministry of Research and Technology, Republic of Indonesia; Venture Incubation & Investment Division of Commercialization and Industry Service Center (CIS) of Industrial Technology Research Institute (ITRI); Division of University Corporate Relations, The University of Tokyo; Small Medium Business Administration(SMBA) of Korea; The Center for Industry, SME and Business Competition Studies Faculty of Economics, University of Trisakti; BPPT; CISCO; and google. The list of the speakers is presented as Annex E.

2.4. Notes of Workshop Discussion Sessions

Notes of workshop discussion sessions can be found in details in Annex F.

2.5. Workshop in Pictures

Pictures of participants and speakers for the whole program during the opening ceremony is illustrated in Fig. 2.1 and 2.2, Activities during the workshop in Fig.2.3. and during the field trip are depicted in Fig. 2.4.
Figure 2.1. Opening remarks by Deputy Minister of Research and Development for Cooperatives and SMEs, Ministry of Cooperatives and SMEs, Republic of Indonesia
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Figure 2.3. Activities during workshop
Figure 2.4. Field visit to Martha Tilaar Factory and LLP KUKM/SPC (SMEs Promotion Center)
III. OUTCOMES AND RECOMMENDATIONS

Based on the discussion during the two-day workshop, it was agreed among all participants that SMEs is an important factor in economy. A variety of SMEs that are different in nature and development dictate what kind of policy government needs to formulate to enhance SMEs’ competitiveness and capabilities, particularly in technology.

It has also been found that access to technology was a common constraint among SMEs in many APEC member economies. As SMEs are market-oriented, they need better access to technology in order to get closer to their customers. Research and development as well as innovation are highly essential and their sources are mainly drawn from their business partners therefore SMEs need a third party, or intermediaries to be able to connect comprehensively to research institutions.

In formulating policy recommendations, nine APEC member economies and a representative of the Business Technology Center, an expert-based institution that focuses on SMEs presented their point of views and shared their economy experience in promoting technology among SMEs. The followings are short conclusion of their presentation:

People’s Republic of China states that a sense of innovation must be greatly applied at every aspects of economy without neglecting the importance of quality control. Special fund for technology innovation must be allocated and having learned from past experience, national and local governments must work hand in hand in developing SMEs.

Chinese Taipei suggested that government needs to formulate a policy that encourages large enterprises to invest on SMEs in terms of business innovation and research and development programs that can be implemented through CSR programs or subsidy. It is also important to bear the value of innovation in the mind of entrepreneurs. There have to be strong commitment and consistency by both government and SMEs and technical development must be a combination of each practical area in business.

The Business Technology Center mentioned that the roles of governments has diminished and was taken over by large companies in terms of technology innovation for enterprises. Government needs to convince companies to invest more in technology
as technology transfer is a part of sales that are beneficial for both SMEs and companies.

Mexico shared its programs in enhancing entrepreneurship which eventually generates technology innovation. Through its National Entrepreneurs Program, the government of Mexico gathers a high number of entrepreneurs from around the economy and assists them with incubation, networking, and free training programs for entrepreneur leaders. The government also consolidates all actors in the national system of business incubators, including local governments, businessmen, investors, academic researchers, industrial parks, virtual market places, specialized agencies, industrial clusters, information system, entrepreneurs and financing.

Malaysia suggested some tools to evaluate SMEs’ advancement in technology by using four main criteria: technology innovation ability, technology commercialization ability, technology innovation management ability, and technology innovation results. Instead of providing grants, the government supports SMEs by offering them with soft loans thus encourage more responsibilities. In order to get closer to customers, SMEs are also encouraged to improve their branding.

The Philippines explained that despite their government’s efforts to make technology more accessible, many SMEs are reluctant to use online marketing and websites as other SMEs may copy their products. In that case, legal assistance and patent laws must be socialized and the establishment of Technology Development Center would be a significant help in encouraging the use of more advanced technology.

Thailand suggested increasing the number of R&D personnel among companies cooperating with SMEs. In developing economies innovation to intermediaries should be established as catalysts and bridging agents of innovation process.

Papua New Guinea shared its economy experience in establishing the Regional Center for Technology and innovation and expanded their networks with major stakeholders such as national government and statutory authorities, provincial governments, research agencies, international technology transfer organization and informal sector representatives.

Peru shared its vision of inclusive growth which incorporating all citizens and economic growth. They also suggested increasing teaching of IT and dissemination of the concept of business and R&D

Indonesia noted the importance of growing culture of techno-entrepreneurs among SMEs and the development of technology and innovation center by APEC.
Policy Recommendations

In improving SME’s access towards technology, systemic approach has to be established to encourage all relevant actors to play their parts. The variation of nature and interests of SMEs also have to be taken into account in order to create a proposal that represents a balanced interest of APEC region.

The government also needs to create a conducive business climate which subsequently will build trust among SMEs, business societies and the government itself, in terms of supporting affordable technology for SMEs and creating fair transaction cost for business societies. Collaboration and networking among SMEs across APEC member and non-member economies are hoped to be realized in the long term thus SMEs can take benefits from the global economic trends. Both national and regional government should support all efforts in easing access of technology to SMEs as the impacts and results will be beneficial to economic national and regional growths.

Technology incubation is an important factor which consideration should be determined by the SMEs, research institutions and private sectors. Therefore the workshop also proposed the establishment of SMEs Working Group as a catalyst in APEC networking and it is hoped that workshop would be continued in the future to contribute a concrete recommendation on what would be collaborated projects in the region.
IV. PROJECT EVALUATION

The APEC questionnaires for participants and speakers were used to evaluate the project. They are addressed separately.

4.1. Speaker Evaluation

Summary of APEC Project Evaluation

(Part A – Speakers)

Project Code : SME 06/2011A

Project Title : Workshop on SMEs’ Access to Technology.

1. General Information

- APEC Workshop on SMEs’ Access to Technology was held in Jakarta - Indonesia on 7-9 February 2012.

- The workshop was officially attended by 53 participants from China (2); Indonesia (35); Malaysia (2); Mexico (2); PNG (2); Peru (2); Philippines (2); Thailand (2); Vietnam (2) and Colombia as an observer (2).

Out of 53 participants, 8 speakers/moderators were from Chinese Taipei (1); CISCO (1); Germany (1); Google (1); Indonesia (2); Japan (1), and Republic of Korea (1), all of them are Males.

- From 8 evaluation sheets that distributed to the listed speakers, 5 of them were filled and returned to the committee (62.5%) under the following composition: Chinese Taipei (1); Indonesia (2); Japan (1); and Republic of Korea (1).

2. Status of Activity and Speakers

- All respondents recognized that APEC Workshop on SMEs’ Access to Technology was held on 7-9 February 2012 during 3 (three) consecutive days.
Out of 8 respondents, 4 of them justified the APEC Workshop on SMEs’ Access to Technology as **Seminar/Symposium**, 1 justified **Conference Forum**, and 3 abstain.

The status of speakers originated from the various roles, namely: 4 government officers (DR Tatang A Taufik, Mr Franz Gelbke, DR. Lih- Woe Chen, Mr. Junghwa Lee), 2 researchers (Prof. Tulus Tambunan, Prof. Shigeo Kagami), and 2 executives of Large Enterprises (Mr. Lucas T Prawira, Mr. Mike Orgill).

3. **Project Accomplishment**

5 respondents confirmed that the project has achieved its objective; and recognized the workshop as a forum for exchange of information on SMEs’ Access to Technology.

3. **Profile of Attendees**

5 respondents justified that the attendees of the workshop were in conformity with the target group.

4. **Project Assessment**

The question on the overall effectiveness of the project were responded as follows: 1 respondent said “Excellence;” 1 respondent said “Effective;” 1 respondent said “Good;” 1 respondent said “need to increase the outreach to broader audience and 1 respondent said all attendees’ can share information for SMEs of each economy.

5. **Project Improvement**

2 respondents have suggested to improve the workshop, 1 respondent reiterated to invite more key persons; another respondent identified the needs of focus on more specific area and visits to relevant examples discussed in the workshop/seminar.
6. Other Suggestions

2 respondents were abstain; 1 respondent want a possible conference that’s focus more an “entrepreneurship” rather than SMEs in general, 1 respondent suggested that the next topics must relate to public awareness to political communities; and 1 respondent suggested that this workshop should be follow up by an APEC joint research to obtain evidence on the issue discussed in this workshop.

4.2. Participant Evaluation

Summary of APEC Workshop Evaluation

(Part B – Participant)

Project Code : SME 06/2011A

Project Title : Workshop on SMEs' Access to Technology.

1. General Information

- APEC Workshop on SMEs’ Access to Technology was held in Jakarta - Indonesia on 7-9 February 2012.

- The workshop was officially attended by 53 participants from China (2); Indonesia (35); Malaysia (2); Mexico (2); Papua New Guinea (2); Peru (2); Philippines (2); Thailand (2); Viet Nam (2) and Colombia as an observer (2). Out of 53 participants, 8 speakers/moderators were from Chinese Taipei (1); CISCO (1); Germany (1); Google (1); Indonesia (2); Japan (1), and Republic of Korea (1)

- From 53 evaluation sheets that distributed to the listed participants, 48 of them were filled and returned to the committee (90.56%) under the following composition: China (2); Columbia (2); Indonesia (30); Malaysia (2); Mexico (2); Peru (2); PNG (2); Philippines (2); Thailand (2) and Viet Nam (2).

2. Perception on Workshop’s Benefits
• 48 respondents have confirmed that primary benefit of the workshop for the economy is sharing experiences on best practises in SME programs and get various information about technology development, technology access, and the method of implementation of R & D result for SME from another APEC Economy;

• In term of new skills and knowledge gained from the workshop, all respondents recognized at having new knowledge about SMEs’ Access to Technology from many angles, such as: policy development, Importance University’s power of R & D, transfer of technology to SMEs, new commercialization collaboration between SMEs and LC, innovation system, sharing experiences among member economies.

3. Implementation of Workshop’s Results

• 40 respondents were keen to pursue workshop’s results in their respective home economy through many approaches, such as: proposed to explore new schemes for technology development and financing, new role for university R & D, select focus industry, establishment of a technology/innovation center for SMEs, share the model and knowledge from the workshop, more collaboration and exchange of knowledge among APEC economy, method of transferring technologies, promotion and strength the connection between university and companies. 8 respondents were abstain.

• Respond to question about what to be done next, and how should the workshop be built upon, 48 respondents definitely responded that similar workshop needs to be continuously undertaken, such as: integrate outcomes of workshop to general work of SMEWG, select good practice then each economy select a practice that they want to try/implement, build the technology center, detect new opportunities in technology transfer or the implementation of new support program, the knowledge shared should be the platform to more forward, some real program for implementing innovation/ technology access for SMEs, assisting to implement technology which suitable in SMEs, organizing specific workshop of best practices strategies, discussion between R & D Institutes/University or government officer need more time, and have more discussion on the feedback.
8 respondents were keen to link workshop’s outcome to the inclusive growth part of the APEC Growth Strategy, 4 participant said it is better if economies linked together to develop and implement the programs for assessing and benchmarking the impact in each economy, 4 respondent said maybe there is a plan if given an opportunity and appropriate funding, 2 respondent said that for the moment is only share with the Mexican companies the best practices in technology access in APEC region, 6 respondent just say yes, 4 respondent will promote the outcomes on the meetings, conferences, or for a which she attend in, 4 respondent will give a report and see what can be adopted from the workshop, 4 respondent said not at the moment but soon, and 12 respondents were abstain.

4. Rating, Effectiveness, and Contents

- In term of workshop’s rating, there were 28 respondents provided rating 5 (very good); 8 provided rating 4 (good); 12 respondents gave rating 3 (near good).

- The overall effectiveness of the workshop has been responded as “Effective” by 12 respondents; “Good” by 12 respondents; “Fair” by 4 respondents.

  4 respondent commend that the workshop was the great opportunity to share experiences implemented in APEC region about technology and innovation actions, 4 respondents said effective in general but not for special SME, 4 respondent said if the participant have influences in the government or in the sector they belong it will be successful, 4 respondent said it's a very helpful project and successful meeting, and the last 4 respondents said this project is very fruitful and enhanced our understandably and communication.

- Out of 48 respondents, 36 has confirmed that the content of the workshop was “Just Right, and 12 respondents said “Not Detailed Enough.”

5. Additional comments
● 12 respondents expressed positive appreciation; and 12 respondents were abstain.

● Additional comments from another 24 respondents were covering the following subjects:

(a) Should have a chance to add/comment on the drafted policy recommendations.

(b) All participants should be informed about presentation so that good presentation could be prepared.

(c) More time should be given to speakers so that more knowledge and experiences gained by participants.

(d) More data and statistics should be acquired to make a better analysis.

(e) More information related to specified technology for specified SMEs in each APEC Economies.

(f) It would be better if there are more representatives from industry to give more successful stories.
# Annex A. Workshop Program

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<thead>
<tr>
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<th>Session and Time</th>
<th>Topic</th>
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<tr>
<td><strong>First Day Workshop</strong></td>
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<tr>
<td>7 February 2012</td>
<td>07.30-08.30</td>
<td>Registration</td>
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<tr>
<td>Venue : Subadra Drupadi Room</td>
<td>08.30-09.00</td>
<td>OPENING By Deputy Minister of Research and Development for Cooperative and SME Resources, Republic of Indonesia</td>
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<tr>
<td></td>
<td>09.00-09.40</td>
<td>“Current State of the Art of Technology Development in SMEs and Their Constraint in Access to Technology”.</td>
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<tr>
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<td>1. Dr. Tulus Tambunan (Indonesia)</td>
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<td>2. Dr. Lih- Woe Chen (Chinese-Taipei)</td>
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<td></td>
<td>09.40-10.20</td>
<td>“The Role of R&amp;D Institutes/Universities in Supporting Technology Development/Innovations in SMEs (Including transfer of technology to SMEs)”.</td>
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<td></td>
<td></td>
<td>1. Dr, Tatang A Taufik (Indonesia)</td>
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<td>2. Mr. Franz Gelbke (German)</td>
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<td></td>
<td>10.20-11.30</td>
<td>Discussion</td>
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<tr>
<td>Venue : Kenanga Restaurant</td>
<td>11.30-13.30</td>
<td>Break and Lunch</td>
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<tr>
<td></td>
<td>13.30-15.00</td>
<td>“Key Determinants behind the Success Stories of Technology Development in SME”</td>
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<td>1. Prof. Shigeo Kagami</td>
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## APEC Workshop on SMEs’ Access to Technology
### Jakarta, Indonesia, 7-9 February 2012

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<tr>
<td>15.00-16.00</td>
<td>Discussion</td>
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<tr>
<td>Venue: Mawar Restaurant</td>
<td>19.00-21.00</td>
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### Second Day Workshop

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<tr>
<td>Venue: Subadra Drupadi Room</td>
<td>08.30-11.45</td>
<td>“The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs”.</td>
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<td></td>
<td>1. Dr. Tatang A Taufik (Indonesia)</td>
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<tr>
<td></td>
<td></td>
<td>2. Dr. Lih-Woe Chen (Chinese-Taipei)</td>
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<td></td>
<td>09.30-09.45</td>
<td>Coffee Break</td>
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<td>09.45-10.15</td>
<td>Discussion</td>
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<td>10.15-11.45</td>
<td>“The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs”.</td>
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<td>1. Prof. Shigeo Kagami (Japan)</td>
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<td>2. Mr. Junghwa Lee (Korea)</td>
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<td>3. Mr. Mike Orgill (Google)</td>
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<td></td>
<td>11.45-12.30</td>
<td>Discussion</td>
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<tr>
<td>Venue: Kenanga Restaurant</td>
<td>12.30-13.30</td>
<td>Break and Lunch</td>
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Jakarta, Indonesia, 7-9 February 2012

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<tr>
<td>Martha Tilaar Factory</td>
<td>13.30-17.00</td>
<td>Field trip 1</td>
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<td>LLP/SPC</td>
<td>18.00-19.00</td>
<td>Field trip 2</td>
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<td>19.00-21.00</td>
<td>Dinner</td>
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<tr>
<td>Third Day Workshop</td>
<td>08.30-12.00</td>
<td>Panel Discussion “TO PRODUCE POLICY RECOMMENDATIONS”</td>
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APEC Workshop on
SMEs’ Access to Technology
Jakarta, Indonesia, 7-9 February 2012

Annex B

Annex B. Presentations from Speakers
Key Determinants behind the Success Stories of Technology Development in SME

Franz Gelbke
February 7th, 2012

Key Determinants behind the Success Stories of Technology Development in SME

Franz Gelbke
February 7th, 2012

Internal and external influence

Key determinants inside SME

- Leadership
- People and Culture
- TQM
- Product and Process
- Knowledge and Information
- Other Factors

Innovation System

- The important role of policy and administration
- The level of intervention and time
- 30 Determinants of a National Innovation Systems
- Promotion tools along the timeline
- The impact after 30 years

Key determinants inside SMEs: Leadership

- Management fosters creative thinking and innovation in the company.
- Everyone in the organization is expected to come up with new ideas. Management takes new ideas very seriously.
- The organization operates a suggestion scheme.

Key determinants inside SMEs: People and Culture

- The culture in this organization promotes change and the structure of the organization facilitates change.
- Bonuses are paid according to the organization’s performance.
- Overall, employees have access to all the resources needed to get the job done.
- The organization is an enjoyable place to work.

People and culture

To run a business in the global economy means to NOT only be fast, BUT the products and processes must be flexibly adaptable to global economy.

The corporate culture plays an important role in adapting process.
Only when the entire team understands the rhythm and the bear of the changes, the business can be run safely.

Key determinants inside SMEs:

**TQM (Total Quality Management)**

- Total Quality Management program and Continuous Improvement (CI) process.
- From a formal structural quality system to a quality culture.
- Therefore, people need positive role models.

The politics/administration should provide good examples.
Key determinants inside SMEs:
Product and process
- Management places top priority on new products and processes.
- Groups and teams are involved in developing new products and services.
- We regularly compare our products and services with those of our competitors.
- Customers are regularly involved in the development of new products and services.
- Everyone in the organization is expected to suggest ways to improve processes and procedures.
- This organization is investing to develop the capabilities it will need in the future.

Key determinants inside SMEs:
Knowledge and information
- Information/knowledge is effectively managed and used throughout the organization.
- Efforts are made to share information/knowledge across the organization.
- Information/knowledge from and about customers is effectively managed within the organization.
- Active management of information/knowledge produces a range of business benefits.

Key determinants inside SMEs:
Sources for Innovation

Key determinants inside SMEs:
Other factors
- Collaboration with other partners – cooperation culture
- Grants for promoting innovation received - stimulation
- Links with universities to support innovation
- Links with other group to support innovation

Internal and external determinants for innovation in SMEs.

Elements to build National / Regional Innovation System
- Education / capacity building
- Research and development institutions
- Financing
- Support institutions / System
- Companies to develop new products or services
- Good governance / law regulations
- Infrastructure
- Company culture
- Leadership
- Organization
- Processes
- Staff qualifications

Source: IBM CEO Study 2006
Influence of Government in National / Regional Innovation System

Matrix of level and type of intervention

30 Determinants of a National Innovation Systems

Technology Promotion Tools: Lesson Learnt from German History

R&D Investment 1981 to 2004 stimulation of private investment in R&D
References

Int. J. Entrepreneurship and Innovation Management, by Rodney McAdam, Vol. 8, No. 1, 2008

Innovation Audit, ttz/SH / WTSH, Kiel, Germany 2003


Federal Report on Research and Innovation 2005 and 2010 / BMBF Germany
The Role of R&D Institutes/Universities in supporting Technology Development/Innovations in SMEs

Franz Gelbke
February 7th, 2012

Definitions
- The understanding of R&D for SMEs
- Types of R&D institute

Development phases within SMEs
- Technology Transfer Process
  - Telemetry System: example
  - Supplier of Technologies.

Reflection

Understanding of R&D for SMEs: 1

Family handicraft business
Cluster development is required.
Basic knowledge on marketing, production process, quality, design and tools building are needed.

Understanding of R&D for SMEs: 2-3

Mechanical production
LOW LEVEL
SMEs need basic knowledge on:
marketing  production process  quality  construction  idea for new product (start development)

Electro-mechanical development and production
MEDIUM LEVEL
SMEs need knowledge on:
optimized injection molds  develop components for microcomputer  training  training on computer simulation based

Understanding of R&D for SMEs: 4

Advanced mechanical development and application of programmable controllers
SMEs need:
opimization of backing wheel supported by 'finite element analysis' using remote maintenance (develop telemetry system)

Types of R&D institute: 1

Vocational school (SMK):
Education  Training  Prototyping
Types of R&D institute : 2
Polytechnic (University of applied science)
Higher Education Training
Prototype Center

Types of R&D institute : 3
University
Education for technology process simulation before prototyping
complex mathematical process optimization

SMEs development:
They started doing R&D themselves and improved the quality and quantity over time

The influence of R&D institutes on product and process development within SME depends on the situation in the SME itself.

The influence of R&D institutes on product and process development within SME is depended on the situation in the SME itself.

Instruments for Technology push and pull
For your consideration
Please write down the existing instruments for:
- Technology push (research results to the market)
- Technology pull (market demand)
Give your comments, what do you think have to be changed for a better efficiency.
Then add new instruments which you have in your mind.

Research results
Polytechnic
University

Market demand oriented
Companies, focus more on SMEs
convince and enable to apply new technologies
Technology Transfer is different to product-selling.

Technology Transfer Example: Telemetry System

Telemetry System: Project result (1)
Positive:
- The company employed one engineer for further development and for technical marketing.
- BPPT staff has gained experiences to develop telemetry system to work in the internet cloud.

Telemetry System: Project result (2)
Negative:
- BPPT develop a product, which unfortunately did not fit the demand from the company.
- The company does not apply that research result into their machines yet.
- From this experience, the company has not planned yet to collaborate with any public research center anytime soon.
- No economic effects up to now and in the near future.

Telemetry System: Project result (3)
Challenge:
- The negative result has nothing to do with the knowledge of the researcher (BPPT). They are very well educated.
- The incentive program has to be adapted. For further collaborative project, SMEs have to get the responsibility.
- Project process at research center shall be changed.

Suppliers of Technologies.
Reflection

Depending on the level of development of SMEs, we need different institutions for R&D and we need intermediaries as door opener.

We often overestimate the importance of R&D institutes in product / process development in cooperation with SMEs.

In fact, it is < 5% that SMEs collaborate with R&D institute/university.

Small and medium-sized enterprises (SMEs)

SME Definition in Europe

<table>
<thead>
<tr>
<th>Enterprise category</th>
<th>Headcount</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>medium-sized</td>
<td>&lt; 250</td>
<td>≤ € 50 million</td>
</tr>
<tr>
<td>small</td>
<td>&lt; 50</td>
<td>≤ € 10 million</td>
</tr>
<tr>
<td>micro</td>
<td>&lt; 10</td>
<td>≤ € 2 million</td>
</tr>
</tbody>
</table>
1. **INTRODUCTION**

2. **SOME GENERAL FINDINGS**

3. **SUGGESTIONS FOR FUTURE POLICY DIRECTION**

4. **CONCLUDING REMARKS**

**THE ROLE OF R&D INSTITUTES/UNIVERSITIES IN SUPPORTING TECHNOLOGY DEVELOPMENT (INNOVATION) IN SMES**

A. **Productivity Center**, e.g.:
   - Use of university faculty or other research staff as advisors and consultants.
   - Any form of funding connection on research to solve particular problems, e.g. as a business development service provider.

B. **Talent Pool**, e.g.:
   - A direct source of staff recruited at graduate or post-graduate level.
   - A source of start-ups by students or staff leaving directly from a university.

C. **Providing Knowledge/Technology-based Services**, e.g.:
   - A source of product ideas.
   - Provision of proven technologies (technology transfer).

D. **Use of University/Institute facilities and equipment**, e.g.:
   - Prototyping center.
   - Business incubation.

**GENERIC ROLES OF R&D INSTITUTES/UNIVERSITIES IN SUPPORTING TECHNOLOGY DEVELOPMENT (INNOVATION) IN SMES**

1. **Intermediary and Networking**, e.g.:
   - Facilitating access to information and other productive resources.
   - Facilitating to business partners and market.
2. **Business and Knowledge/Technology Intelligence**, e.g.:
   - Business intelligence services.
3. **Technology Assessment**.
4. **Support to Regulatory Compliance and Competitiveness Enhancement**, e.g.:
   - Technology audit.
   - Provision of MSTQ (measurement, standardization, testing, quality).
5. **Capacity Building**, e.g.:
   - Upgrading of the company’s human resources.
   - Knowledge sharing.

**A GENERAL PHENOMENA IN INDONESIA**

- Three essential roles of Indonesian universities (“Tri Dharma Perguruan Tinggi”/“Three Elements of Indonesian Higher Education”): education, research and community service.
- Public/government R&D institutes:
  - Technology-related R&D institutes are mostly carried out by departmental/ministerial and non departmental/ministerial R&D organizations at the central government.
  - R&D institutes at regional/local governments generally play coordination roles with a more limited scope of activities (services) in the regions.
OUTLINE

1. SOME GENERAL FINDINGS

SUGGESTIONS FOR FUTURE POLICY DIRECTION

CONCLUDING REMARKS

PERISKOP STUDY (2001)

- Selected Assessment: 10 Regions & 8 Sectors
- Most "comprehensive" study so far:
  - Contacted companies/institutions: 451
  - Interviews: 649
  - Workshops: 401
  - Contacted persons: 1,501

Source: PERISKOP Study (2001)

RELATIVE STRENGTH OF ELEMENTS OF REGIONAL INNOVATION SYSTEMS

Source: PERISKOP Study (2001)

TECHNOLOGY SUPPLY SIDE

- Public R&D institutes and some large universities provide technology supports to SMEs, but the activity outreach is generally still limited
- Most common & a relative easily accessed service: capacity building of SMEs (trainings, knowledge/information sharing)

TECHNOLOGY DEMAND SIDE (SMEs)

- Mostly based on natural resource abundance, low knowledge content (low value added/productivity)
- Limited economies of scale for service providing organizations
- Limited ‘formal educational background’ & absorptive capacity
- Lack of motivation toward continuous improvement

TECHNOLOGY SUPPLY SIDE

- Among limited roles are:
  1. As a talent pool (especially for new/start-up companies)
  2. Provision business & knowledge/technology intelligence
  3. Supports to regulatory compliance (technology assessment/audit)
  4. Provision of proven technology & technology-based services (with adequate technology readiness levels required, a prompt service response, a clear & satisfying IPR arrangements, an affordable business model)
  5. Effective intermediary, e.g. as innovation centers for technopreneurship development (incubators & business development service providers)
TECHNOLOGY/INNOVATION RELATED LINKAGES

1. Institutional gaps & cultural gaps (between R&D institutes/universities and SMEs)
2. Policy supports:
   a. Individual – fragmented government policy measures
   b. Limited adequacy of scope of government intervention
   c. “Rigid” government mechanisms/procedures (e.g., government procurement, funding for innovation initiatives)
   d. Institutional support-related issues, e.g., risk financing (lack of risk capital development)

GENERAL SUGGESTIONS

- Innovation system approach to strengthen SME competitiveness (through national flagship programs)
- Needs more holistic & synergetic policy measures
- Collaborative supports from key stakeholders
- National policy agenda with regional & industrial “flavors” (customization) to support local specific potential strengths.

CLOSING

- R&D institutes/universities need to develop more effective roles in supporting SMEs (serving existing SMEs, and initiating new/start-up companies as well)
- Systemic approach to strengthen innovation, technology transfer & diffusion, and learning process (that is innovation system approach) needs to be the national and regional consensus & movement
- More focus on local specific strengths
- Developing effective intermediary and networking role is among the most important agenda to provide significant leverage for Indonesian SME competitiveness.

OUTLINE

SUGGESTIONS FOR FUTURE POLICY DIRECTION

CONCLUDING REMARKS

... in harmony we progress ...

Thank You
DEVELOPMENT OF MSMEs, THEIR CONSTRAINTS AND MAIN SOURCES OF TECHNOLOGY: THE INDONESIAN STORY

Tulus T.H.Tambunan
Center for Industry, SME and Business
Competition Studies, Trisakti University © 2012

**Aspect**

<table>
<thead>
<tr>
<th>MIEs</th>
<th>SEs</th>
<th>MMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formality</td>
<td>operate in informal sector, unregistered &amp; pays no taxes</td>
<td>some operate in formal sector, registered &amp; pay taxes</td>
</tr>
<tr>
<td>Location</td>
<td>Majority in rural areas/villages, near the owner, no formal labor division &amp; accounting system (bookkeeping)</td>
<td>Many in urban areas/cities, run by the owner, no labor division (majority), no formal management and accounting system (bookkeeping)/majority</td>
</tr>
<tr>
<td>Organization &amp; management</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Aspect**

<table>
<thead>
<tr>
<th>MIEs</th>
<th>SEs</th>
<th>MMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of employment</td>
<td>majority use unpaid family members</td>
<td>some hired wage laborers</td>
</tr>
<tr>
<td>Nature of production</td>
<td>- degree of mechanization very low, mostly manual</td>
<td>- level of technology very low</td>
</tr>
<tr>
<td>Market orientation</td>
<td>majority sell to local market and for low-income consumers</td>
<td>many sell to national market and export, many serve also middle to high-income group</td>
</tr>
</tbody>
</table>

**Aspect**

<table>
<thead>
<tr>
<th>MIEs</th>
<th>SEs</th>
<th>MMEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social &amp; economic profiles of owners</td>
<td>low or uneducated, from poor households, main motivation: survival</td>
<td>some have good education, and from non-poor households, many have business/profit motivation</td>
</tr>
<tr>
<td>Sources of inputs</td>
<td>majority use local raw materials and use own money</td>
<td>some import raw materials, some have access to bank and other formal credit institutions</td>
</tr>
<tr>
<td>External networks</td>
<td>majority have no access to government programs and no business linkages with LEs</td>
<td>many have good relations with government and have business linkages (such as subcontracting) with LEs (including MNCs/FDI)</td>
</tr>
<tr>
<td>Women entrepreneurs</td>
<td>ratio of female to male as entrepreneurs is high</td>
<td>ratio of female to male as entrepreneurs is high</td>
</tr>
</tbody>
</table>

| Total enterprises by size category in all economic sectors in Indonesia, 2000-2009 (000 units) |
|----------------|------|------|------|------|
| MMEs & SMEs | 52,723.5 | 48,822.9 | 44,684.4 | 40,705 |
| MMEs | 78.1 | 106.9 | 93.0 | 78.1 |
| MIEs | 78.1 | 106.9 | 93.0 | 78.1 |
| LEs | 5.7 | 7.2 | 6.7 | 5.7 |
| Total | 52,769.3 | 48,956.8 | 44,984.1 | 40,774.1 |
Total Employment by Size Category and Sector in Indonesia, 2008 (workers)

<table>
<thead>
<tr>
<th>Sector</th>
<th>MIEs</th>
<th>SEs</th>
<th>MEs</th>
<th>LEs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>41,749,303</td>
<td>66,790</td>
<td>643,981</td>
<td>229,571</td>
<td>42,689,635</td>
</tr>
<tr>
<td>Mining</td>
<td>591,120</td>
<td>28,761</td>
<td>78,847</td>
<td>720,130</td>
<td></td>
</tr>
<tr>
<td>Manufacture</td>
<td>1,145,066</td>
<td>1,464,915</td>
<td>1,988,674</td>
<td>12,362,090</td>
<td>2,392,420</td>
</tr>
<tr>
<td>Elect, gas &amp; water supply</td>
<td>51,583</td>
<td>576,783</td>
<td>52,589</td>
<td>51,583</td>
<td>643,981</td>
</tr>
<tr>
<td>Construction</td>
<td>517,835</td>
<td>591,120</td>
<td>78,847</td>
<td>720,130</td>
<td></td>
</tr>
<tr>
<td>Trade, hotel &amp; restaurant</td>
<td>22,168,853</td>
<td>1,079,048</td>
<td>2,107,195</td>
<td>551,419</td>
<td>24,493,493</td>
</tr>
<tr>
<td>Transport &amp; communication.</td>
<td>3,496,493</td>
<td>2,063,747</td>
<td>589,674</td>
<td>3,251,245</td>
<td>83,647,711</td>
</tr>
<tr>
<td>Finance, rent &amp; service</td>
<td>2,063,747</td>
<td>313,921</td>
<td>462,683</td>
<td>3,251,245</td>
<td>5,096,341</td>
</tr>
<tr>
<td>Total</td>
<td>83,647,711</td>
<td>3,256,388</td>
<td>2,776,214</td>
<td>3,851,874</td>
<td>90,672,484</td>
</tr>
</tbody>
</table>

GDP Shares of MSMEs and LEs in Indonesia, 2005-2009 (%)

Structure of Enterprises by Size Category and Sector in Indonesia, 2008 (units)*

<table>
<thead>
<tr>
<th>Sector</th>
<th>MIEs</th>
<th>SEs</th>
<th>MEs</th>
<th>LEs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>26,379,137</td>
<td>1,079,048</td>
<td>2,107,195</td>
<td>551,419</td>
<td>28,501,111</td>
</tr>
<tr>
<td>Mining</td>
<td>258,974</td>
<td>2,107,195</td>
<td>551,419</td>
<td>24,493,493</td>
<td>261,421</td>
</tr>
<tr>
<td>Manufacture</td>
<td>3,176,471</td>
<td>53,458</td>
<td>8,182</td>
<td>12,362,090</td>
<td>3,239,420</td>
</tr>
<tr>
<td>Elect, gas &amp; water supply</td>
<td>10,796</td>
<td>591,120</td>
<td>52,589</td>
<td>51,583</td>
<td>643,981</td>
</tr>
<tr>
<td>Construction</td>
<td>137,555</td>
<td>52,589</td>
<td>52,589</td>
<td>51,583</td>
<td>229,571</td>
</tr>
<tr>
<td>Trade, hotel &amp; restaurant</td>
<td>1,079,048</td>
<td>2,107,195</td>
<td>551,419</td>
<td>24,493,493</td>
<td>24,493,493</td>
</tr>
<tr>
<td>Transport &amp; communication.</td>
<td>1,079,048</td>
<td>2,107,195</td>
<td>551,419</td>
<td>24,493,493</td>
<td>24,493,493</td>
</tr>
<tr>
<td>Finance, rent &amp; service</td>
<td>313,921</td>
<td>462,683</td>
<td>3,251,245</td>
<td>83,647,711</td>
<td>5,096,341</td>
</tr>
<tr>
<td>Total</td>
<td>382,064</td>
<td>3,251,245</td>
<td>83,647,711</td>
<td>5,096,341</td>
<td>51,261,909</td>
</tr>
</tbody>
</table>

GDP Shares of MSMEs and LEs in Indonesia, 2005-2009 (%)

Labor Productivity of Enterprises by Size (Rp/worker)

Number of SEs and MIEs in the manufacturing industry by main obstacles, 2005

<table>
<thead>
<tr>
<th>Main Obstacle</th>
<th>SEs</th>
<th>MIEs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have no serious obstacles</td>
<td>46,495</td>
<td>627,690</td>
<td>674,135</td>
</tr>
<tr>
<td>Have serious obstacles</td>
<td>192,097</td>
<td>3,062,468</td>
<td>3,254,565</td>
</tr>
<tr>
<td>Lack or high prices of raw materials</td>
<td>20,265</td>
<td>50,815</td>
<td>71,080</td>
</tr>
<tr>
<td>Marketing difficulties</td>
<td>77,175</td>
<td>552,221</td>
<td>629,396</td>
</tr>
<tr>
<td>Lack of capital</td>
<td>71,001</td>
<td>643,628</td>
<td>714,629</td>
</tr>
<tr>
<td>Transportation / distribution obstacles</td>
<td>5,027</td>
<td>49,918</td>
<td>54,945</td>
</tr>
<tr>
<td>High price or short supply of energy</td>
<td>4,666</td>
<td>50,815</td>
<td>55,481</td>
</tr>
<tr>
<td>High labor cost</td>
<td>2,335</td>
<td>14,315</td>
<td>16,650</td>
</tr>
<tr>
<td>Other main constraints</td>
<td>11,592</td>
<td>150,646</td>
<td>162,238</td>
</tr>
<tr>
<td>Total</td>
<td>228,262</td>
<td>2,490,118</td>
<td>2,718,380</td>
</tr>
</tbody>
</table>
Sources of Capital of MIEs and SEs in the Manufacturing Industry, 2005 (% of total sampled enterprises)

<table>
<thead>
<tr>
<th>Source of capital</th>
<th>MIEs</th>
<th>SEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own Money</td>
<td>82.41</td>
<td>68.85</td>
</tr>
<tr>
<td>Borrow</td>
<td>2.86</td>
<td>1.75</td>
</tr>
<tr>
<td>Own money and borrow</td>
<td>14.73</td>
<td>29.40</td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Education of the Owners of MSMEs in the Manufacturing Industry, 2006 (%)

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>MIE &amp; SE</th>
<th>SE</th>
<th>MSME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not completed primary education</td>
<td>12.20</td>
<td>7.97</td>
<td>16.09</td>
</tr>
<tr>
<td>Completed primary education</td>
<td>28.87</td>
<td>21.29</td>
<td>31.30</td>
</tr>
<tr>
<td>Completed first level secondary education</td>
<td>23.04</td>
<td>19.58</td>
<td>22.10</td>
</tr>
<tr>
<td>Completed second level secondary education (D1/II)</td>
<td>30.42</td>
<td>27.54</td>
<td>26.87</td>
</tr>
<tr>
<td>Completed Academic level education (DIII)</td>
<td>1.96</td>
<td>3.53</td>
<td>1.44</td>
</tr>
<tr>
<td>University diploma</td>
<td>3.51</td>
<td>10.09</td>
<td>2.20</td>
</tr>
<tr>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**MAIN SOURCES OF TECHNOLOGY**

- LEs
- Government
- University and R&D institutes

**LEs**
- Subcontracting activities between MSMEs and LEs are weak
- Japan is the leading players in subcontracting with local MSMEs (automotive; Toyota)
- No evidence showing strong cooperations in other forms in R&D between MSMEs and LEs
- The main constraint facing potential local subcontractors: lack of basic technology/knowhow
- Indonesian government has been trying to promote subcontracting, but still unsatisfied

**Main Constraints in Starting and Conducting subcontracting**
- Hard to get trust or confidence
- Company must be a legal entity
- Lack of skilled human resource
- Organization must be well developed with clear structure within the company
- Many costs during the tryout
- Lack of information
- Location of potential partner is far away
- Must have minimum technical capability
- Requirements (e.g. ISO 9001) are hard to be met
- Heavy competition from other potential subcontractors
- Difficulties in administrative procedures
- Difficulties in reaching an agreement that secure “win-win Solution”
Necessary Steps to become a Subcontractor
• Your company must be known through e.g. aggressive promotion of your products
• You must be able to show your business capability
• First, you must be able to produce efficiently or with cost competitiveness
• You must have minimum required facilities in place, including production space with necessary production tools.
• You must first improve first your human resource, business organization and management and technology capability

Government
• Existing government sponsored programs focus more on financing
• Transfer of technology to or Technology development in MSMEs not clear/not explicitly stated in National policy on MSMEs; neither in National policy on Technology
• Problems of coordination between government technical departments
• Lack of official staffs and uneven distributed by region dealing explicitly with technology development in MSMEs

Number of Institutions and Assistance Programs to Strengthen MSMEs, 1997-2003

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Number of institutions</th>
<th>Number of assistance programs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Still continuing</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>%</td>
</tr>
<tr>
<td>Government institutions</td>
<td>13</td>
<td>388</td>
</tr>
<tr>
<td>Banking institutions</td>
<td>7</td>
<td>31</td>
</tr>
<tr>
<td>Private companies</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Donor agencies</td>
<td>8</td>
<td>46</td>
</tr>
<tr>
<td>NGOs</td>
<td>20</td>
<td>109</td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>594</td>
</tr>
</tbody>
</table>

The Proportion of Assistance Programs to Strengthen MSMEs and SEs based upon the Type of Activities and the Executing Institutions (%), 1997-2003

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Government institutions</th>
<th>Banking institutions</th>
<th>Private companies</th>
<th>Donor agencies</th>
<th>NGOs</th>
<th>Others</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital assistance</td>
<td>5.3</td>
<td>52.9</td>
<td>21.0</td>
<td>21.0</td>
<td>296</td>
<td>28.6</td>
<td>17.3</td>
</tr>
<tr>
<td>Training</td>
<td>21.1</td>
<td>13.7</td>
<td>22.2</td>
<td>19.0</td>
<td>260</td>
<td>21.4</td>
<td>22.9</td>
</tr>
<tr>
<td>Facilities</td>
<td>11.5</td>
<td>9.8</td>
<td>19.4</td>
<td>7.6</td>
<td>26.7</td>
<td>6.0</td>
<td>16.1</td>
</tr>
<tr>
<td>Information</td>
<td>1.9</td>
<td>7.8</td>
<td>2.8</td>
<td>3.8</td>
<td>1.6</td>
<td>1.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Facilities</td>
<td>16.2</td>
<td>2.0</td>
<td>5.6</td>
<td>0.6</td>
<td>1.0</td>
<td>0.0</td>
<td>9.7</td>
</tr>
<tr>
<td>Promotion</td>
<td>3.0</td>
<td>3.0</td>
<td>13.9</td>
<td>6.7</td>
<td>1.9</td>
<td>7.1</td>
<td>3.3</td>
</tr>
<tr>
<td>Dissemination/introduction of new technology</td>
<td>27.9</td>
<td>0.0</td>
<td>0.0</td>
<td>6.7</td>
<td>1.4</td>
<td>0.0</td>
<td>15.2</td>
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<tr>
<td>Guidelines</td>
<td>4.3</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.7</td>
<td>0.0</td>
<td>2.4</td>
</tr>
<tr>
<td>Others</td>
<td>9.0</td>
<td>9.8</td>
<td>11.1</td>
<td>26.7</td>
<td>7.2</td>
<td>3.8</td>
<td>16.8</td>
</tr>
<tr>
<td>Total activities</td>
<td>531</td>
<td>51</td>
<td>36</td>
<td>105</td>
<td>307</td>
<td>34</td>
<td>1044</td>
</tr>
</tbody>
</table>

Universities and R&D Institutions
• very few universities engaged actively in supporting technology development in MSMEs
• No coordination among universities
• National policy on MSMEs does not mention specifically about the need of strong coordination in technology development between universities and MSMEs
• cooperation between universities and business community is not an Indonesian culture like in Japan, US, and Korea
R&D Policies for SMEs

2012. 2

SMBA
Republic of Korea

Contents

The need and effect of support for SMEs' R&D

1. The necessity of support for SMEs' R&D
2. The effect of technological innovation in SMEs

The current status of SMBA’s support for R&D

The direction of SMBA’s R&D policy

1. The need and effect of support for SMEs’ R&D

- SME: Primary agent for technological innovation
  & Core of the national economy
  - Agent for technological innovation: ▶ Progressive, ▶ Flexible,
    ▶ Fast adaptation to environmental changes
  - Core of economy: 99.9% of Enterprises, 87.7% of Jobs

- Government’s support: Compensating market failure and inducing private investment in R&D
  - Market failure: Avoiding the risk of R&D
  - Stage of investment in R&D
  - Inducing private investment in R&D
    Increasing productivity and inducing private investment in R&D

2. The effect on technological innovation in SMEs

- Product innovation is positively related to the rate of increase in the sales and number of employees of a corporation. (Roper, Freel)
- SMEs increase sales through technological innovation, while large corporations do so by expanding their production scale. (Dr. Zoltan J. Acs)
- Innovation in manufacturing process, marketing and R&D is positively related to the growth of an SME. (Heunks)
- The value of patents a corporation holds is positively related to the value of the corporation. (Schencker and Swanson, Hall et al)

<Outcomes of SMBA’s support for R&D>

- (Commercial outcome) 601 mil Won (KRW) in sales were generated.
- (Technological outcome) 0.5 cases of registration and certification of intellectual property were generated.
- (Job creation outcome) 0.216 jobs were created.
The current status of SMBA's support for R&D

1. Outline of support projects
2. Budget
3. Outcomes
4. Problems

2. Budget

SMBA's budget for R&D: ('09) $433 mil → ('10) $499 mil → ('11) $560 mil

- 2011 government budget for R&D: $13.2 bil (SMBA: 4.2%)

<table>
<thead>
<tr>
<th>Technology development</th>
<th>Scale</th>
<th>No. of projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of new product</td>
<td>530</td>
<td>510</td>
</tr>
<tr>
<td>Technology development</td>
<td>300</td>
<td>85</td>
</tr>
<tr>
<td>Technology development with public-public plant development</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Total R&amp;D budget</td>
<td>1,090</td>
<td>2,290</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry-matching research</th>
<th>Scale</th>
<th>No. of projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry-matching research</td>
<td>1,401</td>
<td>1,401</td>
</tr>
<tr>
<td>Support for establishing</td>
<td>1,401</td>
<td>1,401</td>
</tr>
<tr>
<td>Affiliated research centers</td>
<td>403</td>
<td>403</td>
</tr>
<tr>
<td>Technology development for application of research equipment</td>
<td>114</td>
<td>114</td>
</tr>
<tr>
<td>Support for sharing research equipment</td>
<td>114</td>
<td>114</td>
</tr>
<tr>
<td>Development of R&amp;D plan</td>
<td>114</td>
<td>114</td>
</tr>
<tr>
<td>Total research projects</td>
<td>2,290</td>
<td>2,290</td>
</tr>
</tbody>
</table>

3. Outcomes

Strengthening competitiveness of SMEs
- Per 100 mil won (KRW) of government funding:
  - Commercial outcome: $0.7 mil won (KRW) in sales
  - Technological outcome: 0.5 cases of registration and certification of intellectual property
  - Job creation outcome: 0.216 jobs

Expanding base of technological innovations in SMEs
- Supporting 15,000 SMEs for R&D
- Increasing SMEs with R&D activities by 9% (from 2006 to 2010)
- Increasing total amount of R&D investments of SMEs by 13.9% (from 2006 to 2010)

Fostering multiple major SMEs with new technology
- R&D funding from SMBA: Stepping stone for KOSDAQ registration

4. Problems

- Technological level of Korean SMEs: 75% of the best in the world
- Weakness in investment efficiency and commercialization capability
- Low ratio of R&D commercialization

SMEs' productivity: 1/3 of big corporations

<table>
<thead>
<tr>
<th>Technology level</th>
<th>Korean SMEs</th>
<th>Development of new product</th>
<th>Development of R&amp;D plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>17</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
</tr>
</tbody>
</table>

Difficulties in self-development of technology
- R&D cooperation in SMEs
- Training, experience, self-development of technology

Korean SMEs R&D Investment
- Lower than the investment of advanced nations
  - Scale of R&D: 11% of the US, 10.2% of Japan
    - R&D spending per capita: 1% of big corporations, 9% shortage of technical workforce
**Direction of SMBA’s R&D policy**

1. R&D expansion
2. Strategic support for R&D
3. Strengthening cooperative R&D
4. Shared prosperity & Protection of SMEs’ technology
5. R&D Commercialization
6. Advanced system of R&D management

**1. R&D expansion**

- Support for SMEs’ R&D: Effectiveness of KOSBI
- Expansion of funding for SMEs’ R&D: Ratio of funding for SME’s R&D (up to 6% by 2015)

**2. Strategic support for R&D**

- Supporting promising projects
- Revising & supplementing the existing roadmap
- Finding promising RFPs by roadmap and project-finding committee

- Technological convergence and combination in SMEs
- Increased 2012 budget for ‘Convergent, Combined Technology Development Project’
- Approval Program for convergence projects
- ‘SME Support Center for Convergence and Combination’ (2011) 7 centers → (2012) 11 centers

**3. Strengthening cooperative R&D**

- Creating foundation of innovation
- Operating ‘Platform for Technological Connection’
- Creating of departments dedicated to SMEs in research institutes
- Establishing ‘SME-affiliated Research Center Complex’ in universities
4. Shared prosperity, and Protection of SMEs’ technology

- **R&D between big corporations and SMEs**
  - Private-public R&D cooperation fund to support development of new technology products
  - Participation of big corporations and public institutions in projects for purchase-conditional development of new products

- **Protecting core technology and workforce**
  - ‘Measures to protect and foster technological workforce of SMEs’ (11.3)
  - ‘Technology Protection Center for Smes’ (11.3)

5. R&D Commercialization

- **Incentives to SMEs good at commercialization**
  - Strengthening SMEs’ capabilities for R&D planning
  - Incentives to SMEs with good outcomes for future projects

- **R&D funding for commercialization**
  - ‘Financial Support Program for Stimulation of Commercialization’ for successful R&D projects
  - Private investment and guarantee-based financial support for R&D

6. Advanced system of R&D management

- **Increasing user convenience**
  - Unifying management systems for SMEs’ R&D
  - Providing ‘online learning program’ on projects for SMEs’ R&D

- **Professionalism in evaluation of R&D projects**
  - Raising fairness and professionalism of evaluation by an automatic recommendation system

- **Increasing transparency in project operation**
  - Monitoring by ‘Point system and online management system’
  - ‘Online purchase system’ for transparent management of R&D funding

Thank you.
DIFFERENT EXPERIENCES IN FORMULATING AND IMPLEMENTING TECHNOLOGY DEVELOPMENT POLICY FOR SMEs

A Limited Overview for Indonesia

Dr. Tatang A. Taufik
Deputy Chairman of BPPT-IT Technology Policy Assessment Agency for the Assessment and Application of Technology (BPPT)

Seminar SME's Access to Technology
APEC Project SME 06/2011A
Jakarta, February 8, 2012

INTRODUCTION

• Competitiveness enhancement is a shared responsibility of the Central government (across the sectoral and non-sectoral institutions) and the Regional/Local governments
• Enhancement of business (including SME) competitiveness and technological development and utilization (innovation), and diffusion is a shared responsibility as well
• The achievement is unsatisfactory yet
• Legal instruments are necessary, but not sufficient.

SOME CURRENT CHALLENGES

1. Unfavorable Regulations to Business and Innovation
2. Not strong enough Innovation Resources
3. Weak S&T and Industry Interaction
4. Low Innovation Culture
5. Weak Value Chain
6. Low Capacity to Global Challenge

OUTLINE

1 INTRODUCTION
2 FROM TECHNOLOGY POLICY TO INNOVATION POLICY
3 SOME CURRENT INITIATIVES
4 CONCLUDING REMARKS
### INNOVATION & INNOVATION SYSTEM: A PERSPECTIVE

1. The views change on innovation:
   - **From “market failure” arguments** (of “technology push” and “demand pull” models) ➔ “market-driven” models: a system perspective/approach of a dynamic and interactive-reversive models.
   - **From ‘technical’ views** ➔ multidimension views (technical, business/economic, socio-cultural, etc.)

2. Among some recent important trends, more attentions have been given on:
   - Interactions and roles of actors (e.g., the triple helix model);
   - Local/regional dimensions, where social learning and social capital, and other local specificities play as more and more determining factors (e.g., regional/local innovation systems and industrial clusters).

### DEFINITIONS

**Innovation**: a renewal, resulted from social and creative processes, which generate new socio-economic values.

**Innovation System**: a set (group) of actor (institutions or productive activities) interacting systematically that affect development and pace of innovation, its diffusion (technology and good practices) and the associated learning process (Taufik, 2008).

**Innovation Policy**: a set of coherent policies that give rise to strengthening of the innovation system.

### MARKET FAILURES AND SME INNOVATION

<table>
<thead>
<tr>
<th>Type of Failure</th>
<th>Nature of Failure</th>
<th>Potential local policy actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information error</td>
<td>Flow of information on innovation is error or missing</td>
<td>Promotion of networks &amp; partnerships, Public supports for SME research projects</td>
</tr>
<tr>
<td>Procurement fail</td>
<td>Policies that result in non-excludable goods that contribute to SME innovation</td>
<td>Public policy of basic industrial infrastructure locally</td>
</tr>
<tr>
<td>Externalities</td>
<td>Activities that benefit others in addition to producer ➔ loss of highly skilled labour</td>
<td>Direct public support for SME research projects for training of highly skilled labour in local universities</td>
</tr>
<tr>
<td>Monopolies</td>
<td>Limited entry through high barriers &amp; other barriers, including inability of new entrants, e.g., university research, Small firms enter as local small suppliers</td>
<td></td>
</tr>
<tr>
<td>Inhibitions</td>
<td>Inhibitions cost in creating knowledge</td>
<td>Support small-firms’ policies supporting SMEs in order to foster the playing field. Support to SMEs that are local small suppliers</td>
</tr>
</tbody>
</table>

Source: OECD (2005)

### SYSTEM FAILURES & SME INNOVATION I

<table>
<thead>
<tr>
<th>Type of Failure</th>
<th>Nature of Failure</th>
<th>Potential Local Policy Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructure failure</td>
<td>Underinvestment in local infrastructure with which firms interact ➔ e.g., communications infrastructure</td>
<td>Incentives for private or public communications &amp; knowledge transfer infrastructure</td>
</tr>
<tr>
<td>Transition &amp; lock in failures</td>
<td>Forms &amp; boundaries are highly complex in their own technological areas but in related ones. Unm. to switch from existing technologies</td>
<td>Incentives for technological activities that broaden firm &amp; organizational capabilities &amp; nurturing of emerging systems</td>
</tr>
<tr>
<td>Institutional failures</td>
<td>Institutional and regulatory context has unexpected negative impact</td>
<td>Monitoring &amp; adjusting local institutions &amp; regulations</td>
</tr>
<tr>
<td>Learning failures</td>
<td>Firms may not be able to learn rapidly &amp; effectively</td>
<td>Developing firm capabilities through human capital programmes, support for R&amp;D technology dissemination policies, opening channels to knowledge sources</td>
</tr>
</tbody>
</table>

SYSTEM FAILURES & SME INNOVATION (2)

<table>
<thead>
<tr>
<th>Type of Failure</th>
<th>Nature of Failure</th>
<th>Potential Local policy action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suboptimal balance bet.</td>
<td>Local innovation concentrations may work too much on exploitation &amp; not enough on exploration (or vice versa)</td>
<td>Using public procurement &amp; funding to support exploration, introducing diversity is industry by supporting new &amp; small firms, supporting variety through dissemination of codified information</td>
</tr>
<tr>
<td>Suboptimal balance bet.</td>
<td>Local innovation concentrations may have too rapid selection whereby underperforming firms close, &amp; too little variety, in terms of firms &amp; activities carrying potentially promising technologies</td>
<td>Strengthening competition policies &amp; use industrial &amp; technological policies to support new firms carrying potentially promising technologies, on weakens competition policies &amp; limit use of industrial &amp; technological policies supporting firms, support exploration, introducing diversity is industry by supporting new &amp; small firms, supporting variety through dissemination of codified information</td>
</tr>
<tr>
<td>Appropriability</td>
<td>Ten stringent appropriability may limit spread of knowledge within innovation system</td>
<td>Encouraging local knowledge transfers</td>
</tr>
<tr>
<td>Complementarities failures</td>
<td>The appropriate complementarities may not be present in local innovation system</td>
<td>Formation of R&amp;D networks, industry/university interfaces &amp; bridging systems</td>
</tr>
</tbody>
</table>


CHALLENGES FOR PARADIGM SHIFTS IN INDONESIA

- Mostly based on natural resource abundance, low knowledge content vs. More knowledge-based, innovation, entrepreneurial activities
- Conventional, “business as usual” vs. Breakthrough
- Sectoral – partial vs. Systemic - holistics
- Individual – fragmented government policy measures vs. Integrated – Coherent
- etc...

Need a collaborative framework as a common platform to develop/strengthen coherent and synergetic policies and design their implementable actions and measurable targets/achievements.

BPPT POSITION - A SIMPLIFIED COMPARISON

OUTLINE

SOME CURRENT INITIATIVES

INNOVATION SYSTEM AS NATIONAL COMMITMENT

- PERI Kodop study - 2001, BMF – MRT
- BPPT study since 2004
- Long Term Development Plan 2005 – 2025 (incudes strengthening the National Innovation System/NIS to support knowledge-based economy development)
- National Coordination Meeting on Research and Technology, 2008
- Medium Term Development Plan, 2009-2014
- National Innovation Committee, along with National Economic Committee, 2010

‘NEW’ PARADIGM : KNOWLEDGE-BASED DEVELOPMENT

- Globalisation
- Diversification of S&T and innovation
- Knowledge Economy
- Knowledge Society
- Network Economy
- Local Factors

Contextual issues

Universal Trends and Challenges

Knowledge Economy

Competitiveness and Social Cohesion

Innovation System

QoL/Wealth

Self Reliance

Civlization
5. Develop and strengthen integrated efforts of innovation system and industrial cluster development (at the national and regional levels).
6. Develop and adapt strategic responses to global changes and challenges.

3. Develop synergetic collaboration for innovation and its diffusion, and increase knowledge-/technology-based services.
4. Foster innovation culture.
5. Strengthen knowledge institutions and S&T supports, and enhance absorptive capacity of industry (esp. SMEs).

1. Develop conducive general framework/conditions for innovation and business.
2. Strengthen knowledge institutions and S&T supports, and enhance absorptive capacity of industry (esp. SMEs).

Strategic Initiatives

- Development of Innovative Entrepreneur
- Strengthening Regional Innovation System
- Strengthening National Innovation System
- Development of Innovation Network
- Innovations-driven economy
- Competitiveness Enhancement & Social Cohesion

Basic Principles

- Coherence, Integrated Policy and Collaboration

THE INNOVATION POLICY FRAMEWORK AND THE STRATEGIC INITIATIVES ON STRENGTHENING THE NATIONAL INNOVATION SYSTEM

GENERAL ISSUES (RELATED TO SMEs)

- The silent majority of business actors (SMEs) ~ Limited ‘technological capacity’ of existing SMEs
- Low innovative entrepreneurial activities (number of entrepreneurs = 0.26%)
- Limited role of intermediaries (e.g., estimated business incubators = 50; members of Indonesian Business Incubator Association/AIBI = 24)
- Lack of effective government supports (consistency).

TECHNOLOGY SUPPLY SIDE

- Public R&D institutes and some large universities provide technology supports to SMEs, but the activity outreach is generally still limited
- Most common & a relatively easily accessed service: capacity building of SMEs (trainings, knowledge/information sharing)

TECHNOLOGY SUPPLY SIDE

- Among limited roles are:
  1. As a talent pool (especially for new/start-up companies)
  2. Provision business & knowledge/technology intelligence
  3. Supports to regulatory compliance (technology assessment/audit)
  4. Provision of proven technology & technology-based services (with adequate technology readiness levels required, a prompt service response, a clear & satisfying IPR arrangements, an affordable business model)
  5. Effective intermediary, e.g., As innovation centers for technopreneurship development (incubators & business development service providers)

TECHNOLOGY DEMAND SIDE (SMEs)

- Mostly based on natural resource abundance, low knowledge content (low value added/productivity)
- Limited economies of scale for service providing organizations
- Limited ‘formal educational background’ & absorptive capacity
- Lack of motivation toward continuous improvement

TECHNOLOGY/INNOVATION RELATED LINKAGES

1. Institutional gaps & cultural gaps (between R&D institutes/universities and SMEs)
2. Policy supports:
   a. Individual – fragmented government policy measures
   b. Limited adequacy of scope of government intervention
   c. "Rigid" government mechanisms/procedures (e.g., government procurement, funding for innovation initiatives)
   d. Institutional support-related issues, e.g., risk financing (lack of risk capital development)
**GENERAL SUGGESTIONS**

- Innovation system approach to strengthen SME competitiveness (through national flagship programs)
- Needs more holistic & synergetic policy measures
- Collaborative supports from key stakeholders
- National policy agenda with regional & industrial “flavors” (customization) to support local specific potential strengths.

**TECHNOPRENEURSHIP DEVELOPMENT PROGRAM**

- Is an “innovation system approach” flagship program as the main vehicle to foster innovative businesses (especially by providing techno-based supports to existing SMEs and developing new/startup innovative SMEs).
- Components:
  - Policy/technical assistance
  - Organizational/institutional strengthening
  - Innovation & entrepreneurial culture development
  - Financial supports
  - Incentives & Government regulatory reforms
  - Business intelligent services
  - Talent scouting (Techopreneurship camps)
  - Knowledge/technology based services

**"MINIMUM" SERVICES BY AN INNOVATION CENTER**

An Innovation Center needs to provide a minimum integrated services, at least in:

1. Technology-based services (e.g., design, prototyping, testing, technology-based business incubation, etc.)
2. Human resource development of businesses (SMEs).
4. Facilitating financing (funding) access.

Notes:
1 & 2: technology/knowledge services as the “core competences” of the Innovation Center
3 & 4: intermediary roles

**DESIGNING INNOVATION POLICY MEASURES**

**TECHNOPRENEURSHIP DEVELOPMENT THROUGH INNOVATION CENTERS**

- **Explicit**
  - Incentives for innovation (knowledge-based services)
  - Direct link & match needed services
  - Incentives for adoption of knowledge-based services

- **Implicit**
  - Capacity building for the innovation services
  - Capacity building for innovation networks
  - Capacity building for adopting innovative services

**Contextual Factors**

- Institutional setting
  - National/Regional/Local Advantage
  - Stakeholders
  - 6 Object/Actors to be Influenced

**INNOVATION & MODERNIZATION OF THE SOURCES OF ECONOMIC DEVELOPMENT**

- **Better Cycle** (from vicious cycle to virtuous cycle)
- **ROE**
- **IC**
- **BPPT & Key Key**

**IC DEVELOPMENT IN AN INNOVATION SYSTEM FRAMEWORK**

- An Innovation Center as a “hub” and an “interface” function by:
  - Strengthening/revitalizing an existing organization (e.g., universities, etc.)
  - Setting up a new organization
- Related Organizations
- Regional Office
- Financial Institutions
- SMEs
- Others

**INNOVATION SYSTEM**

1. IC: Innovation System
2. IC: Industrial Cluster
3. IC: Key Stakeholders

**Notes**

- IS: Innovation System
- IC: Industrial Cluster
- BPPT & Key: Business Development Service Provider
- Incubator: Technology-based Business Incubator
**TO START AND DEVELOP SUSTAINABILITY**

- NEEDS TO DEVELOP A "BUSINESS MODEL"
  - 4 Services
  - Innovative SMEs
  - Govt Project, CSR, Licence fee, Profit sharing, etc.

**SOME CURRENT PROGRESS & NEXT INITIATIVES**

- **2009 – 2010**: 35 ICs
- **2011**:
  1. Economic/industrial assessments, policy recommendation & policy briefs
  2. 10 related guide books
  3. 6 new regional techno-based business incubators
  4. 1 university techno-based business incubator
- **2012**:
  1. Organizational development (including Indonesian Business Incubator Association)
  2. Continuing regional & university based Innovation Center development
  3. Network of Innovating Indonesia volunteers (including Young Volunteers of Innovating Indonesia).

**OUTLINE**

1. INTRODUCTION
2. FROM TECHNOLOGY POLICY TO INNOVATION POLICY
3. SOME CURRENT INITIATIVES
4. CONCLUDING REMARKS

**CLOSING**

1. Partial approaches are not effective, do not provide significant leverage. Enhancement of innovation for SMEs needs a system approach (i.e., innovation system); and collaborative efforts from all key stakeholders.
2. Area(s) of collaboration
   - An intergovernmental (& interorganizational) co-operation on policy learning on innovation and business/technopreneurship development.
   - Specific collaborative pilot projects (e.g., innovation center development).
   - Capacity building: S&T organization, Human resource development (HR exchange, including for policy makers).
   - Join knowledge management ~ "cloud" innovation system network.

3. Develop success stories in 1 – 3 years:
   1. Starts from ‘well-defined collaborative activities’ critical to the strengthening of innovation system to support SME competitiveness enhancement
   2. Grow as we go
   3. Create excellent achievement
   4. Build community of practice.

... in harmony we progress ...

Thank You

Gerakan Membangun Sistem Inovasi, Daya Saing dan Koherensi Global di seluruh Wilayah Nusantara (National movement to develop innovation system, competitiveness, and social cohesion through out the Country)

Dr. Tatang A. Taufik
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Agency for the Assessment and Application of Technology
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Gedung BPPT II, Lt 13
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Telp. (+62 21)-316 9441 / 9442
Fax. (+62 21)-319 24127
E-mail: tatang.taufik@bppt.go.id
6. RELIGION (CENTRAL GOVERNMENT ONLY)

1. Decree No. 18/2002:
   - Goals of S&T National System Development: to strengthen S&T capacity to accelerate the realization of state's ultimate goals; to enhance competitiveness; to enhance self-reliance
   - Chapter IV Clauses 18 – 23: Functions and Roles of Central and Regional Governments

3. Act No. 25/2004 on The National Development Planning System
   - The Regional Long Term Development Planning (RPPIP) should refer to the National Long Term Development Planning (RPJPN)

4. Act No. 17/2007:
   - IV DIRECTION, STAGES, AND PRIORITY OF LONG TERM DEVELOPMENT 2005 – 2025: To accomplish as a competitive nation, Point C Mastering, Developing, and Utilizing S&T; innovation system strengthening to drive knowledge based economic development.

5. Act No. 32/2004:
   - Goal of regional autonomy is to enhance public welfare, public services, and regional competitiveness (Clause 2, Verse 3); and
   - Executive and Vice Executive have obligation to: advance and develop regional competitiveness (Clause 27, Verse 1, point g).

See also: Government’s Regulation No. 6/2008 on The Guidelines for Evaluating Regional Government Performance

**EXAMPLES OF LEGAL BASES / REGULATIONS**

1. Constitution 1945 – Fourth Amendment: Clause 28c and Clause 31 - Verse 5, and Clause 33:
   - Right to obtain the benefit from S&T and to self advancement
   - Government advances S&T.
   - National Economy and social welfare (regulated by Laws).

2. Act No. 18/2002:
   - Goals of S&T National System Development: to strengthen S&T capacity to accelerate the realization of state’s ultimate goals; to enhance competitiveness; to enhance self-reliance

3. Act No. 25/2004 on The National Development Planning System
   - The Regional Long Term Development Planning (RPPIP) should refer to the National Long Term Development Planning (RPJPN)

6. President's Instruction No. 6/2007 on RII Sector Acceleration and SME Empowerment
   - Increasing SMEs access to funding sources; Development of Entrepreneur and Human Resources; Enhancing market niche for SME’s products; Regulatory reform


8. President’s Regulation No. 5/2010 on The National Medium Term Development Plan (RPJMN) 2010 – 2014:
   - Period of enhancing the human resource quality including the development of S&T skills as well as economic competitiveness strengthening
   - Book I: National priorities (11) culture, creativity, and technological innovation.


10. President’s Regulation No. 32/2011 on MPMU
    11. Etc.

**EXAMPLES OF LEGAL BASES / REGULATIONS**

6. BUDGET
   -Rp.1,061.4 Trillion (120.67 Bln US $ at 9000/USD)
   -Loan interests, domestic Rp.80.4, foreign Rp.36 Tr [10.7%]
   -Central government Rp.401.4 Trillion (37.7%)
   -Regional government total Rp.409.4 Trillions (37.7%)

10. Strategic Objectives
   -1. Higher economic growth
   -2. Fewer unemployment and better job
   -3. Reduced poverty
   -4. Increased income/capita
   -5. Maintained economic stability
   -6. More significant domestic financing
   -7. Improved food and water security
   -8. Improved energy security
   -9. Higher economic competitiveness
   -10. Greener development

**INTRAAGENICL LAW ENFORCEMENT ORIGINAAL**

**THE ANATOMY OF GOVERNMENTAL AFFAIRS**

Based on Act No. 32 Year 2004

**UNOFFICIAL TRANSLATION OF ORIGINAL**

**INTERNAL LEGAL BASES IN BPPT ~ Transitional**

1. Decree of the Chairman of BPPT No. 064/2011 on Special Assignment to the Deputy of Technology Policy Assessment (PKT) to Implement the National and Regional Innovation System Programs and Activities:
   - To support the implementation of national development program in accordance with the national development direction stated in the National Long Term Development Plan (RPJPN) 2005 – 2025 and the National Medium Term Development Plan (RPJPN) 2010 – 2014.

2. Decree of the Deputy Chairman of BPPT for Technology Policy Assessment, No. 04/2011 on Special Assignment to all echelons under the Deputy of Technology Policy Assessment to Implement the National and Regional Innovation System Programs and Activities:
   - Techno-industry Innovation System Development
   - Innovation Network Development
   - Regional Innovation System Strengthening
   - Technology Audit
   - Entrepreneurship Development, including technology-based business incubator

**NATIONAL BUDGET 2011**

Presidential Remarks, 16 August 2010

**BUDGET**

- Rp.1,061.4 Trillion (120.67 Bln US $ at 9000/USD)
- Loan interests, domestic Rp.80.4, foreign Rp.36 Tr [10.7%]
- Central government Rp.401.4 Trillion (37.7%)
- Regional government total Rp.409.4 Trillions (37.7%)

- Divested to 248 autonomous regions: 33 provinces, 450 districts, 48 municipalities.
- Rp.370.4 Trillion
- Special autonomous regions: Papua and Kupi - Rp.10.3 Tr
- Shared revenue to regions: tax, natural resources, Rp. 82.1 Tr
- Adjustment for school grants/ R&D and civil servant Rp. 10.5 Tr

**10 STRATEGIC OBJECTIVES**

1. Higher economic growth
2. Fewer unemployment and better job
3. Reduced poverty
4. Increased income/capita
5. Maintained economic stability
6. More significant domestic financing
7. Improved food and water security
8. Improved energy security
9. Higher economic competitiveness
10. Greener development
**CURRENT GOVERNMENT DEVELOPMENT POLICY (2010-2014)**

11 National priorities
1. Bureaucracy Reform and Governance
2. Education
3. Health
4. Poverty reduction
5. Food security
6. Infrastructure
7. Investment and business climate
8. Energy
9. Environment and disaster management
10. Marginal areas, outer islands/regions, post-conflict ridden areas
11. Culture, creativity and technology innovation

15 President’s specific priorities
1. Eradication of court law's “mafia”
2. Revitalization of defense industry
3. Terrorism prevention
4. Nation-wide electricity availability
5. Increased food production and strengthened food security
6. Revitalization of fertilizer and sugar factories
7. Regulation improvement in land use and regional planning
8. Infrastructure development
9. Financial/credit support for SMEs amounted to ~US$200 Mio/year
10. Financing and investment scheme
11. Reformulation of Indonesia’s contribution to climate change and environmental challenges
12. Public health reform
13. Harmonization between education and employment
14. Disaster mitigation and management
15. Central and provincial/district governments synergy.

**GLOBAL COMPETITIVENESS INDEX - WEF**

**INDONESIA’S COMPETITIVENESS PROFILE IN 2010 AND 2011 (WEF)**

Source: WEF, 2011

**TECHNOLOGICAL READINESS & INNOVATION INDEXES (2011)**

Source: WEF, 2011
Annex C. Presentations from Workshop Participants
**MSME Development Plan 2011-2016**

Bureau of MSME Development
Department of Trade and Industry

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**Overview of Philippine MSMEs**

Contribution of MSMEs
- 99.6% of total firms
- 61% of employment
- 35.7% of value-added

<table>
<thead>
<tr>
<th>Size</th>
<th>Number (Thousands)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>95.4</td>
<td>95.4%</td>
</tr>
<tr>
<td>Small</td>
<td>4.2</td>
<td>4.2%</td>
</tr>
<tr>
<td>Medium</td>
<td>0.4</td>
<td>0.4%</td>
</tr>
<tr>
<td>Large</td>
<td>0.2</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Source: 2009 List of Establishments, NSO

---

**Overview of Philippine MSMEs**

Manufacturing Sector

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of food products</td>
<td>47%</td>
</tr>
<tr>
<td>Manufacture of wearing apparel</td>
<td>16%</td>
</tr>
<tr>
<td>Manufacture of fabricated metal</td>
<td>12%</td>
</tr>
<tr>
<td>Manufacture of electronics &amp; machineries</td>
<td>10%</td>
</tr>
<tr>
<td>Manufacturing of transport</td>
<td>8%</td>
</tr>
<tr>
<td>Others</td>
<td>1%</td>
</tr>
</tbody>
</table>

Source: NSO List of Establishments, 2009

---

**Challenges**

**Productivity and Efficiency (P&E)**

1. The unsteady supply and high cost of water and electricity reduce the productivity of SMEs
2. SMEs lack information and education on productivity
3. The level of productivity of SMEs is reduced by their poor working conditions arising from non-compliance with labor laws
4. The production systems of SMEs are not environment-friendly
5. SMEs lack the knowledge and capacity to comply with international quality standards
6. SMEs suffer from piracy of highly skilled workers

---

**Productivity and Efficiency (P&E)**

7. Vocational and technical schools do not offer learning programs that are responsive to MSME needs
8. ICT use among SMEs is not pervasive
9. SMEs are not investing in productivity-enhancing technologies
10. The services of government-subsidized technology/packaging centers are expensive
11. SMEs are unable to access productivity programs due to their high cost
**MSME Development Plan 2011-2016**

**The Plan is meant to:**

- Create a business environment that will center around a culture of governance that will foster the establishment, development, sustainability, and competitiveness of SMEs.
- Improve the availability of reasonably priced financial products, services and support programs that SMEs can conveniently access.

**BE Results Statements**

1. The cost of doing business (taxes, fees, etc.) is affordable to MSMEs.
2. The institutional support structures for the development of start-up and existing MSMEs are in place.
3. The policies necessary to develop the MSME sector are crafted and being fully implemented.
4. Support for MSME development is Results based, coordinated, harmonized and sustained by capable stakeholders.
5. An entrepreneurial mindset is pervasive among MSMEs and other MSME stakeholders.
6. Soft and hard infrastructures for MSME development are established.
7. The information needs of MSMEs are available and accessible.
8. MSMEs are gender responsive and environment-friendly.

**A2F Results Statements**

1. The financial products, services and support programs that MSMEs need are sustainably available avenues to start-up MSMEs and MSMEs operating in the countryside.
2. The cost of obtaining MSME loans is reasonable and affordable.
3. The requirements that MSMEs need to comply with to obtain loans are reasonable and manageable.
4. The process that MSMEs need to follow and documents that must be submitted to obtain loans is simplified and streamlined.
5. MSMEs are treated in financial management and are able to understand and speak the language of financial institutions, while financial institutions are trained to understand and speak the language of MSMEs.
6. Financial products and services for MSME lending are gender-responsive and environmentally friendly.
7. The information needed by MSMEs to access financial resources are available and easily accessible.
8. The personnel/intervention by stakeholders to MSMEs in accessing funds are coordinated, relevant and effective.

**A2M Results Statements**

1. MSMEs have diversified their existing markets and penetrated new and emerging markets locally and globally.
2. MSMEs are competitive locally and globally.
3. Marketing support systems are established and are operating on a sustainable basis.
4. MSMEs are implementing the value chain approach and are highly benefited by it.
5. MSMEs are using information technology and intellectual property system to develop a sustainable market chain and gain competitive advantage for their products and services.
6. Market information needed by MSMEs is available and freely accessible.
7. MSMEs have considerable share in the sustainable development market locally and globally.
8. Government support programs (e.g. One Town, One Product (OTOP) Program) to help MSMEs access local and global markets are coordinated and highly satisfactory.

**P&E Results Statements**

1. Government programs and policies on productivity enhancement are coordinated, effective and highly satisfactory.
2. The MSME workforce is highly motivated and is equipped with the appropriate skills and attitude needed by MSMEs.
3. The working environment of MSMEs fosters greater productivity and efficiency among the workforce.
4. MSMEs are using gender-responsive and environment-friendly technologies.
5. MSMEs are compliant with interational quality standards.
6. MSMEs are using state of the art productivity enhancing technologies.
7. Information on productivity enhancement is available and freely accessible to MSMEs.

**MSMED Plan 2011-2016 Results Framework**

- **POVERTY REDUCTION**
  - The contribution of the MSME sector to GVA has increased to 40% by 2016.
  - MSME sector employment has reached 2 million by 2016.

**Access Environment (BE)**

1. The cost of doing business (taxes, fees, etc.) is affordable to MSMEs.
2. The institutional support structures for the development of start-up and existing MSMEs are in place.
3. The policies necessary to develop the MSME sector are crafted and being fully implemented.
4. Support for MSME development is Results based, coordinated, harmonized and sustained by capable stakeholders.
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6. Soft and hard infrastructures for MSME development are established.
7. The information needs of MSMEs are available and accessible.
8. MSMEs are gender responsive and environment-friendly.

**Access Finance (A2F)**

1. The financial products, services and support programs that MSMEs need are sustainably available avenues to start-up MSMEs and MSMEs operating in the countryside.
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3. The requirements that MSMEs need to comply with to obtain loans are reasonable and manageable.
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**Access Market (A2M)**

1. MSMEs have diversified their existing markets and penetrated new and emerging markets locally and globally.
2. MSMEs are competitive locally and globally.
3. Marketing support systems are established and are operating on a sustainable basis.
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**Productivity and Efficiency (P&E)**

1. Government programs and policies on productivity enhancement are coordinated, effective and highly satisfactory.
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5. MSMEs are compliant with interational quality standards.
6. MSMEs are using state of the art productivity enhancing technologies.
7. Information on productivity enhancement is available and freely accessible to MSMEs.
MSME Development Strategy and Approach

Globalization

- promotes the participation of SMEs in global production networks through outsourcing and subcontracting activities
- maximizes opportunities for SMEs in a more open and highly competitive market

Global Themes

Corporate Social Responsibility
- MSMEs can supply raw materials and services to large enterprises
- MSMEs can be the beneficiaries of CSR activities such as capacity building or technology transfer programs
- MSME operational "code of ethics"

Thank you.
PERU

SMES ACCESS TO TECHNOLOGY

GOALS FOR SMEs ACCESS TO TECHNOLOGY

• ECONOMY LEVEL:
• Inclusive growth
• Strengthen involvement of SMEs in technology development
• Develop a scheme whereby universities produce new technology /patent rights
• Increase substantially cooperation between different size of companies in R&D.
(continued)

- Setting up of a strong and efficient alliance among government, private sector (SMEs) and universities for technology creation.
- Devise a mechanism to finance access to technology (financing vs. Access to technology)
- REGIONAL LEVEL
- Take advantage of existing Free Trade Agreements to foster technology development in SMEs

(continued)

- APEC LEVEL
- Eliminate nine chokepoints, as defined by the Joint Ministerial Statement of SME & Trade Ministers (Big Sky Montana, USA, 2011). One of them is access to technology, and the main one access to financing.
Over View of PNG Economy

- PNG is an agro-based economy and agriculture plays a dominant role. PNG produce and export coffee, cocoa, copra, palm kernels, tea, sugar, rubber and vanilla.

- However, recently Mining & LNG has overtaken agriculture. Becoming the dominant player in the economic growth.

- Major Exports include minerals e.g. Gold, copper, silver, nickel and crude oil (LNG), petroleum and agriculture products e.g. timber, coffee, palm oil, cocoa, and copra.

Main Economic Growth Policies and Framework

**VISION 2050** - is the overarching roadmap for the prosperity of the country and aspirations of the people of Papua New Guinea for the next thirty years.

**WEALTH CREATION**

- SME Sector
  - To be the driver in V2050 Wealth Creation under the

National Policies Supporting SME Growth and Expansion;

- Vision 2050 – Wealth Creation
- PNG Development Strategy Plan (DSP) 2010–2030 – Promoting & Supporting SME Sector
- Midium Term Development Plan (MTDP) 2011–2015

**Sect oral Policy Supporting SME Growth and Expansion;**

- Small And Medium Enterprises Policy (1998)

Presentation Outline:

- Overview of PNG Economy
- Main Economic Growth Policy & Framework
  - Sectoral Policies Supporting SME Growth and Expansion;
- Regional Centre for Technology and Innovation (RCTI)
- Summary
- END
SME Constrains in PNG

- Small And Medium Enterprises (SME) Policy (1998) Identified Constraints experienced by the SME Sector
  - Lack of access to Technology
  - Lack of Skilled Human Resources
  - Lack of access to Markets
  - Lack of access to Business information
  - Lack of access to Business Finance
  - Lack of access to Business infrastructure

Regional Centre for Technology & Innovation (RCTI)

- The Appropriate Technology Development Program is a project developed to address the constraints on lack of technologies for the SME Sector as identified in the SME Policy (1998).
  - The project is a ten (10) year sectoral plan approved by the National Executive Council to be funded under PIP but it is a major activity of the Small & Medium Industries (SMI) Section, of the Industry Division.

NEC APPROVAL

- NEC DECISION No. 221/2005, Meeting No. 47/2005 dated 3rd October 2005
  - Directed Department of National Planning and Monitoring to fund the program under Development Budget (PIP)
  - Directed all stakeholders to work with DCI in implementing the program.
  - Endorsed donor funding assistance to the program
  - Directed that the Regional Centre for Technology and Innovation be established to coordinate all activities of the program.

VISION STATEMENT

“Our vision is to promote downstream processing of locally available natural resources into value added products using appropriate technology.”

Objective

- The Industry Division under the Department in rendering its support to the project hope to see the project meet its main objective

Activity

- The main activity of the ID is to monitor the progress of the project (RCTI), guide, promote, and facilitate for other necessary support financially and politically with the aim to see the project a success story.

Resource

- The Industry Division under the Department of Commerce & Industry plays a coordinating role in this project which an officer is required to work closely with the project to provide the necessary support as and when required. In doing so the officer will require K2,000.00 to undertake tasks involved.

Justification

This is a government supported and funded project
FUNDING SOURCES

- NATIONAL GOVERNMENT (PIP)
- PROVINCIAL GOVERNMENTS (Counterpart funding)
- DONOR AGENCIES
- PROJECT SELF FINANCING

Outcome

- To eventually see the expansion of the project which has government support and funding.

Benefit

- The rural population will benefit greatly as they utilize their natural resources, using technologies proven to be appropriate for PNG. The Country will benefit in exports and savings from import substitutions. There will be training of national in manufacture and maintenance of machines. Etc....

IMPLEMENTATION STRATEGIES

1. ESTABLISH COORDINATION CENTRE, THE REGIONAL CENTER FOR TECHNOLOGY & INNOVATION (RCTI)
2. NETWORK WITH MAJOR STAKEHOLDERS
3. PROFILE NATURAL RESOURCES
4. PROFILE APPROPRIATE TECHNOLOGIES
5. DESIGN/MODIFY & MANUFACTURE TECHNOLOGIES
6. PILOT TECHNOLOGIES
7. CARRY OUT EXTENSION SERVICES
   - Technical Training & Commercialization
8. CONDUCT PROJECT MONITORING AND EVALUATION

SECTORS TO BE TARGETED

1. AGRICULTURE & LIVESTOCK
2. COASTAL FISHERIES
3. SMALL SCALE FORESTRY
4. LOW-COST HOUSING
5. RENEWABLE ENERGY
6. RURAL TRANSPORTATION

PROGRESS TO-DATE

ESTABLISHMENT OF COORDINATION CENTRE (RCTI)

- SUCCESSFULLY SOUGHT NEC APPROVAL FOR IMPLEMENTATION OF PROGRAM.
- SUCCESSFULLY SOUGHT GOVERNMENT FUNDING UNDER DEVELOPMENT BUDGET. (2007 – 2011)
- LAUNCHED STRATEGIC PLAN IN JANUARY 2008.
- PREPARED DPM SUBMISSION SEEKING APPROVAL OF RCTI ORGANISATION STRUCTURE.

Con’t...

NETWORKING WITH MAJOR STAKEHOLDERS

HELD CONSULTATIONS WITH:
- 1. NATIONAL GOVERNMENT DEPARTMENTS & STATUTORY AUTHORITIES
- 2. PROVINCIAL GOVERNMENTS/ADMINISTRATIONS
- 3. RESEARCH AGENCIES
- 4. FUNDING AGENCIES
- 5. INTERNATIONAL TECHNOLOGY TRANSFER ORGANIZATIONS
- 6. PRIVATE/SME & INFORMAL SECTOR REPRESENTATIVES
7. SIGNED MOU WITH UNITECH IN 2004.

8. VISITED PROVINCES IN MOMASE AND NEW GUINEA ISLANDS REGIONS, AND GRO AND MILNE BAY PROVINCES IN THE SOUTHERN REGION, TO SEEK VIEWS AND SUPPORT OF THOSE PROVINCIAL ADMINISTRATIONS.

9. IDENTIFIED NATURAL RESOURCES, SKILLED HUMAN RESOURCES, ENGINEERING AND TRAINING FACILITIES.

10. CURRENTLY WORKING ON MOU’S WITH EDUCATION DEPARTMENT ON CURRICULUM DEVELOPMENT, AND SBDC/SIC ON ENGINEERING FACILITIES.

11. MADE INITIAL PAYMENT OF K100,000 TO UNITECH FOR DESIGNING, MANUFACTURE AND TESTING OF IDENTIFIED APPROPRIATE TECHNOLOGIES.

RESEARCH AND DEVELOPMENT WORK (DESIGN, MODIFY & MANUFACTURE TECHNOLOGIES)

RCTI HAS IDENTIFIED (8) PRIORITY INDUSTRIES WITH ABUNDANT NATURAL RESOURCES FOR IMMEDIATE TECHNOLOGY DEVELOPMENT. UNITECH HAS COMMENCED WORK ON IMMEDIATE DEVELOPMENT OF ELEVEN (11) APPROPRIATE TECHNOLOGIES FOR TESTING AND SUBSEQUENT INTRODUCTION TO RESOURCE OWNERS.

1. RICE PRODUCTION
   1.1 RICE DRYER
   1.2 MANUAL RICE HULLER/MILL (AVAILABLE)
   1.3 MANUAL RICE THRESHER

2. COCONUT OIL PRODUCTION
   2.1 ELECTRIC COCONUT SCRAPER (AVAILABLE)
   2.2 COCONUT OIL EXPELLER
   2.3 COCONUT OIL FILTRATION PROCESS

3. CEMENT & CLAY BRICKS PRODUCTION
   3.1 CEMENT BRICK MOULD (AVAILABLE)
   3.2 CLAY BRICK MOULD (AVAILABLE)

4. PEANUT BUTTER PRODUCTION
   4.1 PEANUT BUTTER MAKING MACHINE (AVAILABLE)
   4.2 PEANUT SHELLER
   4.3 PEANUT ROASTER (AVAILABLE)

5. FRUIT JUICE PROCESSING

6. ROOT CROPS PROCESSING

7. RENEWABLE ENERGY (MINI MICRO HYDROS)

8. RURAL TRANSPORTATION

SOME EXAMPLES OF APPROPRIATE TECHNOLOGIES BEING DEVELOPED BY RCTI AND UNITECH, INCLUDING; ……..

AGRICULTURE & LIVESTOCK SECTOR

Manual Rice Mill

Portable Rice Mill

Electric Coconut Scraper

Manual Oil Press
Agriculture Sector,
Con’t…

COASTAL FISHERIES SECTOR

LOW-COST HOUSING/CONSTRUCTION SECTOR

THANK YOU

EM TASOL (MEANS “THE END” IN PIGIN PNG’S COMMON SPOKEN LANGUAGE)
The definition of manufacturing SMEs in Thailand

<table>
<thead>
<tr>
<th>No. of employment</th>
<th>Amount of fixed asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small and Medium enterprise</td>
<td>≤ THB 200 million (~ USD 6.1 million)</td>
</tr>
</tbody>
</table>

Source: The Office of Small and Medium Enterprise Promotion (OSMEP), Thailand

Status of SMEs in Thailand

- The SME sector contributes
  - 99.38% of total enterprises in Thailand
  - 76.05% of total employment
  - only 38.9% of GDP and 31.42% of export
- High risk and economic instability if large enterprises move production base to other countries
- High proportion of SMEs generates income to majority of population
- SMEs is important to Thai economy and competitiveness of the country
- To reduce risk, Thailand needs to strengthen the SME sector in order to improve economic stability and competitiveness

SME’s Needs related to Technology Perspective

Options
1. Buy it
2. Subcontract out
3. Collaboration with alliances
4. Create it by yourself

Obstacle of SMEs
1. Don't know what to do
2. Don't know how to do
3. Don't have staff to do
4. Don't have anyone to help
5. Don't have money to do

Problems and difficulties of SMEs to upgrade their technological capability

Internal constraints
- Lack of finance and access to capital fund because they are small
- Lack of accessibility to information of new technology, knowledge and market insight
- Weak links with knowledge providers e.g. university and research institute, thereby inhibiting knowledge and technology transfer
- Limited resources and low internal capability to perform effective R&D or to spot opportunity for technological development and innovation
- Lack of S&T personal and managerial skills to manage the effective R&D
- Lack of entrepreneurial skills to commercialize their ideas
- Individual perception e.g. risk-adverse, negative to networking with others.

State constraints
- Ineffective of SMEs policy deployment to agencies relating to SME innovation promotion
- Weak links and networking among support agencies
- Limited S&T manpower to support an industrial sector
- Limited financial scheme and support for technological development and innovation in SMEs
Constraints and success factors for Government-University-industry network development

<table>
<thead>
<tr>
<th>From the perspective of public agencies and universities</th>
<th>From the perspective of industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Weak policy measures at middle level</td>
<td>• Discontinuous support, political conflict, and conflict between public agencies</td>
</tr>
<tr>
<td>• Unclear policy for IP management for industrial development projects</td>
<td>• Government/universities: slow to respond and have different perspectives; lack of active support agencies and information centre</td>
</tr>
<tr>
<td>• No motivation and incentives for academic staff</td>
<td>• Limited good experts for machine development and technological consultancy</td>
</tr>
<tr>
<td>• Unclear procedure and poor administration for collaborative projects</td>
<td>• Dishonest of public staff including corruption problem and unfair treat</td>
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<td>• Different point of views and management orientation between academia and business</td>
<td>• Ineffective short-course training, and no specific focus and actual implementation (e.g., too basic subjects, and lack of on-site implementation, good teaching materials, and good instructions)</td>
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<td>• Strict and inflexible process of public agencies that does not support quick response to the demand of industry</td>
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</table>

Success factors of universities and research staff for industrial collaboration and networking

• Continuous projects and support for long-term development and innovation; and based on actual need of industry;
• Clear action plan, project assessment and follow-up systems in each steps of collaborative projects;
• Trustworthiness, patience, commitment and determination of working staff;
• Ability to adjust and accept attitude and culture differences among various parties involved in the projects;
• Allocation of permanent staff to manage and follow up project progress; and
• Professional practices and proactive actions of public staff

Some examples of current SMEs-supporting programs in Thailand

Infrastructure
• 5 Regional Science park: Rental spaces for R&D units of private sector
• University’s Business Incubators

Finance
• Co-investment
• Soft loans
• Tax incentives: R&D projects/donation for R&D

IP services
• Patent searching
• Patent preparation & filing
• Licensing
• Benefit-sharing

Technology transfer / Technology Development
• Intermediary to match industrial needs with the right expert

Country’s interest

• Government support is conducted continually for long-term development
• Monitoring and evaluation system
• Collaboration among SMEs supporting organizations + Systematic workflow
• Intermediary is a catalyst and facilitator to link collaboration between academia and industry
• Country’s focus industry and concrete plan to stimulate development and innovation.

Country’s interest

Industry
• Capital funding for new technology business
• Insufficient number of R&D personnel in industry to increase absorptive capability of industry
Academia
• Rewarding scheme should be improved to encourage academia to work for industry: KPI, benefit sharing-scheme
• Most research results are not commercializable.
### For Region

- Neighbouring: Raw material /create value chain across the region / cluster development
- South and East Asia: Investment in APEC countries
- Latin America: Marketing arm in Latin America Region

  - Share information / research results / patents

### For APEC

- Gather good practices
- Facilitate the adoption of good practices

### Policy recommendations

- Increase high quality S&T manpower to support the industry (e.g. student and staff exchange program, incentive & award establishment to encourage public-private collaboration)
- Strengthen university and support agencies to provide effective services to SMEs
- Improve S&T infrastructure to support private sector investment in research and technological capability development
  - Physical infrastructure (e.g. science park, testing laboratory)
  - Non-physical infrastructure (e.g. legal system, tax incentives, financial support)

### Policy recommendations

- In developing countries, innovation intermediary should be established as a catalyst of innovation process
  - Bridging knowledge providers, support agency and SMEs (mapping & matching supply and demand)
  - Strengthening linkages and creating knowledge networks between knowledge producing agents, industry (mainly SMEs), and government policy and support organizations
  - Provision of management and support for R&D and innovation
  - Financial support for R&D and innovation
Entrepreneurs’ National Program

**Objective**

The Entrepreneurs’ National Program has the objective to promote and enhance in the Mexican’s mind the culture and business development that results in the creation of more and better enterprises through the National Incubators’ Network.

- Source of Enterprises
  - Entrepreneurs’ National Campaign
- To spread the Entrepreneurs’ Program in all the institutions of middle and higher education.

“Factory of Businesses”
- Creation of aggregate value and longevity businesses.
- Creation and consolidation of businesses incubators.

**“Becoming Mexico in an entrepreneurs land”**

Heriberto Guerra

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Entrepreneurs’ Program

**Entrepreneurs’ National Campaign**

- Regional Tours
- “Entrepreneurs’ Day”
- Regional events in 10 different states to promote and encourage entrepreneur activity.
- Exhibition with 50 stands presenting different support options for entrepreneurs, incubators, academic institutions, financial institutions, entrepreneurial organizations and successful graduated business from incubators.
- In addition, 3 thematic conferences, 5 panel discussions regarding to financing, management, innovation, marketing and training.
- Simultaneously, a simulator workshop of traditional and rural businesses.
- This event has the assistance of 1000 entrepreneurs who will receive assistance and information about the range of programs that the Under Ministry for the SME’s offers through the platforms “Mexico taking on business ventures”.

**Advertising Campaign**

Print and electronic media to encourage entrepreneurs’ activity in Mexico.

**Entrepreneurs’ Events**

Invitation to academic institutions, entrepreneurial agencies, social agencies, etc. to promote entrepreneurial activity through different events.

**“Mexico taking business ventures”**

National event with the participation of more than 10,000 young entrepreneurs from all over the country who participated in the Training Program for Entrepreneur Leaders.
**Entrepreneurs' Program**

**Entrepreneurs’ Cards**
- We recognize entrepreneurship through this card, which benefits are a free incubation process, a credit pre-approved of capital seed and the membership to the SME business community.
- The winners in contests and entrepreneurial events, get this card as an award.

**“Entrepreneurs’ Caravan”**
- The Entrepreneurs’ Caravan is a mobile unit (truck trailer) which will go through all the country offering options and opportunities for the entrepreneurs.
- The Caravan will have a simulator, personal assistance, business opportunities, employment opportunities, etc.

**Young Entrepreneurs**
- Support for academic institutions that do not have their own entrepreneur methodology and printing materials for this purpose.

**Training Program for Entrepreneur Leaders**
- It is a training program for youths that have received some methodology for entrepreneurs before, and that present profiles of highly leadership (Entrepreneur Elite).
- Through motivational contents and business skills, the entrepreneurs will work during 10 weeks with multidisciplinary and interinstitutional groups, of 100 youths of each region, will become the source of businesses.

**Entrepreneurs’ Program Goals 2008 - 2012**

**“The Enterprises’ Creation”**

- Vision 2008
  - 1 Mobile unit
  - 10 tours
  - 100 Cards
  - 50 Methodologies (50%)
  - 100,000 Entrepreneurs

- Vision 2012
  - 90 TPEL
  - 4 Mobile units
  - 90 Tours
  - 500 Cards
  - 450 Methodologies (100%)
  - 450,000 Entrepreneurs

**Entrepreneur Card**
- We recognize entrepreneurship through this card, which benefits the winners in contests and entrepreneurial events.

**Business Incubators**

**Entrepreneur Factory**

The National Incubators’ Network is a tool to foster economic growth, to contribute in the creation of more and better enterprises, more and better opportunities.

- The objective is to create and enhance the incubators’ network at national level ensuring the best incubator practices and programs and the appropriate customers services.
- To assist in the creation of innovative enterprises with some added value and competitiveness.
- To take the incubation process to the best practice.

operate the BEST Incubator Policy.

**SME Fund**

**Supports 2008**

**Classifying the Business Incubators**

According with the different kind of the created enterprises, the business is classified:

- Traditional Business
- Intermediary Technology Business
- High Technology Business Incubators

- To support the creation of businesses in traditional sectors with basic requirements of operation. In this classification, incubators are oriented in sectors such as communication and tourism.
- To support the creation of businesses in specialized sectors such as Information and Communication Technologies (ICT’s), microelectronics MEM’s, biotechnology and pharmaceuticals, etc.
The Ministry of the Economy of Mexico considers TechBA to be the top of the iceberg of a whole system of innovation and technology development in local Universities and the United States, generating wealth and jobs in both sides of the border.

Accelerated companies will improve their sales, increasing their national and/or international market share.

Businesses will contribute to the production of innovative products generating new patents.

Its strategic location will allow companies to have more contact with angel and venture capitalists getting the opportunity to expand through this type of financing.

Companies will capitalize the opportunities from joint development of products, processes, materials and/or services of the 25 companies with Universities, Technological Centers and Businesses in Mexico and the United States, generating wealth and jobs in both sides of the border.

The Ministry of the Economy of Mexico considers TechBA to be the top of the iceberg of a whole system of innovation and technology development in local Universities and the United States, generating wealth and jobs in both sides of the border.

There is a whole institutional strategy to support TechBA.
THANK YOU FOR YOUR KIND ATTENTION
Annex D. LIST OF WORKSHOP PARTICIPANTS

1. APEC SPONSORED WORKSHOP PARTICIPANTS

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Name</th>
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<tr>
<td>1</td>
<td>Ms</td>
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<td>3</td>
<td>Mr Sujanarto</td>
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<td>To attend, as required and invited, all sessions and to actively participate in workshop exercise..</td>
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<td>Mr Mohd Shazni Saringat</td>
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<td>Mr</td>
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<td>Mr</td>
<td>Bede Tomokita</td>
<td>PNG</td>
<td>Acting First Assistant Secretary - Industry Division</td>
<td>Department of Commerce &amp; Industry</td>
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<td>Zenaida Pre</td>
<td>Philippines</td>
<td><a href="mailto:Zpre2000@yahoo.com">Zpre2000@yahoo.com</a></td>
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2. APEC NON-SPONSORED WORKSHOP PARTICIPANTS

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<td>1</td>
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<td>3</td>
<td>Mr</td>
<td>Ir. I Wayan Dipta, M.Sc</td>
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<td>(021) 3169441-2, 3169378 08128374185</td>
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<td>Ministry of Cooperatives and SMEs, Republic of Indonesia</td>
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<td>12</td>
<td>Ms</td>
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<td>To attend, as required and invited, all sessions and to actively participate in workshop exercise..</td>
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<td>13</td>
<td>Ms</td>
<td>Airin Rachma</td>
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<td>Staff at the intra-regional Cooperation Director ASPASAF</td>
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<td>To attend, as required and invited, all sessions and to actively participate in workshop exercise..</td>
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<td>14</td>
<td>Mr</td>
<td>Bayu Fajar Nugroho</td>
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<td>Ms Lia Puji Lestari</td>
<td>Staff at the Director General of Small and Medium Enterprises</td>
<td>Ministry of Industry Republic of Indonesia</td>
<td><a href="mailto:einno_kagayaki@yahoo.com">einno_kagayaki@yahoo.com</a> (021) 5251761, 5251449 081310323790</td>
<td>To attend, as required and invited, all sessions and to actively participate in workshop exercise..</td>
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<td>16</td>
<td>Mr Ari Gunawan, SE</td>
<td>Head of research procedure</td>
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<td>085711221144</td>
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<td>17</td>
<td>Mr M. Supriyadi, ST</td>
<td>Staff</td>
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<td>18</td>
<td>Mr Indra Wiryawan</td>
<td>Staff</td>
<td>Ministry of Cooperatives and SMEs, Republic of Indonesia</td>
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<td>DR. Ir. Ugay Sugarmansyah</td>
<td>Indonesia</td>
<td>Director of the Center for Technology Innovation Policy Assessment</td>
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<td>20</td>
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<td>Drs. Syamsuddin, MM</td>
<td>Indonesia</td>
<td>Deputy Assistant for cooperative research, Ministry of Cooperatives and SMEs, Republic of Indonesia</td>
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<td>Mohammad Iqbal</td>
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<td>22</td>
<td>Mr L Pandu Pamardi</td>
<td>Indonesia</td>
<td>Manager</td>
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<tr>
<td>23</td>
<td>Mr Alex Widjaja</td>
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<td>Manager</td>
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<td>Ms Raeti</td>
<td>Indonesia</td>
<td>Chairman of Public Relations</td>
<td>Farmer and Patchouli Entrepreneur Association of Indonesia</td>
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<td>Mr Syihabuddin, SE</td>
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<td>Farmer and Patchouli</td>
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<td>Ms Nuraini</td>
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<td>Direktor</td>
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<td>27</td>
<td>Ms Gita Triantika</td>
<td>Indonesia Direktor PT Pemalang Agro Wangi</td>
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<td>28</td>
<td>Ms Ida Busneti, SE. MM.</td>
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<td>29</td>
<td>Ms</td>
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<td>32</td>
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<td>DR. Anwar Sitomulp</td>
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<td>33</td>
<td>Mr Suharyanto, Indonesia</td>
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<td>0274) 546111, 512456, 543582</td>
<td>Invited, all sessions and to actively participate in workshop exercise.</td>
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<td>34</td>
<td>Mr Ir. Patoni A Ghafar, M.Sc</td>
<td>Head of Competence Development and Technology Transfer, Center for Agro Industry</td>
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<td>35</td>
<td>Mr Dr. Ir. Rizal Alamsyah, M.Sc</td>
<td>Head of Facilities and Standardization Research, Center for Agro</td>
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# Annex E

## Annex E. LIST OF SPEAKERS

### 1. APEC SPONSORED SPEAKERS

- **LIST OF INVITED SPEAKERS, TOPICS, AND GUIDANCE IN WRITING THE PRESENTATION FUNDED BY APEC**

<table>
<thead>
<tr>
<th>No</th>
<th>Name of Speaker and Institution (Program, dates invited)</th>
<th>Address</th>
<th>Topic of Presentation</th>
<th>Guidance for Presentation Content</th>
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<tr>
<td>1</td>
<td>DR. Lih-Woe Chen, Division Director, Venture Incubation &amp; Investment Division of Commercialization and Industry Service Center (CIS) of Industrial Technology Research Institute (ITRI) 7-8 February 2012</td>
<td><a href="mailto:lewislw@itri.org.tw">lewislw@itri.org.tw</a></td>
<td><strong>Current State of the Art of Technology Development in SMEs and Their Constraint in Access to Technology</strong></td>
<td>How is the performance of SMEs, especially with respect to output growth, productivity, export intensity, concentration or diversification of products, subcontracting with large enterprises (LEs), including multinational companies (MNCs), involved in regional/global supply chains/production networks? How SMEs have been doing in developing their technologies and conducting innovations? What are the main sources of technology for SMEs: LEs/MNCs, universities, R&amp;D institutes, or government agencies (e.g. Ministry of Industry)? What are the main constraints that SMEs facing in access to advanced technology and knowledge and how they cope with those constraints? What is the best practice for SMEs to improve their technology and to increase their ability to do innovations?</td>
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<td><strong>The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs</strong></td>
<td>How has the government been doing in supporting capacity building in SMEs, especially with respect to technology and innovations? Has technology development or innovation been given</td>
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# APEC Workshop on SMEs' Access to Technology

## Jakarta, Indonesia, 7-9 February 2012

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<td>2</td>
<td>Prof. Shigeo Kagami, Professor, General Manager – Science Entrepreneurship and Enterprise Development (SEED), Division of University Corporate Relations, The University of Tokyo 7-8 February 2012</td>
<td><a href="mailto:Kagami@ducr.u-tokyo.ac.jp">Kagami@ducr.u-tokyo.ac.jp</a></td>
<td>Key Determinants behind the Success Stories of Technology Development in SME</td>
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**Key Determinants behind the Success Stories of Technology Development in SME**

What are the key determinants of successful SMEs in capacity building in technology and innovations? Do the level of entrepreneurship and the level of education of the owners play key roles in those successful SMEs? Are market structures and trade regime (i.e. free trade versus protectionism) effect the successful SMEs in innovations? Are ‘external factors’ (e.g. business environment, economic stability, government supports, market structure, infrastructure, demand/competition pressure) more important than ‘internal factors’ (e.g. social and educational background, and motivation of the owners, skills of the workers, capital) in determining the capability of SMEs to improve their technology and to do innovations? What are the roles of Business Development Services in technology development for SMEs?

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**The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs**

How has the government been doing in supporting capacity building in SMEs, especially with respect to technology and innovations? Has technology development or innovation been given the highest priority in SME policy? What kind of programs introduced by the government, and do they meet the real needs of SMEs? Are they effective; if not, what are the main problems?
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<tbody>
<tr>
<td>3</td>
<td>Mr. Junghwa Lee, Director, Small Medium Business Administration (SMBA) of Korea</td>
<td><a href="mailto:wooyang@smgba.go.kr">wooyang@smgba.go.kr</a></td>
<td>The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs</td>
<td>How has the government been doing in supporting capacity building in SMEs, especially with respect to technology and innovations? Has technology development or innovation been given the highest priority in SME policy? What kind of programs introduced by the government, and do they meet the real needs of SMEs? Are they effective; if not, what are the main problems?</td>
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<td>4</td>
<td>Prof. Tulus Tambunan, Professor-Economics, The Center for Industry, SME and Business Competition Studies Faculty of Economics, University of Trisakti., Jakarta, Indonesia</td>
<td><a href="mailto:sjahrir@rad.net.id">sjahrir@rad.net.id</a></td>
<td>Current State of the Art of Technology Development in SMEs and Their Constraint in Access to Technology</td>
<td>How is the performance of SMEs, especially with respect to output growth, productivity, export intensity, concentration or diversification of products, subcontracting with large enterprises (LEs), including multinational companies (MNCs), involved in regional/global supply chains/production networks? How SMEs have been doing in developing their technologies and conducting innovations? What are the main sources of technology for SMEs: LEs/MNCs, universities, R&amp;D institutes, or government agencies (e.g. Ministry of Industry)? What are the main constraints that SMEs facing in access to advanced technology and knowledge and how they cope with those constraints? What is the best practice for SMEs to improve their technology and to increase their ability to do innovations?</td>
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### 2. APEC NON SPONSORED SPEAKERS

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<th>Guidance for Presentation Content</th>
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<tr>
<td>1</td>
<td>DR. Tatang A Taufik, BPPT, 7-8 February 2012</td>
<td></td>
<td>The Role of R&amp;D Institutes/Universities in Supporting Technology Development/Innovations in SMEs (Including transfer of technology to SMEs)</td>
<td>How have R&amp;D institutions and universities been playing a role in transferring technologies to SMEs or have they been the key source of technology for SMEs? In what forms or how have SMEs being supported for their technology upgrading and innovation by R&amp;D institutes and universities? What are the main obstacles, from the perspective of suppliers of technology and knowledge (i.e. R&amp;D institutes and universities) as well as from the perspective of potential users of technology and knowledge (i.e. SMEs), in doing collaborations between SMEs and the suppliers in technology development and innovation? What is the best practice to strengthen the cooperation between SMEs and the suppliers of technology and knowledge?</td>
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<td></td>
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<td>The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs</td>
<td>How has the government been doing in supporting capacity building in SMEs, especially with respect to technology and innovations? Has technology development or innovation been given the highest priority in SME policy? What kind of programs introduced by the government, and do they meet the real needs of SMEs? Are they effective; if not, what are the main problems?</td>
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<tr>
<td>2</td>
<td>Mr Lucas T Prawira, CISCO 7 February 2012</td>
<td></td>
<td>Key Determinants behind the Success Stories of Technology Development in SME</td>
<td>What are the key determinants of successful SMEs in capacity building in technology and innovations? Do the level of entrepreneurship and the level of...</td>
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<td>3</td>
<td>Mr Mike Orgill, Google</td>
<td>The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs</td>
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<td>How has the government been doing in supporting capacity building in SMEs, especially with respect to technology and innovations? Has technology development or innovation been given the highest priority in SME policy? What kind of programs introduced by the government, and do they meet the real needs of SMEs? Are they effective; if not, what are the main problems?</td>
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<td>4</td>
<td>Mr. Franz Gelbke, German Advisor for Business and Technology Transfer, Ministry of Research and Technology, Republic of Indonesia</td>
<td>The Role of R&amp;D Institutes/Universities in Supporting Technology Development/Innovations in SMEs (Including transfer of technology to SMEs)</td>
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<tr>
<td>7 February 2012</td>
<td><a href="mailto:gelbke@btc-network.com">gelbke@btc-network.com</a></td>
<td>How have R&amp;D institutions and universities been playing a role in transferring technologies to SMEs or have they been the key source of technology for SMEs? In what forms or how have SMEs being supported for their technology upgrading and innovation by R&amp;D institutes and universities? What are the main obstacles, from the perspective of suppliers of technology and knowledge (i.e. R&amp;D institutes and universities) as...</td>
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### Key Determinants behind the Success Stories of Technology Development in SME

What are the key determinants of successful SMEs in capacity building in technology and innovations? Do the level of entrepreneurship and the level of education of the owners play key roles in those successful SMEs? Are market structures and trade regime (i.e. free trade versus protectionism) effect the successful SMEs in innovations? Are ‘external factors’ (e.g. business environment, economic stability, government supports, market structure, infrastructure, demand/competition pressure) more important than ‘internal factors’ (e.g. social and educational background, and motivation of the owners, skills of the workers, capital) in determining the capability of SMEs to improve their technology and to do innovations? What are the roles of Business Development Services in technology development for SMEs?
1. **Presentations on “Current State of the Art Technology Development in SMEs and Their Constraint in Access to Technology”**.

From the discussion, it has been found that in overcoming these constraints, governments can have a significant role in encouraging SMEs to utilize advanced technologies. It was recommended for the governments to formulate policy assessment on national advantages and disadvantages that could provide some insights and directions for the SMEs on what the customers really need. Conducive business environment is also necessary to support R&D activities among SMEs, such as provision of incentives thus the technologies become more affordable to the SMEs, as well as subsidizing and funding program.

2. **Presentations on “The Role of R&D Institutes/Universities in Supporting Technology Development/Innovations in SMEs (Including Transfer of Technology to SMEs)”**

From the discussion, it has been found that intermediaries are significant to play a role between research institutions and SMEs. In a country like Japan, local banks serve to meet the gaps between two parties and support in terms of licensing, patents and agreements. Government can also have a role in boosting the quantity of companies which are willing to cooperate with research institutions by providing them tax subsidy and incentives.

3. **Presentations on “Key Determinants behind the Success Stories of Technology Development in SME”**.

From the discussion, it has been found that the most important key determinant factor is working more with the market demands. Moreover, to strengthen the cooperation between universities and SMES, it is stated that legal enforcements are necessary. It should be obliged by the law for universities to support community development such as in research and create start-up models for SMEs. To address the issue on bringing financial supports for projects, there are several approaches that can be taken, such as:
• Through collaborated research projects with private companies
• Collaboration between government, universities and SMEs in gathering the funds. The government might double the modal in funding the project.

4. Presentations on “The Difference between Experience in Formulating and Implementing Technology Development Policy for SMEs”.

From the discussion, it was found that government has an important role to reduce the barrier in bringing their business online. The government should also invest in facilitating and educating SMEs to use internet as means for business. In the discussion about what proper security net should provide in case of failure, there were best practices from Japan and Korea. In Japan, there is a mentoring system to assist the university start-ups entrepreneur to go the right path. In Korea, failures do not awarded with penalty. If a certain SME fail, they are given another chance to apply one more time in the program.