

APEC Center for Technology Foresight  
**2014 International Advisory Board Meeting Minute**



12<sup>th</sup> of November 2014  
Bangkok, Thailand

APEC Center for Technology Foresight  
National Science Technology and Innovation Policy Office

## 2014 IAB Meeting Minute

**Date:** 12<sup>th</sup> of November 2014

**Time:** 9.30 – 20.00 hrs

**Venue:** The Sukosol Bangkok Hotel

**Hosted by:** National Science Technology and Innovation Policy Office, Thailand

**Attendance:**

**International Advisory Board Members:**

- |                                 |                              |
|---------------------------------|------------------------------|
| 1. Dr. Richard Silbergitt       | USA (Chair)                  |
| 2. Prof. Dr. Masuo Aizawa       | Japan                        |
| 3. Dr. Kerstin Cuhls            | Germany (virtual attendance) |
| 4. Prof. Dr. Jung Won Lee       | Korea                        |
| 5. Adj. Prof. John Edward Smith | Canada                       |
| 6. Dr. Chatri Sripaipan         | Thailand                     |

**Secretary:**

Dr. Surachai Sathitkunarath Executive Director, APEC CTF

**APEC CTF Staff:**

- |                                 |                          |
|---------------------------------|--------------------------|
| 1. Dr. Angkarn Wongdeethai      | Policy Specialist        |
| 2. Dr. Charnwit Udomsakdigool   | Policy Specialist        |
| 3. Dr. Jakapong Pongthanaisawan | Senior Policy Researcher |
| 4. Dr. Warong Sukchotrat        | Senior Policy Researcher |
| 5. Ms. Sopida Tongsovit         | Senior Policy Researcher |
| 6. Ms. Supak Virunhakarun       | Senior Policy Researcher |
| 7. Dr. Srichattra Chaivongvilan | Senior Policy Researcher |
| 8. Ms. Nisara Jantarapatin      | Policy Researcher        |
| 9. Ms. Sirinya Lim              | Policy Researcher        |
| 10. Dr. Apichat Aphaiwong       | Policy Researcher        |

11. Ms. Siriporn NamDang                      Project Coordinator

**Apologies:**

- |                                |           |
|--------------------------------|-----------|
| 1. Prof. Dr. S.K. Chou         | Singapore |
| 2. Prof. Dr. Ron Johnston      | Australia |
| 3. Prof. Dr. Lan Xue           | China     |
| 4. Prof. Dr. Terutaka Kuwahara | Japan     |

## **1. Introduction**

### **1.1 Greetings by Chair and Executives**

Dr. Richard Silbergitt, Chair of the Board, welcomed the board members to the 14<sup>th</sup> IAB Meeting. Dr. Chatri Sripaipan participated in the morning session, and Dr. Kerstin Cuhls joined the meeting via Skype in the afternoon session.

### **1.2 Adoption of Agenda**

The Chair asked for an adoption of agenda. The agenda was adopted with no objections.

### **1.3 Brief Introduction of APEC CTF**

Dr. Surachai reported the transition of APEC CTF from the Industrial Science and Technology Working Group (ISTWG) to the Policy Partnership on Science Technology and Innovation (PPSTI) Working Group. The development of APEC PPSTI was reported in a later session.

#### **1.4 Roles and Renewal of IAB Members and Election of New Members**

Dr. Silberglitt mentioned that the membership of 5 IAB members, namely, Dr. Richard Silberglitt, Prof. Dr. S. K. Chou, Prof. Dr. Ron Johnston, Prof. Terutaka Kuwahara, and Prof. Dr. Lan Xue, would expire this year. Therefore, the board needed to identify candidates and submit a list to Dr. Pichet for review and approval before nomination.

Dr. Surachai described the roles of IAB and regulations of IAB membership. The IAB candidate list was proposed and discussed as followed:

1. PPSTI Chair/Secretary. This was proposed by Dr. Pichet due to a concern of connection with PPSTI. However, it is difficult to appoint these positions as the Chair is rotated and the Secretary focuses mainly on administration.
2. Dr. Angela Wilkinson, Counsellor for Strategic Foresight at OECD, proposed by Dr. Surachai.
3. Ms. Joan Moh, Head of the Centre for Strategic Futures (CSF), Public Service Division, Prime Minister Office, Singapore. This was proposed by Dr. Surachai as the unit does practical foresight activities for their government but they seems to keep their strategy confidential and does not reveal to others.
4. Dr. Bach Tan Sinh, Deputy Director of Research Centre of S&T Policy, National Institute for Science and Technology Policy and Strategic Studies (NISTPASS), Ministry of Science and Technology, Vietnam. This was proposed by Dr. Surachai because of his impressive contribution to the “Integrated Foresight for Sustainable Economic Development and Eco-Resilience in ASEAN Countries: Food - Energy - Water Nexus” project.
5. Dr. Jet P. H. Shu, a professor at Automotive Engineering Department, National Taipei Technology, and an advisor for science and technology at Department of Industry Technology (DoIT), the Ministry of Economic Affairs (MOEA), Chinese Taipei. This was proposed by Dr. Surachai as Dr. Shu works in technology foresight, in particular, for industries in Chinese Taipei, and at present he is the leader of Chinese Taipei delegations in APEC PPSTI, implying loud voice in the working group.

6. Dr. Alexander Sokolov, Director of International Research and Educational Foresight Centre, and a tenured professor at Higher School of Economics (HSE), National Research University, Russia. This was proposed by Dr. Surachai because of fast development and progress of foresight activities in Russia, especially, at HSE. Nonetheless, the possibility is low due to political situation in Russia.
7. Dr. George H. Atkinson, formerly a professor at Arizona State University, a founder of the International Science and Technology Policy Development, and formerly the Science Advisor to the US Secretary of the States, proposed by Dr. Silberglitt.
8. Steven W. Popper, Deputy Director of Science and Technology Policy Institute at RAND Corporation which supports the US President's Science Advisor, proposed by Dr. Silberglitt.
9. Robert J. Lempert, who has run a long-term foresight study for human condition in general at RAND Corporation, proposed by Dr. Silberglitt.
10. Philip S. Anton, who has worked in acquisition technology policy and global technology evolution studies at RAND Corporation, proposed by Dr. Silberglitt.
11. Prof. Mu Rongping, Chinese Academy of Science, proposed by Adj. Prof. Smith.
12. A candidate from Australia would be proposed by Prof. Johnston.
13. Another candidate from China would be proposed by Prof. Xue.

**Idea sharing and suggestions:**

- Prof. Aizawa recommended Dr. Jet P. H. Shu.
- Dr. Sripaipan supported Dr. Bach Tan Sinh as a candidate from a developing country.
- Adj. Prof. Smith also supported Dr. Bach Tan Sinh, Ms. Joan Moh, and a candidate from the US for regional representation, either Dr. George H. Atkinson or Steven W. Popper.
- Prof. Lee recommended that candidates should include not only from APEC PPSTI committee which is difficult but also from other national

organizations or working groups with various sectors, and Finland is also an active country in terms of foresight.

- Dr. Surachai asked Prof. Lee to recommend a candidate from government organizations as last month STEPI had a conference on Government Foresight Network. Prof. Lee mentioned that a list of candidates from UNESCO, Finland, Canada, OECD, USA, India, and Japan could be provided.

### **1.5 Introducing Staffs of the Center**

All 12 current staffs presented their current position, education background, area of interest, expertise, and recent project involvement to the board. There are 5 new members, namely, Dr. Charnwit, Dr. Warong, Ms. Sirinya, Dr. Apichat, and Ms. Siriporn.

1. Dr. Surachai Sathitkunararat	Executive Director
2. Dr. Angkarn Wongdeethai	Policy Specialist
3. Dr. Charnwit Udomsakdigool	Policy Specialist
4. Dr. Jakapong Pongthanaisawan	Senior Policy Researcher
5. Dr. Warong Sukchotrat	Senior Policy Researcher
6. Ms. Sopida Tongsovit	Senior Policy Researcher
7. Ms. Supak Virunhakarun	Senior Policy Researcher
8. Dr. Srichattra Chaivongvilan	Senior Policy Researcher
9. Ms. Nisara Jantarapatin	Policy Researcher
10. Ms. Sirinya Lim	Policy Researcher
11. Dr. Apichat Aphaiwong	Policy Researcher
12. Ms. Siriporn NamDang	Project Coordinator

## **2. Adoption of the Last IAB Meeting Minute (2013)**

The Chair asked for an adoption of the last IAB meeting minute. The agenda was adopted with no objections. Dr. Kerstin Cuhls's position would be corrected by changing from an observer to an IAB member.

## **3. Report of Activities (October 2013 – October 2014)**

Dr. Surachai mentioned that there were many uncertainties last year from both the government and within STI Office. As APEC CTF is hosted by STI Office, the Center had to follow the previous government policy and directions before the coup d'état. After the coup, every sector in Thailand had to reform themselves. STI Office was assigned to lead Thailand STI Reform, and subsequently, STI Office organized many events around the nation to gather ideas and suggestions from relevant stakeholders. Dr. Pichet also asked APEC CTF to adopt foresight tools for these events, for instance, by applying Card Techniques, Technology Roadmapping, and Scenario Building.

Soon after, Dr. Pichet, Secretary General of STI Office, has been appointed as a member of parliament for Ministry of Science and Technology. In addition, Assoc. Prof. Somchai Chatratana, Deputy Secretary General of STI Office, has been appointed as Deputy Secretary General of Prime Minister or Secretary of Prof. Dr. Yongyuth Yuthavong, Deputy Prime Minister. This implies a potential channel for implementation of STI policies, nevertheless, APEC CTF had to devote human resources of the Center to Thailand STI Reform. Moreover, by comparison with this year, there were substantially more foresight activities conducted last year, including small events. This is due to an advice from Dr. Pichet that APEC CTF should carry out big-impact projects this year.

Dr. Surachai also reported that this year the governance, administration, and progress of activities within APEC PPSTI are fast-moving. Dr. Surachai and Dr. Angkarn participated and significantly contributed to PPSTI meetings in China. The team presented a concept note of an APEC CTF project which was ranked

first among six other projects. Details of the project was reported in a later session.

### **3.1 Foresight Projects**

#### **3.1.1 Integrated Foresight for Sustainable Economic Development and Eco-Resilience in ASEAN Countries: Food - Energy - Water Nexus**

Dr. Warong reported the progress on revision of a project report “Integrated Foresight for Sustainable Economic Development and Eco-Resilience in ASEAN Countries”. This project, in agreement with the ASEAN Krabi Initiative’s vision of the ASEAN leaders in promoting “Science, Technology and Innovation for a Competitive, Sustainable, and Inclusive ASEAN”, was managed by APEC CTF of the National Science Technology and Innovation Policy Office (STI), in partnership with the Rockefeller Foundation. The aim was to apply an integrated foresight approach coupled with sustainable economic and ecological choices to develop strategies and actions that advance science, technology, and innovation for inclusive development of ASEAN countries. The results of the project are intended for formulation of a new set of insights about what may be possible in terms of stable, productive, and innovative employment prospects in the emerging ASEAN economies by 2020, after the completion of the ASEAN Economic Community (AEC) in 2015.

#### **Idea sharing and suggestions:**

- Adj. Prof. Smith suggested that APEC CTF should continue on the implementation of this project as Dr. Pichet is now in a key position in the government, and this should improve the economy of the country by uses of foresight activities. Dr. Silberglitt agreed that it is a rare opportunity that STI Office now has leadership in the government, so there should be concrete recommendations. Dr. Surachai mentioned that the revision of this report was proposed to Dr. Pichet and was suggested that APEC CTF should make stronger recommendations,



engage stakeholders, and make use of this report. In an afternoon session, there would be a discussion on a project linked with this report.

- Prof. Dr. Aizawa mentioned that in the last meeting Dr. Pichet suggested that this meeting should be much more active. Dr. Aizawa also commented that this report has two layers - policy in general and Thailand STI policy - and they sometimes overlap. Therefore, APEC CTF has to be careful to describe both aspects, and Dr. Pichet would like the IAB to discuss for policy in Thailand. Dr. Surachai explained that as APEC CTF works for APEC but is hosted by STI Office, APEC CTF has to adapt to work for both APEC and the national organization. And this year APEC CTF proposed a project to APEC PPSTI Working Group, which will be discussed in the afternoon.
- Dr. Silbergliitt pointed out that from the report, the recommendations would be separated into local, national, and region levels, and now it is a special opportunity to implement recommendations at the national level. Dr. Surachai mentioned that there are signals from Dr. Pichet's policy that there are attempts to work beyond Thailand, for example, Science Diplomacy project that firstly focuses on ASEAN, and on other regions afterwards.

### **3.1.2 Innovation Futures in APEC: Competitiveness and Grand Challenges**

Dr. Apichat reported an ongoing APEC PPSTI project entitled "Innovation Futures in APEC: Competitiveness and Grand Challenges". In collaboration with the National Science and Technology Development Agency (NSTDA), APEC CTF proposed this project with an objective to integrate foresight tools such as Horizon Scanning, Real-Time Delphi survey, Expert Panels, and Key Technology, to understand the dynamics of innovation system by identifying emerging markets, key drivers, technology trends, technology readiness level, key technology, and requirements, and to strengthen collaboration among private sectors, governmental organizations, and academia through participation in training and exercises on foresight methodology as well as

international workshops and online surveys. This will raise awareness of investment in key technologies and their readiness, resulting in a change in directions of science, technology, and innovation at a national level and simultaneously promote technology transfers across APEC economies.

**Idea sharing and suggestions:**

- With a slide showing criteria for Key Technology exercise, Dr. Apichat explained to Dr. Silberglitt about the word “opportunity” of criteria under attractiveness parameter that this implied importance and impacts rather than feasibility, and the criteria shown were only examples for presentation of Key Technology methodology.
- Dr. Surachai responded to Adj. Prof. Smith’s question on how to include public policy barrier in Key Technology Exercise that it would be indicated by criteria under feasibility parameter.
- Dr. Silberglitt commented that this is a challenging project because on a 2-dimensional graph from Key Technology results, APEC CTF needs to define benefits in some ways along one axis while defining probability of achieving the goal on the other axis. The most important task is to have clear definitions of each variable and its scores, and it is difficult to define Technology Readiness Levels (TRLs) as everyone looks at them differently. Several projects in the US that involved TRLs were not good due to a problem with definitions of TRLs. Dr. Silberglitt also suggested that the Delphi survey should be submitted to the board for review, and it will take some time to complete the design of the survey.
- Prof. Dr. Aizawa suggested that the handout of the presentation and the proposal of the project should be provided to the board for discussions in an afternoon session.

### **3.1.3 Thailand's National Materials Technology Development Framework**

Dr. Jakapong reported a project by APEC CTF, the National Science Technology and Innovation Policy Office (STI), in collaboration with the National Metal and Materials Technology Center (MTEC), a member of the National Science and Technology Development Agency (NSTDA), to explore vision and strategic plan of national Materials technology development framework for Thailand's industrial sectors. Three foresight workshops were organized during November 2013 and January 2014 with application of foresight tools such as Scenario Building, Technology Roadmapping, and Stakeholder Analysis. The target industrial sectors include automotive and auto part, machinery, rail transport infrastructure, food and agriculture, energy, garment, construction, electronics, medicine and health care, and packaging.

#### **Idea sharing and suggestions:**

- Adj. Prof. Smith inquired boundaries between Materials Framework and Nanotechnology Framework. Dr. Silbergliitt also asked for description of importance of particular Materials applications. Dr. Sripaipan mentioned that there should be identification of levels of technologies.
- Prof. Dr. Aizawa mentioned that as the world is quickly moving to the next generation of manufacturing, when holding workshops APEC CTF should be careful not to concentrate only on current situations as this would provide narrow views of foresight. Prof. Dr. Lee also mentioned that in Korea it is believed that the core of, for example, 3D printing manufacturing is materials, not the system.
- Dr. Jakapong responded to Prof. Dr. Lee's question on the roles of the government and private sectors that now APEC CTF is analyzing the linkage and knowledge flow between them, and the roles of each actor. Dr. Silbergliitt suggested to explore advancement manufacturing from develop economies that Thailand could adapt.

### **3.1.4 Thailand National STI Reform Forum**

Dr. Charnwit reported the “Science Technology and Innovation Reform Forum for Thailand”, by the National Science Technology and Innovation Policy Office (STI), Ministry of Science and Technology (MOST), for the preparation of the Science Technology and Innovation Reform Proposal. By brainstorming with card technique for foresight of science, technology, and innovation policy for Thailand in the next ten years, a forum in Bangkok provided three STI policy issues: STI and national development plan, system of budget allocation, and regulation and management system for STI. In addition, three fora were arranged in Chiang Mai (Northern), Khonkhan (Northeastern), and Songkla (Southern) to provide two issues: STI for industrial development, and STI for social and environmental development.

#### **Idea sharing and suggestions:**

- Prof. Dr. Aizawa suggested that with this big plan, STI Office has to be careful to design the role of science, technology, and innovation. Science and technology should be a driver to obtain innovation, but this plan is to find outputs of STI. The STI investment at 1% of GDP must be separated into contributions from the government (including universities and industries) and from the industrial sector.
- Adj. Prof. Smith asked how foresight involved in this project, and how well the structure is being prepared. Adj. Prof. Smith also commented that there should be more contributions from the private sector.

## **3.2 Networking**

### **3.2.1 NISTPASS visit for Thailand’s experience in science and technology integration with ASEAN member countries**

Dr. Apichat reported a visit of delegates from the National Institute for Science and Technology Policy and Strategy Studies (NISTPASS) Vietnam at STI Office in November 2013. APEC CTF also arranged meetings for delegations with several organizations in Bangkok.

### **3.2.2 UK-Thailand Workshop: Science and Foresight for Strategic Flood Risk Management**

Dr. Surachai reported that the British Embassy organized a one-day workshop on foresight and science for flood risk and climate change in Bangkok in November 2013, and invited Dr. Surachai to give a presentation on “Foresight and Science to inform public policy” in the foresight and strategy session.

### **3.2.3 UN ESCAP Nexus**

Dr. Surachai reported that the Asia nexus dialogue on “Water Infrastructure Solutions for the Food-Energy-Water Nexus” was organized prior to the World Water Day 2014 (WWD2014) in March 2014, and Dr. Surachai was invited to give a presentation on the topic “Integrated Foresight for Sustainable Economic Development and Eco-Resilience in ASEAN Countries” in the nexus case study in Asia session.

### **3.2.4 International Foresight Conference, Japan**

Dr. Surachai reported an international conference entitled “the 5<sup>th</sup> international conference on foresight: foresight activities for solving societal issues”, organized by the National Institute of Science and Technology Policy (NISTEP) in February 2014 in Tokyo, where Dr. Surachai was invited to speak on the topic “Integrated Foresight for Sustainable Economic Development and Eco-Resilience in ASEAN Countries”. In addition, Dr. Surachai also participated in a workshop on future scanning entitled “Futures with water: Too much and too little (2034)”, organized by NISTEP.

#### **Idea sharing and suggestions:**

- Dr. Surachai reported to Dr. Silbergliitt that the organizer of the workshop sent Dr. Surachai a report on future scanning of water. This could be of helpful for other APEC CTF projects.

### **3.2.5 Collaboration with Foresight and S&T Research Institutes in Chinese Taipei**

Dr. Angkarn reported that in June 2014, APEC CTF organized a visit of Taiwanese researchers from Industrial Technology Research Institute (ITRI) and Taiwan Institute of Economic Research (TIER) and facilitated high-level meetings with several leading S&T research institutes in Thailand. In September 2014, ITRI and TIER organized an innovation foresight workshop called “InnoSight Workshop 2014: A New Vision for Industry Technology”, where Dr. Angkarn, as an APEC CTF representative, requested for closed meetings with key stakeholders who are responsible for Taiwanese national foresight projects. In August 2014, APEC CTF visited key foresight stakeholders under Ministry of Economic Affairs (MOEA), and had a meeting with the Department of Foresight and Innovation Policies - a foresight unit under Ministry of Science and Technology (MOST) in Taipei.

#### **Idea sharing and suggestions:**

- Adj. Prof. Smith mentioned that it is a strategic partnership with ITRI, and Dr. Silberglitt would like to discuss scenarios generated by Chinese Taipei in the afternoon.

### **3.3 Trainings**

#### **3.3.1 The 2<sup>nd</sup> Science Technology and Innovation Policy Management Program (STI-PMP)**

Dr. Jakapong reported “the 2<sup>nd</sup> Science Technology and Innovation Policy Management Program (STI-PMP)” by the National Science Technology and Innovation Policy Office (STI), in support of Thailand’s National Science Technology and Innovation Policy and Plan (2012-2021). The aim of the program was to provide STI knowledge base to executive directors and high-level policy makers from different organizations for further integration on STI with other sectoral policies. Several foresight tools, namely, Scenario Building, Future Wheels, Delphi survey, and SWOT analysis, were employed

in a workshop of the program, generating an outcome as precise view of challenges and opportunities in science, technology, and innovation system, and development of strategic policies and measures.

### **3.3.2 Foresight lecture, Siam University**

Dr. Surachai reported foresight lectures given to undergraduates of Siam University. The lectures aimed to educate 4,000 university students on foresight thinking, foresight tools, and case studies and lesson learn of APEC CTF.

### **3.3.3 Foresight course, Thammasat University**

Dr. Surachai reported the formulation of a university course entitled “Technology Foresight and Roadmapping”, and lectures given to graduate students of Innovation College, Thammasat University. The lectures aimed to teach graduate students on technology foresight, foresight tools, both theory and practice, in particular Technology Roadmapping.

## **3.4 Consultancies in APEC Economy**

### **SEAMEO Regional Study and Development of Post-2015 Education Agenda in Southeast Asia**

Dr. Angkarn reported that in June 2014, APEC CTF facilitated a brainstorming workshop for the Southeast Asian Ministers of Education Organization (SEAMEO) survey project to build preferable depiction of the Post-2015 Education in Southeast Asia. The project entitled “Survey on Education Scenario and Education Agenda in Southeast Asia beyond 2015”, conducted by SEAMEO in partnership with the National Institute of Science and Technology Policy (NISTEP), Ministry of Education, Culture, Sports, Science, and Technology (MEXT) Japan, and APEC CTF, the National Science

Technology and Innovation Policy Office (STI) Thailand, involved SEAMEO's key partners including the Institute for the Promotion of Teaching Science and Technology (IPST) Thailand, Burapha University Thailand, the Thailand-United States Education Foundation (Fulbright Thailand), the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the United Nations Children's Fund (UNICEF). APEC CTF also provided suggestions for Real-Time Delphi Lime-survey questions and technical supports for launching the Delphi survey across ASEAN countries. The full result of the Delphi survey was analyzed, summarized, and used as preparation materials for the SEAMEO Executive Committee Meeting in August 2014.

**Idea sharing and suggestions:**

- Adj. Prof. Smith commented that it is important for APEC CTF to connect with other policy institutes, and this should be included in the portfolio of the Center.
- Dr. Angkarn responded to Dr. Silberglitt on the finding of the survey that there were many recommendations obtained from the participants. Dr. Surachai also explained that the details were being analyzed by SEAMEO.
- Prof. Dr. Lee mentioned that in Korea, Science and Technology area is separated from Social Science in high schools, but they would be integrated with 3-5 years. In universities, Korea is trying to integrate disciplines since early stages of university. However, teachers and professors are critical barriers for the change as they could lose their jobs upon integrations

### **3.5 Recent Development in APEC PPSTI**

This topic was discussed in an afternoon session.



### **3.6 Publications**

Dr. Apichat reported the publication of an article on Key Technologies in Foresight Society section of Horizon Magazine, the 15<sup>th</sup> issue.

#### **Idea sharing and suggestions:**

- Dr. Apichat explained to Dr. Silberglitt about the methodology of Key Technology exercise which involves three steps: location and selection of experts, formulation of the initial list of technologies, and prioritization of technologies. This foresight tools would be applied in the APEC PPSTI project (Innovation Futures in APEC: Competitiveness and Grand Challenges).

## **4. Policy for 2015 and Beyond**

### **4.1 The development of APEC Policy Partnership on Science Technology and Innovation (PPSTI) Working Group and APEC PPSTI project**

Dr. Surachai reported the development of Policy Partnership on Science Technology and Innovation (PPSTI) Working Group, its scope of work, its strategic plan, and the position of APEC CTF in the Priority Area B: to promote Public-Private-Partnerships (PPP) for science and technological innovation. From APEC PPSTI meeting in 2014, China proposed a concept note entitled “Toward Innovation-Driven Development” which referred to APEC CTF in one statement: give full play to the existing APEC mechanisms such as: Asia Pacific Center for Theoretical Physics, APEC Cooperation for Earthquake Simulation, APEC Climate Center, APEC Research Center for Typhoon & Society, and APEC Center for Technology Foresight (APEC CTF). This implied a good time for the Center to contribute to APEC PPSTI as this shows vision of the working group.

Dr. Surachai then continued to summarize an APEC PPSTI project entitled “Innovation Futures in APEC: Competitiveness and Grand Challenges” which was briefly discussed in a morning session. The project was co-proposed by Russia and “co-sponsored” (credentially supported) by China, Chinese Taipei, Japan, Republic of Korea, and Vietnam. Dr. Surachai described the work flow of the project and asked the IAB for advices.

**Idea sharing and suggestions:**

- Dr. Silberglitt pointed out that criteria for key technologies would need to be carefully determined to distinguish them from non-key technologies, and conditions for Technology Readiness Levels (TRLs) would need to be specified as they depend on the environment such as countries, areas, and applications.
- Prof. Dr. Aizawa mentioned that Delphi survey could be used to focus on which area of technology is practical, but to address social issues it is not enough to promote key technology independently. Dr. Silberglitt also suggested that the criteria for key technology exercise should be able to evaluate whether technologies would fit into social structures or not.
- Prof. Dr. Lee suggested to find solutions on how to cope with a list of technologies at different levels that would be obtained from literature review, and on whether it would be good or not to obtain high-level technologies as key technologies.
- Dr. Cuhls mentioned that Germany has stopped using the concept of key technology as the criteria were quite broad to select technologies, and eventually the government did not actually implement the results. Dr. Cuhls also raised issues of whom the policy recommendations are for, and although the organization of the processes was well described, whether APEC CTF could put valuable recommendations into the system so that the final report would be acknowledged and implemented. Dr. Silberglitt suggested that the answer might be to change from “key technologies” to “key technology applications” as this would define the users of the results.

- Dr. Surachai responded that APEC CTF would like to act as a strategic unit for APEC PPSTI, and at a national level this is to formulate plans for Thailand, as a result, STI Office would use the results. In addition, NSTDA which is a national agency would also be a user of this research as a strategy for NSTDA for the next 4 years, and the partners of this project would submit the finding to their governments.

#### **4.2 National Designated Entity for Technology Development and Transfer for Climate Change under Technology Mechanism of the United Nations Framework on Climate Change (UNFCCC)**

Dr. Surachai reported the nomination of National Designated Entity (NDE) Thailand. Ms. Supak described the background of the United Nations Framework on Climate Change (UNFCCC), the Technology Executive Committee (TEC), the Advisory Board, the Climate Technology Centre and Network (CTCN), the roles and responsibilities of NDEs, and relationship and work flow between these units. Dr. Surachai asked the IAB for suggestions on models and the structure of this national focal point of Thailand.

##### **Idea sharing and suggestions:**

- Dr. Silberglitt suggested that APEC CTF could look at the US National Science Foundation for a model, and have rotating panels to look at both incoming and outgoing, followed by prioritization. Dr. Cuhls raised an issue whether APEC CTF staffs have capacity and competency to cope with advanced areas of technology. Dr. Surachai explained that APEC CTF planned to set up a national committee to evaluate proposals. Dr. Cuhls also pointed out at the time constrain for working on technology transfer requests. Dr. Surachai mentioned that so far there is no obligation on time constrain from CTCN but the Center would try to complete the process as soon as possible.
- Dr. Cuhls suggested to learn from national evaluation procedures by European commission on the process time, selection of participants of panels, and criteria for proposals. Prof. Dr. Aizawa suggested that

proposals should be for “Facilitating Deployment of Existing Technologies” and “Stimulating Development and Transfer of Technologies” categories, while “Responding to Country Requests” category should be managed by CTCN itself. Adj. Prof. Smith mentioned that there should also be requests from industries and STI Office should conduct surveys for current situations.

- Prof. Dr. Lee stressed that APEC CTF was established to promote foresight activities and this activity should be related to foresight study. Prof. Dr. Lee also noted that the network of CTCN should include not only private sectors but also government organizations and academia. Dr. Surachai explained that APEC CTF used Multi-Criteria Decision Analysis (MCDA) to obtain the results for Technology Needs Assessment (TNA) project for identification of needed technologies.
- Dr. Surachai responded to Adj. Prof. Smith’s question on Intergovernmental Panel on Climate Change (IPCC) that IPCC just published the 5<sup>th</sup> Assessment Report (AR5) as for academic side, and the UNFCCC used the IPCC report as a reference, but for this project APEC CTF used our own scenarios and models to forecast emission from various sector. Dr. Silberglitt suggested that the government should have regulations and rules for industries to reduce emission and this would create users in the market for technology transfer, rather than only have models.
- Prof. Dr. Lee also mentioned that in Korea the government tried to diffuse technologies to rural areas only with social acceptance. Dr. Silberglitt pointed out that both industries and society need to adapt to accept these technologies.
- Dr. Surachai responded to Prof. Dr. Aizawa’s concern on sea level rise that Thailand, in corporation with Asian Development Bank (ADB), had models to forecast which areas particularly in Bangkok would sink due to sea level rise, unfortunately, the issue was not discussed seriously. Nonetheless, it was suggested that Bangkok should build barriers for blockage of water.

- Dr. Cuhls suggested that the roles of APEC CTF would be similar to a broker of the system to bring technologies to people, bring back their views to industries, and sometimes to provoke people.

### **4.3 Global Resilience Partnership project**

Dr. Silbergliitt described the Global Resilience Partnership which is a new concept created by the Rockefeller Foundation and U.S. Agency for International Development (USAID). The Resilience Partnership will operate in the Sahel, the Horn of Africa, and South and Southeast Asia. These three regions have experienced high frequency and magnitude of acute shocks and chronic stresses in climate change and extreme weather events, population growth, urbanization, food, water, and energy insecurity, economic and political instability, and conflict. This is related to the project “Integrated Foresight for Sustainable Economic Development and Eco-Resilience in ASEAN Countries”.

The Global Resilience Challenge is a competitive process intended to bring together multi-disciplinary teams to collaborate with local and regional stakeholders in the diagnosis of resilience problems and opportunities for viable, locally-driven, and high-impact solutions. The first stage is to select 5 teams from each region. Interdisciplinary teams will apply to the Challenge with a Pre-Proposal that describes the direction the Resilience Team will take in the next stage. The members of each team will be mostly, but not exclusively, from their region, with a leader from a non-government organization. Finalist Resilience Teams will be awarded up to \$200,000 USD to participate in Stage Two. The winning Resilience Teams will be given a monetary award, of up to \$1.0 million USD for Stage Three implementation of their Solution Proposal and Solution Implementation Plan to be used for building resilience to the identified problem.

Dr. Pichet and Dr. Silbergliitt had identified several components to be members of a team, namely, APEC CTF, STI Office, King Mongkut's University

of Technology Thonburi (KMUTT), National Institute for Science and Technology Policy and Strategy Studies (NISTPASS), the Indonesian Institute of Sciences (Lembaga Ilmu Pengetahuan Indonesia, LIPI), the RAND Corporation, the Australian Centre for Innovation and International Competitiveness Limited (ACIIC), and the Office of Technology Foresight (OTF) at the National Research Council of Canada.

**Idea sharing and suggestions:**

- Prof. Dr. Aizawa suggested that it is important to define issues or challenges, and there should be comprehensive collaboration to overcome the greatest barriers to building resilience.
- Dr. Silbergliitt added that from the Integrated Foresight project, it was concluded that the complex nexus of food-energy-water should interest local community, a lot of the output is consistent with this project, and Dr. Pichet propose to focus on water issue and look at the connections to energy and food issues.
- Dr. Cuhls pointed out that it is crucial to ask the right questions by foresight tasks on different aggregation levels to cover the whole chain related to water.
- Dr. Silbergliitt mentioned that there was a group at RAND that developed methods to tackle complex problems with a lot of uncertainties on water climate change issue. Last year the group did a project with NISTPASS to look at water management for Ho Chi Minh City, and this could be considered upon developing the Global Resilience proposal.
- Prof. Dr. Lee was concerned on what would be advantages or competitiveness of the team for this project, and suggested that approaches from previous work could be applied with this project. Also there should be connections between foresight and sociology. Dr. Silbergliitt mentioned that another aspect is to look at community resilience, by extracting from the team members' experiences. This would be the implementation step of the Integrated Foresight project.

## **5. Other matters**

### **5.1 Date of the next IAB meeting**

Dr. Silberglitt suggested to plan the date by holding a window of time a year in advance, sending out a reminder every quarter, and establishing the actual date 3-6 months in advance. The board agreed to mark the calendar for the week of the 9<sup>th</sup> of November 2015 (9<sup>th</sup>-13<sup>th</sup>). It was suggested that a poll should be sent to the board to propose 2-3 preferable dates.

### **5.2 Other matters**

#### **Collaboration with Foresight and S&T Research Institutes in Chinese Taipei (continued)**

Dr. Angkarn presented scenarios “Multiple Deployment and Focused Development” created by Chinese Taipei. Dr. Silberglitt commented that this is interesting because the economy put their own local interest into the scenarios, and this could be applied to future work of APEC CTF. Adj. Prof. Smith mentioned that with four-quadrant matrix, navigation between them is important. The essence of their success is the ability to choose industries early and expand from local to global.

Dr. Cuhls mentioned that Europe also combined sustainability thought and societal thought with technological development and foresight, but the question is how to perform and whom to be involved as it is not only desk research. Dr. Silberglitt suggested that APEC CTF would have to identify stakeholders, industries, and social objectives. Prof. Dr. Aizawa commented that these scenarios were drawn from the viewpoint of targets of innovation but they didn’t determine players and drivers. STI innovation foresight has to include players.



