



Asia-Pacific  
Economic Cooperation



# ANNUAL REPORT 2004

## APEC Center for Technology Foresight Bangkok, Thailand



Asia Pacific Economic Cooperation



National Science and Technology Development Agency of Thailand





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APEC Center for Technology Foresight has been in operation for seven years now. To fulfill the mandate of developing and diffusing foresight capability throughout the APEC region, the center has worked on many projects and workshops that involved more than 2,500 experts and participants in many economies. Though APEC CTF cannot claim to be responsible for the increased foresight activities in the region, it nevertheless is contributing to be a part on the ongoing development.

In 2004 the APEC Center for Technology Foresight has launched a major APEC-wide project on “Foresighting Future Fuel Technology”. This project was a self-funded basis to pre-empt the activities in 2005 when the APEC Central Fund will be utilized. Another international project is the ASEAN Technology Foresight and Scan project which aims to develop capability in technology foresight amongst ASEAN member countries by building up expertise and network through workshops and a pilot ASEAN-wide foresight project. One of the ongoing activities is the international foresight training workshop “Tools for Managing the Future - A Portfolio Approach” which has run for three consecutive years. Moreover the Center has played various roles in in-country foresight activities of many organizations such as the Electrical and Electronics institute, the Health System Research institute, the National Electronics and Computer Technology Center, and Kasetsart University. Also in this year, the technology foresight Network – TFN – has been reformed to enhance the connections between individual experts to engage in technology foresight activities, the Network seeks to foster greater information sharing and understanding of foresight best practices.

For the upcoming year in 2005, APEC Center for Technology Foresight is looking to Stage II of the APEC – wide “Foresight Future Fuel Technology” project and the final phase of the ASEAN Technology Foresight and Scan project. To confirm our commitment on sharing foresight knowledge and skills, the center plans to arrange at least two international foresight training workshops every year. Furthermore, we hope that the result of Technology Foresight Network will show a great improvement along with the center website and data base system.

All readers are recommended to visit the Center’s home page at [www.apecforesight.org](http://www.apecforesight.org) for more information and to find data on technology foresight in practice, announcement of training workshops and publications that are free to download.

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## **Background**

The APEC Center for Technology Foresight (APEC CTF) is a project of the Industrial Science and Technology Working Group (ISTWG) of APEC. Through this establishment origin, the Center has been chartered with a mission to promote foresight knowledge and capability throughout the APEC region. The Center fully participates in the biannual ISTWG meetings and holds a side meeting in order to keep the ISTWG members informed of its ongoing activities and to seek the opinions, suggestion, and support from all ISTWG members. The Center was set up through the support of the Royal Thai government and as a unit in the National Science and Technology Development Agency (NSTDA) with the important mission to serve all APEC economies.

APEC CTF has so far conducted and finished seven APEC-wide foresight and multi-economy projects, published a number of general books on foresight, conference papers and reports. It has also been consulting and facilitating a number of foresight projects in many APEC economies at national and institutional levels, as well as holding many training workshops on foresight tools. Through these activities CTF has built competency in foresight methodologies and strong relationship with clients and international experts, resulting in a growing network of supporters and alumni who see value in linking their activities to those of CTF.

Since its inception, APEC CTF has regularly submitted proposals to APEC ISTWG to compete with other projects for funding from the APEC Central Fund. Yet it is important to note that NSTDA of Thailand provides the core funding and employs the staff. The Center also relies on the support and in-kind contributions of member economies, to whom it is bound by mutual interest and trust rather than formal relationships. The Center has the International Advisory Board (IAB) to guide and advise the overall plan and activities on the Center's programs.

## **Objectives, core competencies, and scale of operation**

In November 2004, the IAB meeting has revised the objectives of the APEC CTF.

### **Objectives:**

To develop and diffuse foresight capability and leading edge planning tools to prepare APEC economies for rapid change and major societal challenges through:

- APEC-wide foresight projects
- Regional, sectoral, and organizational foresight
- State-of-the-art foresight training
- National and regional strategy planning

Other principles of APEC CTF, as agreed at joint meeting of IAB and SC in Ayuthaya, Thailand in December 2000, remain.

**Core Competencies of the Center:**

Capability to coordinate and facilitate multi-economy foresight studies (with embedded training);  
Expertise in training and consultancy services;  
Expertise in foresight methodologies and practice;

**Underpinned by:**

Ability to work effectively across a range of cultures and types of organizations.  
Ability to understand and communicate basic science and technology and its implications for socio-economic development.

**Scale of Operation:** The APEC Center for Technology Foresight operates as a semi-virtual center. From a solid base in its host economy – Thailand - the Center aims to serve and involve all the members of APEC through partnerships and networking.

## **1. APEC–Wide Foresight Project**

### **1.1 Foresighting Future Fuel Technology**

The uncertainty and instability of energy supply and sustainable fuel availability in the region represents a potential threat to the development aspirations and stability of many Asia-Pacific economies. Given the potential problems posed to industrial, economic and social development, the APEC Center for Technology Foresight (APEC CTF) proposed a foresight study on future fuel technology in the context of APEC to be conducted in 2004-2005.

#### **Approval of the project proposal**

The concept of this new project was strongly supported by member economies, and in early 2004 a detailed proposal was prepared by APEC CTF, the National Metal and Materials Technology Center (MTEC) of the National Science and Technology Development Agency (NSTDA) and the Office of Technology Foresight of the National Research Council of Canada (NRC). This proposal received strong and unanimous support by the 26th ISTWG Meeting in Christchurch, New Zealand in March 2004 for partial support from the APEC Central Fund. The project was ranked number 1 for operational funding in this meeting (See Appendix II). The budget was subsequently approved by APEC Budget Management Committee (BMC) in mid-2004. APEC CTF decided to commence Stage I of the study in 2004 as a self-funded project based mainly on scenario planning process. Stage II, to be carried out in 2005 is to use the budget approved by APEC and will focus on technology roadmapping process.

#### **ISTWG – EWG cooperation**

At the APEC Science Ministers Meeting in Christchurch in March 2004, the Ministers directed that the Working Groups cooperate to ensure optimum use of resources. APEC CTF had been contacting with the EWG Secretariat since late 2003 and the Lead Shepherds of EWG and ISTWG later communicated to confirm cooperation between both working groups. This was discussed at the 27th ISTWG Meeting in Singapore in September 2004 (Appendix III) and Professor Greg Tegart was delegated as the ISTWG Observer to attend the 28th EWG Meeting at Port Douglas, Australia in November 2004 (See Appendix II). The EWG Lead Shepherd delegated Mr. Aidan Storer to represent him at the subsequent first workshop of the project held in Krabi, Thailand, thus starting the tangible cooperation between the two working groups. At the Krabi workshop Mr. Storer presented an outline of the EWG activities and participated in discussions on future cooperation.

#### **Pre-workshop data gathering**

In mid-2004 the Center commissioned a number of Position Papers related to future fuels to some APEC experts. Contributions came from several economies, i.e. Canada on biofuels, integrated energy futures and methane hydrate; Japan on conventional hydrocarbons, and Thailand on biofuels. An additional presentation on biofuels was made at Krabi by Dr Sergio Trindade

of USA. The Position Papers had been posted on the APEC CTF website prior to the Workshop to stimulate discussion and to encourage participants to complete a short questionnaire on their views.

### Scenario Workshop

At the Krabi “Scenario 2030” Workshop during 13-15 December 2004 there were 57 participants from 11 APEC member economies who brought together their experience and creativity. As a result of paper presentations, the survey presentation, and facilitated small group discussions, 6 scenarios for the future of APEC were created and a common theme of *energy security* was agreed upon. This finishes Stage I of the study and sets out the essential steps that provide a basis for Stage II. The Center has published a report on the findings of Stage I and circulated among participating experts for reviewing and to focal points through its website and e-mail.

### Plan for 2005

Stage II, starting in 2005, consists of a series of workshops directed to technology roadmapping of selected technologies will be held in Vancouver, Canada in April 2005, in Chinese Taipei in August, with a final meeting in Chiangmai that year. Despite the support from APEC Central Fund, co-sponsoring economies will still make some further contributions e.g. event hosting and other in-kind contributions, with Canada and Chinese Taipei playing major roles. A final report with the complete roadmap, recommendations and policy implications will be completed by year end and distributed in early 2006.

**Table 1. Work Plan of APEC-wide Project on Foresighting Future Fuel Technology**

<i>Date</i>	<i>Activities</i>
<b>2004 – STAGE ONE: Scenario Planning, self-funded stage (<i>finished</i>)</b>	
January	Preparation of an Overview Paper and Project Proposal by CTF staff and a few experts from MTEC. Circulation of the Proposal to all ISTWG focal points.
8-9 March	Seeking formal endorsement and sponsorship at 26 <sup>th</sup> ISTWG meeting in Christchurch, New Zealand.
March – May	Solicitation of at least 3 Position Papers on each area of future fuel from member economies. Discuss concept and start designing web page for discussion and probably short surveys.
May	Phase I of web-based discussion (for technology development trends, future uses and issues of economies)
June	Position Papers complete.
July – August	Second phase of web-based discussion, focusing on emerging issues from the Position Papers. Questionnaire survey done through web if needed.
Sep – Oct	Report of the progress to 27 <sup>th</sup> ISTWG Meeting
November – December	<u>Scenario Workshop</u> in Krabi, Thailand hosted by CTF, including experts, policy makers and industry representatives to create future scenarios and prioritize the theme for the subsequent Technology Roadmapping. Stage I report completed and submitted to participants and focal points to prepare for Stage II.

<i>Date</i>	<i>Activities</i>
<b>2005 – STAGE TWO: Technology Roadmapping, partially funded by the APEC Central Fund.</b>	
January	Setting up the Steering Committee and the workshop ‘Core Team’. The Core Team will prepare a working paper on TRM process and scope to be circulated to each hosting economy’s local teams for e-discussion.
February	Email and web board discussion among Core Team and host economies.
April	<u>TRM Workshop I</u> to be held in Vancouver, Canada. The Core Team will send 3-4 TRM experts to facilitate the workshop.
June – July	<u>Inter-workshop consultation and preparations by electronic communication</u>
August	<u>TRM workshop II</u> to be held in Pingtung, Chinese Taipei. The Core Team will send 3-4 TRM experts to facilitate the workshop.
September	Drafting of an interim report
October	Report of the progress to 29 <sup>th</sup> ISTWG Meeting
November	<u>Wrap-up Symposium</u> in Chiangmai attended by a wide range of stakeholders including policy makers and the media.
December	Final Report completed
<b>2006</b>	
January onwards	Distribution of Final Report and Post-foresight activities

It is to be noted that cooperation and division of labor with the APEC Energy Working Group (EWG) during the whole period of Stage II will remain an important issue and to be encouraged. The Industrial Technology Research Institute (ITRI) who will be co-hosting the second TRM Workshop in Chinese Taipei has taken an important step by submitting to EWG an EWG-ISTWG Cooperation Proposal. Positive response from EWG will ensure a justified foundation for the workshop to be held as a joint activity between EWG and ISTWG.





## **1.2 DNA Analysis for Human Health in the Post Genomic Era**

### **Post foresight activities on DNA Project**

The APEC-wide foresight project on DNA-Analysis for Human Health in the Post-Genomic Era has been completed in December 2003. The APEC CTF produced the two volumes of the publication; a summary report for policy makers, and a full report for researchers and the public. They were distributed to policy-makers around the region, including all the participated experts. The reports are also available in electronic form ready for download at <http://www.apecforesight.org> The Evaluation Report was submitted to APEC Secretariat in January 2004.

Post foresight activities continued focusing on participation and recommendation to the APEC Life Sciences Innovation Forum (LSIF). The Forum was launched by recommendation of the APEC Committee for Trade and Investment with strong support of Thailand and USA, among other economies which committed to place emphasis on life sciences and their application in the health care. The DNA study complements the activities of the Forum, and APEC CTF therefore attended the LSIF meetings to show the Forum that foresight approach has been effective in providing a mechanism for bringing the stakeholders together and grasping the complexity of the issues. Close contact is being maintained with the Forum organizers and thus ensures that the outcomes of the DNA study contribute to the development of the Life Sciences Strategic Plan, to be developed by the Forum throughout 2004 and beyond. Prof. Greg Tegart and Dr. Nares Damrongchai presented a paper at the LSIF Experts Meeting in Khonkaen in February 2004. Prof. Tegart also attended the Second APEC Life Sciences Innovation Forum in Penang on 16-17 September 2004 assisting with Professor Peter Sheehan, who is Academic Vice-Chair of the forum, Director of Centre for Strategic Economic Studies, in restructuring the draft to make it more acceptable to Governments. Subsequently further revisions of the Strategic Plan for Life Sciences in APEC have been made for presentation to APEC Leaders in Chile later in November 2004.

### **1.3 Post Foresight activities on Nanotechnology Project: Nanotechnology: the Technology for the 21<sup>st</sup> Century**

Thailand has been receiving significant inputs from the Center's publication and workshop on Nanotechnology project conducted in 2002. This project contributed to the decision of the Thai government to establish the National Nanotechnology Center (NANOTEC) on 13 August 2003, with some contribution of the Center's staff in drafting its first strategic plan and the national master plan on nanotechnology for Thailand. In February 2004 some members of the CTF and NANOTEC along with other national experts paid a study-visit on nanotechnology to Chinese Taipei. The study tour was organized by Dr. Hsien-Chun Meng, the Director General of Chinese Taipei's Science and Technology Information Center (STIC), National Science Council. After the mission, a national strategic plan was drafted and approved by NSTDA's Board. In September 2004, the National Nanotechnology Committee has been established in Thailand with the Prime Minister as its chairman.

## **2. Multi-economy foresight training, conference and seminars**

### **2.1 Tools for Managing the Future: a Portfolio Approach" 23-27 February 2004, Amari Watergate Hotel, Bangkok**



This third-yearly training workshop attracted 18 participants from 6 APEC economies and 1 country; Brunei Darussalam, China, Chinese Taipei, Iran, Japan, Malaysia and Thailand. All 18 participants attended Part I of the workshop from 23-25 February 2004 that was an intensive training in foresight methodology and appropriate use of tools, and 8 stayed for Part II from 26-27 February 2004 to exercise on applying the knowledge from the first part to designing a foresight project of their own choice.

The workshop has continuously been improved from the first year. This year, a new session, “A Case Exercise in Foresight” was introduced at the beginning of the workshop to provide an illustration of many factors to be taken into account in the design and conduct of a successful foresight study: a respond to recommendations from the 2003 cohort. The introduction part was also made more concise with the merging of the sessions of “The Challenge of the Future” and “The Portfolio of Tools”. Many new case studies and reading materials were added.

Evaluation suggested high satisfaction on the course. Overall content of the course was rated at an average of 3.47 from a full scale of 4.0. The participants were pleased with the opportunity to participate in the class (note: most sessions contained a thinking exercise and discussion time) and the chance to communicate with the facilitators during the workshop: both were rated at 3.47. Materials provided were scored the highest at 3.65. In terms of information and knowledge obtained and the expected future utilization, both were rated at an average of 3.29. Hotel room and facilities needed improvement and rated rather low at 2.94.

Participants rated their own competency after the workshop. ‘Situating foresight in the portfolio of knowledge management tools’ was rated at 3.43, followed by their understanding of the tools and their strengths, limitations and assumptions at 3.31. In terms of understanding of each key tool, scenario planning and environmental scanning were equally rated at 3.29, followed by technology roadmapping at 3.24 and delphi polling at 3.06. Competence in ‘design, logistics and management of foresight activities’ received the lowest rating at an average of 2.76. From discussions during the workshop and answers in the final summation questionnaire, we found that many participants in the course had no experience in foresight practice before and came with the purpose to be introduced on its concept and tools; thus it might be the main reason for the low confidence in managing a foresight project.

### Workshop Evaluation (Total number of replies: 18)

	Average (out of 4)	Number of replies			
		Very good (4)	Good (3)	Fair (2)	Poor (1)
<b>Program</b>					
1. Content	3.47	8	9	-	-
2. Time Schedule	3.18	5	10	2	-
3. Material provided	3.65	11	6	-	-
4. Opportunity to participate	3.47	9	7	1	-
5. Information and Knowledge obtain	3.29	6	10	1	-
6. Expected future utilization of information and knowledge obtained	3.29	6	10	1	-
<b>Communication</b>					
7. Communication between you and the facilitators during the workshop	3.47	9	7	1	-
8. Communication between you and the organizers before the workshop	3.29	6	10	1	-
9. Communication between you and the organizers during the workshop	3.59	11	5	1	-
<b>Other</b>					
10. Environment and facilities	2.94	2	12	3	-
11. Meals and other refreshments	3.41	8	8	1	-

### Participants' Self-Evaluation of Achievements (Total number of replies: 17)

	Average (out of 4)	Number of replies			
		High (4)	Medium (3)	Low (2)	Don't Know
<b>Competency</b>					
Situate foresight in the portfolio of knowledge management tools*	3.43	9	6	-	1
Identify the drives of change in the 21 <sup>st</sup> century*	3.13	2	14	-	-
Recognize the limitations on knowing the future*	3.06	3	11	2	-
Understand the range of tools in the portfolio for managing the future, their strengths, limitations, and assumptions	3.31	6	9	1	-
Be able to make informed selection among portfolio tools	3.18	4	12	1	-
Environmental scanning	3.29	5	12	-	-
Delphi polling	3.06	3	12	2	-
Technology roadmapping	3.24	5	11	1	-
Scenario planning	3.29	5	12	-	-
Design, logistics and management of foresight activities	2.76	2	9	6	-
Implement the findings of foresight project	3.00	4	10	2	1

\*total number of replies for these competency items is 16



## **2.2 ASEAN Technology Foresight and Scan Project**

### **Background**

ASEAN Technology Foresight and Scan project is a project of the ASEAN Sub-Committee on S&T Infrastructure and Resources Development, in cooperation with the National Science and Technology Development Agency (NSTDA), Thailand as the project's executing agency. The project received funding support from Japan-ASEAN Exchange Programme (JAEP) worth 253,851 US dollars to enable participation of all ASEAN member countries to workshops, involvement of foresight experts and consultants, and publications.

### **Objectives**

The project aims to develop capability in technology foresight amongst ASEAN member countries by building up expertise through workshops and a pilot ASEAN-wide foresight project that is constituted by sub-projects in support from each member country. It also aims to establish a regional network of "foresight champions" who are regularly updated about foresight developments worldwide and promote foresight activities in the ASEAN member countries, and to initiate a bi-monthly newsletter on the subject to support such activities. The project starts from July 2003 and lasts two and a half years. As parts of project strategic actions, two training workshops were planned and organized. The first one was taken place in August 2003 and the other in December 2003.

### **Design and Methodology Workshop, 4-5 August 2003, Hanoi, Vietnam**

A 5-day Training Workshop, 15-19 December 2003 at Pathumwan Princess Hotel Bangkok, Thailand, 31 participants from 9 countries (3 of each country, except 6 from Malaysia and 4 from Vietnam), 8 facilitators and working team, and 3 members of ASEAN Secretariat attended the workshop. Professor Ron Johnston, and Professor Akio Kameoka, and Dr. Chatri Sripaipan were the lead facilitators, with support from staff of APEC CTF.

Team members of each country were urged to submit their project proposals "In-country projects" by end of January 2004 and to be offered consultancy in running the project if need arise via network communications. At the same time, the teams were encouraged to exchange their problems and concerns in the Discussion Forum and suggest suitable solutions to each case. However, very few participants used the provided facilities.

By June 2004, it was clear that some countries have difficulties to start their own projects. APEC CTF proposed to provide further assistance to three countries i.e. Cambodia, Lao PDR, and Myanmar by conducting an in-country scenario workshop. It is highly likely that the workshop in Laos, Cambodia, Myanmar were confirmed its interest.

### **Newsletters**

The bi-monthly newsletter was planned as a means to create an ASEAN network of foresight champions aiming primarily at the participants of the

project. The inaugural issue was first launched in early December 2003 and sent widely by email and some by fax to all people involved in the Project so far. The series of following issues were delivered in through out the year 2004.

Moreover, Dr. Nathasit Gerdri, a Thai expert in technology roadmapping (TRM) from Portland University, agreed to have his series of articles about TRM published in the ASEAN newsletters, started at the issue 5 in September 2004. However, this issue was delayed due to difficulties in obtaining progress of the in-country projects and lack of proper network



Country project and method list:

Country Projects	Main Objectives	Foresight Tools
<u>Brunei Darussalam</u> Vocational and Technical Education and Training 2024 focusing on human resource development	To study manpower requirements of the emerging industries and find out how VTET can increase the contribution to HRD.	Environmental scanning Scenario planning Technology roadmapping
<u>Indonesia</u> Technology Roadmap for Automotive Components Industry	To achieve preferred condition of the industry in 5 years (2009)	Technology roadmapping Technology Forecast Focus Group Meeting
<u>Lao PDR</u> Human Resource Development for Livestock Industry in Laos	To increase the livestock products both in quantity and in quality	Scenario planning Technology roadmapping
<u>Malaysia</u> Technology Foresight for the Agro-based Industry	To build future scenarios of the industry and define market development	Scenario planning Delphi survey and others
<u>Myanmar</u> Foresight and Scan for Mode of Transportation System in Yangon City Core	To propose the strategic plan in developing the transportation system in Yangon city area	Environmental scanning Scenario writing

<u>Philippines</u> Human Resource Capability Towards the Creation of Technology Champions in Key Industries: Electronics	To strengthen the human resource capabilities in electronic R&D, entrepreneurial skills, techno- ventures and linkages.	Environmental scanning Scenario planning Technology roadmapping Consultations
<u>Thailand</u> Manpower Needs for Effective Development of Biotechnology in Thailand	To propose the strategic plan in biotechnology HRD including the critical skills need for effective development of biotechnology industry.	Scenario Writing Focus Group Meeting
<u>Vietnam</u> Roadmapping HRD for the Development of Biotechnology Industry up to 2015.	To build a HRD roadmap to meet the need of BioTech industry up to 2015	environmental scanning, SWOT analysis, Mini- Delphi survey Technology Roadmapping
<u>Cambodia</u> Capacity Building in Human Resources on Marine Products	** Cambodia has reported on the political situation that makes it difficult for the project to start going.	

Current progress of each member's project is now posted on our web site ([www.apecforesight.org](http://www.apecforesight.org)) discussion forum and each is provided with comments from the Center. A bi-monthly newsletter has been published until Newsletter issue 6 (November 2004), the Center is planning for special consultations for 2 ASEAN members, Myanmar and Lao PDR, by assisting them in conducting on-site foresight workshops in their respective countries in the beginning of 2005.

### 3. Workshops and Consultancies at single-economy level

#### Workshop

- **Workshops on Higher Education Planning**

The APEC Center for Technology Foresight, NSTDA sought assistance from Thailand-U.S. Educational Foundation (Fulbright) to invite Professor Jim Dator, Director of the Hawaii Research Center for Future Studies, University of Hawaii, Manoa to visit Thailand. In January, Professor Dator spent 2 weeks conducting a number of workshops on future studies and exchanging views with Thai partners and audience.

Within 2 weeks, a number of workshops were arranged to allow executives from educational institutions, government organizations, private companies and industrialists to learn how to use the foresight technique in their business planning. The topics and attendants were listed below:

<b>Workshops Topic</b>	<b>Attendees</b>
Manpower Planning in Education, Science and Technology: A Foresight Approach Joint program with SEAMEO's RIHED	SEAMEO's RIHED Ministry of Education NSTDA
R&D Branding for Chiang Mai University	The President of Chiang Mai University and senior administrator executives
High Level Manpower Planning in Science and Technology for Industrial Clusters	The Commission on Higher Education, Ministry of Education
Top-End Manpower Planning in Science and Technology for Industrial Clusters	NSTDA, Universities, major industries, Ministry of Industry
Foresight Methods in University Planning	The Association of Private Higher Education Institutions in Thailand

All of these foresight workshops, not only gave ideas and knowledge to a wide range of audience, but also created the opportunity for public and private partners to see the national future and make a fine tune for common goals together.

#### Consultancies

##### **Thai Foresight Projects: EEI, HSRI, NECTEC, and KU**

- **Electrical and Electronics Institute (EEI) Foresight Project.**

APEC CTF provided consultation to the Electrical and Electronics Institute (EEI) of Thailand to plan and design a foresight project for Thailand's electrical industries. Their first scenario workshop was conducted by Professor James Morrison, emeritus professor of Education, University of North Carolina at Chapel Hill, USA. The objective of this workshop was to stimulate thinking about future of EEI from decision makers of private and

public sectors. The consulting role of APEC CTF ended at the scenario workshop. EEI has continued to run technology roadmap with a consulting team from KISTEP of Korea at the end of 2003. Five products were identified and derived from the workshops and from the three main EEI's Industries listed below.

<b>Electrical and Electronics Industries</b>	<b>PRODUCTS</b>
1. Home Appliances	1. Audio Video 2. Motor Compressor
2. Components and Devices	3. Batteries and Energy saver
3. Software	4. Embedded Software for Automotive Industries 5. Agri-tronics

Leaders of products working groups were to prepare full project plans and schemes to secure budget for the recommended products from the Thai government.

- **Consultation for Thailand's Health System Research Institute (HSRI)**

HSRI, Ministry of Public Health, Thailand is continuing its foresight programs as part of an effort to develop a ten-year plan (2003-2013). With some technical support from CTF it has conducted two major studies on pharmaceutical system and oral health respectively. A pre-foresight meeting for nursing system was convened in April 2004 and the Center's staff participated as resource persons. This project was considered quite success as the team members of HSRI comprehend foresight both in principle and in practice. They could run their own series of workshops in their next foresight projects.

- **Consultation for National Electronics and Computer Technology Center (NECTEC)**

NECTEC consulted CTF in the initiation of a foresight project aiming at prioritizing its research and development activities in the next 10 years to best serve industry and society needs. One scenario session was conducted. A technology roadmapping exercise on environmental GIS is being considered.

- **Kasetsart University (KU)**

Dr. Malee Suwana-Adth convinced the President of Kasesart University on the merit of foresight. APEC CTF was asked to be the consultant to foresight the future of the University in 2028 when it will be 80 years old. A one and a half day scenario workshop was conducted in early October 2004. The second workshop in November 2004 used the Balanced Score Card to drive the strategy map for the university. The project is to be completed in February 2005.

## 4. Promotions through Network

### 4.1 APEC Technology Foresight Network

#### **Mission Statement**

The purpose of the APEC Technology Foresight Network is to provide pathways to foresight experts, information related to foresight and an efficient way to diffuse the results of foresight activities.

The Technology Foresight Network – TFN – has been established to enhance the connections between the small group of individuals engaged in technology foresight activities both within APEC member economies and globally. In building the personal relationships within this group, the Network seeks to foster greater information sharing and understanding of foresight best practices.

The Technology Foresight Network has adopted a broad understanding of foresight: "Foresight involves systematic attempts to look into the future of science, technology, economy and society, and their interactions, in order to promote social, economic, and environmental benefits"

#### **Objectives:**

- to enhance communication amongst foresight practitioners in order to stimulate collaboration, development of foresight techniques and best practices within APEC member economies and globally;
- to foster awareness and collaboration by linking key foresight practitioners globally;
- to facilitate the exchange of information, ideas and expertise about foresight;
- to improve access to reports of foresight activities and projects.

#### **Current Members (reviewed as of 23 October 2004)**

<b>Experts:</b>	<b>62 Profiles</b>
<b>Publications:</b>	<b>48 Profiles</b>
<b>Events (past events):</b>	<b>11 Profiles</b>

#### **Activities Report:**

November 2003 to April 2004, Professor James Morrison, emeritus professor of Education, University of North Carolina at Chapel Hill provided CTF advice for the APEC Technology Foresight Network project (<http://www.apectf.net>). The consultation included web content layouts and technical designs, and membership promotion.

Due to DNS (Domain name Server) difficulties during March to May 2004, APEC TFN website was temporary technically disconnected. The problems were solved in June 2004 with kind assistance from Canada Institute for Scientific and Technical Information (CISTI), National Research Council of Canada (NRC).

#### **Future Plans:**

APEC CTF planned to improve and enhance the website of this project for the coming years as follows:

- Remove "Organization" and "Economy" profiles so that "Expert" profiles could be more concentrated.

- Enhance the project website and its contents by updating all profiles
- Summarize APEC CTF current projects, future conferences.
- Manage all publications
- Develop a moderated mailing list of experts in order to facilitate communication and the development of virtual community.
- Use discussion forum facility by posting questions and issues to encourage sharing ideas in the discussion forum, and inform members periodically about the discussion forum so that they can interact with each other on the topics related to foresight and its methods as well as substantive issues with the APEC economies.

APEC CTF also proposed to initiate face-to-face and virtual conferences focusing on trends, potential events, and issues that are and will affect APEC economies in the future. The Conference would be a place where foresight experts and practitioners actively exchange their experience and ideas face-to-face after communication through email and website. Such activity would increase effectiveness of the network and develop future project collaborations among member economies and countries around the world.

## Infrastructure

### Website

APEC CTF's website has regularly been updated and kept posted for providing information about the center, its activities, foresight research projects, and foresights in APEC since October 1997. Most of the updates emphasized APEC-wide foresight projects. APEC CTF marches onward to further on website development on both contents and format layouts to provide foresight information worldwide. It was also expected that the website will be an efficient way to diffuse the result of foresight activities, and a powerful communication tool to connect global visitors with APEC CTF's foresight projects.

### SUMMARY OF VISITING COUNTS

#### Monthly Visits

Jan.04: 974  
Feb.04: 831  
Mar.04: 915  
Apr.04: 478  
May04: 807  
Jun. 04: 556  
Jul. 04: 409  
Aug.04: 411  
Sept.04: 774  
Oct.04: 482  
Nov.04: 670  
Dec.04: 807  
**Total: 8,114**

#### Foresight Projects: (Jan.-Dec. 04)

Future Fuel:	364	from Jun. 04
DNA:	73	from Nov. 01
NANO:	112	from Jul. 01
HMC:	30	} From 25 May 00
ST:	29	
TLC:	71	
WSM:	34	

#### Remarks:

Foresighting Future Fuel Technology  
DNA Analysis for Human Health in the Post-Genomic Era  
Nanotechnology: the Technology for the 21<sup>st</sup> Century  
Healthy Futures for APEC Megacities  
Sustainable Transport  
Technology for Learning and Culture  
Water Supply and Management

### TrueHits.net registration

APEC CTF acted on the advice from the IAB meeting in November 2002 and November 2003 to continue subscribing on the Thai government's IT free services through NECTEC at TrueHits.net which proposed systematically tracking on visitors' detailed information such as number of IP, ISP addresses, countries, etc. for only sponsorship members. The service cost 1,800 Baht per year. APEC CTF had already paid for the annual fee to the institute and the services started from 23 February 2004 to 22 February 2005.

### Free Publication Downloads

The total of downloads were recorded. The download system was created with requirements of email, position, and organization of the downloaders. A summary of the downloaded publication from January 2002 to October 2004, listed in the next page and ranked by maximum numbers of downloads.

No	Publication Titles	# of downloads
1	Nanotechnology the Technology for the 21st Century Volume 1	153
2	Introducing Foresight and the APEC Center for Technology Foresight	141
3	Nanotechnology the Technology for the 21st Century Volume 2	140
4	Technology Foresight as a tool for strategic science and technology planning and policy development	56
5	APEC Technology Foresight in Thai Language	50
6	IT for Education (Full report in Thai language)	36
7	The Future of APEC Megacities: A Foresight Approach	35
8	Authority, Legitimacy and Credibility of Technology Foresight Studies	31
9	Technology for Learning and Culture in the APEC Region to 2010 Volume 1	31
10	Healthy Futures for APEC Megacities: Summary Report of a Foresight Project	25
11	Technology for Learning and Culture in the APEC Region to 2010 Volume 2	24
12	Application of Technology Foresight	19
13	Sustainable Transport for APEC Megacities: Issues and Solutions Volume 1	18
14	Information Leaflet	17
15	Annual Report 2001	17
16	Sustainable Transport for APEC Megacities: Issues and Solutions Volume 2	16
17	Activities Report 1999-2000	16
18	DNA-Analysis for Human Health in the Post-Genomic Era Volume 1	15
19	Water Supply and Management in the APEC Region Volume 1	15
20	Multi-Country Foresight - Issues and Challenges: a paper based on a foresight study in progress, on the Future for Water Supply and Management in the APEC Region to 2010	14
21	DNA-Analysis for Human Health in the Post-Genomic Era Volume 2	9
22	Water Supply and Management in the APEC Region Volume 2	9
23	Training of the trainers for strengthening local government capacity on foresight project (English Abstract)	8
24	Technology Foresight (file size: ~39MB)	8
25	Annual Report 1998	7
26	Annual Report 2000	7
27	Annual Report 1999	5
28	IT for SMEs (English Abstract)	4
29	Activities Report 1998	2
30	Annual Report 2002	2
31	Annual Report 2003	0
<b>Total</b>		<b>930</b>

**Note: total publication counted in 2003 is 748.**

## Web Promotion

APEC CTF acted on advice from the IAB from the last November 2003 meeting to find a company to promote CTF's website, due to decreasing of visiting counts in 2003. APEC CTF outsourced a web promotion company "Online Advertising Company" to promote CTF's website visibilities and increase popularity in the global search engines, Yahoo, Google, MSN, AOL, Lycos. Descriptions of 15 keywords, estimated of 350 words in each keyword, provided to the company to increase the center's web visibility and to attract visitors at the global search engines. This undertaking started running for a period of 12 months, from September 2004 to September 2005. The promotion period was extended to July 2006 due to company changes of ownership at the beginning of 2005.

## Budget report

(Unit: Baht)

<b>Thai-Government Budget for Fiscal year 2004 (As of 30 September 2004)</b>				
List of items	Budget	Spent	Committed	Balance
<b>1. Salaries</b>	<b>2,477,236.77</b>	<b>2,444,826.77</b>		<b>32,410.00</b>
<b>2. Equipment</b>	<b>30,000.00</b>	<b>19,400.00</b>		<b>10,600.00</b>
Computer equipment	30,000.00	19,400.00		10,600.00
Office equipment				-
<b>3. Expenses</b>	<b>409,501.72</b>	<b>325,535.58</b>	<b>21,253.17</b>	<b>62,712.97</b>
Office expenses	7,500.00	2,254.99	745.01	4,500.00
Advertisement	58,350.00	35,588.00	20,000.00	2,762.00
Publications	26,000.00	21,222.25	508.16	4,269.59
Hosting guest	12,000.00	3,116.00		8,884.00
Meeting & Training	256,728.90	244,660.60		12,068.30
Honorarium	12,000.00			12,000.00
Postage	6,922.82	3,747.28		3,175.54
Textbook	15,000.00	11,581.98		3,418.02
Internet membership	15,000.00	3,364.48		11,635.52
<b>4. Experts</b>	<b>809,000.00</b>	<b>714,426.00</b>	<b>66,000.00</b>	<b>28,574.00</b>
Fee for experts and consultants	809,000.00	714,426.00	66,000.00	28,574.00
<b>5. Travel expenses</b>	<b>603,070.00</b>	<b>334,268.40</b>	<b>266,181.35</b>	<b>2,620.25</b>
In country travel	17,240.00		17,240.00	-
Foreign country travel	585,830.00	334,268.40	248,941.35	2,620.25
<b>6. Foresight Projects</b>	<b>2,735,874.54</b>	<b>943,612.97</b>	<b>1,597,493.72</b>	<b>194,767.85</b>
Pre-Foresight Future Fuel	1,220,000.00		1,220,000.00	-
Webpage	49,746.00		20,000.00	29,746.00
Post Foresight	386,395.33	185,154.20	200,436.72	804.41
Staff training	34,700.00	27,235.00		7,465.00
Foresight workshop (TRM)	178,778.52	178,778.52		-
Foresight network (website ranking)	561,080.00	247,943.00	157,057.00	156,080.00
Foresight DNA Analysis	305,174.69	304,502.25		672.44
	<b>7,064,683.03</b>	<b>4,782,069.72</b>	<b>1,950,928.24</b>	<b>331,685.07</b>

## 2. Non-budget for fiscal year 2004

Project	Income	Expenses	Balance
Tools for Managing the Future	837,701.81	521,707.61	315,994.20
Ministry of Health Malaysia : Health Malaysia 2005	269,577.00	-	269,577.00
ASEAN Technology Foresight and Scan	6,047,448.50	2,417,938.25	3,629,510.25*
	<b>7,154,727.31</b>	<b>2,939,645.86</b>	<b>4,215,081.45</b>

\* to be paid for the last workshop in Bangkok, Newsletter and extra workshops in Lao PDR and Myanmar

## 3. In-kind contribution of fiscal year 2004

APEC economies namely : Australia; Canada; China; Japan; Korea; Malaysia; Philippines; Chinese Taipei; Thailand; USA. and Vietnam provided in-kind contribution of about 4.4 million bahts for activities of Foresighting Future Fuel, IAB and Workshop on Higher Education Planning.

## **Publications**

### **An article on “APEC Center for Technology Foresight”**

At the early of 2004, Mayuree Vathanakuljarus, an assistant policy researcher, was invited to write an article to be published in the Journal of Futures Studies (JFS). The article was published in volume 9 no. 1, August 2004 issue, entitled “APEC Center for Technology Foresight (APEC CTF)”.

The article was about the brief history of APEC CTF, how the center has been operating its activities, constitution of the organization structure, and foresight expertise and its experience for the past seven years. Future plans were also strategically proposed for the APEC CTF to develop itself to become the center of both foresight in theory and in practice within the APEC region while promoting active foresight networks and capabilities to serve needs in learning more about foresight in the APEC region.

In the same issue of JFS, there were more articles from high recognized futurists, such as Professor Jim Dator, Director of Hawaii Research Center for Futures Studies, Mrs. Jenifer Coote, Director of Future Watch, etc. All articles were published and copyrighted by Journal of Futures Studies. For more information about JFS and to read the articles, please visit JFS’s website at <http://www2.tku.edu.tw/~tddx/jfs/>

### **Annual Report 2003**

The report included the key activities conducted in 2003 and was aimed to serve as another resource book for the public.

## Plan for 2005

<b>APEC CTF Plans and Activities for 2005</b>													
<b>Project</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>1</b> 1.1. APEC-Wide Foresight Project on 'Future Fuels' (Phase I: Self-Funding for Scenario Planning) 1.2. APEC-Wide Foresight Project on 'Future Fuels' (Phase II: APEC Central Fund for TRM)	Experts' Meeting Workshop (Scenario Planning)	Full report											
		Workshop "Core Team"	Email & Discussion Forum		1st TRM Workshop (Vancouver)			2nd TRM Workshop (Taipei)				Draft interim report	Wrap-up symposium in Bangkok
<b>2</b> APEC Technology Foresight Network	Project web modification	<b>Foresight experts membership recruitment and online communication</b>											
<b>3</b> APEC CTF 's website Development	<b>Development of the APEC CTF Website to be the "Hub of Foresight Information in the APEC Region"</b>												
<b>4</b> Training workshop 2005: Tools for Managing the Future		Yahoo.com advertising & marketing	Bangkok (21-24)										
<b>5</b> Training workshop with prof. Sohail: Creating Future with a Difference										Bangkok (21-23)			
<b>6</b> Prospecta Peru 2005										3rd-15th Peru			
<b>7</b> ASEAN Technology Foresight and Scan Project	Newsletter Issue 6	Newsletter Issue 7		ASEAN Foresight Meeting								Newsletter Issue 12	Full Report
			Newsletter Issue 8								Newsletter Issue 9	Newsletter Issue 10	Newsletter Issue 11
<b>8</b> APEC ISTWG Meetings				28th in Korea									29th in Singapore
<b>9</b> Post-foresight													

## Appendix

## Appendix I

### Composition of International Advisory Board Members

**Arthur Carty** (Chairman)  
National Science Advisor to the Prime Minister of Canada

**Greg Tegart**  
Executive Advisor, APEC Center for Technology Foresight (Australia)

**Hsien-Chun Meng**  
Director General, Science and Technology Information Center, National Science Council, Chinese Taipei

**Malee Suwana-adth**  
Independent Consultant (Technology Management) and Special Consultant,  
National Center for Genetic Engineering and Biotechnology, NSTDA

**Ron Johnston**  
Executive Director, Australian Centre for Innovation and International  
Competitiveness Limited, University of Sydney

**Hiroshi Nagano**  
Director General, National Institute of Science and Technology Policy (NISTEP),  
Japan

**Yongyuth Yuthavong**  
Director, Thailand Graduate Institute for Science and Technology

**Youngrak Choi**  
President, Science & Technology Policy Institute, Republic of Korea

**Yada Mukdapitak (Secretary)**  
Acting Executive Director, APEC CTF

## Appendix II

### Side Meeting Report

APEC Center for Technology Foresight

26th APEC ISTWG Meeting, Christchurch, New Zealand

March 8th, 2004, 15:30 – 17:00

**Number of participants:** 17 participants from 10 economies: Indonesia (2), Japan (1), Korea (1), Malaysia (3), New Zealand (2), The Philippines (1), Singapore (1), Chinese Taipei (1), Thailand (4), and Vietnam (1).

#### Objectives:

- To ensure that the Center's activities respond to the needs of APEC members
- To seek ISTWG delegates' ideas on the projects and participation of economies
- To promote understanding of the value of technology foresight

#### Outcomes:

Two sessions were reported: Activity Report; and New APEC-wide proposal on Foresighting Future Fuel Technology.

#### 1. Activity Report (October 2003 – March 2004)

Dr. Chatri Sripaipan, Vice-Chairman of the Center's Steering Committee, reported on the activities undertaken by the Center during the months of October 2004 and March 2004. The presentation covered a range of activities under the Center's main objectives to diffuse knowledge and capabilities on foresight across the APEC region. Those were carried through the APEC-wide projects, post-foresight activities, consultancy, training and workshops, conference and seminars, APEC Technology Foresight Network (TFN), web sites and publications.

- The project on DNA Analysis for Human Health in the Post Genomic Era is completed. Two volumes of final reports were published in hard copies as well as electronic form downloadable from the Center's web site. The Evaluation Report was submitted.
- Post-Foresight activities on the above project has continuously been carried out by the Center, through providing recommendations according to the findings of the study to the newly formed APEC Life Science Innovation Forum (LSIF). The Center will maintain its close contact with LSIF by contributing towards its formulation of strategic plan at the APEC SOM Meeting in Chile later this year.
- ASEAN Technology Foresight and Scan is a two-year project which intends to build up technology foresight capacity in the member countries of ASEAN (7 out of 10 members are APEC member economies). A Training Workshop was held 15-19 December 2003. A bi-monthly newsletter is also published.
- A training workshop under the title Tools for Managing the Future: A

Portfolio Approach, led by Prof. Ron Johnston was held for the third year during 23-27 February 2004. It introduced a collection of foresight tools to 18 participants from various fields of expertise including representatives from business sector, government officials and research institutes.

- The Center's consulting activities include providing foresight services to Thailand's Health System Research Institute in the project on foresighting dental care and nursing system. Another consultation was provided for Malaysia's Ministry of Health, on determining research priorities in Kuala Lumpur, November 2003.
- With support from the Fulbright Foundation, Professor Jim Dator of the Institute for Futures Research and Study, University of Hawaii, U.S.A. conducted a number of workshops on Higher Education Planning during 5-14 January 2004 for SEAMEO-RIHED as well as some institutions in Thailand.
- The web-based APEC Technology Foresight Network (TFN), set up to provide pathways among foresight experts to exchange information related to foresight and an efficient way to diffuse the results of foresight activities will be upgraded this year and a face-to-face meeting will be organized in Krabi, Thailand for active participants.

### **New Proposal: An APEC-wide study on Foresighting Future Fuel Technology**

The broad concept of 'Future Fuels' was initially proposed at the 24<sup>th</sup> ISTWG Meeting, and was selected among other topics. At the 25<sup>th</sup> ISTWG Meeting the Concept Paper of the study was presented and received favorable support. Before the 26<sup>th</sup> ISTWG Meeting, the full proposal was submitted by the Center through ASTWeb and circulated among ISTWG member economies. Several economies expressed their intention in co-sponsoring the project, and some gave invaluable advice and suggestions for further improvement of the proposal to best suit the interest of APEC economies even beyond ISTWG.

Dr. Nares Damrongchai, policy researcher, gave a presentation on the newly submitted proposal at this Side Meeting. Rationale, scope, and methodologies of the project were presented in further details, including budgeting. In the presentation, it was proposed that the project will be divided in two stages: Stage One, to be implemented in 2004 under self-funding, involves scenario planning workshops and a web-based discussion. Scenarios will narrow down and prioritize the theme to be undertaken by the subsequent technology roadmapping. Stage Two, planned in 2005 and partially funded by the APEC Central Fund, will be mainly dedicated to the development of technology roadmaps, deriving from the established scenarios. The technology roadmaps, since they will draw from multiple scenarios, may have several pathways that can be thought of as competing or cooperating visions for plausible energy and fuel development in the different parts of the region.

It is naturally expected that different economy in the region may have different geoeconomic situation regarding fuel and energy, and therefore different approach to the issue, depending also on their level of development, existence

of fuel industry, internal fuel supply, and import dependency, among other factors. Consequently, one important feature of this new proposal is that it aims to achieve an ambitious advance from previous projects of the Center. While the Center, on its last several projects, involved one scenario workshop as their core activity of foresight, this new project proposes 2 scenario workshops and 2 technology roadmapping workshops, each planned to be hosted in different economies to encompass the diversity of the APEC region. The project is strongly supported by Canada, who will host the first Scenario Workshop in Vancouver later this year (2004), and will also take a major role in the subsequent stage in 2005. It has now 8 co-sponsoring economies: Canada, Indonesia, Japan, Malaysia, the Philippines, Chinese Taipei, and Vietnam, with Thailand as the proposing economy.

There were active discussions after the presentation:

- Japan pledged its support to the project through the National Institute of Science and Technology Policy (NISTEP), organization home to Japan's technology foresight center.
- Korea expressed its support to the project while suggested some idea on streamlining the project to fit the APEC funding capacity.

The Center will continue its dialogue with some potential member economies to get their further viewpoints, specifically on further in-kind contribution to the project, e.g. hosting workshops, providing consultancy and supporting traveling expenses of other member economies.

Meeting closed at 17:00.

## Appendix III

### Report of Side Meeting (4)

#### APEC Center for Technology Foresight

27th APEC ISTWG Meeting, APEC Secretariat, Singapore.

September 14th, 2004, 10:30 – 12:00

**Number of participants:** 22 participants from 12 economies plus the APEC Secretariat: Australia (1), Brunei Darussalam (1), Canada (2), Indonesia (1), Korea (2), New Zealand (1), The Philippines (1), Russia (2), Singapore (3), Chinese Taipei (2), Thailand (4), Vietnam (1) and APEC Secretariat (1).

#### Objectives:

- To ensure that the Center's activities respond to the needs of APEC members
- To seek ISTWG delegates' ideas on the projects and to encourage participation of economies
- To promote understanding of the value of technology foresight

#### Outcomes:

Two sessions were reported: Activity Report; and the current APEC-wide proposal on Foresighting Future Fuel Technology.

#### Activity Report (April – September 2004)

Dr. Chatri Sripaipan, Vice-Chairman of the Center's Steering Committee, reported on the activities undertaken by the Center during the months of April and September 2004. The presentation covered a range of activities under the Center's main objectives to diffuse knowledge and capabilities on foresight across the APEC region. Those were carried through the APEC-wide project, post-foresight activities, consultancy, training and workshops, conference and seminars, APEC Technology Foresight Network (TFN), web sites and publications. Below are the major activities carried out by the Center during the past 6 months, excluding the APEC-wide project, that will be covered separately in details.

- Post-Foresight activities on the finished *DNA Analysis for Human Health in the Post Genomic Era* project has continuously been carried out by the Center, through providing recommendations according to the findings of the study to the newly formed APEC Life Science Innovation Forum (LSIF). The Center will maintain its contact with LSIF and encourage the forum to utilize foresight tools in its future activities.
- ASEAN Technology Foresight and Scan is a two-year project which intends to build up technology foresight capacity in eight member countries of ASEAN (7 out of 10 members are APEC member economies). Current progress of each member's project is now posted on our web site discussion forum and each is provided with comments from the Center. A bi-monthly newsletter has been published and Newsletter #5 is in preparation. Further, the Center is planning for special consultations for 2 ASEAN members, Myanmar and Laos, by assisting them in conducting on-site foresight workshops in their respective countries in the next several months.

- The Center's consulting activities include providing continued foresight assistance to Thailand's Health System Research Institute. Previous Scenario workshops were on Thailand's drug system, dental care and nursing system. A recent project on *Foresighting Physical Therapy* was added in 2004. The entire project is to be concluded soon by HSRI. *KU Foresight 2023* was a new project initiated by Kasetsart University with the objective to foresight the future of the University amidst current change following the planned restructuring of Thai university systems. The project is to utilize a 20-year scenario and other foresight tools.
- The web-based APEC Technology Foresight Network (TFN), set up to provide pathways among foresight experts to exchange information related to foresight and an efficient way to diffuse the results of foresight activities. This project materialized the Center's commitment in enhancing connections between the small groups of individuals engaged in technology foresight activities.

### **Progress of the APEC-wide study on *Foresighting Future Fuel Technology***

The project is strongly supported by Canada and Chinese Taipei, who agreed to host Technology Roadmapping Workshops in April and July 2005 respectively. It has altogether 8 co-sponsoring economies: Canada, Indonesia, Japan, Malaysia, the Philippines, Chinese Taipei, and Vietnam, with Thailand as the proposing economy, and was ranked number one in the previous ISTWG meeting.

Dr. Nares Damrongchai, APEC CTF's Policy Researcher, gave a presentation on the progress of the project, including its budgeting. Emphasis of the presentation and the subsequent discussions were given to the scope of the project, and particularly cooperation with the APEC Energy Working Group. This project is differentiated from EWG's work in that it covers fuel (as energy carrier) and fuel-related technologies; mainly hydrogen, biofuels, conventional hydrocarbons and perhaps other fuel sources that require future technological breakthroughs. The time range for the foresight is currently considered to be up to the year 2030.

The project is currently being carried out in Stage One (2004), where it is self-funded, with the main activities involve a pre-workshop web-based articulation, and the organization of a Scenario Workshop in Thailand among APEC experts during 13-15 December 2004. Scenarios will narrow down and prioritize the theme to be undertaken by the subsequent technology roadmapping in the next stage.

Stage Two is planned in 2005 and recently received approval for partial funding from the APEC Central Fund (approximately \$100,000). This stage will be dedicated to the development of technology roadmaps (TRM) for specific fuel or fuel technologies (to be decided at the 2004 Scenario Workshop). The technology roadmaps can be thought of as pathways with cooperating visions for plausible fuel technology development in the parts of the APEC region.

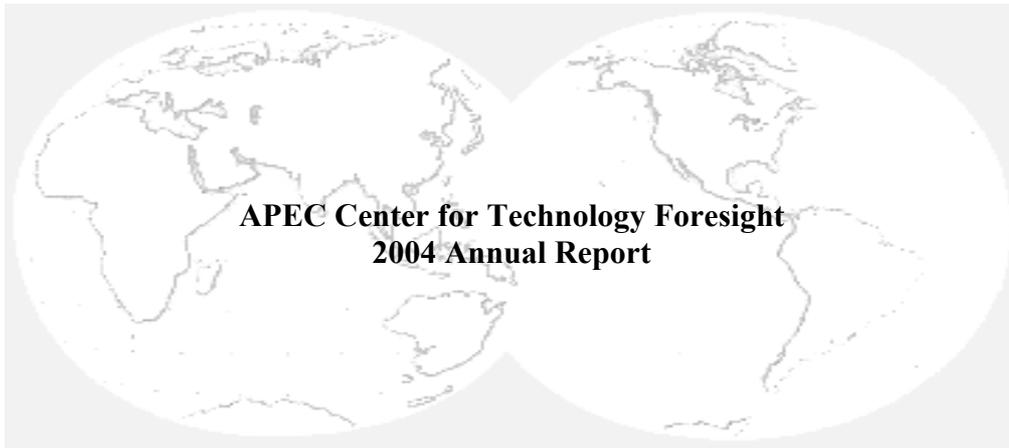
There were active discussions after the presentation as summarized here:

- **Cooperation and division of labor with EWG.** This was a major issue of discussion. The Center has started some exchange of opinions with EWG representatives from many member economies since 2003, before the submission of the proposal. It has been made clear in the proposal that the current project gives emphasis to *future fuel technology* that can be thought of as a mean to develop new industries and new technologies. On the other hand EWG emphasized on how to handle energy issues to support the industry, as the EWG Lead Shepherd had earlier suggested that “*ISTWG should focus on pre-competitive stages while EWG focuses on applied stages*”. According to the draft outline of the Scenario Workshop’s program, EWG representative is to be invited to the Workshop and to give a presentation on EWG’s activities. Canada gave an additional comment that it is logical that EWG also get involved in Stage Two (TRM) since implementation plans are to be formulated in details. Chinese Taipei, who is to host a TRM Workshop in 2005 is prepared to involve EWG as suggested. It is also hoped that ISTWG representatives have the opportunity to attend the coming EWG meeting in Port Douglas, Australia in November 2004 to clarify the issues.
- **Participation of non-APEC representative.** Korea suggested that since fuel and energy is a global issue and even if the current scope is APEC, worldwide development of the issues has to be reviewed. In light of this comment, it was discussed whether and how representative(s) from the EU or the non-APEC OECD members can be invited to the meeting. Mr. Tong Xianguo, EWG’s Program Director who also attended this Side Meeting clarified this point by confirming that interactions with non-APEC members used to be authorized by Senior Officials but has currently fallen under the sole consideration of Working Groups.
- **Consistency of the study in terms of different nature of fuels.** The Philippines asked how the project covers and treats individual fuel or fuel technologies in a consistent manner since each has different natures. This issue was clarified by the further explanation of the TRM Stage, where roadmaps will be developed for each fuel/fuel technology separately.

It is expected that discussions relating to EWG will continue in the subsequent Plenary Session, Agenda (6) *Interface with EWG activities on Hydrogen and Fuel Cell Technologies*.

The Center will continue its dialogue with member economies to get their further viewpoints and cooperation. Member economies are encouraged to find connections and initiate consultation with their respective EWG representatives for better awareness and understanding regarding the benefit of creating good relationship between ISTWG and EWG through this project. It also called for participation of experts from member economies in the coming Scenario Workshop, to be held in Krabi, Thailand in December 2004.

Meeting closed at 12:00.



**APEC Center for Technology Foresight  
2004 Annual Report**

**Contacts**

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