2015 APEC Workshop on STI cooperation
(In conjunction with the Fifth HSE Annual Conference on Foresight and STI Policy)
Date: 18th - 20th of November 2015
Venue: National Research University, Higher School of Economics
Moscow, the Russian Federation
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Day 0: 18th of November 2015

TECHNICAL TOUR

MOSCOW STATE UNIVERSITY (MSU) SCIENCE PARK

Moscow State University (MSU) Science Park, established in 1992, is an operating technopark providing offices and laboratory premises to over one hundred technological companies. MSU Science Park also provides consulting services in market research, technological projects expert reviews, investment deals structuring, project fund raising, business assessment, recruitment, intellectual property protection, and implementation of educational programs. As MSU Science Park is located in the territory of Lomonosov MSU campus, residents of the Science Park have advantages in undertaking joint studies with MSU scientists, hiring university graduates, and accessing laboratory equipment at MSU. Examples of successful companies are Mavicom, Maxtelcom, Deco Geophysical, Obtiz, Fidesys, Napoli, MedEco, etc.

Mr. Vitaliy Morozov, Deputy Director of MSU Science Park
MOSCOW STATE UNIVERSITY (MSU) BIOTECHNOLOGY BUSINESS INCUBATOR

Moscow State University (MSU) Biotechnology Business Incubator was implemented in 2013 as a part of the innovation infrastructure of MSU. The goal of the program is to transform prospective ideas into developed start-up project. The main task of the incubator is to provide comprehensive support such as infrastructure, residence, and services to innovative biotechnology companies and projects.
Day 1: 19th of November 2015

PARTICIPANTS FROM THAILAND

1. Dr. Surachai Sathitkunarat, Executive Director, APEC Center for Technology Foresight (APEC CTF), Director of Department of Energy and Environment, National Science Technology and Innovation Policy Office (STI), Ministry of Science and Technology (MOST)
2. Ms. Nisara Jantarapatin, Policy Researcher, APEC Center for Technology Foresight (APEC CTF), National Science Technology and Innovation Policy Office (STI), Ministry of Science and Technology (MOST)
3. Dr. Apichat Aphaiwong, Policy Researcher, APEC Center for Technology Foresight (APEC CTF), National Science Technology and Innovation Policy Office (STI), Ministry of Science and Technology (MOST)

From left: Dr. Apichat, Dr. Surachai, and Ms. Nisara
WELCOME AND INTRODUCTION TO THE CONFERENCE,

LEONID GOKHBERG, NATIONAL RESEARCH UNIVERSITY, HIGHER SCHOOL OF ECONOMICS (HSE), RUSSIA

The opening remarks were given by Mr. Leonid Gokhberg, National Research University, Higher School of Economics (HSE), Russia. The conference would focus on foresight methodologies and results of regional and sectoral foresight studies on Day 1, followed by new foresight instruments, APEC methodologies and analysis, and EU Horizon presentation on Day 2.
SESSION 1: S&T FORESIGHT

CHAIR: PHILIP SHAPIRA, GEORGIA INSTITUTE OF TECHNOLOGY (GEORGIATECH), USA; UNIVERSITY OF MANCHESTER, UK

TRENDS IN FUTURES STUDIES METHODOLOGIES

TED FULLER, UNIVERSITY OF LINCOLN, UK

The development of foresight methods and methodologies is a natural role of foresight community to develop its capacity. This creates new knowledge in new forms, new knowledge structures, and new relationships with the future. Foresight can be regarded as “an anticipatory system – a natural system that contains an internal predictive model of itself and of its environment, which allows it to change state at an instant in accord with the model’s predictions pertaining to a later instant (Rosen 1985)”.

MONITORING AND ANALYZING STI GLOBAL AND NATIONAL TRENDS – TOOLS AND METHODS TO DEALING WITH LARGE AMOUNTS OF DATA

MARCIO DE MIRANDA SANTOS, CENTRE FOR STRATEGIC STUDIES AND MANAGEMENT (CGEE), BRAZIL

The Centre for Strategic Studies and Management (CGEE) provides strategic perspectives for monitoring and analysis of large volumes of data. Currently, the focus is to accelerate the processes for capturing, processing, monitoring, and expert interpretation of trends in STI to promptly inform decision-makers. The basic processes are planning and direction, data collection and processing, and analysis or classification of the collected information.
MATCHING MARKET PULL AND TECHNOLOGY PUSH

JONATHAN LINTON, UNIVERSITY OF OTTAWA, CANADA; HSE INSTITUTE FOR STATISTICAL STUDIES AND ECONOMICS OF KNOWLEDGE (ISSEK), RUSSIA

MARINA KLUBOVA, ANASTASIA EDELKINA, HSE ISSEK, RUSSIA

OLEG KARASEV, HSE ISSEK; LOMONOSOV MOSCOW STATE UNIVERSITY, RUSSIA

The research question is how to close the gap in decision support for prioritizing and selecting R&D projects for a firm by taking into account market and customer needs and R&D technology. A two-dimensional (ease of access against market prospects) Push-Pull Matrix (PPM) can be developed from a systematic combination of technology-push (technology readiness against firm-technology-fit) and market-pull (firm technological position against market attractiveness) matrices. The portfolio proposed by the PPM is a list of technologies with high market-prospects that are easy to access; however, for diversification, poor market-prospect projects are recommended.

GAINING INSIGHT INTO MARKETS – ENVIRONMENTAL SCANNING, FORESIGHT, AND INTELLIGENCE PRACTICES IN EUROPE

JONATHAN CALOF, UNIVERSITY OF OTTAWA, CANADA

“Competitive Intelligence (CI) is a necessary, ethical business discipline and/or skillset for decision making based on understanding the competitive environment in order to drive to competitive advantage in the marketplace.” The developed CI is systematic, forward-looking, integrative, open source, and comprehensive. The process cycle involves planning, collection, analysis, communications, and evaluation or management. Examples of analytical techniques are competitor analysis, technology forecasting, etc. Currently, two on-going phases are online survey prior to in-depth study, and survey administration at SCIP Europe conference.
MULTILINGUAL META-SCANNING ON THE NEXT PRODUCTION REVOLUTION

JOSHUA POLCHAR, OECD DIRECTORATE FOR SCIENCE, TECHNOLOGY, AND INNOVATION

OECD has completed a TNO project in creating shared value and an EU (FP7) project to evolve concepts of security. Presently, OECD is conducting Next Production Revolution. The activity is comprised of 4 components, namely, search issues relating to identified technologies (nanotechnology, biotechnology, robotics, internet of things, and 3D printing), scan weak signals on production, wider context of social pulls of technological developments, and strategic foresight for input to scenario planning, megatrends analysis, etc. The project methods include source and sample, process and archive, mine text, analyze, and review and evaluate.

TECHNOLOGY TRENDSPOTTING

OZCAN SARITAS, PAVEL BAKHTIN, ANNA SOKOLOVA, HSE ISSEK, RUSSIA

The use of trend analysis for foresight can generate ideas and identify opportunities, identify early warning signals, distinguish real trends and hypes, and understand the future of specific industries. Quantitative trend analysis helps identifying new concepts, inventions, knowledge, technologies, markets, and innovation. The analysis also produces evidence for expert evaluation and helps exploring new trends and developments.

The S&T Foresight 2040 project conducted since 2015 involves key issues of socio-economic development, exploring strategic trends, breakthroughs, weak signals, and wild cards, and forecasting innovative products, technologies, and markets. The methodologies are long-term scenarios and more sophisticated methods with the integration of qualitative and quantitative tools. The HSE ISSEK Global Trend Monitoring Process includes trend spotting through review of external sources, trend mining, surveys, and review of internal sources, followed by trend description via expert panels, bibliographic analysis, foresight, and roadmapping, and eventually trend promotion of trend database.
TEXTING MINING: FULL-TEXT ANALYSIS AND ONTOLOGY BUILDING

ILYA KUZMINOV, HSE ISSEK, RUSSIA

The first stage of technology foresight methodology is to form a pool of experts, collect and pre-process data, develop forecast model, and create preliminary analytic and forecast data, then the next stage is production and validation of foresight results. With full-text collections from international analytic reports and scientometrics statistics of patent and publication activity, citation indices, and research fronts, foresight ontologies can generate a variety of outputs such as impartial selection of experts, forecast estimate comparison, weak signals, trend systematization, impartial key words, expected effects of innovation, structured timelines, etc.

STATE OF THE FUTURE INDEX BY THE MILLENNIUM PROJECT

JOSE CORDEIRO, SINGULARITY UNIVERSITY, USA; VENEZUELA NODE OF THE MILLENNIUM PROJECT

The State of the Future Index (SOFI), developed since 2000 by Ted Gordon and the Millennium Project, is a dynamic method to study whether the future seems to be improving or not and to test the effects of policy on the future outlook. The SOFI inputs are constructed of weighed variables e.g. GDP, population growth, life expectancy, employment, etc., all historical data for 20 years, prospective data for 10 years, and expert judgments on variables, weights, expectations, and future developments. The SOFI processes are data collection, curve fitting, non-dimensionalizing, and SOFI computation.
SESSION 2: S&T FORESIGHT (CONTINUED)

CHAIR: TED FULLER, UNIVERSITY OF LINCOLN, UK

STRATEGIC FORESIGHT IN PRACTICE

DAVID SARPONG, UNIVERSITY OF THE WEST OF ENGLAND, UK; HSE ISSEK, RUSSIA

Foresight is to connect the past, present, and the future. The foresight analytic process is framing, scanning, forecasting, and visioning by using tools such as scenario planning, business war-gaming, value chain analysis, trend-spotting, competitive intelligence, technology forecasting, and roadmapping. Corporate foresight practices, which are affected by competitive and organizational environments, are likely to increase in firms.

STI IN SENEGAL TOWARDS 2035: AN AGENDA FOR INCLUSIVE AND SUSTAINABLE DEVELOPMENT

RICARDO SEIDL DA FONSECA, CONSULTANCT ON FORESIGHT, AUSTRIA

The conceptual proposal of a project entitled “STI in Senegal towards 2035” was reported. The goal is to build a national STI system that is sustainable and supportive to the economic, industrial, social, and cultural progress of the country. The objective is to develop STI policies and strategies with STI role and strategically dynamic, performance analysis, foresight, and engagement and networking components. Proposed foresight methods are key performance indicators, stakeholder mapping, successive year scenarios, SWOT analysis, continuing expert panels and survey, critical technologies, wild cards, weak signals, roadmapping, multi-year R&D timing and planning, and policy recommendation chain.
CHINA 2025: RESEARCH AND INNOVATION LANDSCAPE – TRENDS & SCENARIOS

EPAMINONDAS CHRISTOFILOPOULOS, GREEK NODE OF THE MILLENNIUM PROJECT; PRAXI NETWORK, GREECE

China is shifting from low-labor manufacturing to services, internal consumption, and production of high-technology products. From trend spotting via desktop analysis, media scanning, Delphi study, and crowd sourcing, 16 trends that will shape Chinese research by 2025 were identified. In addition, 4 scenarios were outlined, namely, Ying Yang – the best scenario with balance financial growth and transparent governance, Dungeons and Dragon – powerful governance blocking some researches, Blue Jasmin – the economic is not so good, and Breathless Queen – the worst scenario with despotic governance and slowdown finance.

RUSSIAN FORESIGHT 2040: METHODOLOGICAL APPROACHES

ALEXANDER CHULOK, HSE ISSEK, RUSSIA

The Russian S&T policy needs a strategic agenda to cope with current economic policy agenda and global trends, with aids from a network of over 650 organizations and 1250 experts. The basic requirements for S&T foresight projects are time horizon of at least 10 years, participatory of all stakeholders, at least 100 qualified experts for national projects and at least 50 potential experts for sectoral or problem-oriented projects, a combination of evidence-based, creative, and interactive methods, and support in the political decision making process. Non-obligatory elements are high competence of the project team, verification of the methodology and results with international experts, linkages between the logic of the project, inclusion of key national and regional strategic documents, and dissemination of the results. The methodology of the S&T Foresight 2040 project includes studies of emergence of new market segments, main products and their technical and economic, consumer characteristics, basic key technologies, scenarios for long-term development, and technology push.
FORESIGHT OF SERVICE SYSTEMS

SARAH CHEAH, NATIONAL UNIVERSITY OF SINGAPORE (NUS), SINGAPORE

Servitization is the transition from product to service offering, and service systems are defined as value co-creation configurations of technology, people, and value propositions that deliver services. The systemic foresight approach of Singapore Foresight of Service Systems 2025 project consists of 5 stages, namely, Intelligence (horizon scanning and literature review), Imagine (scenario development and modelling), Integrate (SWOT and Delphi), Interpret (technology roadmap), and Implement (R&D plans of 10 years). The results reveal that customer needs deep customization, continued customer participation to co-create value, intensified customer knowledge, faster, simpler, more seamless, and more reliable service, and much greater contextual awareness.
THE 10th JAPANESE FORESIGHT

KUNIKO URASHIMA, NATIONAL INSTITUTE OF SCIENCE AND TECHNOLOGY POLICY (NISTEP), JAPAN

The 10th S&T Foresight was implemented with Delphi Survey focusing on problem-solving scenario planning. The project started in November 2013 with discussion of prospect of future society by a qualitative survey to identify viewpoint of global issues. Then a quantitative questionnaire-based survey was conducted in April 2014 for selection and evaluation of S&T to realize the future. Finally, a qualitative discussion-based survey in September 2014 transformed visions from the previous stage to create scenarios. The Delphi survey was designed to explore 932 topics in 8 areas, including service-oriented society as influenced by ageing society issue. The response periods were 1-30 September 2014 and 6-24 October 2014, with time range from 2015 to 2050. The results were processed with Delphin System, which is an online-based Delphi analysis system developed by the National Institute of Science and Technology Policy (NISTEP).
Day 2: 20th of November 2015

SESSION 3: STI POLICY

CHAIR: JONATHAN LINTON, UNIVERSITY OF OTTAWA, CANAGE; HSE ISSEK, RUSSIA

ASSESSING PRODUCTIVITY OF PUBLIC RESEARCH INSTITUTIONS: FINDINGS FROM NATIONAL EVALUATION EXERCISE

KONSTANTIN FURSOV, HSE, ISSEK, RUSSIA

During 1998-2014, there had been a significant growth of R&D budgets; however, low productivity of R&D units in terms of international publications, share of the world publication output, and patent applications were reported. The first round of the national evaluation exercise was carried out during 2009-2011 by public agencies, covering around 400 research institutions. Then during 2011-2013, there were small-scale studies and public debates on the use of S&T indicator for research evaluation. Subsequently, in November 2013, another round of national evaluation exercise was conducted to provide evidence for S&T policy making and to allow benchmarking of R&D performing institutions. From preliminary data analysis, it was found that there is a strong correlation between expenditure on basic research and publication output. The algorithm of the exercise consists of 4 steps, namely, division by fields of science producing 40 research areas from unified classification of scientific fields, identification of research profile from various types of outputs, construction of reference groups, and nomination of a performance category by key indicators. It was suggested that further verification using different samples and statistical modelling, and further peer-review process of organizations from all performance categories are needed.
IMPLEMENTING RESPONSIBLE RESEARCH AND INNOVATION: EARLY INSIGHTS FROM SYNTHETIC BIOLOGY

PHILIP SHAPIRA, GEORGIA INSTITUTE OF TECHNOLOGY (GEORGIATECH), USA; UNIVERSITY OF MANCHESTER, UK

Responsible Research and Innovation (RRI) is “a process that seeks to promote creativity and opportunities for science and innovation that are socially desirable and undertaken in the public interest”. In synthetic Biology context, key elements of RRI are to anticipate possible impacts of synthetic Biology technologies and implications in society, economy, and the environment, to reflect the purposes, motivations, potential implications, and uncertainties of the research, to open up broader visions, and to lead the direction of the research and innovation process. The work plan of RRI in the first two year includes benchmark self-study, RRI Centre workshops, RRI internal training, collaborative publications, RRI infrastructural development, industry and stakeholder engagement, and “End-to-End” projects.

STI POLICY INSTRUMENTS FOR PUBLIC RESEARCH – THE MEANING/IMPACT OF POLICY EVALUATION

NICHOLAS VONORTAS, THE GEORGE WASHINGTON UNIVERSITY, USA; HSE ISSEK, RUSSIA

“The task of policy makers is to develop an optimal mix of policies and instruments for stimulating innovation performance that takes into account possible positive and negative interactions among instruments. In practice, given the uncertainties and limitations faced, the policy mix should be sufficiently good in terms of the overall net benefits (OECD, 2010)”. Key activities in the system of innovation are provision of knowledge inputs to the innovation process, demand-side activities, provision of constituents for the system of innovation, and support services for innovating firms.
STRUCTURAL CHANGES IN THE NATIONAL INNOVATION SYSTEMS OF THE EU10 COUNTRIES

ATTILA HAVAS, INSTITUTE OF ECONOMICS, CENTRE FOR ECONOMIC AND REGIONAL STUDIES, HUNGARIAN ACADEMY OF SCIENCES, HUNGARY

The EU10 countries comprise Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Although the EU10 countries are characterized by similar history, their structural composition of the research sub-system revealed a great diversity and significant changes since the year 2000, without observed direction towards a similar structure. This could be a result of several factors such as conscious STI policy efforts, differences in working conditions among main research performing sectors, the type and pace of privatization, structural changes in the economy, brain drain to other occupations or to foreign countries, fiscal policy, etc.

EVOLUTION OF SOUTH KOREAN STI

JEONG DONG LEE, SEOUL NATIONAL UNIVERSITY, KOREA

The evolution of South Korean STI can be divided into 4 periods. During 1962-1973, the goal was to secure foreign currency by export with government incentive support of around 20%, and there was no R&D investment. In stage 2 (1973-1986), the heavy and chemical industry was promoted not by market force but with the 3rd 5-year Economic Development Plan (1972). The Sector Specific Promotion Acts also elevated 6 industries, namely, iron and steel, electronics, petro-chemical products, automobile, ship building, and machinery. The policy of the next period (1986-1999) was transformed from sector-specific to sector-neutral. The Industrial Development Act (1985, 1986) provided clear guideline for government intervention and support for technological capability upgrade, focusing on R&D investments, knowledge infrastructure, and human resources. From the year 1999 until present, there have been no explicit industrial policy but a strong commitment on technology development. The ICT sector has been developed as a national agenda. The future prospect suggests that innovation capability based on creativity will be needed, as well as a change of societal institutional framework to support creative tries and tolerate failures.
MEASURING HETEROGENEOUS DEMAND ON INNOVATION POLICY INSTRUMENTS

VITALY ROUD, HSE, ISSEK, RUSSIA

The objective of the project entitled “Measuring heterogeneous demand on innovation policy instruments” is to model demand side of the policy mix using firm-level data. The first step was to monitor innovation behavior of enterprises through personal interviews with the top management representatives. From explicit closed list of instruments, it was found that “tax incentives for R&D and innovation” showed the largest share of users in companies of 7.15%, followed by “subsidized credit interest rates for production and export” of 5.67%. The study also revealed strong sectoral biases in innovation support, empirical policy-mix patterns as implemented by companies, heterogeneity of demand on policy measures, and output-based innovation-mode composition.

INNOVATION AND INSTITUTIONAL ENVIRONMENT: TURKISH STI POLICIES

ERKAN ERDIL, MIDDLE EAST TECHNICAL UNIVERSITY (METU), TURKEY

The Strategic Framework of Turkish National Science, Technology, and Innovation Strategy (2011-2016) details mission-oriented approaches in areas with strong R&D and innovation capacity, need-oriented approaches in areas with a demand for gaining acceleration, and bottom-up approaches including basic, applied, and frontier research. These approaches can be facilitated by development of human resources for STI, transformation of research results into products and services, diffusion of a multi-actor and multi-discipline R&D cooperation culture, promotion of the role of SMEs within the national innovation system, and contribution of R&D infrastructures to knowledge production. The R&D targets for 2023 are to achieve an R&D intensity of 3%, increase business R&D expenditure to 2%, and increase the total number of researchers to 300,000 FTEs, of which 60% is in the private sector. The priority sectors under the strategy are automotive, machinery and production technologies, ICT, energy, water, food, security and space, and health.
SESSION 4: DEVELOPMENT OF METHODOLOGY AND ANALYSIS OF STI OPERATION IN APEC REGION

CHAIR: LEONID GOHKBERG, HSE, RUSSIA

IDENTIFYING PRIORITIES OF RUSSIA’S INTERNATIONAL S&T COOPERATION: COUNTRIES AND THEMATIC AREAS

ANNA PIKALOVA, MAXIM KOTSEMIR, HSE ISSEK, RUSSIA

A project entitled “Identifying priorities of Russia’s international S&T co-operation: countries and thematic areas” was reported. The project methodologies include a variety of analyses such as bibliometric analysis of 25 countries’ publications (2003-2014) indexed in Web of Science, countries’ priorities of S&T development, indices of scientific specialization, Russia’s S&T key partners, thematic areas of Russia’s S&T collaboration, and analysis of S&T strategies and programs. APEC economies under these analyses are Canada, China, Japan, Malaysia, Mexico, South Korea, Singapore, Chinese Taipei, and the USA. Three rounds of experts’ surveys were launched to approach representatives of 38 Russian research organizations, S&T counsellors of 15 foreign embassies and delegations to Russia, and foreign experts who are authors of joint publications with Russia. With 530 completed questionnaires from 19 countries, the result was a list of priority areas recommended for Russia’s S&T cooperation with foreign countries – ICT, Biotechnology, medicine and health, new materials and Nanotechnology, rational use of natural resources, transport and space systems, and energy efficiency.
INTERNATIONAL STI COOPERATION IN APEC REGION: KEY CHARACTERISTICS AND COMPOSITE SCORES

GALINA SAGIEVA, ELENA NECHAEVA, HSE ISSEK, RUSSIA

The main objective of the study of the composite index of STI cooperation in the APEC region (APEC CICSTI) is to apply a measurement framework that would reflect the development of cooperation between APEC economies and analysis of performance. The project activities are to measure STI activities developed in international organizations and statistical standards for STI used in APEC economies, and to analyze the development of intra-APEC STI cooperation and its influence on the economies’ innovation systems. The project outputs will be methodological guidelines for measurement of STI cooperation in the APEC region, publication of special statistical bulletin and data book “STI cooperation of APEC economies”, analytical report “STI cooperation within the APEC region”, and workshop for APEC economies to discuss the results of the analysis and make recommendations to foster STI cooperation.
DISCUSSION ON EFFECTIVE SUPPORT INSTRUMENTS OF INTERNATIONAL STI COOPERATION

POINT OF INTERNATIONAL COOPERATION BETWEEN MANY COUNTRIES IN STI

YUTAKA HARA, EMBASSY OF JAPAN IN THE RUSSIAN FEDERATION

International cooperation can tackle a challenge to global issues such as disaster risk, infectious diseases, and climate change. The environment for science, technology, and innovation can be improved through joint research activities, sharing data, knowledge, experiences, and common tools, standardization of data, and mobility and networking of researchers and students e.g. exchange program, workshops, etc. An example of Japan experiences is Sendai Cooperation Initiative for Disaster Risk Reduction (DRR), contributing to build a resilient society with international communities by sharing Japan’s knowledge and technologies.

S&T DEVELOPMENT STRATEGIC PLAN

CHAO-MING FU, TAIPEI-MOSCOW ECONOMIC AND CULTURAL COORDINATION COMMISSION

In Taiwan, the S&T development strategic plan is based on the Fundamental S&T Act which is re-formulated every 4 years. The Advisory Board on Academic Research and the Advisory Board on Bridging Academia and Industry are involved in planning international S&T cooperation and identifying thematic areas of S&T cooperation with foreign states. The missions is to plan and promote national S&T development strategies, to support academic research and manpower cultivation, to facilitate academia-industry collaboration, and to develop science parks.
EFFECTIVE SUPPORT - INSTRUMENTS OF INTERNATIONAL STI COOPERATION

SURACHAI SATHTKUNARAT, APEC CENTER FOR TECHNOLOGY FORESIGHT (APEC CTF), THAILAND

APEC Center for Technology Foresight (APEC CTF) was established as a project of the Industrial Science and Technology Working Group (ISTWG) within APEC in 1998 and was transformed into the Policy Partnership on Science Technology and Innovation (PPSTI) Working Group in 2012 to include issues of innovation policy development and intensify cooperation among governments, businesses, and academia. The APEC CTF aims to develop and diffuse foresight capability and leading-edge planning tools to prepare APEC economies for rapid changes and major societal challenges. The Center conducts APEC-wide foresight studies, provides consulting and trainings for public and private sectors, and organizes conferences on foresight and emerging technologies. Currently, the Center is implementing a project entitled “Innovation Futures in APEC: Competitiveness and Grand Challenges” to formulate a list of key technologies for the next decade and evaluate technology readiness through the use of foresight techniques.
A networking dinner:
Dr. Alexander Sokolov (HSE ISSEK, Russia), Mr. Hara Yutaka (Embassy of Japan in Russia), Dr. Kuniko Urashima (NISTEP, Japan), Dr. Sarah Cheah (NUS, Singapore), Dr. Surachai Sathitkunarat, Ms. Nisara Jantarapatin, and Dr. Apichat Aphaiwong (APEC CTF, Thailand)

From left: Ms. Nisara, Dr. Surachai, Dr. Apichat, Dr. Sarah, Dr. Kuniko, Dr. Alexander, Mr. Hara

Apichat Aphaiwong
December 2015
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