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Energy audits and energy efficiency

An original, highly interactive, technically focused, completely hands-on, practice-oriented 10-day workshop on Energy Audits and Energy Efficiency was organized by the APO and National Productivity Council (NPC), India, at its vast campus in Chennai housing the Centre of Excellence for Training in Energy Efficiency (CETEE; www.cetee.in), 2–11 June. The objective was to provide an opportunity for industry managers and professionals to understand the practical methodology and major components of energy audits, reduce energy consumption, and improve energy performance in organizations. At the outset, NPC Director General Harbhajan Singh stated, “We would be keen to organize more programs for energy auditors sponsored by APO member countries. We would also be happy to partner in their economic growth with efficiency in energy consumption.” Twenty-four energy professionals from 14 APO members read about, listened to, and acted upon/performed components of energy efficiency, enabling them to remember the practical aspects forever in line with Aristotle’s advice: “One must learn by doing, for though you think you know it, you are not certain until you try.”



Participants observing and assessing combustion furnace burner performance.

There are significant differences between the theory and practice of energy audits and management. APO experience in training in the field showed that while participants understood the theoretical concepts, it was more challenging to translate theory into practice and reap the benefits in the form of energy savings. Generally, a new energy engineer works under an experienced energy auditor for at least three years before auditing independently. Energy-efficient technologies and practices are being increasingly adopted worldwide, although more needs to be done, especially in the Asia-Pacific where growing energy demand, emerging environmental issues, and increased stress on aging energy infrastructure are evident. The CETEE is a world-class, hands-on training center in the NPC conceived to bridge the gap between energy efficiency theory and practice. This facility was built and handed over to Indian energy auditors after extensive training by Japanese experts. Most equipment was provided under an Indo-Japanese aid project. Industrial-scale models of energy equipment such as compressors, fans, pumps, furnaces, boilers, lighting systems, heat exchangers, energy-efficient motors, etc. are available so that trainees can conduct trials and see the resulting energy savings. They can then suggest similar measures in sites where they conduct energy audits.

The participants worked on various equipment and filled in detailed worksheets based on actual measurements while analyzing energy performance. Despite summer heat of up to 43°C, their work at the CETEE was marked by passionate intensity.

Chief Electrical Inspector for the Government of Tamil Nadu S. Appavoo inaugurated the workshop and praised the APO for “bringing Asia to Chennai” and introducing the CETEE to the APO family. “Right away, I will start sharing the knowledge gained with all heads of divisions in my company, record energy usage within the organization, and put energy efficiency measures in place. I will also disseminate knowledge to other organizations for multiplier effects,” pledged Indonesian participant Isep Gojali. Farshad Yahyazadeh Elizee from IR Iran commented, “Everything in the workshop was handled very professionally and I will never forget my experience here.” Sri Lankan participant G.A.I Mihindukulasuriya summed up his experience succinctly: “Truly an excellent training workshop.”



Hands-on diagnosis of pump systems.

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Lean thinking: A solution for the service sector

Lean thinking has its roots in the manufacturing sector, but it also offers many benefits to the service sector, including healthcare. Around the world, a growing number of healthcare organizations are turning to lean. Why? How could a concept used in automobile assembly plants also work in the patient-care setting? There are three key reasons why lean is beneficial to the healthcare industry and other service subsectors: 1) Lean is founded on the principle of respect for people. 2) Lean focuses on waste reduction. 3) Lean can be a differentiator.

Respect for people

The original name for Japan's Toyota Production System was the "Respect for Humanity" system. Respect for people is a fundamental principle, and many would argue the most important principle, of lean thinking. The service sector is all about people, identifying their needs, and delivering services to meet those needs in a way that adds value. In the healthcare sector, respect for patients can take many forms. For example, it means designing processes to minimize customer wait times for services. Lean helps us to remove bottlenecks, streamline steps, and improve scheduling to reduce wait times.

At Rouge Valley Health System, one of the earliest lean achievements was a redesign of processes in the preoperative clinic, which patients must visit a few days preoperatively to receive tests and instructions in preparation for surgery. Before lean was introduced, patients spent an average of 7.5 hours at the preoperative visit and walked approximately 493 steps to receive various tests in multiple departments. Many of these patients were scheduled to have hip or knee replacements, so excess walking was a hardship. After a kaizen event to improve the processes, the duration of the preoperative visit was reduced to only 1 to 2 hours and the number of walking steps dropped to 246. The hospital staff did this by making respect for patients their top priority. The staff and doctors changed their processes so that patients stay in one room for most of their visit and various healthcare professionals came to them. A simple visual management system was put in place to track which professionals had been to see patients.

Respect for people also applies to employees. Lean thinking considers it disrespectful to have employees work with inefficient processes that waste time and energy and take staff away from their main role of serving customers. Examples include staff spending time looking for things that they need to do their job such as supplies, equipment, and forms. Lean provides ways to reorganize work areas and improve process flows so that staff can spend more time doing the jobs they were hired to do. This shows respect for the skills and expertise that employees bring to their roles. After Rouge Valley Health System conducted kaizen to improve the organization of its medical inpatient unit, staff satisfaction rose from 35% to 79%.

Waste reduction

In many parts of the world, healthcare consumes such a large portion of government expenditure that spending cannot continue at its current rate. Today, the Province of Ontario spends 42% of its budget on healthcare. Ontario's Action Plan for Health (2012) states: "Without a change of course, health spending

would eat up 70% of the provincial budget within 12 years, crowding out our ability to pay for many other important priorities...." As a result, government funding increases for hospitals are now limited to approximately 2% per year. However, when inflation, population growth, population aging, and union agreements are taken into account, we are actually facing a net decrease in funding every year.

Lean thinking provides a proven approach to examine processes to identify opportunities for change that can reduce costs while maintaining or improving quality. Lean does this by teaching us how to see and remove waste from processes. Waste is defined as any activity that takes time, space, or resources, but does not contribute directly to satisfying the needs of a customer. Lean is the only improvement methodology that focuses on reducing the non-value-added activity. According to experts, most processes are 95–99% non-value added, meaning that the improvement potential is huge.

There are eight types of operational waste that can be reduced or eliminated by using lean thinking: defects, overproduction, waiting, nonutilized talent, transportation, inventory, motion, and excess processing (DOWNTIME; Figure 1).









Defects Wrong/inaccurate information, rework Having to re-enter requests or orders because of wrong or missing information 	Overproduction Producing too much too early Redundant paperwork 	Waiting For people, information or supplies Patient waiting for appointments 	Non-Utilized Talent Poor utilization of existing talents, ideas, abilities, and skill sets Poor utilization of existing talents, ideas, abilities, and skill sets 
Transportation Movement of something farther than necessary Moving supplies/medicine/requisitions, etc. around the hospital unnecessarily 	Inventory Excess stock or things in queue waiting Medicine or supplies that have expired because of excess ordering and stocking 	Motion Unnecessary motion not required to perform tasks Moving a patient unnecessarily or looking for supplies, charts, patients, etc... 	Excess Processing Producing things or completing a task not needed Asking the patient the same question 6 different times 

Figure 1. DOWNTIME examples in the healthcare setting.

Lean as a differentiator

Competitive advantage is critical to the growth and survival of organizations in the service sector. Even those, such as hospitals, that are government funded often must compete for market share and new programs. Lean thinking supports innovation by engaging staff at all levels, but particularly those on the front line of service delivery, to come up with creative ideas to improve processes. Leaders do not have all the answers. Staff who directly deliver services to customers every day are the experts on how things are done and how they could be done better.

Tapping into the knowledge and expertise of staff can result in solutions that set an organization apart from the competition.

At Rouge Valley Health System, all departments are required to have idea boards where staff can post any ideas they have to improve services. The hospital tracks the number of ideas generated and the number implemented (Figure 2). The number of ideas implemented is one of the top 10 metrics reported to the Board of Directors on the hospital's corporate scorecard. Idea celebrations are held to recognize staff for their contributions.

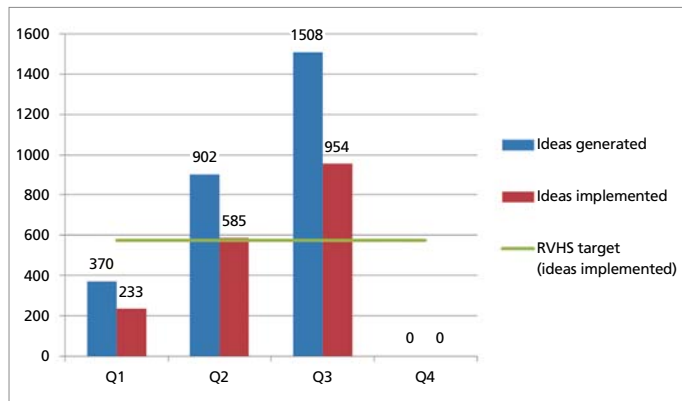



Figure 2. Idea generation and implementation in Rouge Valley Health System, April–December 2013.

At Rouge Valley Health System, the hospital's strategic plan states that “we will be seen by industry as leaders in lean management” and “we will transform through innovation, learning, and continuous improvement.” The hospital is proud to promote its commitment to lean and it is highlighted in job postings as a way of attracting talented people who are excited to work in a lean environment.

Lean has evolved from a methodology for the manufacturing sector to an approach that can help to transform the service sector and other industries. By designing processes that respect people and eliminate waste, service organizations can differentiate themselves from their competition and achieve growth and success. 



Michele James (formerly Jordan), Bsc, MBA, CHE, is the Vice President, Women's and Children's Program, Quality Improvement and Transformation, at Rouge Valley Health System in Toronto, Canada. James joined the hospital in 2008 to develop and execute a strategy for a major operational and cultural transformation. A key component of this strategy was the use of lean thinking as the hospital's management philosophy. In January 2011, she served as a resource person at the APO seminar on Regional Sharing of Lean Applications in Healthcare in Bangkok. James has worked in the healthcare sector for over 25 years.

Strengthening of NPOs

The Research and Planning Department conducted a coordination meeting for its research project on Strengthening of NPOs Assistance Program (SNAP) at the APO Secretariat in Tokyo, on 27 and 28 May. Fifteen national experts from 15 NPOs of APO members and one chief expert participated. The objectives of SNAP are to: enhance institutional development and capacity development programs for NPOs; strengthen NPOs in the delivery of services to stakeholders in their countries; and improve the visibility of NPOs as productivity movement leaders. In achieving these objectives, SNAP will review APO programs for NPO capability building and institutional strengthening; assess the performance of each NPO including profiling of resources and programs; identify the core competencies of each NPO including strengths, weaknesses, opportunities, and threats; identify the emerging roles and challenges of NPOs resulting from sociopoliticoeconomic changes; and identify the organizational development, capacity building, and institutional support needs of NPOs to lead productivity-related initiatives.


In his welcome remarks, Secretary-General Mari Amano emphasized the significance of SNAP to NPOs because, “Any recommendations made that will strengthen NPOs and improve the APO's services will pave the way for achieving the ambitious vision of being the leading international organization on productivity enhancement, enabling APO economies to be more productive and competitive by 2020.” He added that, “Since the national experts are mostly representatives from the NPOs of member countries, the APO

has high expectations that they will help in finding ways that will make our projects and activities more relevant, valuable, and helpful in meeting the needs of all stakeholders to achieve our common goal of increased productivity.”

Given this backdrop, the national experts expressed their strong commitment and dedication to undertaking the research.



Participants in the SNAP coordination meeting.

The output of SNAP will also contribute to the ongoing planning of the APO 2020 Road Map. As SNAP is a one-year project, the national experts will be immersed in research and data gathering not only from NPOs but also from their various stakeholders. Although time was short during the two-day meeting, it was just sufficient to discuss the methodology and framework, and all the experts pledged to contribute to adding the final touches. The chief expert for this research is Dr. Robin Mann, a leading proponent of the business excellence concept and the founder and director of the Center for Organizational Excellence at Massey University, New Zealand. 



Using green biotechnology to increase agricultural/crop productivity

Increasing productivity is key to staying competitive in farming. Very simply, this means to produce more with less or to produce better quality with the same inputs. Both give farmers or other producers more value for their efforts. The Food and Agriculture Organization of the UN has estimated that food production will have to increase by about 70% to keep pace with demand by 2050. Biotechnology is one set of tools which offers the potential to increase production significantly by increasing yields and reducing losses, while concurrently ameliorating the effects of climate change on food availability, physical access, and its utilization.

Agriculture is an important area for applying biotechnology. Modern biotechnology applications in agriculture may be divided into several broad categories such as:

- 1) Diagnostic and early detection tools;
- 2) Inputs such as biofertilizers and biopesticides;
- 3) Crop planting material derived from micropropagation and tissue culture;
- 4) Crop varieties derived from marker-aided selection; and
- 5) Crop varieties derived from genetic engineering.

Scope of green biotechnology to improve productivity

In its traditional sense, biotechnology was considered any technology based on biology, and would therefore include microbial fermentation. In its modern, contemporary sense, biotechnology is taken to mean new cell and tissue culture techniques as well as the new recombinant DNA technologies that utilize some aspect of genetic engineering to produce transgenic plants. At a practical application level, biotechnology includes any technique that uses living organisms or substances derived from those organisms to make or modify a product, improve plants or animals, or develop microorganisms for specific uses. Biotechnology therefore includes a wide set of tools making use of biological processes or organisms in their original or modified form to meet human needs.

Green biotechnology is biotechnology applied to plant agriculture. An example would be the selection and multiplication of plants via micropropagation or tissue culture. Another example is the designing of transgenic plants (genetically modified or engineered plants) to grow under difficult conditions such as drought or flooded environments. A further example is the engineering of a plant to express a protein that, when ingested by certain types of insect pests, will kill those insects and thereby reduce the need for the application of chemical pesticides, ultimately making them more environment friendly.

For small firms and farmers in Asia, productivity may be influenced by factors that: 1) affect the firm's relative cost of production, such as

input costs (chemicals, labor, raw material, etc.), and profit/profitability; 2) increase the total output of production for the same level of inputs; and 3) affect the quality, or perceived quality, of a product or business enterprise. In practice, improved productivity in agriculture through individual farmers and firms may be obtained by reducing input amounts and costs, increasing yield, and improving product quality. Green biotechnologies allow farms to achieve one or more of these benefits.

Proven technologies for productivity improvement

Diagnostics

Diagnostic kits produced from biotechnology include those for confirming specific animal and plant diseases; many are based on immunology, e.g., the kit for detecting the fungus causing rice blast disease, *Magnaporthe grisea*, which acts to detect the presence of the fungus and also confirm its identity. This early detection and confirmation of a disease enables growers to take prophylactic action before any damage is caused. Another example relates to the global trade in food items such as soybeans and corn, most of which now contain specific genes and gene products that are regulated. With increasing trade in biotechnology products, the detection of the low-level presence of such products has spawned an industry to help countries meet international reporting requirements.

Biopesticides and biofertilizers

Biopesticides are either material derived from a biological origin or biological organisms themselves used to control pests (insects, pathogens, and weeds). A form of biopesticide is the microbial insecticide based on a bacterium called *Bacillus thuringiensis* (commonly known as Bt) which is fatal to a certain class of insects belonging to the butterfly family and includes many damaging pests such as the diamond-backed moth whose caterpillars feed on cabbage. Bt is produced en masse and sold to organic growers in particular to help them control this moth. Biofertilizers are commonly microbes such as *Rhizobium* species, which when applied to crops help them to absorb more nutrients or directly provide nutrients to the crops. The biopesticide and biofertilizer industry has grown in recent years due to two factors: the demand by the organic food sector for substitutes to replace synthetic chemical fertilizers and pesticides; and the demand for reduced dependency on petroleum-based fertilizers and pesticides. This has also been supported by scientific breakthroughs in isolating microbes and engineering them for increased efficiency as fertilizers and pesticides, as well as in technology to prolong the effectiveness of the microbes concerned.

Micropropagation and tissue culture

One of the challenges facing all growers is to produce plants with the same quality and growth at approximately the same rates and to the same sizes. Through micropropagation of selected genetic material and using



Figure 1. Uniform lettuce plants produced using seedlings derived from tissue culture.

tissue culture to multiply uniform planting material in large numbers (Figure 1), flower and vegetable growers in particular have been able to maintain high and competitive levels of production. Crop varieties derived from tissue culture are also grown widely, especially through the planting of clones derived from the same genetic background such as the large areas of rubber and oil palm in Southeast Asia.

Genetically improved crop varieties

Genetic improvement of plants to produce new varieties expressing preferred traits (such as improved pest and disease resistance, tolerance to environmental stress, etc.) have been made possible through biotechnology tools such as tissue culture, marker-aided selection, and genetic engineering. Tissue culture, apart from mass producing uniform plants, has also been used to create varied cell lines from which specific lines have been selected with useful properties. Marker-aided selection makes use of information from genetic markers, which indicates the presence of specific major genes in a crop parent used in plant breeding; this makes breeding less of a process based on phenotypes and more based on genotypes.

Biotechnology crops, also known as genetically engineered crop varieties or genetically modified (GM) plants are the most widespread and high-valued of all modern green biotechnology applications. For example, Table 1 shows how a GM crop engineered to resist insect pests of cotton, called Bt cotton, has positively affected productivity factors in India. Table 2 shows the productivity factors directly attributable to biotechnology and the range of advantage conferred by biotechnology crops.

Table 1. Summary of 12 Indian studies on the benefits of Bt cotton, 1998–2010.

Production factor	Positive change in metric range
Yield increase	31% to 60–90%
Reduction in number of insecticide applications	21–75%
Increased profit	50–110%
Average increase in profit per hectare	US\$76 to US\$250

Source: W.C. James. 2012. *ISAAA Brief No. 44*. International Service for the Acquisition of Agri-biotech Applications: Ithaca, NY, USA, Table 18.

Table 2. Advantages conferred by biotechnology crops.

Competitive or productivity factor	Biotech crop trait	Advantage
Input cost: pesticides	Bt (all crops)	Reduced cost to farmers
Input cost: labor for pest control	Bt (all crops)	Reduced cost to farmers
Product quality	Bt (corn)	Reduced molds and mycotoxins
Product quality	Delayed senescence	Extends shelf life and freshness of fruit and vegetables
Farmer health	Bt (all crops)	Reduced exposure to pesticides and reduced medical expenses
Environmental health	Bt herbicide tolerance (all crops)	Resurgent populations of beneficial organisms in agro-ecosystems
Net profit	All traits	Increased profit per hectare to farmers; cheaper products

The data show that the greater competitiveness of biotechnology crops is conferred directly through input cost reduction, improved product quality, and profitability. In addition, other positive outcomes such as improved farmer health and environmental quality contribute to competitiveness and sustainability. All competitiveness factors were increased by more than 10% each, attributable to biotechnology. Apart from the above, biotechnology crops confer stability of production every season to assure product buyers continued access to food or fiber products. Most APO member countries now have the capability and regulatory systems in place to develop and grow biotechnology crops.

Increasing productivity is an important objective in the face of reduced arable land, labor, and water in Asia, and therein lies the huge potential for green biotechnology to contribute to sustainable development. The adoption and use of diagnostics, biofertilizers/biopesticides, marker-aided selection, and tissue culture techniques are widespread across the Asia-Pacific region and in some countries have even generated multimillion dollar businesses. What offers the most potential to increase productivity and therefore competitiveness is the underexploited applications of genetic engineering in the Asia-Pacific. 🌱



Professor Paul Teng holds a PhD in agricultural microbiology/systems research from the University of Canterbury, New Zealand. He has held positions in academia, the private sector, and international organizations and has published eight books and over 200 technical papers on topics including plant pathology, biotechnology, food security, and agribusiness. He is currently a professor at the Nanyang Technological University, Singapore, holding appointments as Dean of Graduate Studies & Professional Learning in the National Institute of Education and Senior Fellow (Food Security) in the S. Rajaratnam School of International Studies.

SME service excellence

The service sector plays a vital role in a country's economic growth. The promotion of productivity and service excellence is crucial to drive national economies. Economic growth in advanced economies with a good quality of life typically is dominated by the service sector. The strength of the national economy requires efforts to raise service quality and create an experience of hospitality for customers.

The service sector is also important in Thailand and accounted for more than half of the economic growth registered in the last decade. Seventeen participants from 12 countries and six local ones spent the workweek from 19 to 23 May involved in a workshop on SME Best Practices in Service Excellence in Bangkok. Implemented by Thailand Productivity Institute (FTPI), the workshop aimed to share, learn, and observe the best practices utilized by SMEs in the sector to achieve service excellence. In conjunction with the workshop, the FTPI organized a seminar on Enhancing Service Excellence in Organizations on 19 May with 70 participants.

Three international experts from Singapore, Japan, and the ROC served as resource persons for three core modules and discussions during the workshop: transforming SMEs for service excellence through productivity and innovation; benchmarking and integrating the customer satisfaction index for productivity improvement; and principles and practices of service quality for SMEs to create new value for customers. It was concluded that the fundamental model of service excellence consisted of two factors: service experience design; and organizational culture building.

Participants also shared best practices from their home countries. Tsung-Tse Chen from the ROC explained the customer experience efforts of Lian-Ji Tea, a small company with 20 employees producing its own-brand tea and operating tea shops. That component of the workshop proved popular. "The specific knowledge I have gained by participating in this program is the best practices of other participants. They really represent valuable knowledge," enthused Bolor-Erdene Baatar from the Golomt Bank of Mongolia.



Participants viewing the intensive care unit of Thonglor Pet Hospital in Bangkok.

Examples of service excellence in Thailand observed by participants were Thonglor Pet Hospital with the motto "Choose the best for your pet," where they saw the organizational culture created in a hospital setting. Another visit was hosted by Nakornchai Air Transportation, a bus company that improved its passengers' experience by developing an IT-based reservation and customer management system. Participants were also introduced to the vehicles and related facilities of the company. 🌀

Environmental labels and declarations

A training course on Environmental Labels and Declarations (ISO 14021, 14024, and 14025) was held in Dhaka, Bangladesh, 27 April–1 May, as a follow-up to an e-learning course on the topic in October 2013. The objectives were to understand the basic concept, philosophy, and principles of environmental labels and declarations; learn the basic characteristics of ISO 14021 (Type 2), ISO 14024 (Type 1), and ISO 14025 (Type 3); and to formulate plans for promoting eco-labeling and declaration schemes.

The course mainly focused on the criteria for and verification process of eco-products and covered not only Type 1 eco-labeling but also Types 2 and 3. Seventeen international and two local participants attended. The APO assigned four international resource persons from the ROC, Japan, the Philippines, and Thailand and one local expert from the Government of Bangladesh supported the program, which consisted of lectures, a site visit, group discussions, and an exam.

The opening ceremony was attended by approximately 70 local participants including the Secretary, assistant secretaries, and directors general of the Ministry of Industries, heads of local associations, CEOs of private companies, and local media. Secretary of the Ministry of Industries and APO Director for Bangladesh Mohammad Moinuddin Abdullah delivered opening remarks on behalf of the Minister of Industries Amir Hossain Amu. The program was widely covered in the national media.

A visit to Bengal Plastic Industries Limited provided a useful example of a local private firm in compliance with environmental laws and regulations in both its headquarters and factory operations. Two group discussions were conducted after the site visit. The first reviewed Bengal Plastic Industries' achievements and discussed how better compliance with environmental standards could be accomplished. The second group discussion focused on action plans by participants. Some of those plans, such as the one drafted by Sri Lankan participants, went beyond the scope of eco-labeling by connecting the contents with a business excellence initiative in that country.



A demonstration of plastic hanger production at Bengal Plastic Industries Limited.

In the next stage of eco-labeling activities, raising awareness, strengthening networks, and training pools of experts will be key activities as most countries are still at the beginning of their labeling initiatives. Assigning experts through TES would be an effective follow-up for their national projects. The APO will monitor participants' progress in initiating eco-labeling schemes and identify the main challenges for which NPOs and the Secretariat could provide further assistance. 🌀

APO/NPO update

India

New APO Liaison Officer

Name: Manoj Saxena

Designation: Director & Head (Int'l Serv.), National Productivity Council

Effective date: 29 May 2014

Republic of Korea

New APO Alternate Director

Name: Sungcheon Kang

Designation: Director General for Industrial Policy, Ministry of Trade, Industry and Energy

Effective date: 18 March 2014

Lao PDR

New APO Liaison Officer

Name: Dr. Keomarakoth Sidlakone

Designation: Deputy Director General, Department of Small and Medium Enterprise Promotion, Lao National Productivity Organization

Effective date: 28 April 2014

Pakistan

New APO Director

Name: Raja Hassan Abbas

Designation: Federal Secretary, Ministry of Industries

Effective date: 8 May 2014

Sri Lanka

New APO Alternate Director and NPO Head

Name: W.M.R.P. Weerasinghe

Designation: Additional Secretary, Ministry of Productivity Promotion

Effective date: 1 January 2014

New APO Liaison Officer

Name: W.M.D. Suranga Gunarathne

Designation: Director, National Productivity Secretariat

Effective date: 16 May 2014

Vietnam

New name of National Productivity Center

Organization name: Vietnam National Productivity Institute (VNPI)

e-Mail address: vnpi@vnpi.vn, vnpi@fpt.vn

Website: www.vnpi.vn

Effective date: 1 June 2014

Photo news



Dr. Ralph D. Christy, Director, Cornell International Institute for Food, Agriculture and Development and Professor of Applied Economics and Management, Cornell University, Ithaca, NY, USA, with Secretary-General Amano on 18 March at the Secretariat after finalizing the APO-Cornell University MOU on the Asian Agribusiness Executive Management Workshop to be launched in July.



Secretary-General Amano (front row, center) at the opening ceremony of the training course on Development of Productivity Practitioners: Basic Program on 9 June in the DAP office, Manila.

ANNOUNCEMENT



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Background and concept

Industry Innovation 3.0 (II 3.0) that focuses on productivity improvement in the manufacturing industry under the current five-year plan (2013–2017) is being implemented in the ROK. Productivity improvement of “root” and small companies is essential for sustainable economic growth. II 3.0 started after Korean companies and industry experts agreed that productivity improvement of SMEs was important for overcoming the current economic crisis (the productivity level of SME manufacturers was 28% of that of large companies in 2011). Figure 1 shows the progression of II projects in the ROK.

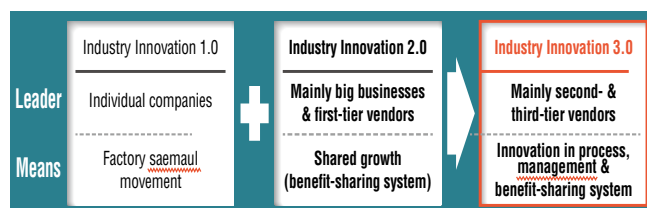


Figure 1. Progression of II projects in the ROK and main focus of each.

Basic principles

The five basic principles of II 3.0 are: 1) embracing the whole business ecosystem to include lowest-tier vendors; 2) encouraging the voluntary participation of SMEs with innovative spirits; 3) motivating businesses to participate in innovation activities through benefit sharing; 4) ensuring openness in project implementation using standard methodology, with room for flexibility at the industry and corporate levels; and 5) fostering innovative mindsets among participating CEOs for continuation of improvement.

Funding resources and implementation system

Large, medium-sized, and public companies funded (US\$200 million over five years) II 3.0 to provide consulting on manufacturing process innovation and replace old facilities of SMEs. The main analysis and consulting tool is the Korea Production System (KPS) developed by the Korea Productivity Center (KPC). The target of II 3.0 is establishing an

advanced industrial ecosystem by supporting 2,000 second- and third-tier SME vendors yearly from 2013, reaching 10,000 over five years.

About 75% of the fund is allocated to SMEs supplying their products to large, medium-sized, and public companies that participated fully in II 3.0 funding. The remaining 25% of the fund is allocated to SMEs with no linkage to contributing companies.

The central headquarters directing II 3.0 is the Korea Chamber of Commerce and Industry and substructures of multiple industry association headquarters. A steering committee of large, medium-sized, and public companies assists all activities. The KPC emphasizes three factors for the success of II 3.0: CEOs’ willingness to innovate; ability and contributions of participating consultants; and appropriate service infrastructure.

Role of the KPC

As the main organization in II 3.0 central headquarters, the KPC not only developed the KPS consulting tool but is also involved in establishing groups responsible for field analysis and consulting, providing innovation consulting and replacing old facilities in SMEs, and offering know-how on project performance management and management for innovation tasks. KPC Chairman and CEO Hong Jin confirmed that II 3.0 would be the main public project for establishing an advanced industrial ecosystem to sustain business growth.

Results

CEO Kooksoo Kim of Dong-in Engineering stated, “My company got great productivity innovation results by participating in II 3.0. I really appreciate the passion and efforts of central headquarters and consultants.” The first year of II 3.0 ended in June 2014. More SMEs applied for participation in the second year after noting the tangible results of the first and are expected to establish their own productivity management systems.

Contributed by Korea Productivity Center International Cooperation Department Director and APO Liaison Officer for ROK Sang Yong Han. 🌐



Figure 2. Example of improved housekeeping in an SME in the II 3.0 project.