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Innovations in Energy and Environment Areas Towards Improved Efficiency

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Editorial

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INTRODUCTION

Information and communication technologies (ICTs) are pivotal for a system-wide mitigation of environmental impacts and adaptation to inevitable changes in the environment. ICT offers enormous scope for efficiency improvements throughout the economy, including in the context of smart grids, and also provide scope for further green innovation. Biotechnology, in particular industrial biotechnology, also plays an important role in delivering eco-efficiency. Innovation depends on people who are able to generate and apply knowledge and ideas in the workplace and in society at large. A broad range of skills contributes to innovation and soft skills as per requirements. They include basic skills such as reading and writing, academic skills, technical skills, generic skills such as problem solving and soft skills such as multicultural openness and leadership. Training at work plays a key role, as it builds work-related competencies and helps workers cope with change. It also contributes to the technological capabilities of firms and is positively related to innovation.

Innovations Keeping China towards Competitive Leading Edge Economy

China is by far the largest consumer of semiconductors; it accounts for about 45 percent of the worldwide demand for chips, used both in China and for exports. But more than 90 percent of its consumption relies on imported integrated circuits. Integrated-circuit companies in China entered the semiconductor market late—some two decades after the rest of the world—and have been playing catch-up ever since in an industry in which success depends on scale and learning efficiencies. Low-cost smart phones designed in China are flooding the market. For instance, Android phones designed in China now represent more than 50 percent of the global market, compared with their negligible presence five years ago. Lenovo's significant deals early in 2014—first acquiring IBM's low-end X86-based server business for \$2.3 billion and then buying Motorola from Google for almost \$3 billion—further suggest that the customer base for hardware is moving to China. Meanwhile, Beijing and Shenzhen have become innovation hotbeds for wearable devices and other connected consumer electronics. Technology companies in these regions are not trailing others in this area of innovation; they are running neck and neck with other early entrants ^[1].

Some Novel Innovations Initiatives in Energy and Environment Areas

Gasification plant producing bio-fuel for transport in Sweden: Valmet's indirect gasification plant developed by the Austrian company Repotec is the first of its type in the world had been commissioned in 2013 and gasifies forestry wastes and wood pellets. In this process, the gasification takes place in a separate reactor and heat is transferred from a combustion chamber by circulation of hot bed material. Biomass is fed into the gasifier, where, on contact with the hot bed material, it undergoes thermo chemical decomposition. The indirect gasification generates high energy gas with high heating value that can be mixed with natural gas. This makes it possible to replace a lot of today's fossil transportation fuel by fossil-free fuel in gas powered vehicles ^[2].

Upgraded residential recycling facility in Canada: The Cowichan Valley Regional District (CVRD) facility in Canada provides residents with access to one of the most innovative residential recycling facilities which accepts hundreds of products for recycling, mostly free of charge, as well as a 'Free Store' where items that are in good or repairable condition can be taken away free of charge. The new facility's design included the full reuse and refurbishment of an old incinerator building on the site, as well as recycled metals and concrete. The facility also reused 45,000 cubic meters of ash generated by an old incinerator on the site by using advanced technology to safely enclose it within the base of the new recycling centre. Locally processed food waste will be used to nourish native, drought-tolerant grasses, bushes and shrubs planted around the site.

Producing renewable fuels and chemicals from biogas and natural gas in Houston: Houston, Texas based Waste Management (NYSE: WM) Waste Management's East Oak site in Oklahoma has formed a joint venture company to produce renewable fuels and chemicals from biogas and natural gas using smaller-scale Gas-to-Liquids (GTL) technology. Various partners includes Pasadena, Texas based refineries specialist, Ventech Engineers International and Princeton, Texas based clean energy company, NRG Energy (NYSE: NRG) and Houston, Texas based GTL technology developer Velocys (LSE: VLS). This collaboration will pursue the development of multiple plants utilizing a combination of renewable biogas (including landfill gas) and natural gas to supply renewable gas and, in certain cases, project sites.

Waste wood pyrolysis plant to produce bio-oil in Finland: Finnish sustainable energy company, Fortum had commissioned in Joensuu in Finland a new facility fast pyrolysis technology, in which wood biomass is rapidly heated in oxygen-free conditions produce around 50,000 tonnes per year of bio-oil from waste wood. As a result the biomass decomposes and forms gases that are then condensed into oil. This facility is the first of its type in the world, and has been integrated into its Joensuu combined heat and power plant. Bio-oil is produced from forest residues, wood from first thinnings and other wood biomass, such as forest industry by-products, sourced locally from the Joensuu region. Bio-oil is used at heat plants or in industrial steam production as a replacement for heavy and light fuel oil, and could in the future be used as a raw material for various bio chemicals or transport fuels. The use of bio-oil has significant positive environmental impacts because energy produced with bio-oil reduces carbon dioxide emissions by as much as 90% or more compared to fossil fuels. The bio-oil facility will increase the company's wood use in energy production in Joensuu from 300,000 to 450, 000 solid cubic meter per year and will have an annual production of 50,000 tonnes of bio-oil - corresponds to the heating needs of more than 10,000 households.

Latest Innovative Developments in Energy Conservation and Environment Protection Initiatives and Strategies

Texas State Energy Conservation Office (SECO) Encouraging Energy-Efficiency Projects: Oil Overcharge Funds used for energy efficiency and renewable energy projects are consistent with settlement guidelines and approved by the U.S. Department of Energy (DOE). Energy education programs of SECO promote energy conservation and efficiency through education ^[3].

Florida Gulf Coast University Reducing Operating Expenses: National Center for Academic Transformation implements effective uses for information technology in order to improve student learning and reduce the cost of higher education ^[4].

Wisconsin Environmental Education Board and University Of Wisconsin-Stevens Point Utilizes Community Resources: K-12 energy education program (KEEP) encourages school-to-career skills and the use of a rich

set of community resources including professionals, businesses, environmental organizations, and institutions of higher education ^[5-8].

York University Encouraging Green Buildings: The Computer Sciences Building of York University is an ideal example of a "green" building built at no cost premium^[9-12].

Canadian Industry Program for Energy Conservation (CIPEC) Developing Comprehensive Projects: The Canadian Industry Program for Energy Conservation (CIPEC) with representation of 294 companies, and 24 sector task forces is active in developing comprehensive projects to improve conservation in their municipal operations ^[13].

University of Nîmes in Southern France Organizing Programs for Eco-Citizens: University of Nîmes in Southern France, in March 2007, organized a program to promote the behavior of "eco-citizens". Concentrating on the promotion of waste management and economizing on energy use a university wide campaign for providing practical demonstrations of environmental awareness linked to social psychology theory ^[14].

Bedford College in Southern England Providing Training: Bedford College in Southern England is a center for excellence in green energy, providing training for small businesses in installing and maintaining solar panels, wind turbines and biomass technology ^[15].

CONCLUSIONS

Innovations in work organizations have the potential to optimize production processes in companies and improve employees' overall experience of work. It may also lead to wider innovation in products and services, which could result in employment growth. Social innovations in the workplace apply new and combined interventions in work organization, human resource management

and supportive systems. The most advanced workplaces are those that innovate the most, and where both productivity and job satisfaction is at its optimum. Workplace innovation improves performance and working lives through positive organizational change involving inclusive dialogue and by releasing the creativity of employees in which a creative convergence is forged between enhanced organizational performance and enhanced quality of working life.

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