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Cover Picture: South East Asia's Sustainable Energy Future

Dear Reader,

The vast majority of us are aware that our environment is reaching a crisis point. A crisis point that society is desperately trying to pull back from as humanity continues to belch out toxic carbon emissions (CO2 gasses) in its continued efforts to provide the type of existence we feel is necessary.

Scientists have recently discovered that the Earth's temperature is rising at an alarming rate. In fact, if we see a further 3 degree rise in temperature, we will be at the point of no return. This temperature rise is commonly known as global warming and we are all aware that something needs to be done.

No one can predict with any certainty what the energy mix will look like in 2030, let alone 2050. Fossil fuel generation will undoubtedly still be a substantial part of the equation. However, it is clear that any future low carbon energy infrastructure will have to include a significant proportion of energy generated from renewable sources – most scenarios showing the proportion of primary energy having to reach 40-50 percent by 2050. Some of the leading technology contenders are emerging and, in some cases have begun to build significant experience.

Onshore Wind: The most mature of the renewable energy sectors, the onshore wind industry saw 21GW built in 2007, bringing installed capacity to over 100GW.

Offshore Wind: When the best sites for onshore wind have been snapped up, the next place to look for large quantities of renewable energy is offshore. Offshore wind offers enormous potential, with stronger, more predictable winds and almost unlimited space for turbines.

Solar Photovoltaic Power: Photovoltaic (PV) technology has made very rapid strides in the past four years, in terms of reducing the cost of crystalline silicon (its main component) and commercializing thin film technology, with investment volume growing to US\$ 50 billion in 2007-2008. Although there has been a bottleneck in the production of solargrade silicon, new capacity is coming on line and costs are set to reduce.

Municipal Solid Waste-to-Energy (MSW): The use of municipal solid waste to generate energy is increasing, led by the EU countries. Waste has traditionally been deposited in landfill sites, a practice which is becoming increasingly expensive and constrained by shortage of sites.

Sugar-based Ethanol: The period 2004-2006 saw US investment in biofuels soar, with investors pouring US\$ 9.2 billion into the sector. But most of this flowed into corn-based ethanol, which is more expensive to produce than sugar-based ethanol, subject to volatile prices and controversial because its feedstock is a food staple around the world.

Cellulosic and Next Generation Biofuels: The argument over

food vs fuel is an emotive one. In most regions, there is sufficient land to increase biofuels production from the current 1.0 percent of transport fuel to 3.0 percent or even 5.0 percent without impacting on food availability (as long as we can quickly return to increasing annual agricultural productivity).

Geothermal: Geothermal power is particularly attractive as a renewable energy source because it can be used as predictable base-load power in a way that wind and solar power cannot be. Until now, geothermal power has been used only in limited regions, but a raft of new approaches has helped make it economically viable across a wider area.

It is important to emphasize that these are by no means the only clean energy sectors of promise. There are many other emerging technologies – a wide range of biomass based power generation approaches, wave and tidal power, ground source heat pumps, ocean thermal and osmotic power – each of which has substantial potential and its fervent admirers.

Please enjoy reading this journal focusing on renewable energy in South East Asia, Korea and Pakistan.

Yours sincerely



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Swiss President's Visit Forges Ties with Indonesia & Singapore

Indonesia and Switzerland are moving forward to building closer relations and cooperation in the fields of economy, trade, investment and development with the four-day official visit of Swiss President Doris Leuthard from 6 to 9 July, 2010.

In order to foster the two countries' 58 year-old relations, President Leuthard, will have a series of meetings with President Susilo Bambang Yudhoyono and other Indonesian officials as well as attend a business forum on the competitive power of Indonesian and Swiss businessmen, starting from the day of her arrival in Indonesia on 6 July.

According to Dino Patti Djalal,

spokesman for the Indonesian President, Leuthard will also meet officials of the Indonesian Chamber of Commerce and Industry (Kadin), and visit the International Labor Organization (ILO) project in Jakarta, meet with and attend a lunch with the Secretary General of the Association of Southeast Asian Nations (ASEAN) Surin Pitsuwan.

Both countries last year established economic cooperation through a Joint Economic and Trade Commission (JETC). Through the JETC on November 26, 2009, Indonesia has been named a priority country for strategic partnership with Switzerland in the development of economic and development cooperation.



Doris Leuthard with Susilo Bambang Yudhoyono

Indonesia so far is still suffering from a deficit in its trade balance with Switzerland.

"Our trade balance is in favor of the Swiss country because we are importing capital goods, while our exports are raw materials whose values are lower," Head of Research and Development of the Ministry of Trade Muchtar said after attending an Indonesia-Switzerland Business Forum.

The business forum was attended by a Swiss delegation comprising businessmen from various sectors led by the President of the Swiss Confederation, Doris Leuthard.

According to data of the Ministry of Trade, Indonesia's trade deficit with Switzerland in 2006 stood at US\$70.4 million. It dropped to US\$40.5 million in 2007 but drastically increased to US\$141.1 million in 2008. In 2009, Indonesia's trade balance with that country also experienced a deficit of US\$259.2 million.

During the January-March 2010 period the country's balance of trade with Switzerland still suffered a deficit of US\$57.8 million, which were larger than its trade balance deficit in the same period in 2009 which stood at US\$54.5 million.

This condition has happened not because Indonesia was not able to balance Swiss trade, but because the value of Indonesia's main export commodity products is smaller than the value that of Swiss export products to Indonesia.

The volumes of their two-way trade have been fluctuating since 2007. The volume of trade between the two countries in 2007-2008 rose 47.09 percent to US\$983.9 million. It dropped 38.43 percent in 2009 to US\$621.5 million.

Indonesia's main exports to Switzerland are essential oil, garments, shoes, electronic products, furniture, oil,

coffee, tea, spices, and vegetables, tin, plastic and plastic products.

Switzerland's main exports to Indonesia meanwhile are electricity generator parts, pharmaceutical, chemical and cosmetic products and high-end products.

Muchtar said Indonesia still could increase its exports to Switzerland to step up their values.

In the meantime, the Swiss investment in Indonesia is ranked 15th between 1990-2009 totaling US\$740.7 million in 120 projects including 36 new projects in the period between 2005 and 2010 worth US\$313 million.

Swiss investment is found in food, chemical and pharmaceutical industries, shipping, plantations, hotels, drinking water project and engineering. The Swiss government also participates in the development of power plants in cooperation with the Asia Development Bank (ADB).

There are around 75 Swiss companies currently operating in Indonesia such as ABB, Ades, Credit Suisse, Nestle, Novartis, Panalpina, Roche, Holcim and UBS providing employment to more than 59,000 people.

On 6 July, Indonesia in cooperation with Switzerland launched a Sustaining Competitive and Responsible Enterprises (SCORE) program. Sofyan Wanandi, Chairman of the Indonesian Employers' Association (APINDO), said the program was initiated to help small and medium businesses in the country improve their quality and productivity, working conditions, reduce environmental impacts and increase collaboration and communication between employers and workers.

"I think we must support the program because it is very important and needed by small and medium businesses in Indonesia. Small and medium businesses must increase their productivity, efficiency, competitive

power and cooperation between employers and workers in the framework of creating better working conditions. SCORE could help small businesses in Indonesia compete in national and international markets," he said.

Indonesia is one of the seven countries that have chosen to implement the SCORE project. The other countries include China, Columbia, Ghana, India, Vietnam and South Africa. In Indonesia the program has been started in the spare parts sector and would soon cover two other business sectors.

The joint commitment was signed by representatives from workers' unions and the employers' association, witnessed by President of the Swiss Confederation, Doris Leuthard and Indonesian Manpower Minister Muhaimin Iskandar.

Dino said the visit of President Leuthard this time not only reflected the two countries' good bilateral relations but also as part of efforts to increase the friendship and cooperation that have been developed for the past 58 years.

The good relations between Indonesia and Switzerland were also marked by visits by the two countries' leaders such as in January 2000 by late President Abdurrahman Wahid and in February 2007 to Indonesia by Swiss President Calmy Rey. ■

ASEAN Offers Enormous Opportunities: *Leuthard*



Switzerland, which has already developed strong bilateral relations with many of the ASEAN Member States, is now increasingly turning its attention to ASEAN as a region in view of its increasing influence and dynamism.

Congratulating ASEAN on its achievements in the last 42 years, especially on the adoption of the ASEAN Charter in December 2008, the President of the Swiss Confederation, Ms Doris Leuthard, acknowledged the importance of ASEAN and welcomed the role of ASEAN in regional integration. ASEAN, she said, presented "enormous opportunities" and Switzerland was keen on engaging with the region.

Ms Leuthard, who was on a four-day visit to Indonesia from 6 to 9 July 2010 and accompanied by a Swiss business delegation, was speaking at a business luncheon, where the Secretary-General of ASEAN, Dr Surin Pitsuwan was in attendance.

In his remarks, Dr. Surin said that ASEAN would need the support and

cooperation of all its partners and friends as it aspires towards an ASEAN Community by 2015. ASEAN, he said, was very much interested in the European Free Trade Association (EFTA) which has a Free Trade Agreement (FTA) with Singapore and currently negotiating an FTA with Thailand and is in a feasibility study phase with Indonesia, Malaysia and Viet Nam. Switzerland is a member of EFTA, which also comprises Iceland, Liechtenstein and Norway. In his remarks, Dr Surin also said that one area where Switzerland could assist the region was in the area of political-security, especially "to share experiences and its commitments to the humanitarian law tradition".

In terms of trade between ASEAN and Switzerland, the total trade volume in 2008 amounted to USD14.6 billion, growing at an annual rate of 42 percent. ASEAN exports to Switzerland grew by 31 percent from 2007 to 2008, i.e. from USD 3.3 billion to USD 4.3 billion. ASEAN imports from Switzerland for the same period also showed an increase of 48 percent or from USD 6.9 billion to USD 10.3 billion.

Switzerland is keen to expand its economic and trading ties with the Association of Southeast Asian Nations (ASEAN).

ASEAN, as many Asia-centric experts in Switzerland will tell you, is the third biggest collective market, after China and India, for Swiss products which range from high-precision tools, machinery and watches to food products such as chocolates and cheese.

The significant feature of the visits is that, it is not just important protocol-wise.

Since Leuthard is accompanied by a high-profile economic delegation, the visit assumes a much more tangible significance, as it is expected to set the pace for greater trade and investment flows in both directions.

Swiss manufacturers are willing to invest in the ASEAN region, employing the strategy of "operating from within the market", rather than just manufacturing in Switzerland and exporting to it.

Leuthard is visiting Indonesia because of its size and for increasingly pitching itself as an "ASEAN hub" in a number of Western countries.

The Swiss head of state has also lined up meetings with Indonesia's trade minister and other ministers as well. This reflects Switzerland's keen interest in intensifying its economic and trading ties with Indonesia.

Leuthard is also expected to lay the groundwork for subsequent talks on an economic partnership agreement between the European Free Trade Association (EFTA), of which Switzerland is a member, and Indonesia.

The Swiss Economics Ministry has been closely monitoring the ratings given by independent agencies to Indonesia, the world's largest Muslim nation, which is forecast to post an impressive growth in the future.

In 2009 Switzerland's exports to Indonesia amounted to 372 million Swiss francs while imports from the country were around 171 million Swiss francs. ■

Swiss, Singapore Leaders Discuss Common Challenges



Doris Leuthard talks with S. R. Nathan at the Istana Presidential Palace in Singapore

Leuthard's visit to Singapore 9 July 2010 will also have a strong economic component, as evident from her planned meetings with the finance and trade ministers as well as the Chairman of Singapore's central bank.

During her meeting with Senior Minister Goh Chok Tong, they exchanged views on the common challenges faced by the two countries.

Singapore is Switzerland's most important trading partner in Southeast Asia and ranks 4th in all of Asia. In 2009, the total foreign trade between Switzerland and Singapore amounted to S\$3.2 billion.

In terms of foreign direct investments, Switzerland is ranked no. 5 in Singapore, with US\$10 billion direct investments in 2008. The strong presence of Swiss companies in Singapore also highlights the importance of Singapore as a hub to the whole region. There are over 200 Swiss companies in Singapore, employing some 20,000 people.

Singapore and Switzerland took the opportunity to discuss three issues, including the need to update an investment protection treaty that was signed in 1978.

Another area of discussion was the need to negotiate a double taxation agreement that would comply with OECD (Organization for Economic Co-operation and Development) standards.

The third issue dealt with the financial sector. Ms Leuthard said that Singapore and Switzerland are both small, competitive financial hubs. She noted that both countries are not members of G20, and they need to work together and with other allies to defend their financial interests. ■

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Enhanced Sustainable Energy Security S-E Asia's Prime Concern



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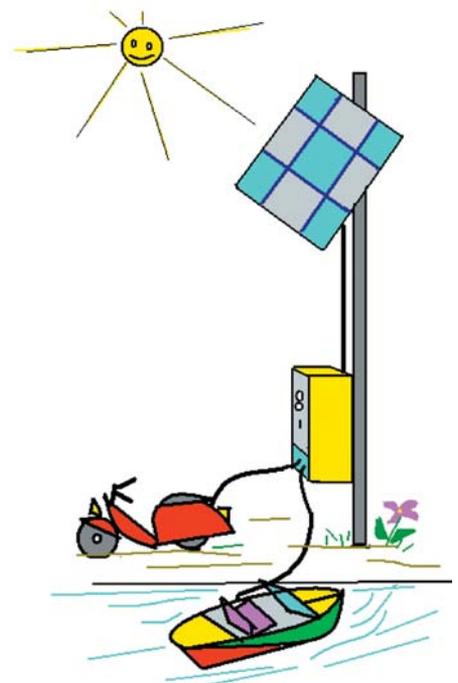
In the past three decades, the South East Asia region has experienced the fastest economic growth in the world, with a 10-fold increase in GDP, accompanied by rapid urbanization. The urban population is projected to increase by 50 percent over the next two decades. As a consequence, energy consumption has more than tripled over the past three decades and is expected to double over the next two decades.

This remarkable growth and rapid urbanization have led to twin energy challenges in the region: improving environmental sustainability and enhancing energy security. The region has many of the world's most polluted cities, resulting from fossil fuel combustion. The region also contains some of the largest greenhouse gas emitters in the world, although their per capita and historical emissions are much below the levels of industrialized countries. Concerns with energy security have grown because of increased risks of price volatility and possible disruptions in supplies for oil and gas.

This shift to a clean energy revolution requires major domestic policy and institutional reforms. Governments can adopt climate-smart domestic policies now to deploy existing low-carbon technologies while a global climate deal is negotiated. Energy efficiency contributes to more than half of the emission reductions between the Sustainable Energy Development (SED) and Reference (REF) scenarios, and is fully justified by development benefits and future energy savings. To fully realize the huge energy efficiency potentials in the region requires the removal of fossil-fuel subsidies and incorporation of environmental

externalities into energy pricing as well as a concerted strategy to tackle market failures and barriers with effective regulations, financial incentives, institutional reforms, and financing mechanisms. Under the Sustainable Energy Development scenario, low-carbon fuels for power generation renewable energy and nuclear power would meet half of the power demand by 2030. Scaling up renewable energy requires putting a price on carbon and providing financial incentives to deploy renewable energy technologies. Not-yet-proven advanced technologies, such as carbon capture and storage, also are needed to bend the emission curve beyond 2030, but require accelerated research, development, and demonstration today.

Developed countries need to transfer substantial financing and low-carbon technologies. To achieve this sustainable



energy path, a major hurdle is to mobilize financing for the net additional investment of \$80 billion per year over the next two decades. It is estimated that approximately \$25 billion per year would be required as concessional financing to cover the incremental costs and risks of energy efficiency and renewable energy. In addition, substantial grants are also needed to build capacity of local stakeholders. The technical and policy means exist for such transformations, but only strong political will and unprecedented international cooperation will make them happen.

The total capital investment costs in power generation from 2010 to 2030 will be \$2.3 trillion, or an average of \$100 billion per year. Of the annual average, \$60 billion will be for thermal power, \$30 billion for renewable energy, and \$10 billion for nuclear power. Almost 90 percent of this total investment will be in China. The financial costs of REF, including both investment and fuel costs, will be large but will decrease as a percentage of GDP over time.

The economic costs of local environmental damages, although small relative to the financial costs, increase over time as local damage values grow with per capita income. Emission costs are proportionately higher for China, for which coal comprises a far higher proportion of total primary energy supply (currently, 64 percent compared to 12 percent in South East Asia).

It is within the reach of the region's governments to simultaneously maintain economic growth, improve environmental sustainability, and enhance energy security. These goals require major domestic policy and institutional reforms, as well as transfers of substantial financial resources and low-carbon technologies from developed countries. It is technically and economically feasible to stabilize CO2 emissions in South East Asia by 2025. Increased energy efficiency is the

backbone of this sustainable energy path. Major expansion of low-carbon technologies also is needed, and under the SED scenario, would meet half of the power demand in 2030. Carbon capture and storage (CCS) is expected to play an important role in future coal use in a carbon-constrained world, particularly beyond 2030. However, if CCS could become commercially available on a large scale by 2020, it could bring peaking time to 2021 and further reduce CO2 emissions at a modest cost. To achieve the SED scenario requires a net additional investment of \$80 billion per year from 2010 to 2030. After the initial

The South East Asian countries also would need to substantially reduce their energy intensities until 2030. The reduction would be by 3.3 percent per year for Indonesia, 3.1 percent for the Philippines, 2.8 percent for Vietnam, 2.5 percent for Malaysia, and 1.8 percent for Thailand. To achieve such ambitious targets requires major policy and institutional reforms. If these reforms are in place, energy efficiency could reduce regional energy demand by more than 20 percent by 2030.

Many South East Asian Countries Have National Plans and Sustainable Energy Targets.

Country	Energy efficiency	Renewable energy	Carbon reduction
Indonesia	30% energy efficiency improvement from business as usual by 2025	17% of primary energy from renewable by 2025	26% reduction in carbon emissions from business as usual by 2020; 41% with international support
Thailand	1. Energy conservation fund and ESCO fund 2. EGAT demand side management program 3. Appliance standards and labeling	20% of final energy demand from renewable by 2022	Bangkok Metropolitan Administration (BMA) set a target to reduce the city's carbon emissions by 15% per year from 2007-12
Philippines	Annual energy savings of 2.9 Mtoe from 2005-14a	Doubling renewable capacity by 2030	
Vietnam	3%5% reduction in total energy consumption by 2010, 5%8% reduction by 2015	3% and 5% of power capacity from new renewable by 2010 and 2020	

three years, this investment would be offset by energy savings. However, financing the upfront investment costs is a major hurdle in developing countries.

The Energy Intensity in South East Asian Countries to Decline Dramatically, 2007-30.

However, to realize this large potential of energy savings in South East Asia is a major challenge and requires fundamental reforms. Energy efficiency improvements require well-functioning institutions. In many South East Asian countries, governments find it politically difficult to raise energy prices, but low energy prices discourage energy



conservation.

Small-scale, fragmented energy-efficiency measures involving multiple stakeholders and tens of millions of individual decision makers clearly are more complex than large-scale, supply side options. Energy-efficiency investments need cash up front, but future savings are less tangible, making such investment perceived to be risky compared with asset-based energy-supply deals.

Indonesia has a significant potential to make cost-effective energy efficiency improvements in four manufacturing sectors: cement, textiles, basic metals, and food. These four account for half of the country's industrial emissions.

In contrast, Vietnam's priorities should focus on incorporating efficient technologies in the new industrial capacity built over the next decade. This new capacity alone will produce more than all of Vietnam's industry today. At the same time, cutting energy waste in existing industry could save an additional 25 percent30 percent of energy.

Energy Efficiency in Buildings & Appliances

The second largest energy saving potentials in most South East Asian countries come from buildings in the residential, commercial, and public

service sectors. Buildings consume nearly 40 percent of the world's final energy. Although South East Asia's emissions currently are dominated by the power and industrial sectors, over the next 20 years, the transport and building sectors are expected to grow more rapidly due to unprecedented urbanization.

Renewable energy: Under the Sustainable Energy Development scenario, renewable energy would meet 40 percent of the power demand by 2030. The renewable would come largely from hydro, wind, and biomass in China; hydro, biomass, and geothermal in Indonesia; geothermal and hydro in the Philippines; imported hydro and biomass in Thailand; and hydro in Vietnam.

South East Asian Countries have rich renewable energy

Resources (GW power capacity)

	China	Indonesia	Thailand	Philippines	Vietnam
Hydro	400	75	0.7	3.0	22
Wind	380	9	1.6	5.5	2
Biomass	60	50	4.4	0.5	1
Geothermal		27		3.0	1.4
Total	840	160	6.7	12.0	26

The potential for expanding renewable energy depends largely on resource availability. Wind, hydropower, and geothermal power are limited by availability of suitable sites. Biomass is constrained by competition from land and water for food and forests. Solar power is the most abundant energy source on earth but is still costly.

Renewable energy resource potential is large in the region, particularly in China, Indonesia, the Philippines, and Vietnam. Specifically, China, Indonesia, and Vietnam have rich hydro resources; and Indonesia has the world's largest geothermal resources.

Regional hydropower trade could provide the least-cost energy supply with zero carbon emissions. Lao DPR,

for example, is rich in hydro power resources, but the size of its power market and economic fundamentals are not sufficient to justify and enable development of those resources on their own. On other hand, Thailand has limited renewable energy resources, and Cambodia relies heavily on diesel for power generation with a high cost of 2530 cents/kWh.

The evident solution is regional power trade among neighboring countries. The main effect of power trade is to support the development of a higher number of large-scale hydro schemes that would not otherwise be viable at the national level.

Costs of renewable energy have declined dramatically over the past two decades. Small hydro is now cost-competitive with coal. Wind, geothermal, and biomass co-generation from wastes can be economically viable compared to the costs of coal-fired

power plants plus local and global environmental external costs. With rising fossil-fuel prices, the cost gap is closing.

Biomass geothermal power, and hydropower can provide base load power; and solar and wind power are intermittent. Solar energy is still costly. However, over the next few years, costs are expected to decline rapidly along the learning curve due to technology breakthroughs and economy of scale.

Malaysia, Thailand, and Vietnam also have firm plans to introduce nuclear power. However, building the first new nuclear power plant will be a long process, and none is expected to be in operation before 2020. In these countries, the Sustainable Energy

scenario keeps the nuclear power capacity at the same level, based on government's power development plans, as in the REF scenario.

Nuclear power is a significant option for mitigating climate change, but it is limited by four problems. They are: higher costs than coal-fired plants, risks of nuclear weapons proliferation, uncertainties about waste management, and public concerns about reactor safety.

The Sustainable Energy scenario would need a total investment cost of \$4 trillion in South East Asian countries plus China, or an average of \$180 billion per year from 2010 to 2030. Of the annual average, \$20 billion would go to thermal power, \$55 billion to renewable energy, \$20 billion to nuclear power, and \$85 billion to energy efficiency. China would account for 85 percent of this investment.

Shifting to a sustainable energy path requires South East Asian governments to take immediate action on major policy and institutional reforms to transform the energy sector toward much higher energy efficiency and more widespread use of low-carbon technologies. To fully realize the huge energy efficiency potentials in the region depends on policy and institutional

reforms to overcome market failures and barriers.

To achieve this sustainable energy path also requires transferring substantial financing and low-carbon technologies from developed countries.

A major hurdle is to mobilize financing for the net additional investment of \$80 billion per year over the next two decades. Approximately \$25 billion per year are required as concessional financing to cover the incremental costs and risks of energy efficiency and renewable energy. In addition, substantial grants are needed to build the capacity of local stakeholders and provide technical assistance.

While many South East Asian countries are taking steps to get onto a sustainable energy path, accelerating and scaling up these efforts are needed. The window of opportunity is closing fast. Delaying action would lock the region into a high-carbon infrastructure, requiring future costly retrofitting and premature scrapping of existing energy stocks.

Policy tools and financing mechanisms exist for such transformations, but they need to be tailored to the maturity and costs of technologies and national context. Only strong political will and unprecedented international cooperation will make them happen.

Sustaining economic growth without compromising the environment is the greatest energy challenge facing South East Asia over the next two decades. The South East Asian region is among the most vulnerable in the world to climate change threats. Particularly vulnerable are the large numbers of people living along the coasts and on low-lying islands. Crop yields in many South East Asian countries are projected to decline, due partly to rising temperatures and partly to extreme weather events (IPCC 2007). Without immediate action, the overall costs and risks of climate change could be at least 5.0 percent of global GDP each year and could cost more for vulnerable South East Asian Region. ■



Renewable Energy Potential Untapped Fully

Indonesia has not yet utilized its renewable energy resources optimally because of its strong dependence on fuel oils, a National Energy Council (DEN) member said.

The country has energy potentials such as geothermal, bio-energy, solar, wind, micro-hydro, uranium and thorium energy which are quite big but have not been exploited optimally.

The potential of hydro-power energy reached 75,679 MWe but only 4,200 mega watts of it had been used while the geothermal energy potential is recorded at 28,170 MWe but only 1,180 MW of it had been used.

The micro-hydro potential totalled 500 MWe but only 86.1 MW of it had been exploited; only 12.1 MW of the solar energy potential reaching 4.8 KWh/M2/per day had been exploited while the exploitation of wind energy only reached 1.1 mega watt out of 9,290 MWe potential, he said.

Uranium with an energy potential of 34,120 tonnes and thorium 1,500 tonnes have not even been exploited.

The renewable energy sources could not as yet be exploited optimally because the price of renewable energy is relatively more expensive so that it could not compete with the conventional price which is still subsidized by the government.

The government's subsidy to the price of fuel oils and electricity creates dilemmatic problems. On the one hand it enlightens the burden of the people with low income but on the other it increases the burden of the budget," he said. The subsidy for fuel oils and

electricity in 2005 reached around Rp104 trillion (US\$11.2 billion) and rose to Rp221 trillion in 2008. "This happens because so far energy has been used inefficiently in all sectors.

Other problems still being faced by the country is access to commercial energy which is still limited due to existing energy infrastructure shortages as indicated by the low per capita ratio between electrification and energy consumption.

Based on the ratio of 55,400 families across the country only 36,078 have had access to electricity meaning 19,000 families have not yet had access to electricity.

The World Bank is set to help Indonesia meet its growing electricity demand and make electricity supplies in Java and south-central Sumatra more reliable, through a newly approved financing package worth US\$ 225 million. The project entails direct cooperation with Indonesia's state electric company, PLN, and once successfully implemented, is expected to benefit over 56 million people in Java and Sumatra. It is also expected to play an important role in supporting economic growth in both islands over the medium to long term.

A reliable and sustainable supply of electricity is essential for Indonesia to realize its potential as a large middle-income economic power. At present however, Indonesia's economy is growing at a pace that exceeds its ability to provide electricity. To keep up with demand, electrification rates would need to grow at a rate of around seven percent per year. ■



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Indonesia to Double Geothermal Power Generation Capacity

The Sarulla geothermal plant in North Sumatra is a part of Phase 2 of the government's fast-track electricity generation program, the plant is expected to come on stream next year and reach its full 440-MW capacity by 2015.

Sarulla is owned by a consortium consisting of Japan's Itochu Corporation, Israel's Ormat Corporation and local company PT Medco Energi International.

In September 2006, JBIC reached an agreement with the Finance Ministry to encourage the development of independent power producer projects in the country.

Last month the two parties stepped up cooperation by agreeing to hold regular consultation meetings focused on independent power projects and geothermal energy.

The second phase of the fast-track program, scheduled to be completed by 2015, will boost electricity generation capacity by 10,150 MW and will focus on cleaner technologies such as gas and geothermal.

State-owned electricity utility PT Perusahaan Listrik Negara is expected to spend \$5.9 billion on the construction of

21 new power plants with a combined capacity of 5,118 MW as part of the second phase.

The government is aiming for independent power producers to provide the rest of the capacity by investing a total \$10.05 billion in the construction of an additional 72 power plants.

PLN has already attracted financing from another Japanese organization, the Japan International Cooperation Agency, to help build one coal-fired power station and two geothermal projects that are part of phase two of the fast-track.

A New Climate Investment Fund Plan

"Indonesia has the largest geothermal energy potential in the world," explains Katherine Sierra of the World Bank. "The co-financing will help Indonesia reduce the use of fossil fuels to meet its rapidly growing energy needs. It also gives a clear signal on the practical actions developing countries can take to combat global climate change."

The US\$400 million plan, endorsed by the Trust Fund Committee of the Clean Technology Fund (CTF), will transform Indonesia's use of renewable energy, including geothermal, and support the

Government's long-term goal of reducing GHG emissions by 26 percent by 2020.

The plan will use co-financing from the multilateral CTF to expand large-scale geothermal power plants and to accelerate initiatives to promote renewable energy and energy efficiency by creating risk-sharing facilities and addressing financing barriers to small- and medium-scale investments.

Funding to Leverage Additional Support

Under the plan for Indonesia, the CTF will mobilise an additional US\$2.7 billion from a range of other sources.

"The greater availability of power supplies will help the government of Indonesia reach its objective of providing electricity access from the present 65 percent of the population to 90 percent by 2020," says Ursula Schaefer-Preuss of the Asian Development Bank (ADB). "Through the utilization of a cleaner fuel source, geothermal development will also result in better health benefits and more energy access for poor people."

Indonesia is the fourth country in Asia to have a CTF-funded investment plan for the deployment of low-carbon technologies such as geothermal endorsed by governments. The other countries are the Philippines, Thailand and Vietnam.

The Trust Fund Committee's endorsement of Indonesia's plan raises the level of CTF support to Asia to US\$1.2 billion, mobilizing a total of US\$13 billion from government, private sector, and other sources. ■



Biogas from Cattle Manure Makes Life Easier for Farmers

Biogas provides opportunity for dairy farmers to turn their cattle's manure into better use and at the same time minimizing pollution. The Biogas unit produces methane gases that can be used as fuel for cooking and lighting. The final waste from the process is an excellent organic fertilizer and can also be used as fish food for farms in the surrounding area. "Developing a pro-poor Biogas Model for Dairy Farmers in East Java" is a project implemented in Lumajang, East Java, aimed to tackle problems in three areas: energy, environment, and economy.

Firstly, biogas provides an alternative clean energy for the farmers. Prior to using the biogas for cooking, the dairy farmers used wood as their cooking fuel that produced CO₂. Wood is also impractical because it takes a long time to cook and they need to collect the firewood first. Sukaningoyo, one of the dairy farmer said, "Before we had biogas, every two or three days, I was always looking for firewood in our own farmland. Then after we got biogas, all these hassles are gone. Like at 3 am in the morning, we don't need to find

wood to cook. All we have to do is to turn the knob, light the fire and we're ready to cook".

After they switch to biogas, they are now using methane-fueled gas stove which is cleaner and easier to operate. The methane is also used as fuel for their lighting.

Secondly, by processing the manure into biogas, it also helps clean the environment of pollution. Before the farmers had the biogas unit, the manure stacked in their yard was spreading stink in the neighbourhood.

Another way of removing the manure was by flushing it into the river or stream which polluted the water. By processing the manure into biogas, it minimizes the environmental pollution caused by animal waste.

Lastly, the final waste of the whole biogas process is dried sludge which has been proven to be a better organic fertilizer and with further processing it can be alternative food for fish. Some farmers also sell the waste as organic fertilizer or as food for fish. After

finishing the biogas digestion process, the sludge is flowed into oxidation boxes, a series of open chambers designed to kill the bacteria and unwanted organisms that are still left in the waste. The sludge is then dried in the drying area to remove excess liquid that it still contains.

The District Government of Lumajang in East Java Province supported by UNDP, in cooperation with KEMCO and PT. Bumi Harmoni Indonesia has been successfully installed and runs 15 pilot biogas units. Each installation is capable of providing fuel for two to three households. The dairy cows from these households provide the necessary manure for the biogas unit.

Dairy farmers involved in the pilot project did not get the installation for free. Instead, they have to pay IDR 10,000 per day for the next three years for each biogas installation to the sub-district's treasurer. The treasurer manages the fund which will be used to develop future new installation of Biogas units for other farmer groups in the district



By utilizing the biogas, it's now easier for the dairy farmers to cook using gas stove

Tax Incentives for Renewable Energy

The Indonesian Government has announced that it will reduce net tax by 5.0 percent per year on total investment for six years in renewable energy projects.

According to a decree, signed on 29 January 2010 by Finance Minister Sri Mulyani Indrawati, the Government will also allow faster asset amortization and impose a lower tax rate on dividend payments for non-resident investors, the decree said. The Government will also provide

exemption from value-added tax and import duty for equipment and machinery used in renewable energy projects, it added.

The Government had earlier said that it wanted to use more renewables and would be targeting by 2025 an energy use mix of 30 percent from gas, 20 percent from oil-based fuels, 30 percent from coal, and the rest from renewables such as geothermal and solar power.

Djoko Susilo, Indonesia's Ambassador to Switzerland



Djoko Susilo, has been appointed as Ambassador Extraordinary and Plenipotentiary of the Republic of Indonesia to Switzerland and is accredited to the Principality of Liechtenstein.

Born in Boyolali on 6 June 1961, Susilo studied International Relations (1985) at the Gajah Mada University's Faculty of Social and Political Sciences in Yogyakarta, Indonesia. He obtained Master of International Management (1990) from University of Maryland, USA. He then went to the University of Wales, Cardiff, UK, from where he obtained both Master of Art in Journalism (1995) and Ph. D (1997).

Susilo was trained in Business Ethic and Media Reporting, Tokyo, Japan (1994), Media Report on Environmental Issues, London, UK, (1996), and Parliamentary Oversight on Military Budget and Procurement, Clingendael, The Netherlands (2003).

Susilo began his professional career as a Lecturer at the Department of International Relations, Faculty of Social and Political Sciences, University of Airlangga, Surabaya, Indonesia (1985-86). He was Editor for International Affairs, Jawa Pos Daily, Surabaya (1986-88). He then became the Washington Correspondent of Jawa Pos Daily, and was its Deputy Chief Editor (1992-94). He later became Europe Correspondent (based in UK) for Jawa Pos Daily (1994 - 98).

Susilo became Member of Parliament, Comission I (Defense, Intelligence and Foreign Affairs for two terms (1999 - 2004) and (2004 - 09). He also taught as Lecturer at the Department of Communication, Faculty of Social and Political Science, Muhammadiyah University, Jakarta (2006)

Susilo is married and blessed with three children.

Swiss Envoy to Indonesia, Timor-Leste Presents Credentials



Mr Walker-Nederkoorn presented his credentials as Ambassador Extraordinary and Plenipotentiary of Switzerland to the Republic of Indonesia to President Susilo Bambang Yudhoyono on 12 January 2010, to Timor-Leste to President Ramos-Horta on 23 February 2010, and to ASEAN to General-Secretary Surin Pitsuwan on 10 March 2010.

Born in 1958 in Schattdorf/Canton of Uri, Mr. Walker-Nederkoorn holds a PhD in Economic and Social Sciences from the University of Fribourg. After working at the same University as an Assistant at the Chair of Economic Policy, he entered the Federal Department of Foreign Affairs in 1990 and went through his probation in Berne, Bucharest and Geneva. In 1992, he was assigned as a Diplomatic Officer in the Division of Economic and Financial Affairs with a special focus on trade, investment and regional integration.

In 1998, Mr Walker-Nederkoorn was transferred to the Embassy in Berlin as Cultural Counsellor. In 2002, he was assigned as Deputy Chief of Mission of the Embassy in Cairo. From July 2006, he was Deputy Head of the Political Affairs Division V in Berne, concurrently in charge of Economic and Financial Issues until December 2007, and from January 2008 of Culture, Education and Science.

He is married and father of three daughters.

New National Vision: Low Carbon Green Growth

The Korean Government announced 'Low Carbon, Green Growth' as Korea's new national vision at the 60th anniversary of the founding of the Republic of Korea on 15 August, 2008. Korea's economy grew by an average of more than 8.0 percent every year from 1962 to 1989, recording the world's 15th largest GDP in 2008. However, an absolute dependency on overseas energy resources including the world's 4th volume of petroleum import drove Korea into a country with one of the highest CO₂ - emission growth rates in OECD. At the same time, it was necessary to identify a new growth engine to ensure continuous economic growth and better quality of life. The current 'vicious' cycle among energy, economy, climate and eco-system should be transformed into 'virtuous'

circle through a paradigm shift with more emphasis on the use of new and renewable energy resources. 'Low Carbon Green Growth' aims to pursue high energy efficiency to strengthen energy security and Low CO₂ generation as a response to climate change. It will create a synergistic relationship between quality-oriented economic growth and environmental protection. 'Low Carbon Green Growth' will contribute to the international efforts to strengthen ecological soundness of our planet.

Green Conversion

Based on the consensus among the society, industry, academia and government, three objectives of 'Low Carbon Green Growth' were concretized into ten policy directions.



By Yoontae **KIM**,
Director, KOTRA,
Zurich Korea Business Center
Switzerland
E-mail: y.kim@kotra.ch

Mitigation of climate change & energy independence	Creating new engines for economic growth	Improvement in quality of life and enhanced international standing
1. Effective mitigation of greenhouse gas emissions	4. Development of green technologies	8. Greening the land, water and building the green transportation infrastructure
2. Reduction of the use of fossil fuels and the enhancement of energy independence	5. The "greening" of existing industries and promotion of green industries	9. Bringing green revolution into our daily lives
3. Strengthening the capacity to adapt to climate change	6. Advancement of industrial structure	10. Becoming a role-model for the international community as a green growth leader
	7. Engineering a structural basis for the green economy	

Action: The Five-Year Plans

In order to fulfill the policy goals and to implement the strategy for green growth, Korean government designed the Five-Year Plans as a part of mid to long term (2009-2050) national agendas. The first Five-Year Plan will cover the period between 2009 and 2013. Roughly 2.0 percent of the nation's annual GDP will be allocated, which is double the recommended amount by the Green Economy Initiative by the UNEP. The main fiscal spending of 107 trillion KRW (86 billion USD) is planned to be allocated to R&D in green technology such as solar energy, fuel cells, restoration of the four major rivers and green transportation. In initial terms, the Investments on the infrastructure will be bigger than on R&D due to the 'New Deal' element, in order to counter the current economic downturn. However, the R&D portion will be increased as the economy recovers.



1. Effective Mitigation of Greenhouse Gas Emissions

One of the most important tasks of the first Five-Year Plan is laying the groundwork for effective and sustained reduction of greenhouse gas emissions.

- To achieve its mid-term (2020) mitigation target for greenhouse gas emissions, Korea will set up mitigation strategies for buildings, transportation means and industrial sectors that are cost-effective.
- Korea will make it mandatory for relevant economic players to report their greenhouse gas emissions. Korea will build a national greenhouse gas inventory reporting system, and based on this system, design and implement its mitigation policy, including emissions trading mechanism. The inventory reporting system will greatly contribute

to making carbon information more easily available.

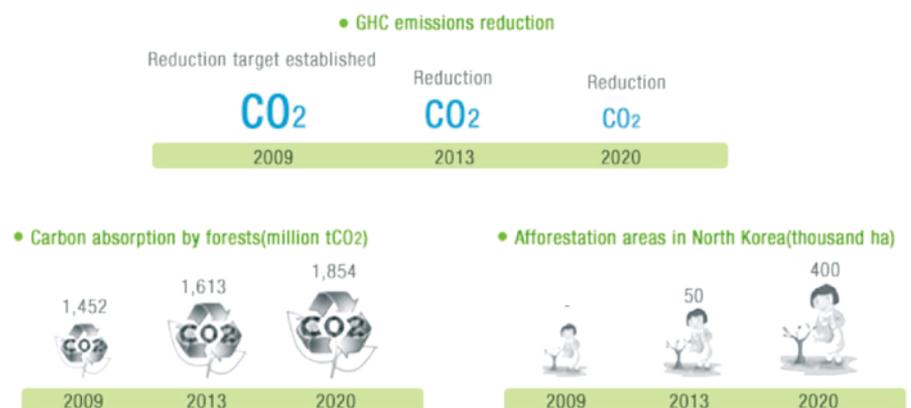
- Forestation and sustainable forest management will be pursued to increase carbon absorption. Further efforts will be made to raise the overall carbon absorption capacity through preservation as well as creation of wetlands.
- Korea will support a 'Green Korean Peninsula' through the rehabilitation and restoration of degraded forests in North Korea and by helping to enhance North Korea's emergency response capacity against natural disasters in shared waters.
- Greening projects in North Korea will be pursued in several phases through international organizations that will act as intermediaries, considering the inter-Korean relationship.

- Korea will increase energy efficiency levels to catch up with developed countries by effectively managing the energy demand in each sector and deploying energy efficiency technology. Through these policies, Korea will reduce energy intensity (toe/1,000 USD) from 0.317 in 2009 to 0.290 in 2013 and 0.233 in 2020.

- New and renewable energy supply will be increased from 2.7 percent in 2009 to 3.78 percent in 2013 and 6.08 percent in 2020 by industrializing new and renewable energy production, developing and distributing new and renewable energy according to the characteristics of households, buildings and cities, and applying renewable energy portfolio standard (RPS), which obligates increased renewable components in utilities.

- To reduce CO₂ output from power

Targets of Major Green Indicators



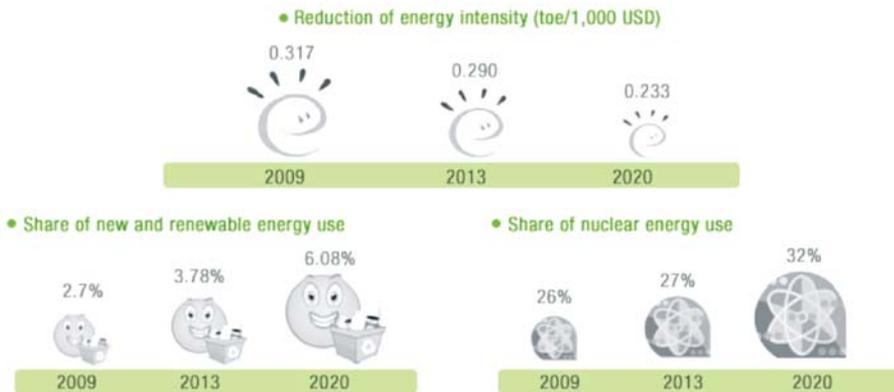
2.Reduction of the Use of Fossil Fuels & Enhancement of Energy Independence

Korea imports 97 percent of its energy supply from overseas and 84 percent of the energy supply comes from fossil-based energy sources. In order to reduce the use of and reliance on fossil-based energy sources and move beyond oil, actions will be taken to enhance energy efficiency and increase the use and supply of clean, renewable energy which will contribute to national energy independence.

plants, Korea will enlarge the use of nuclear energy from 26 percent in 2009 to 27 percent in 2013 and 32 percent in 2020, while also increasing the export of nuclear power plants. This will have the additional benefit of boosting the Korean economy.

- Business enterprises specializing in overseas resources development will be encouraged to use their expertise and explore cooperative endeavors, with their activities calibrated to meet country-specific requirements.

Targets of Major Green Indicators



3. Strengthening Capacity to Adapt to Climate Change

As adverse impacts of climate change are already apparent around the world despite the global efforts to reduce greenhouse gas emissions, Korea will establish and implement adaptation policies to minimize the damages from the adverse impacts of climate change.

- Korea will expand its climate change monitoring system based on a three-dimensional (e.g., air-, ship- and satellite-based) observation system in order to further improve its climate change forecasting capacity and make available adequate information for more effective adaptation to climate change.
- To prepare for the possible disturbances in food supply as a consequence of climate change, Korea will develop “climate-friendly” food production technology, increase the share of environment-friendly agricultural products to 10 percent in 2013 and 18 percent in 2020, and strengthen international cooperation for a secure food supply.
- The four major river-restoration project is expected to solve water shortages as well as seasonal flooding problems by securing an adequate supply of freshwater and strengthening flood controls. To prepare against droughts, a water conservation scheme will also be enhanced.
- Disaster response systems will be

reformed taking into account the effects of climate change and early disaster forecasting and warning systems will be installed. Water resources management will be carried out within the wider context of the preservation of the ecological environment, and also in a way that can help the nation to better cope with water-related natural disasters.

- To increase and protect forest resources, urban forests and green areas will be built and forest fire prevention activity will be enhanced. Also, the protection of forest ecosystems will be strengthened to cope with the adverse effects of climate change.

Targets of Major Green Indicators



4. Development of Green Technologies

Korea will work on developing technologies that will significantly contribute to reducing greenhouse gas emissions. By doing so, it will secure new engines for future economic growth and gain a competitive edge in the global market.

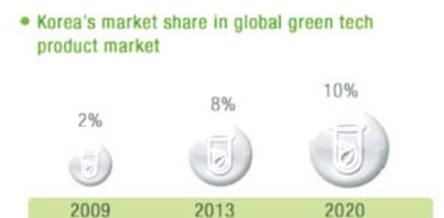
- Korea plans to launch intensive efforts to develop several important green

technologies such as silicon-based solar cells, bio-energy, advanced light water reactor, high-efficiency fuel cells, integrated coal gasification combined cycle technology, and smart grids, boosting its global market share in the relevant sectors to 8.0 within five years.

- Under the coordination and oversight of the Presidential Commission on Green Growth and the National Science & Technology Council, a mechanism will be put in place linking the academia, industry and research sectors involved in green R&D. This will energize R&D investment, boost efficiency, and help to establish a world-class green technology information structure including a testing and certification system.
- To promote and foster green technology transfer and commercialization, Korea will fortify the basis for practical application and industrialization as well as education, development of human resources and the establishment of the financial and banking infrastructure.
- Korea will also encourage and foster collaborative projects with the world’s leading green research institutes and

offer incentives to attract green technology workforce and expand human resources exchange.

Targets of Major Green Indicators



• Number of foreign specialists in green tech working in Korea



5. 'Greening' of Existing Industries & Promotion of Green Industries

Considering that 57 percent of Korea's energy consumption occurs in the industrial sector, which proves the pervasiveness of traditional energy-intensive manufacturing patterns in the nation's economic structure, it is imperative for Korea to pursue industry-wide low carbon high efficiency.

- Korea will systematically manage the recycling of resources throughout the entire manufacturing process of factor input, production, use, disposal and recycle, thereby firmly establishing the 3R – reduce, reuse and recycle - as the governing principle. Urban mining of wastes will be encouraged to extract and distill precious metals such as gold and silver. The resource recycling rate will be raised from 15 percent in 2009 to 17 percent in 2013 and 17.6 percent in 2020.

- Korea's major strategic industries such as steel, cars, semiconductors, shipbuilding and chemistry will be encouraged to increase the green portion in R&D and plant equipment investment. Through the assistance for eco-friendly plant building and other commercially viable green projects, green goods exports in the major industries will be increased from 10 percent in 2009 to 15 percent in 2013 and 22 percent in 2020.

- The Korean government will encourage small and medium enterprises (SMEs) to green their businesses by providing assistance in R&D, expanding government procurement of green goods from SMEs and assisting them in finding export markets for their products. Also, assistance will be offered to diagnose the

extent of SMEs, and help enhance their capacities through green partnerships with big enterprises. The number of participating enterprises in green partnerships will be increased from 685 in 2009 to 1,500 in 2013 and 2,900 in 2020.

- By tapping the green potentials of regions, green clusters will be created to achieve a virtuous cycle through cooperation and technological innovation. Green clusters will be typically formed where cooperation between industry, academia and research institutes can be most efficiently pursued. Synergy effects are expected from the physical concentration of green industries in one place. Green industrial complexes with circulation facilities where waste energy and by-products can be reused and recycled will be expanded from five in 2009 to 10 in 2013 and 20 in 2020. The circulation process will use the 3R technology and information technology that will be widely applied in green industrial complexes and throughout their work processes

technology industries that utilize information and communications technology, and high value-added industry, where energy intensity per unit/value is much lower, will help Korea to pursue climate change mitigation and sustainable development simultaneously.

- Korea will energetically develop six major sectors - healthcare services, education, financing and banking, contents industry, software, and tourism industry - as the core of its high value-added service industry. With the improvement of the healthcare services industry, many foreign patients will benefit from traveling to Korea for its world-class medical treatment. Educational systems will also be further refined, advancing the development and popularization of ubiquitous learning.

- The state-of-the-art convergence technology industry will be actively promoted, including broadcasting and telecommunications, information and communications technology, robotics, new materials, nano-materials, bio

Targets of Major Green Indicators

• Resource recycling rate



• Number of enterprises in green partnerships



• Share of green goods exports in the major industries



• Number of green industrial complexes



6. Advancement of Industrial Structure

Since Korea's economic performance is in large part owed to its manufacturing prowess, it is a challenge for Korea to reduce greenhouse gas emissions that are produced in the manufacturing process. State-of-the-art convergence

resources, medical appliances, and green food industry. By combining information technology with more traditional manufactures such as cars and shipbuilding, new grounds will be gained, along with the sharpened competitive edge and increased value-addition.

Targets of Major Green Indicators

• Number of foreign patients receiving healthcare in Korea



7. Engineering a Structural Basis for the Green Economy

By laying the groundwork for the green economy, it will become much easier to attain the greenhouse gas mitigation goals and boost green growth. Korea will lay the basis for the green economy with a focus on extending public assistance to and increasing investments on green enterprises. Korea will introduce a carbon emissions trading system, adopt environment-friendly tax system and overhaul the regulatory system in a climate-friendly manner.

- Korea will gradually introduce the carbon emissions trading system with the objective of creating a viable domestic carbon market with the estimated trading volume of 500 billion KRW (0.4 billion USD) in 2013 and 2 trillion KRW (1.6 billion USD) in 2020.

- Public credit guarantee will be provided to the green technology and green industry sectors, with the total amount of assistance increased from 2.5 trillion KRW (2 billion USD) in 2009 to 7 trillion KRW (5.6 billion USD) in 2013 and 8.0 trillion KRW (6.4 billion USD) in 2020. The Korean government will encourage the private sector, especially the enterprises, to disclose carbon and environmental information, develop green stock index, increase investment in green financing and develop new financial products.

- The tax system will be overhauled in a more environment-friendly way and tax benefits will be extended to producers of green goods and green investors. Incentive/disincentive systems will be installed to encourage greenhouse gas emissions reduction, improve energy

• Broadcasting and telecommunications convergence industry exports



efficiency and enhance green economy-related activities.

- Measures will be taken to improve energy efficiency in low-income households, to recognize the basic rights to minimum level of energy use, and to increase energy welfare funding, thereby reducing the ratio of energy-poor households from 7.3 percent in 2009 to 5.0 percent in 2013 and 3.5 percent in 2020.

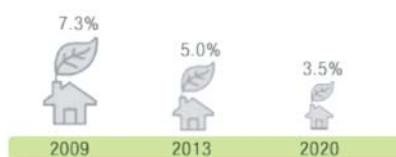
- Comprehensive information systems on green jobs will be made available for job-seekers. In addition, the National Technical Qualification Testing System will be modified to better reflect and lead domestic green trends with the purpose of facilitating and encouraging employment in the green industries. Furthermore, green social enterprises will be intensively cultivated with an aim to reach approximately 300 in numbers by 2013 and 500 by 2020, which will lead to an increase of new green jobs.

Targets of Major Green Indicators

• Volume of trade in domestic carbon emissions trading market



• Percentage of energy-poor households



8. Greening the Land, Water & Building the Green Transportation Infrastructure

Along with transforming the energy-intensive industrial structure, to effectively reduce greenhouse gas emissions, green urban planning and the greening of buildings and transportation are necessary. Particularly, it will be taken into account that buildings and transportation take up 43 percent of Korea's emissions.

- Green city designs that are appropriate to Korea's environment will be selected to construct carbon-neutral new cities and rehabilitate the dilapidated parts of the cities. Korea will develop these cities to the level that can be designated by the UNEP as green cities.

- Green centers such as the four major rivers, reclaimed land, and various coastal areas will be increased.

- Korea will expand nature reserve areas from 100,000 ha in 2009 to 150,000 ha in 2020. Also, ecological space will be widened through the restoration of city streams and the increase of forestation in the cities, which is expected to have the effect of enabling the city-dwellers to garner environmental benefits and thus acquire environment-friendly values.

- Energy-efficiency ratings and green building rating systems will be expanded. Design guidelines and

• Public credit guarantee for green tech and green industry



• Number of green Social Enterprises



incentives will be offered to encourage the construction of green buildings. The government will take the lead in applying the green building code to the construction of public housing, public office buildings, schools and public welfare institutes.

- Green transportation and mass transportation will be increased. The share of passenger transportation by rail will be increased from 18 percent in 2009 to 22 percent in 2013 and 26 percent in 2020. The overall share of mass transit will be increased from the current 50 percent to 55 percent by 2013 and 65 percent by 2020.
- Bicycles will be promoted as convenient and important green transportation means. The volume borne by bike transport will be increased from 1.5 percent of the total passenger transport volume in 2009 to 5.0 percent by 2013 and 10 percent by 2020. Public bike rentals will be offered and national bike road networks will be expanded.

Targets of Major Green Indicators



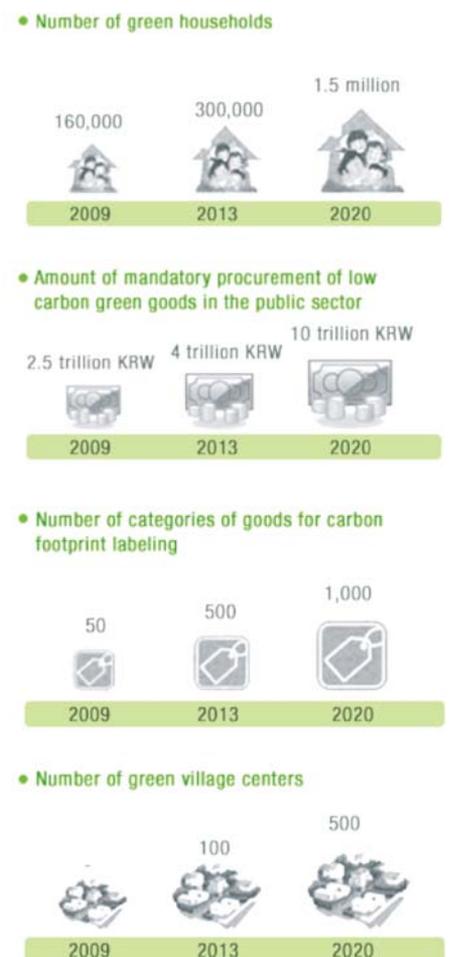
9. Bringing Green Revolution into Our Daily Lives

Korea plans to actively foster civil society participation in green growth. Campaigns will be conducted to raise public awareness and achieve social consensus on the necessity of green growth. This campaign is expected to induce the voluntary participation of citizens to make it the social norm to adopt environment-conscious, 'green' lifestyles.

- Educational goals will be set up to produce tangible results in green growth throughout society. Regular school curriculums as well as continuing education for adults will promote green growth. Educational materials on green growth will be developed and distributed to the general population as well as schools.
- The green lifestyle index will be developed for citizens. Also, model lifestyles will be recommended to inculcate low carbon habits. Nationwide green life movement will be launched with the purpose of fortifying green life networks which is to be dubbed Green Start. Incentives such as the carbon point system will be offered to increase the proportion of green citizens and green households to 10 percent (1.5 million) of the general population by 2020.
- Carbon footprint labeling and certifying system for goods will be enacted, and green store certification

and developed as an environmentally responsible tourism mode. Pilot projects will be launched, infrastructure for eco-tourism will be expanded, and attractive tour packages will be offered. Professional eco-tour guides will undergo adequate training and their qualifications will be ensured by a certification system.

Targets of Major Green Indicators



10. Becoming a Role Model for the International Community as a Green Growth Leader

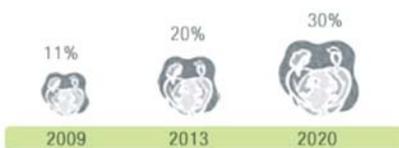
Korea will strive to become a role model for green growth in the same way that it has been a good example for economic development in the past. Korea will play its part in promoting green growth by offering full cooperation on the global stage. It will also provide assistance to developing countries to help them

realize green growth.

- Korea will actively engage in international negotiations on climate change and make contributions by playing a constructive role in building an effective global climate regime.
- Between 2009 and 2012, the East Asia Climate Partnership will be the main conduit through which the Korean government will offer assistance and cooperation to neighboring developing countries in Asia to help them combat climate change. In addition, "World Friends Korea", the overseas volunteers program, will be enlarged and will more actively engage in green growth activities in developing countries.
- Korea will also increase the amount of official development assistance, while raising the proportion of Green ODA to 20 percent by 2013 and 30 percent by 2020, compared to 11 percent in 2007. Also, contributions to multilateral organizations such as the UN Global Environment Facility will be expanded.
- As showcases for green growth, green growth urban models will be built and green industrial clusters that employ green technologies and green systems will be utilized. Also, the Korean government will strongly support effective multilateral organizations to spearhead green growth efforts in Asia.

Targets of Major Green Indicators

• Proportion of Green ODA



Expected Benefits of Green Growth

The necessary infrastructure for the development of green technology, green Small and Middle-sized Enterprises (SMEs) and the cultivation of the cutting-edge convergence industry will be built in order to develop new engines for future economic growth. The four major river restoration project and green transportation development will be a significant part of the overall green infrastructure building.

- As the overall infrastructure for green growth improves and expands, various spill-over effects such as production increase, value-addition, and creation of jobs are expected to occur on several fronts.
- Green technology application on green cars, light-emitting diodes and solar cells will greatly contribute to raising the overall economic productivity and thus redouble the economic spill-over effect.

The five-year plan for green growth is expected to have a positive effect on production inducement in the amount ranging from 182 to 206 trillion KRw(146 to 165 billion USD) over the next five years. This translates into an annual sum of 36 to 41 trillion KRw(29

• Number of "World Friends Korea" volunteers dispatched overseas



percent to 1.8 percent of Korea's annual GDP.

The number of jobs created is estimated at 1.56 to 1.81 million and the annual average will be 0.31 to 0.36 million jobs.

- One distinctive characteristic of the five-year plan is the creation of jobs for both skilled and unskilled laborers. Skilled jobs include greenhouse gas emissions certifiers, emissions permits trading certifiers, green building evaluators and certifiers, and green building certifiers, among others.
- Unskilled laborers will be able to find jobs in forestation, green landscaping along the waterways and construction of small and medium-sized dams, among others.

Overview of Korea's Green Growth National Vision (UNEP, Aug 2009)

The Republic of Korea has committed itself to moving away from the traditional "brown economy" growth-at-any-cost model to a "green economy" model where long-term prosperity and sustainability are the key objectives. This commitment by the Republic of Korea has the potential of creating a domino effect on the other major Asian economies.

Excellent Business and Investment Opportunities in Korea

Korea's 'Low Carbon Green Growth' also creates excellent business and investment opportunities. With its highly qualified human resources and solid technology fundamentals, Korea will successfully shift its growth paradigm into a knowledge-based green concept. Korea's well-systemized logistic chains offer seamless access to major Asian markets including China and Japan. For more information please contact KOTRA Zurich Korea Business Center (Tel + 41 44 202 12 32).

Source: *The Presidential Commission on Green Growth*, KOTRA Invest Korea. ■



to 33 billion USD), which is about 3.5 percent to 4.0 percent of Korea's annual GDP. And the value-added effect is estimated at 75 to 95 trillion KRw(60 to 76 billion USD) over the next five years, and annually 15 to 19 trillion KRw(12 to 15 billion USD) which amounts to 1.5

Ready to Reap Rich Benefits from Renewable Energy

For Malaysia as a whole, biomass utilization leads to substantial economic and environmental gains. For businesses, exploiting renewable resources enhances profit margins and eliminates waste disposal costs. The potential to utilize huge biomass reserves and solar resources allows progressive companies to generate electricity exports, seek regional markets and expand opportunities from lower manufacturing costs.

In the Eighth Malaysian Plan, Renewable Energy (RE) was announced as the fifth fuel in the energy supply mix. Renewable Energy is being targeted to be a significant contributor to the country's total electricity supply. With this objective in mind, greater efforts are being undertaken to encourage the utilization of renewable resources, such as biomass, biogas, solar and mini-hydro, for energy generation.

The Government has launched several fiscal incentives to stimulate the emergence of RE activities and technologies. Palm oil mills, sawmills, manufacturers and large institutions can start to benefit immediately by using local technology to generate income and reduce operating costs. RE resources are available in two primary forms: biomass residues from agriculture wastes (palm oil waste, wood waste, rice husks, etc.), municipal solid waste and energy from the sun.

Many companies are already taking advantage of RE technologies to begin reaping energy cost savings and revenue:

- **TSH Bio Energy Sdn. Bhd.** As the first biomass RE project using empty fruit bunches as fuel, the company sold electricity to TNB at 21.25 sen/kwh.

With its 14 MWe capacity, the TSH Bio-Energy Sdn Bhd. is the largest palm oil residues fired cogeneration plant in the world. Located in Kunak, Sabah, it has concluded a renewable energy purchase agreement (REPA) with the Sabah Electricity Sdn Bhd to supply up to 10MW of green electricity for 21 years. Commissioned in January 2005, the cogeneration plant includes a watertube steam boiler with a capacity of 80 t/h at 66.5 bar (g) and a turbo-alternator with a rated output of 17,500 KVA.



- **Jana Landfill** By producing biogas and converting it to electricity, this project, the first RE grid-connected project in Peninsula Malaysia, eventually sold power to TNB at 16.7 seb/kwh.

- **Bekok Kiln Drying and Moulding Sdn. Bhd** By converting a fuel oil boiler to one



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that burns wood waste, annual fuel savings alone amount to RM 2 million.

• **Awana Kijal Golf & Beach Resort** By installing a solar water heating system to supply up to 35 percent of its consumption needs at a cost of RM 400,000, the resort continues to save on energy and maintenance and paid back its investment in only six years.



For Malaysia, embarking on renewable energy provides benefits that enable the country to remain strong. Among these

include an improved balance of trade, foreign exchange savings, more competitive industries, new export markets, employment opportunities, lower consumer prices and a better environment.

Renewable energy is a commodity just like any other form of energy. It has a major role in meeting energy demand needs and combating global warming. Presently, RE represents a prime opportunity to seek alternative energy options. Getting on board with RE today, secures your energy needs for the future

Solar Energy

Solar energy plays an important role towards achieving long lasting, sustainable, environment friendly renewable energy resources to fulfill the energy needs for mankind. The use of non-renewable fuels, such as fossil fuels

have many side effects. Their combustion products produce pollution, acid rain and global warming.

Conversion to clean energy sources such as solar energy would enable the world to improve the quality of life throughout the planet Earth, not only for humans, but also for its flora and fauna as well. Because of the foregoing, there is a need to develop an ingenious method of solar energy conversion systems and then to substitute it where applications of fossil fuels are most vulnerable. Therefore, extensive research and development in solar energy utilization technologies must be carried out. ■

A Government's Initiative & Incentives for Green Agenda



Margaret Lee,
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PricewaterhouseCoopers,
Taxation Services Sdn Bhd

What are your views on Malaysia's current tax incentives for green initiatives?

The Malaysian Government has given greater focus to green development in recent years, recognizing the social and environmental costs involved if green technologies are not applied. The importance given to this area is reflected by the renaming of the Ministry of Energy, Water and Communications to Ministry of Energy, Green Technology and Water in 2009. That same year, Prime Minister Datuk Seri Najib Razak launched the National Green Technology Policy which revealed the Government's intention to stimulate the adoption of green technology in the building industry.

From a tax perspective, the Malaysian Government has in the past introduced a series of tax incentives to encourage companies to be environmentally friendly by investing in energy efficient systems and generation of energy using renewable energy sources. These tax incentives include accelerated tax depreciation and 100 percent additional write off in the form of investment tax allowance for energy savings capital expenditure.

Could you please explain what you mean by "tax exemption given on incremental costs incurred in buildings?" How does that work?

The incremental costs which qualifies for tax exemption refers to the additional construction costs of a building,



alteration, renovation, extension or improvement of an existing building. The amount of incremental costs will be certified by Greenbuildingindex Sdn Bhd and this amount will be inserted in the GBI Certificate. The “incremental costs” will be claimed by building owners to reduce their business statutory income in their tax returns resulting in a reduction in their tax liability.

Are we doing enough to encourage the property sector to go green?

Malaysia's journey so far towards achieving a developed green technology status is as follows.

1. The GBI is Malaysia's industry-recognized green rating tool for buildings to promote sustainability in the built environment and raise awareness among developers, architects, engineers, planners, designers, contractors and the public about environmental issues and our responsibility to the future generations. It was launched on May 12, 2009 by Works Minister Datuk Shaziman Abu Mansor.

2. The National Green Technology Policy (NGTP) was launched by Prime Minister Datuk Najib Seri Najib Razak on 24 July, 2009. The objective of the NGTP is to promote low-carbon technology and ensure sustainable development while conserving the natural environment and resources. The policy also includes setting up a legislative and regulatory framework that will support development of green technologies.

3. GBI tax incentive, stamp duty exemption and RM1.5 billion funding under the National Green Technology Fund was announced by Prime Minister Datuk Najib Seri Najib Razak during his 2010 Budget speech on October 23, 2009.

Clearly, the Malaysian Government is serious in its long-term commitment of promoting green technology. The

Ministry of Energy, Green Technology and Water has also announced an initiative in the creation of a Green Technology Fund - an introduction to a “polluters will pay” concept.

The responsibility of adopting green technology does not rest solely on the Government. The public has a role to play as well and there is no room for public apathy if Malaysia wants to adopt green technology. There is a need for effective promotion and public awareness as these are critical success factors for the successful development of green technology. The change of mindset of the public is important in order for the public and businesses to adopt green practices, for example, simple measures like recycling household wastes, using energy saving devices, etc. before the green agenda can be achieved.

With the setup and roll out of the Government's policies and initiatives and effective implementation, these should steer the nation towards achieving green technology and with the commitment of all Malaysians, it is hoped that Malaysia will be on track to achieve its green agenda.

What more can be done to enhance the existing green tax incentives?

Green buildings which are awarded GBI Malaysia ratings are classified in four categories i.e. Platinum, Gold, Silver or Certified, depending on the scores achieved. Green buildings are evaluated based on six key criteria:

- Energy efficiency
- Indoor environmental quality
- Sustainable site planning and management
- Material and resources
- Water efficiency
- Innovation

As a start, I feel that the recently introduced GBI incentive, while it provides tax exemption on the incremental costs to all green building owners, is not sufficiently attractive for

Platinum and Gold green buildings.

How else can the tax incentives for green buildings be enhanced?

Tax incentive enhancements could take the following form:

1. For Platinum and Gold green buildings, considerations could be given for enhanced tax incentives. For example the entire building costs would qualify for tax write-off, instead of the incremental costs to obtain the GBI certificate. It could take the form of tax depreciation over a 10-year period. In addition, the energy efficient assets incurred by the Platinum and Gold green building owners would also qualify for tax incentive. Based on the current tax legislation, GBI incentive and tax incentive on energy-efficient assets are mutually exclusive.

2 Double deduction should be given on costs incurred on renewal of GBI certificate. The GBI certificate is renewed every three years and buildings are required to achieve six green criteria before the GBI certificate is renewed.

3. Green assets incurred in buildings which are not “plant” qualifying for tax deduction purposes. For example, green roof systems, environmentally friendly



dry partition walls, etc. which are suitable for our tropical climate, should be given “plant” status so that tax depreciation can be claimed on these assets.

4. It is hoped that the Malaysian Government will also consider broadening the scope of tax incentives

to be extended to property developers so that they will enjoy tax incentives when they develop green townships.

In addition, it would be a welcome move to introduce attractive indirect tax incentives for the purchase of hybrid cars. This would encourage consumers to gravitate towards environmentally friendly vehicles.

What are our neighbouring countries doing in respect of attaining green status for their buildings?

Singapore is well-known as a clean and green city, with its Government focusing on environmental sustainability. The Singapore Government has initiated several funding and incentive schemes related to energy efficiency, clean energy, green buildings, water and environmental technologies, green transport, waste minimization, environmental management system, environmental initiatives and clean development mechanism.

Some of the measures introduced for green buildings in Singapore include:

Green Mark Incentive Scheme for Existing Buildings (GMIS-EB)

The Singapore Government has announced in the Sustainable Singapore blueprint that it has set a target of 80 percent for the existing building stock to achieve at least Green Mark Certified rating by 2030. A S\$100 million GMIS-EB was set up by the Building and Control Authority (BCA) to encourage private building owners of existing buildings to undertake improvements in energy efficiency. The scheme provides a cash incentive that co-funds up to 35 percent of the costs for energy efficiency improvements and capped at SGD1.5 million.

Green Mark Incentive Scheme for New Buildings

The SGD20 million Green Mark Incentive Scheme for New Buildings by BCA is to accelerate the adoption of



green building technologies and design practices. The scheme provides cash incentives to developers, building owners, project architects and M&E engineers, who achieve at least a BCA Green Mark Gold rating in the design and construction of new buildings.

What do you anticipate in the next few years, in relation to the adoption of 'green tax practices' by the real estate sector?

With continuous education and publicity about the importance of adopting green measures and initiatives, properties purchasers will understand the need to go green. I foresee a demand for green buildings. This is inevitable with rising costs such as utilities rates and with the potential withdrawal of utilities' subsidy, there will be a demand for green buildings and energy-efficient assets. Owners and tenants of green buildings will enjoy cost savings as such buildings will result in less consumption of electricity.

It is also hoped that owners of existing buildings will also strive to achieve GBI status when they carry out refurbishment exercises. The existing GBI incentive

and stamp duty exemption on the incremental cost incurred by the buyers and owners will encourage the real sector to pursue the green agenda. One of the major stakeholders in the property sector is the property developers.

Currently tax incentives are not available for property developers who develop their properties for resale. In order to encourage property developers to develop green buildings and houses, it is hoped that the Government will grant tax incentives to property developers since they are an important driver to promote and achieve the Government's green agenda.

What about tax deductions for the general public? Are there any deductions currently? If not, what types of tax deductions are recommended?

Currently, there are no tax incentives given to the general public on purchase of energy-efficient assets. The Government can encourage households to purchase energy-saving devices such as solar panels, by granting incentives in the form of personal relief to them. ■

EFTA Resolves to Formalize Co-operation with Malaysia

The recent annual summer conference of the Council of Ministers of the European Free Trade Association (EFTA) held in Reykjavik in the beginning of July 2010 whose members comprise Iceland, Liechtenstein, Norway and Switzerland, resolved that it would finalize a declaration of intent that will formalize cooperation with Malaysia.

Analysts familiar with Asia, especially the Association of South-East Nations (ASEAN), said that Malaysia was seen as an important country in the ASEAN region with an excellent infrastructure, abundant raw materials, access to a large market in the region and availability of skilled personnel.

They said that at the Reykjavik meeting hosted by Iceland, it was resolved that a memorandum with Malaysia would be signed soon.

The global economic crisis has set off alarm bells in the developed countries forcing them to proactively tap new markets with strong growth potential - there has been a tectonic shift in global trade that is moving away from the

developed countries to Asia with the three giant markets of China, India and ASEAN, in that order, playing a key role in this tectonic shift - and cushion themselves against any further economic bloodletting unleashed by recessionary attacks.

As one of the "core members" of the ASEAN group, the analysts said that Malaysia could play the role of a platform for doing business with the ASEAN region for EFTA companies interested in penetrating the Southeast Asian region.

An effective tool that EFTA has found has been signing free trade agreements with interesting partner countries or regions, they said.

The group has already signed 21 Free Trade Agreements (FTAs), thus forming the largest network of FTAs.

They also said that smaller partner countries such as Liechtenstein stand to benefit from this network because that country can export to markets outside its traditional region outside Switzerland and the European Economic Region.

However, EFTA states are increasingly focusing their efforts to attain greater trade and investment benefits on Asia which, apart from China and India, is attracted also by the ASEAN region.

The EFTA states are already doing a feasibility study on an FTA with Vietnam. Talks are also expected to be pursued with Thailand.

The President of the Swiss Confederation, Doris Leuthard, who is currently on a state visit to Indonesia after attending the recent conference in Reykjavik, announced at the meeting that EFTA would start negotiations on an agreement with Indonesia.

Switzerland presently chairs the EFTA by rotation.

Leuthard described the proposed agreement with Indonesia as "another milestone" in bilateral relations after concluding her one-hour talks with Indonesian President Susilo Bambang Yudhoyono.

On his part, Yudhoyono described the agreement as a "good thing" for both sides, helping to create new jobs for Indonesians.

The EFTA agreement with Indonesia, which could also serve as a model for Malaysia, would be an extensive economic partnership agreement, covering trade in goods and services, investments, intellectual property protection, procurement and economic cooperation. ■



EFTA Ministerial Meeting - Reykjavik

On the Path of Productivity, Profits & Potential



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Pakistan offers one of the most liberal investment regimes in the region. All sectors are open for any foreign investment without any restriction on repatriation of capital and dividends. The Government of Pakistan is committed to pro-business policies pursuing the path of privatization, deregulation and liberalization.

There are over 600 foreign companies in Pakistan. They are there because of high profitability. They are there because of the ease of doing business (Pakistan ranks 85 of the 183 countries in the 2010 World Bank report on the ease of doing business as compared to China at number 89 and India at number 133). In a survey undertaken in September-October 2009 by Pakistan's Overseas Investors Chamber of Commerce and Industry, 74 percent of foreign investors in Pakistan showed interest in continuing investment for the next two years.

Swiss Companies are doing well in Pakistan, where they are ably represented by the Swiss Business Council in Karachi. The big success story is Nestle. Arriving in Pakistan in 1988, with a joint venture "par excellence" with Pakistan's Milkpak, Nestle established four factories, including the largest milk-reception plant in Asia. With annual revenues of CHF 600 million and a projected growth rate of 13 percent per annum, Nestle is bullish on Pakistan. There are, however, many other areas to explore where Switzerland has the requisite expertise and Pakistan the natural resources. Pakistan has identified seven sectors for investment: oil and gas, minerals, coal power generation, alternate energy, commercial agricultural farming, livestock, and industrial manufacturing.

The recent surge in global food prices provides Pakistan a unique opportunity to harness its latent capabilities in both agriculture and horticulture. The adjoining markets are food importers. Processing and packaging of higher value, particularly of seasonal products and organic commodities, now fetch premium prices. Investments in these fields are bound to receive excellent returns. The year is expected to see high crop yields in wheat (23.8 million metric tonnes), rice (6.7 million tonnes) and cotton (at 12.7 million bales, Pakistan is the fourth largest producer of cotton). The Government has set an ambitious target of US\$ 25 billion in export of textiles by 2014.

It is also pertinent to note that Pakistan's economy is making a turnaround after the exogenous shocks of the international financial crisis of 2008-2009. External accounts deficits have narrowed, foreign exchange reserves improved, and inflation has declined significantly (average CPI inflation is 11-13 percent as compared to 20.5 percent in 2009). The economy has been boosted by higher remittances by overseas Pakistanis i.e. 17.6 percent more from July 2009-March 2010 as compared to the same period the previous year. There are other visible signs of recovery e.g. Private sector borrowing has increased in the past eight months (Rs. 137 billion from July 2009 - 8 March 2010). Car sales jumped by 38.4 percent (from July 2009-March 2010) as compared to the same period last year. The target for the current fiscal year is a GDP growth rate between 3-3.5 percent.

Pakistan is determined to deal with the main problems: the energy crunch in the manufacturing sector, water shortages in

Nestle plant in Kabirwala



the face of extreme adversity.

In January 2010, Goldman Sachs reaffirmed Pakistan's place on the list of its top 15 emerging economies for 2010, included Pakistan in the "Next 11" Group after the four BRIC countries. According to Goldman Sachs, Pakistan has a good size population, with a modern industrial base i.e. the ability to produce consumer goods and consumers with purchasing power. Investors with vision are able to see beyond the headlines, towards Pakistan's productivity in the short term despite incredible odds, high profits for investors in the medium term, and as one of the new "emerging economies", its growth potential in the long term. ■

the agricultural sector, broadening the tax base and a problem familiar to everyone - netting tax evaders! In February, 2010 the World Bank noted that Pakistan was on the right track having taken the difficult decision to eliminate (power and oil) subsidies. Still more difficult decisions have to be taken on VAT. Pakistan's macro-economic stabilization program has received encouragement from the IMF and the Asian Development Bank (ADB). Most importantly, the Friends of Democratic Pakistan (FODP), the US Government, the EU, etc. have been very supportive and recognize the need to address both

political and economic challenges.

In discussing Pakistan's potential, one must also address concerns on security in Pakistan. The successes of the anti-terrorist strategy in Swat, Malakand, and South Waziristan have been acknowledged. And for the first time in years, local communities have reclaimed their administrative responsibilities in these areas. In 2009-2010, there were retaliatory terrorist attacks in major cities, but the targets were never business enterprises. Significantly, the Pakistan business community has proved its resilience in

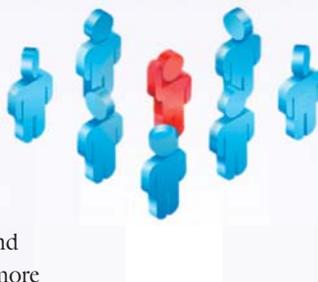
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Investment Avenues Abound in Renewable Energy Projects



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Pakistan's growing population, per capita energy use and level of industrialization make it an ideal location for renewable energy projects. The total primary energy supply is expected to quadruple by 2025 to meet increasing demand. While the Government of Pakistan has initiated some joint ventures in this very dynamic and profitable sector, this is only a beginning. The Government has established the Alternative Energy Development Board (AEDB) to not only promote and develop renewable energy technologies, but also to act as a "one-window facility" for private sector investments. The Board has identified the following renewable energy potential in Pakistan:

Wind	:340,000 MW
Solar	:2.9 Million
MW Hydro (Small)	:3000 MW
Hydro (Large)	:50,000 MW
Mini & Small Hydel	:2,000 MW
Bagasse Cogeneration	:1800 MW
Waste to Power	:500 MW
Geothermal	:550 MW

Government Incentives

The Government is providing several incentives to investors in the field of renewable energy. These incentives include cost plus tariff guarantee (15 percent Return on Equity), guaranteed electricity purchase, no import duties on equipment, zero sales tax, no income tax/withholding tax, permission for repatriation of equity and dividends, permission to issue corporate registered bonds, net metering, banking of electricity, wheeling provisions, concept of Grid Spill-over, etc. Furthermore, carbon credits may be obtained through the CDM Facility.

Wind Power Projects

The Government has identified the wind-swept corridor in Gharo-Keti Bandar (Sindh Province) as the place to set up 10 Wind Power projects, each with a capacity of 50MW. While the grid provision is the responsibility of the purchaser, the wind risk is borne by the Government. Such wind power projects would also benefit local communities by electrifying remote villages. At present, there are joint ventures in wind power projects with the USA, China, Germany, Turkey, Republic of Korea, Malaysia, and neighbouring Iran. While Prime Minister Syed Yousaf Raza Gilani inaugurated Pakistan's first-ever wind energy project at Jhimpir in April 2009, there are several other projects underway.



View of Zorlu Enerji's Wind Park in Pakistan

Solar Thermal Power Projects

As Pakistan is energy-deficient, the Government is actively promoting the establishment of solar thermal power projects of 10MW to 50MW capacity through Public-Private Partnerships (PPP). In this equation, the public sector would provide guaranteed purchase of electricity, counter guarantees, and in kind contributions (land) as required. For these projects, counter guarantees would be provided by the Asian Development Bank (ADB) and the State



A small village in Thar Desert powered with solar energy

Bank's subsidized financing for up to 10MW plants. Such solar thermal projects would also have obvious benefits for local communities by reducing their dependency on fossil fuels such as kerosene oil. The Government is also focusing on the installation of agricultural solar water pumps for irrigation purposes to replace existing diesel pumps, solar water heaters in the domestic and industrial sectors to supplement piped natural gas, and solar photovoltaic (PV)-based street lights. Solar panels have been installed on Pakistan's M-2 motorway to power telephone used by commuters during emergencies.

Hydro Power Projects

While Switzerland exploits between 80-90 percent of its hydro-electrical potential, in Pakistan it is less than 15

percent. The Government is committed to the construction of small dams in the North (Khyber Pakhtunkhwa Province, Punjab Province, Azad Jammu & Kashmir (AJK) and Gilgit-Baltistan), which has a similar topography to Switzerland. The Government is interested in both Private Investment and Public-Private Partnerships (PPP) for up to 50 MW Hydro Power projects. The AEDB has data on specific projects between 8MW to 28 MW. In the case of hydro power projects, the hydro risk is borne by the Government and the grid provision is also the responsibility of the Government. For these projects, counter guarantees would be provided by the ADB and the State Bank's subsidized financing for up to 10MW plants. These hydro power projects would not only have huge social and economic benefits, but would also have a great impact on the environment by preventing deforestation, and reducing the use of wood, kerosene oil, diesel consumption for generators, dry cell batteries, etc.

Waste-to-Energy Power Plants

In 2008, the Dutch Government undertook a study for the assessment of Solid Waste Management in 13 selected cities in Pakistan. They calculated that the total waste generation of these cities was over 22,850 tonnes per day. In Pakistan there are enormous opportunities to turn municipal waste into energy. In the case of waste-to-

energy projects, the grid provision is also the responsibility of the Government. For these projects, counter guarantees would be provided by the ADB and the State Bank's subsidized financing for up to 10MW plants. These waste-to-energy projects have several benefits including better disposal of waste, better hygiene, and of cleaner electricity generation. The Government is also focusing on the installation of many Biogas Plants as Pakistan is an agricultural country with a livestock population of more than 53 million. Livestock manure can be used to produce biogas to meet the energy requirements, particularly in rural areas. There are several ongoing projects in Pakistan for example, in April 2007 the Government of New Zealand launched a pilot waste-to-energy project in Landhi, which is a traditional cattle colony supplying milk to the mega-city of Karachi.

Switzerland is a major foreign investor in Pakistan, and has a proven record in hydroelectric generation in Pakistan. Switzerland is a leader in renewable energy technologies, and this is a sector which can be beneficial not only for the people of Pakistan but lucrative for foreign investors. It must be emphasized that Pakistan offers one of the most liberal investment regimes in the region where all sectors, including renewable energy, are open to foreign investment without any restriction on repatriation of capital and dividends. Simply put this is a win-win opportunity with major economic, social and environmental benefits!

For more information please contact Arif Alauddin, CEO of the Alternative Energy Development Board (AEDB) at E-mail: alauddin@aedb.org ■



View of an Spillway

Abundant RE Resources Hold Key to Filipino Energy Security

The Philippines is endowed with abundant renewable energy (RE) resources. Being an agricultural country, major crops grown are rice, coconut and sugarcane could generate substantial volumes of residues that could be utilized as energy fuel. The Philippines is known to have also an abundance of bio-energy fuel sources at its disposal because of its extensive agricultural, forestry, and livestock industries.

Moreover, the country is situated on the fringes of the Asia Pacific monsoonal belt thus exhibiting a good potential for wind energy. With its location just above the equator, the Philippines likewise has vast potential for various solar energy applications.

In the past years, initiatives have been geared towards increasing generation from geothermal and hydro resources that has significantly reduced the country's dependency on imported and polluting fuels. In addition, renewable sources such as solar, micro-hydro, wind and biomass resources are seeing wide-scale use in the government's rural electrification efforts. With the current soaring of oil prices in the world market, harnessing and utilization of renewable energy is critical in the government's strategy to provide energy supply for the country.

As an aggressive move to promote renewable development and use, the Department of Energy (DOE) has identified long-term goals, namely, to (i) increase renewable-based capacity by 100 percent by 2013; and (ii) increase non-power contribution of renewable energy to the energy mix by 10 million barrels of fuel oil equivalent in the next ten years. In support of these general

goals, the Government aims to (i) be the number one geothermal energy producer in the world; (ii) be the number one wind energy producer in Southeast Asia; (iii) double hydro capacity by 2013; and (iv) expand contribution of biomass, solar and ocean by about 131 MW. These goals serve as concrete benchmarks for the Government to advance its vision of a sustainable energy system with RE taking a prominent role in the process.

With increased private sector investments as well as the adoption of modern and innovative technologies in exploration and development, the DOE is targeting the installation of an additional 1,200 MW of geothermal capacity within the next 10 years, resulting in an increase of about 60 percent from the 2002 level of 1,931 MW. The attainment of this target is being pursued as a strategy to maintain, if not improve, the Philippines' ranking as the second largest geothermal producer in the world. For the hydro sector, the aim is for up to 2,950 MW of additional capacity to be installed within the next ten years on top of the 2002 level of 2,518 MW, reaching a total of 5,468 MW by 2013. Finally, the DOE will push for the installation of up to 548 MW from RE sources by 2013. Of this total, 417 MW will come from wind-based power while the remaining 131 MW will be sourced from solar, ocean and biomass.

As of end 2006, the country's total installed capacity from RE generated 5,261 MW. Hydropower accounted for the largest share of 61.9 percent followed by geothermal with 37.6 percent and the remaining 0.5 percent was provided by solar and wind. In addition, wind sites promise a huge



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contribution to the achievement of the envisioned double capacity for renewable energy.

With the Signing of the Philippine Renewable Energy Act of 2008 (Republic Act 9513) the Philippines seeks to achieve 60 percent self sufficiency in energy by 2010. Besides cutting back on carbon emissions, it saves the cost of imported oil, and is an important generator of foreign investments for the country.

- The country's installed hydropower capacity of 3,289 MW will be greatly increased with the operation of mini-hydropower plants adding 13.5 megawatts to the national grid.
- The Biofuels Act which was enacted into law last January 2007 will require the mandatory blending of coco-biodiesel with petroleum diesel initially at 1.0 percent by early May 2007, increasing to 2.0 percent within two years.
- The Philippines holds the largest potential (76,000 MW) for wind energy among the Southeast Asian countries.
- On geothermal energy, the Philippines is the second largest producer in the world.
- Solar power technology has been instrumental in providing power to agrarian communities in the countryside. The solar support project, initiated by the Philippine National Oil Company (PNOC), has been crucial in this regard.
- The country has abundant biomass resources with installed capacity expected to reach 161 MW by 2014.

The Energy Development Corp. (EDC), the Lopez Group's renewable energy unit, may now put up wind farms in Mindanao after it got the thumbs up from the Energy Department. The company applied for wind projects in Camiguin, Dinagat and Surigao, with an estimated cost of P7 million each.

Energy Development also got the department's nod to put up wind farms in the Luzon grid, which include 40-megawatt (MW) Balaoi-Pagudpud project and the 86-MW Burgos project in Ilocos Norte's Barangay Saoit. Since the end of March 2010 the department has approved 44 wind projects with a total capacity of 921 MW.

The country's first wind project, the 33-MW wind farm of NorthWind Power Development Corp. is in Bangui, Ilocos Norte is the biggest wind farm in Southeast Asia to date.

Market Opportunities - Increase in Consumption

The total additional power generation capacity needed (from renewable and non-renewable energy sources) is estimated at 4,000 4,350 MW.

Visayas and Mindanao islands are starting to experience power shortages around 23 power plants with an estimated total capacity of 557 MW are being targeted by the government by 2014 (333 MW in the Northern Luzon Agribusiness Quadrangle, 124 MW in Metro Luzon Urban Beltway, 85 MW in



Wind Energy in the Philippines

The Philippines remains the top wind producer in Southeast Asia with its 33 MW wind turbines that started operation in 2005. A study by the US National Renewable Energy Laboratory (US NREL) shows that there are 10,000 sq. km. of land areas with good-to-excellent wind resources here in the country. Using the conservative assumption of about 7 MW per sq. km., these windy areas could support a potential installed capacity of 70,000 MW. Most of these windy areas can be found in the northern part of the country, particularly in the Ilocos region

Central Philippines, and 15 MW in Mindanao) generation of wind energy increased from 25 MW in 2005 to 33 MW in 2008.

Philippines' Advantage - Natural Resources

The Philippines' potential for wind energy is attributed to its location in the Asia-Pacific monsoon belt. Total wind potential installed capacity of 70,000 - 76,600 MW over 10,000 sq. km. of windy land areas estimated to exist with a good-to-excellent wind resource potential wind power density at 500 W/m²

Technology Situation

- Wind turbine active stall type
- Resource assessment on selected sites by wind mapping
- Grid-connected wind farms

Support industries/ infrastructure

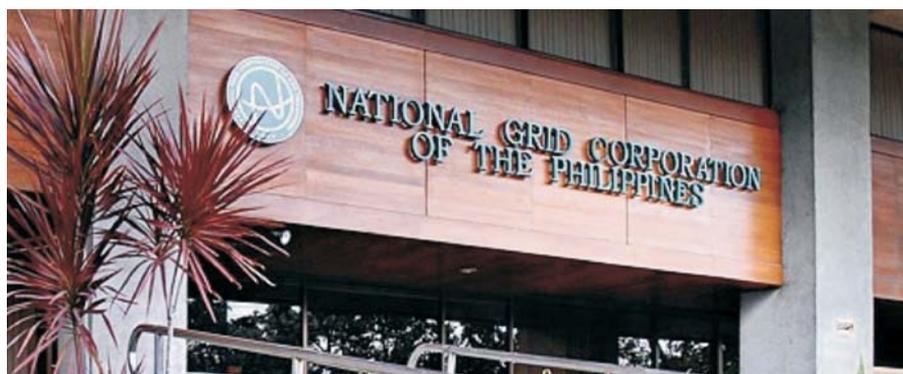
High voltage backbone system of interconnected transmission lines, substations and related facilities exist in Luzon, Visayas, and Mindanao

Luzon Grid 19,271 MVA, Visayas Grid 3,269 MVA, Mindanao Grid 2,103 MVA

National Grid Corporation of the Philippines (NGCP) is a corporate body that is responsible for the planning, construction, and centralized operation and maintenance of high-voltage transmission facilities, including grid interconnection and ancillary services.

Ideal locations

The best wind resources are found in the following regions: Higher interior terrain of Luzon, Mindoro, Samar,



Leyte, Panay, Negros, Cebu, Palawan, eastern Mindanao, and adjacent islands, islands of Batanes and Babuyan, north of Luzon, northwest tip of Luzon (Ilocos Norte), east-facing coastal locations from northern Luzon southward to Samar, wind corridors between Luzon and Mindoro (including



Lubang Island), between Mindoro and Panay (including the Semirara Islands and extending to the Cuyo Islands).

Wind mapping is the process that helps the DOE to determine potential wind farms in the country.

Growth in Numbers of Wind Power Plants

USDOE-NREL study showed that out of the 73 provinces in the Philippines 47 have at least 500 MW in wind potential and 25 with at least 1,000 MW. There are six wind farm projects under development:

- PNOC-EDC 140 MW in Ilocos
- UPC Asia (100 MW)
- Energy Logics (40-60 MW)
- A Spanish firm in Burgos province (10-15 MW)
- Aklan Project (10-15 MW)
- Bulalacao Project (40 MW)



23 new plants are expected to be on-stream by 2014.

New Investments

The recently passed Philippines Renewable Energy Act of 2008 is expected to accelerate the exploration and development of renewable energy resources in the Philippines and that includes wind.

Increasing Share in Electricity generation

The current installed capacity of 33 MW represents less than 1.0 of total power generation capacity.

Government Support - Enabling Laws/Policies

Renewable Energy Act of 2008 (R.A. 9513) - establishes the necessary infrastructure and mechanisms to carry out the government's thrust to promote the development, utilization and commercialization of renewable energy sources which includes wind energy.

It promotes the purchase, grid connection and transmission of electricity generated from renewable energy sources to ensure its market. Provides incentives such as exemption from various taxes and duties to renewable energy developers to make investments more attractive.

Fiscal Incentives

- Income Tax Holiday (ITH) for seven years
- Duty-Free Importation of RE Machinery, Equipment and Materials

including control and communication equipment.

- Special Realty Tax Rates on Equipment and Machinery not exceeding 1.5 percent of their original cost less accumulated normal depreciation or net book value.
- Net Operating Loss Carry-Over (NOLCO): Net operating loss during the first three years from the start of commercial operation which had not been previously deducted from gross income shall be carried over as deduction from gross income for the next seven consecutive taxable years immediately following the year of such loss.
- Corporate Tax Rate of 10 percent on net taxable income after seven years of Income Tax Holiday.
- Accelerated depreciation of plant, machinery and equipment may be applied if the project fails to receive an Income Tax Holiday before full operation.
- Zero percent Value-Added Tax rate.
- Tax exemption on Carbon Credits.
- Tax Credit on Domestic Capital Equipment and Services - Value-Added Tax and custom duties.

The Department of Energy (DOE) signed in February 2010 at least \$1.5 billion worth of renewable energy contracts, signifying the continued confidence of both local and foreign investors on the emerging RE industry.

The DOE awarded 68 mini-hydroelectric, five geothermal and 17 wind energy projects with total estimated investment of \$1 billion.

For biomass projects, the DOE approved 22 service contracts amounting to P19.9 billion or about \$500 million.

The Energy Secretary said that the signing of the 112 Renewable Energy contracts is an indication of the

continuing interest of investors in the country's power industry.

"People are expressing confidence in investing in the RE sector because we have a renewable energy law passed a little over a year ago that accorded fiscal and non fiscal incentives to RE. And we're now seeing the fruits of efforts of RE law which is a model other countries are trying to imitate," he said. It is also an indication of the growing awareness on the significant role of RE in combating the worsening impact of climate change.

"This is good news and it is expected that these investments will address not only our requirements for additional power but address problems of climate change and at the same time try and drive the economy towards growth and development. With investments, you have additional jobs, additional income, and additional resources available for government for its infrastructure projects," the Secretary said.

The DOE, through its Renewable Energy Management Bureau, signed the Renewable Energy Service Contracts (RESCs) in a follow up to the two successful signing held on 14 September, 2009 and 23 October, 2009 with seven contracts (\$983 million) and 87 contracts (\$2 billion) respectively.

The new contracts signed on hydropower, geothermal and wind projects will generate an estimated capacity of 2,007.5 MW.

Renewable Energy from Biomass Supply

Based on information from the Department of Agriculture (DA) and the Department of Environment and Natural Resources (DENR), the Philippines could generate substantial volumes of residues which can be utilized as energy fuel. Based on geographical consideration on biomass supply, there is an abundant supply of

bagasse, coconut residues and ricehull available.

At present, biomass technologies utilized in the country vary from the use of bagasse as boiler fuel for cogeneration, rice/coconut husks dryers for crop drying, biomass gasifiers for mechanical and electrical applications, fuelwood and agriwastes for oven, kiln, furnace and cookstoves for cooking and heating purposes. The household sector will remain the largest user of these energy forms particularly fuelwood.

Renewable energy from biomass is targeted to contribute 120 MW to the overall energy self-sufficiency target of 60 percent in 2010. Initiatives from private sectors provide a good indication on the potential of biomass energy development in the country. Capacity additions expected from these biomass indicative projects are: 15 MW in 2009, 57 MW in 2010, 50 MW in 2013 and 61.9 MW in 2014.

The new biomass projects are expected to bring about 256.7 MW additional power to the country within the next two to five years.

Solar Power

Solar energy refers to energy derived from solar radiation which can be converted into useful thermal or electrical energy.

Considering that the country is situated near the equator, there is a nationwide potential for harnessing solar energy. In 2000, the Philippines installed a PV (photovoltaic) capacity of about 567KW. And presently, there is a 960KW CEPALCO solar power plant which is located in Cagayan de Oro in Mindanao.

There are eight solar energy programs, seven of which are funded by foreign donors. The Solar Power Technology Support (SPOTS) Project was designed to install solar energy systems in about 80 Agrarian Reform Communities



(ARCs). There are also 5,600 solar energy systems completed in 154 barangays under this program. While electric co-operatives and private companies have installed home PV systems on approximately 500,000 houses, the power grid infrastructure remains underdeveloped. The nation's PV applications include street lighting, telecommunications, battery-charging modules, solar-powered theaters and egg incubators.

As of April 2010, the SunPower Foundation provided the equipment

and technicians to install solar PV systems for 150 schools. These systems will power lighting, computers and Internet access for about 135,000 students. SunPower will also contribute to the electrification of 12,000 homes with solar PV systems and other sources of renewable energy.

Launched in April 2010 by the Philippine Department of Energy (DOE), Project ACCESS will install solar PV systems in 55 remote barangays (villages) that span five provinces of Lanao del Norte, Masbate, Palawan, Aklan and Northern Samar. In a cooperative effort between DOE and the MIRANT Foundation, with assistance from the World Bank and the Global Environment Facility (GEF), the initiative will construct the solar power systems for 180 public organizations,

including health clinics, schools and village halls. A project that promotes renewable energy to help sustain livelihoods in local, impoverished communities, RENEW Negros is financed by the Japan Fund for Poverty Reduction via the Asian Development Bank and implemented by Winrock International, according to the Philippine Information Agency. As of 2009, the project completed 14 renewable energy systems at a cost of \$1.5 million. These systems include hybrid biomass and solar power devices for fish drying, which have been installed in a handful of island communities. In addition, solar lantern-charging stations have been set up in Sagay City, Barangay Molocaboc and Sitio Matabas, reports the Daily Star. ■

ADB to Spearhead Metro Manila Rooftop Solar Energy Project

The Asian Development Bank (ADB) will lead a solar energy project for rooftops in Metro Manila buildings as part of the agency's campaign to encourage the use of renewable energy sources.

ADB energy committee chair S. Chander told reporters in a press briefing they are already in talks with regulators and electricity distributors to create an interconnection agreement between current electricity sources and solar energy generators.

He said plans are already under way to test the solar energy project in the ADB's rooftop in its headquarters in Ortigas Center, Pasig. "In the Philippines, we will be promoting largely rooftop or small-scale solar installations. And the first example of

that will be the ADB's own rooftop," Chander said.

"We hope that in the next six months we should get something going in the Philippines. We are also talking to the Energy Regulatory Commission to put up an interconnection with [Manila Electric Co.] and they are already crafting regulations."

He added the goal of the project is to "encourage more volume in the solar energy sector so prices for the materials go down much like supply and demand."

Chander said there is no target capacity for the project but he noted that Metro Manila rooftops are estimated to generate around 370 kilowatts to up to one megawatt.

For ADB's own rooftop, Chander said the winning bidder will be given a long-term lease of the bank's rooftop for 20 years and a loan of up to 15 years. The project is estimated to be commissioned in April or May next year.

The ADB is also looking into giving out a loan for solar energy proponents of up to 25% of the project cost or on average around \$4 million for one megawatt for a loan term of 15 years. The bank is also targeting to invest and loan out \$2 billion every year for clean energy projects.

Chander said the rooftop solar energy project would hopefully allow the bank to save energy but also encourage greater use of the renewable energy source. ■

Striking a Balance between Economy, Energy & Environment



By **Ariste Chiabotti**,
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Singapore is a small island state with a vibrant economy which cannot be sustained without imported energy. The resource-scarce country refines 1.3 million barrels of crude oil daily with less than 100,000 barrels per day for its own consumption.

Global warming is an important issue for Singapore due to her low-lying islands. The rise in sea level reduces the coastal land size and floods the densely built-up financial hub. Opening of the Arctic sea route, owing to the melting ice caps, would hence directly affect Singapore's strategic location as a regional trans-shipment centre.

Singapore plays her roles as a responsible world citizen in mitigating climate change. It ratified the United Nations Framework Convention on Climate Change (UNFCCC) in August 1997, and acceded to the Kyoto Protocol in April 2006. Clean energy will be encouraged where-ever feasible. The country also will ride on the opportunity due to clean energy to grow its already robust energy sector. Its energy policy will strike a balance between the economy, energy security and the environment.

In the global energy scene, rising energy prices and world climate change are the dominating issues. Any country energy policy must address these concerns and capitalize on the opportunities generated.

An efficient market system working towards an achievable minimum price would help maintain low and affordable energy prices. Measures like supply competition, alternative choices of energy, availability of supply infrastructure would contribute towards

this objective to control inflating prices.

For countries whose energy depends on import, they must have taken appropriate measures in ensuring an undisturbed supply of energy to sustain their economy. There is no exception for Singapore.

Despite the undisrupted supply of fuels, one should also ensure the consumption to be minimized through conservation efforts and equipment/process efficiency. It would help in cost reduction, reduce energy consumption and cause less environmental pollution.

Singapore aims to build a livable city with a vibrant economy. It means a city of economic and environmental excellent. Pollutions, not limited to green house gas, must be minimized through the best viable technologies.

Clean energy is a new dimension in its energy policy. Clean energy applications are encouraged with incentives to overcome the cost entrance barrier of the clean energy technology. It is also believed that clean energy would bring new opportunities to the energy industries, manufacturing sector and energy trade.

The concerns over global warming fuel the demand in renewable energy through both government incentives and consumers' inclination toward green energy. The IEA predicted an 80 percent share of hydrocarbon fuel and a 2.0 percent of renewable energy by 2030.

The renewable energy, though, is small in its share. The annual growth rate (6.6 percent) would be high due to its current low base. Singapore will ride on the rapid growth rate of renewable energy to

add it as a new dimension to its energy industries, manufacturing sector and the energy trade.

Since the fossil fuels will still have a dominant share (80 percent) in total

energy consumption, the efficient use of fossil fuel has great potential to both mitigate CO₂ emissions as well as conserve the fossil fuel reserve. The increased energy efficiency also leads to

better air quality, reduces energy costs, and moderates the growth in energy consumption. ■

Singapore Builds Largest Thin-film Photovoltaic Plant

Singapore has built the country's largest thin-film photovoltaic plant using the world's largest thin-film modules used in its construction.

Singapore-based Phoenix Solar Pte Ltd, a subsidiary of TecDAX listed Phoenix Solar AG, Germany, has completed Singapore's largest photovoltaic plant built with thin-film modules with a peak output of 380 kilowatts (kWp) on the new company building of Applied Materials Inc. in Singapore.

The thin-film modules used in construction are the world's largest, with a surface area of 5.7 square metres. In

addition to the 380 kWp large-scale tandem modules, the Phoenix team also used 4.8 kWp of semi-transparent thin-film modules along with 14.4 kWp multi-crystalline modules, which brings the plant's peak output to around 400 kilowatts in total.

Applied Materials' 32,000 square metre operations centre serves as a hub for the company's activities throughout Asia. The building has been rated Green Mark Platinum by Singapore's Building & Construction Authority and was inaugurated on 13 April 2010. The photovoltaic modules were manufactured in Germany and China using the so-called "SunFab Thin Film

Line TM", a production line developed by Applied Materials. This fully integrated thin-film production line is suitable for either single junction or tandem junction thin-film modules and, with modules measuring 2.2 m x 2.6 metres, can produce the world's largest and most powerful mass-produced thin film solar modules. These large modules lower the installation costs as assembly is swifter and save on mounting materials.

"At approximately 105 kg and yet only 8 mm thick, handling and installing these modules on the roof was a challenge. We are extremely proud of the entire project team for their innovative engineering solutions", said Christophe Inglin, Managing Director of Phoenix Solar Pte Ltd.

"The new photovoltaic system on our roof is an excellent showcase for our SunFab technology and is accessible to anyone who visits our new Singapore Operations Centre", said Inglin. ■



Harnessing Power in Wind-less Land via Vertical Turbines

Singapore, It's an oftheard expression in Singapore, from policy makers to academics: "There's no wind in Singapore."

The vertical axis wind turbine takes advantage of both lift and drag wind forces. As a result, the turbines can self-start with wind from any direction.

This has become a defeatist mantra for a potential alternative energy source, but one that needs to be re-examined if Cygnus Power's chief executive Ong Gin Keat has his way.



By **Ong Gin Keat**,
CEO, CygnusPower Pte Ltd
Singapore

Singapore-based Cygnus designs and manufactures vertical wind turbines. The technology has been perfected by experts in Japan and Korea over past decades and only recently has been brought into the Southeast Asian market.

Design of turbines is a key issue to harnessing wind power. Many of the turbines studied for use in Singapore are those better suited to temperate climates,

such as horizontal axis turbines (for example, ones that are propeller shaped). They will spin when air currents flow in a certain direction and at a certain speed, and perform ideally in conditions such as in Europe and North America. For wind energy to be harvested in a tropical climate, a specific, localized turbine design is necessary.

Design for Tropical Climate

Cygnus Power thinks it has solved the design puzzle. Its patented turbine design takes advantage of both lift and drag wind forces. As a result, its turbines can self-start with wind from any direction and are capable of capturing wind as slow as 1 metre per second - a unique design advantage.

Considering that in Singapore, the average wind speed at the lower range is two to three metres per second, this bodes well for Cygnus's turbines. Ong notes that when elevated off the ground and located strategically, speeds of up to eight metres per second and above can be found in Singapore.

So far, these vertical turbines have an efficiency of more than 20 percent, and this goes up to 90 percent in some instances. Efficiency refers to the conversion of wind energy (kinetic or moving energy) into electrical energy. This includes losses as wind passes through the turbine blades, converting into electricity by the generator. The Cygnus models operating at low wind



speeds demonstrate a 20 to 27 percent higher efficiency than other vertical axis wind turbines.

Ong notes that there are some vendors in the industry that are the cause for wind energy's allegedly bad reputation. "They will sell poorly-designed turbines for sites inappropriate for wind energy. Then when the turbines don't spin, everyone observes that wind will not work here," he said.

"The wind is blowing just fine, you just have to put the turbines in the right spot, and at the right elevation," he said.

Harnessing Urban Wind Potential

As in real estate, location, location, location, is key to harnessing the potential of wind energy - and it's not just naturally-occurring wind that blows through our landscapes. "There is a huge untapped potential for man-made wind sources," Ong notes.

Cygnus has recently explored the possibilities of harnessing excess wind from cooling towers and ventilation systems to recover the energy that is otherwise lost. Given that hotels alone account for 10 percent of Singapore's energy consumption, recovering part of that energy in cooling towers is something to be considered.



In Singapore's urban landscape, turbines could also have applications along major roadways, in train tunnels, or between buildings where wind might regularly occur.

Cygnus Power is currently piloting one of 2 kilowatt (kw) units at Nanyang Polytechnic atop one of its buildings. The turbine has a specially-designed base that allows it to straddle the roof structure with no additional modification to the building structure. There is also another installation of a 1 kw unit at Nanyang Technological University (NTU), as well as a 200w unit trialed by the Housing and Development Board (HDB).

In an urban environment, the strength of such vertical turbines is its efficient use of land and space. Cygnus has models ranging from 1 kw to 500 kw, and unlike horizontal access turbines, they can be installed side-by-side, taking up a smaller area of space. From hilltops to rooftops, this means that a higher capacity of energy generation could be fit into a smaller land area.

Remote Applications

Outside cities, some other potential applications for the vertical turbines include remote communications towers. Having a built-in supply of alternative energy would lower the dependence on diesel generators at many mobile phone sites located in rural areas.

Offshore islands are also promising. "Wind accelerates over wide open areas of ocean. Small islands could reap the benefits of offshore wind," Ong says. The vertical turbines are designed to take wind velocities of up to 60 metres per second, or 216 km per hour. On an island where typhoons occur frequently, a special frame can be fitted to protect the turbine from flying debris.

Such offshore islands, like remote communications towers, are frequently dependent on diesel generators. If energy is supplied from wind turbines

instead, the amount of diesel imported to these remote locations can also be reduced.

Tackling Singapore's Energy & Emissions Issues

Although Singapore is not a remote destination, all of its energy is imported, mainly in the form of natural gas and crude oil. Being able to harness local wind resources and alternative sources of energy will reduce Singapore's demand and dependence on fossil fuels. This could help increase economic stability and moderate the price of energy.

Ong sees a big potential in wind energy to reduce carbon emissions. Local wind projects can qualify for carbon credits under the Clean Development Mechanism scheme administered by the United Nations Framework Convention on Climate Change (UNFCCC).

Ong also highlights that with the cost of fossil fuels on the rise, investments into renewable energy will inevitably pay back over time.

While Ong has gone to great lengths to prove that wind energy can work even in Singapore, he acknowledges that it will take time to change attitudes and speed uptake. However, due to both economic and environmental reasons, the energy mix in countries around the world will need to shift, and vertical wind turbines increasingly seem like a major part of the solution. ■

IFC Supports Thai Fund to Boost Solar Power Generation

The International Finance Corporation (IFC), the investment arm of the World Bank, is joining local institutions in putting up a Bt1billion fund to promote solar power generation in Thailand, with the first project slated for Nakhon Ratchasima (also called Korat).

The project will be granted the existing adder rate of Bt8 per unit as being one of 18 pilot projects worth Bt1 billion supported by the government, said Energy Minister Wannarat Charnnukul.

He said the National Energy Policy Council meeting next week would consider revising down the adder rate for purchasing solar power from Bt8 per unit. The adder rate for other kinds of power - generated from wind, hydro and rubbish - would remain at Bt8.

The IFC is investing US\$1.7 million (Bt55 million) for a 20 percent stake in Solar Power (Korat 1) Co. Ltd., the largest solar power plant in Southeast Asia, to expand private power generation while helping develop rural Thailand.

Solar Power (Korat 1) Co. Ltd. owns and operates a 6-megawatt grid-tied solar power plant in the Nakhonratchasima Province, an area with one of the best solar resources in Thailand. The project supports the government's goal of generating at least 20 percent of energy from renewable sources by 2022, which will improve the supply of clean energy, help move Thailand toward low-carbon growth, and reduce the country's reliance on imported energy. The solar farm will displace an estimated 4,785 tonnes of carbon dioxide equivalent annually, boosting global climate change mitigation efforts.

SPC Korat 1 Co. Ltd. is majority owned by Solar Power (SPC), a Thai developer of large, grid-connected, solar photovoltaic projects. The developer has secured 34 licences to build and operate grid-connected solar farms across Thailand. SPC Korat 1 was created to develop the first of these licenses and its 6megawatt solar power plant went into operation in April.

"We are very happy to have IFC as a partner in this first project to provide a cleaner and more sustainable energy source for our country," Wandee Khunchornyakong, managing director of Solar Power (SPC), said in a statement. "We are considering other renewable energy investments and we look forward to working with the IFC on these projects in the future."

IFC's investment in this first project represents the start of a partnership with SPC with plans to co-invest in some future solar projects as well as in SPC itself. If fully exercised, IFC's investment rights in SPC and its related companies could amount to as much as \$20 million. SPC Korat 1 also has received a minority equity investment from the Energy for Environment Foundation and debt financing from Kasikorn Bank.

Anita George, IFC director for infrastructure, said "IFC's support to renewable energy generation in Thailand, specifically solar, will



By **Anita George**

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encourage similar investments in the region. And also we look forward to working with SPC, a Thai sponsor whose management has decades of experience in the solar industry, to help them replicate their success with this project on future sites."

Since 2005, IFC has invested more than \$1 billion in renewable energy projects. IFC's strategy in Thailand focuses on enhancing the competitiveness of the private sector; providing opportunities for populations outside the main urban economies, particularly in the northeast and southern provinces; and supporting environmentally and socially sustainable growth.

Korat 1 was developed through one of our special purpose vehicles (SPV). The Project supplies clean power to the PPA under Thailand's Very Small Power Producer (VSPP) program which allows independent power generation under 10 MW to be supplied to the Provincial Electricity Authority of Thailand (PEA)

In addition, SPC Korat 1 Co. Ltd. enjoys significant promotion privileges from the Board of investment (BOI). These promotional incentives include the following.

1. The exemption of import duties on machinery and equipment.

2. The full exemption from corporate income tax for the first eight years.

3. A 50 percent reduction of corporate income tax for the following five years.

4. The exemption of income tax on dividends distributed by company

5. The double deduction of taxable income for transportation, electricity and water costs, for 10 years from the date of the first revenue received.

6. A deduction from net profit of any cost of installation or construction of facilities at a maximum rate of 25 percent of the amount invested in the promoted activity. ■



Korat 1 project is a green-field 6MWP grid - connected solar farm project located at Donchompoo.



President Triet Urges More Swiss Investors to Come to Viet Nam

Viet Nam's President Nguyen Minh Triet has urged more and more businesses from Switzerland to come and invest in his country, taking advantage of the conducive investment climate prevailing there.

Addressing the Vietnamese-Swiss Business Forum on the theme, "Viet Nam: The Land of Golden Opportunities", in Zurich, during his recent visit to Switzerland, President Triet expressed his delight at the heartening growth of the Viet Nam-Switzerland relationship, especially in political and economic fields.

"This has represented the mutual understanding and close relationship between the two countries. More and more Swiss businesses have effectively invested in Vietnam," he said.

President Triet emphasised that his visit

to Switzerland aimed at further widen the co-operation between the two countries, particularly in trade, economics and investment.

He thanked Switzerland for rendering great assistance to Vietnam through the Most Favoured Nation (MFN) treatment, the generalized preferential tariffs (GPT), and especially the Official Development Assistance (ODA) and human resource development programme.

President Triet affirmed that Swiss investors were enjoying favourable conditions in Viet Nam thanks to the country's socio-political stability, high economic growth, good investment environment and high labour and consumption market, as well as its law and policy on foreign investment protection and welcomed more Swiss enterprises to join in.

Swiss State Secretary for Economic Affairs Jean Daniel Gerber highlighted his visit to Vietnam in July 2009, saying that Swiss businesses have huge opportunities in Vietnam, especially in banking, insurance, service, communications, tourism and pharmaceutical sectors. Vietnam has become an attractive market for Swiss entrepreneurs.

He said that over the past 10 years, the value of bilateral trade has increased five times over, reaching US\$2.7 billion in 2009. Last year, Switzerland ranked the fourth most popular export destination for Vietnamese products.

Vietnam was one of seven countries that Switzerland had singled out for priority in development-assistance programmes. Swiss enterprises are often praised for



President of Vietnam Nguyen Minh Triet

being leaders in seeking business and investment opportunities in Vietnam.

Swiss State Secretary Gerber said President Triet's visit marked an important development in the relationship between the two countries.

At the Forum, President Triet also witnessed the signing of contracts between several Vietnamese and Swiss enterprises for two-way trade in handicrafts and fertilizers.

During his stay in Switzerland, the Vietnamese President visited the international financial services giant Credit Suisse Group, which pledged to fund more major projects in Vietnam. The group also said it was willing to train financial management staff for Vietnamese government corporations.

President Triet's Fascination for Football

President Triet was told during his stay in Switzerland, that FIFA planned to provide a large sum of money for football development in Viet Nam, particularly for women.

This emerged during his discussion on football with Joseph Blatter, President of FIFA, the world governing body for soccer, at FIFA headquarters in Zurich. The two exchanged views on the World Cup 2010 that will kick off in South Africa in June, 2010.

President Triet thanked Blatter and hailed FIFA's programmes to support the nation's soccer development, especially professional football.

Blatter, who has visited Viet Nam three times, said FIFA wanted to create favourable conditions, both technically and financially, for national football federations of member countries, through projects such as GOAL and Vision Asia.

He said FIFA supported Viet Nam's proposal to host the U-20 Women's World Cup in 2012, and announced FIFA's plan to provide a large sum of money to foster football development, especially women's football, in Vietnam.

During his stay in Switzerland as the guest of Swiss President Doris Leuthard, President Triet also met Vietnamese Embassy staff and representatives of the Vietnamese community in Switzerland. VNS ■

President Nguyen Minh Triet's Swiss Visit Fruitful: Jt Statement

The joint statement by Switzerland and Vietnam on the occasion of the official visit to Switzerland by President Nguyen Minh Triet

At the invitation of Doris Leuthard, President of the Swiss Confederation, Nguyen Minh Triet, President of the Socialist Republic of Vietnam, paid his first-ever official visit to Switzerland from 16 to 19 May 2010.

The President of Vietnam started his visit on 17 May 2010 by opening a Swiss-Vietnamese business forum organized by the Swiss-Asian Chamber of Commerce in Zurich.

On 18 of May 2010, President Nguyen Minh Triet held talks with Federal President Doris Leuthard and Swiss Foreign Minister Micheline Calmy-Rey at Landsitz Lohn in Kehrsatz, the estate

for official visitors to Switzerland. The two presidents reviewed the status of bilateral affairs and agreed that relations were strong, comprehensive and excellent. They welcomed the strengthening of relations between Switzerland and Vietnam in a wide range of areas, including politics, economics, trade, investment, development co-operation, as well as education and training. They agreed to enhance multi-faceted co-operation between the two countries in the future, taking into consideration the forthcoming 40th anniversary of bilateral diplomatic relations in 2011.

Federal President Doris Leuthard

praised Vietnam's achievements after nearly 25 years of reforms and integration into the global community, and in particular its reduction of poverty and its early achievement of the UN Millennium Development Goals. She referred to the commitment of the Swiss Agency for Development and Cooperation (SDC) and the State Secretariat for Economic Affairs (SECO) in Vietnam totalling over 330 million Swiss francs, and assured President Nguyen Minh Triet of Switzerland's ongoing support. The Vietnamese President thanked Switzerland for the effectiveness of its official development assistance, which contributed to Vietnam's progress in this area.

Federal President Leuthard went on to confirm that Vietnam is to benefit from an enhanced co-operation programme provided by the State Secretariat for Economic Affairs (SECO). Assistance is to cover priority needs of Vietnam concerning macroeconomic conditions and the financial sector, the promotion and internationalization of small and medium-sized companies, and trade policy.

The President of the Swiss Confederation commended the Vietnamese government for its continuous implementation of economic reforms in general and the new initiative on public-private partnerships in particular. The Swiss Government is confident that this initiative will boost Vietnamese development, especially in the area of major infrastructure projects.

The two Heads of State welcomed and praised the dynamic growth of economic, trade and investment relations between their countries. The bilateral trade volume increased by a factor of five between 1998 and 2008 (approximately 600 million Swiss

francs), and reached the exceptionally high level of 2.7 billion Swiss francs in 2009. Foreign direct investment amounted to 1.43 billion US dollars in 2009, making Switzerland the 19th largest foreign investor out of 89 countries and territories that have invested in Vietnam. The two presidents discussed ways to enhance trade and investment relations, as well as to encourage and support business between companies in both countries.

The ongoing discussions between the EFTA member states, including Switzerland, and Vietnam have enhanced the understanding of each other's economies and of the opportunities for further economic exchange and co-operation. Both Heads of State are very pleased that the Vietnam-EFTA joint study group on the feasibility of a free trade agreement between Vietnam and EFTA is to be officially established tomorrow, 19 May 2010, in Geneva.

Both presidents emphasized the importance of the reform of the education system for sustainable development in Vietnam. They

commended the already existing close and fruitful co-operation between various universities and universities of applied sciences in both countries, and welcomed the signing of a memorandum of understanding aimed at fostering co-operation in education and training between higher education institutions in Vietnam and Switzerland.

Both presidents acknowledged that the further development of the country requires that the rule of law be strengthened through clear framework conditions, as well as predictable and transparent legislation. The President of the Swiss Confederation has welcomed the efforts undertaken by Vietnam in this area.

The two Presidents also discussed international issues of common interest, particularly climate change. Vietnam is likely to be one of the countries most severely affected by the consequences of global warming. The UN and the Security Council, as well as Vietnam's experiences as a pilot state for the "one UN" reform process, and the universalization of the International Criminal Court. They also agreed on



Over 270 participants attended the Viet Nam-Switzerland Business Forum

intensifying co-operation between their governments at the multilateral level.

Federal President Doris Leuthard commended Vietnam's active efforts at the international level through its presidency of ASEAN in 2010, its contributions as a member of the UN Security Council and its ongoing efforts to integrate Vietnam into the global economy following its accession to the WTO in 2007. She congratulated Vietnam on hosting the World Economic Forum (WEF) on East Asia for the first time in Ho Chi Minh City in June 2010.

The Vietnamese President welcomed the accreditation of a Swiss Ambassador to ASEAN in September 2009 and congratulated Switzerland on hosting

the 13th Summit of the Francophonie from 22 to 24 October 2010 in Montreux.

Both presidents expressed their satisfaction with the quality of the bilateral dialogue on human rights, initiated in 1997. The 8th round of talks took place on 22 April 2010 in Switzerland in a fruitful atmosphere. It confirmed the will of both sides to continue their co-operation in the field of human rights in a substantial and trustful way. Federal President Doris Leuthard expressed her great appreciation for Viet Nam's decision to support Switzerland's candidacy for a seat on the UN Human Rights Council for the period from 2010 to 2013.

Both Heads of State agreed that the

results of the Presidential visit marked a mile-stone in relations between Vietnam and Switzerland, and contributed towards the strengthening and development of the traditional friendship and comprehensive co-operation between the two countries. President Nguyen Minh Triet extended an official invitation to the Federal President to pay a visit to Vietnam.

President Nguyen Minh Triet concluded his official visit by meeting the President of the Swiss Council of States, Erika Forster-Vannini, the "Friends of Vietnam" parliamentary group, as well as leading figures in the Swiss and Vietnamese business communities. ■

Switzerland, Viet Nam Ink MoU at Roundtable Meet

On the occasion of the official visit of President Nguyen Minh Triet to Switzerland a meeting between representatives of the economic sector of Vietnam and Switzerland took place in Berne on 18 May 2010.

The aim of the meeting was to strengthen the bilateral relations between Switzerland and Vietnam; to underline this a Memorandum of Understanding (MoU) was signed between the Swiss Business Federation *economiesuisse*

(*economiesuisse*) the Vietnam Chamber of Commerce and Industry (VCCI) and the Swiss-Asian Chamber of Commerce (SACC).

The MoU was signed at the Bernerhof in Berne by VCCI Chairman and President Vu Tien Loc and *economiesuisse* President Gerold Bühler and the SACC President, Dr. Urs Lustenberger. According to the MoU, both the countries shall co-operate to further improve and expand trade. The parties agreed to support and encourage exchange of trade and delegations and missions as well as visits of businessmen either individually or in groups between the two countries.

During his official visit to Switzerland President Triet witnessed the signing of many documents about boosting economic, trade and investment cooperation between Vietnam and Switzerland. ■



President Minh Triet President Doris Leuthard witness the MOU signing SACC VCCI Economiesuisse

Land of Golden Opportunities for Doing Business

Viet Nam's Deputy Minister of Industry and Trade Nguyen Nam Hai, in an address to Swiss entrepreneurs talked about the business climate in his country and the golden opportunities that it offered to Swiss business enterprises. He was part of the delegation accompanying Viet Nam's President Nguyen Minh Triet during the latter's visit to Switzerland from 16-19 May 2010. Following is the full text of Minister Hai's speech to the distinguished Swiss audience, that included Swiss Secretary of the State Jean-Daniel Gerber.



By **Nguyen Nam Hai**
Deputy Minister of Industry and Trade ,
Viet Nam

First of all, on behalf of the Ministry of Industry and Trade of the Socialist Republic of Viet Nam, I would like to express our sincere thanks to Jean-Daniel Gerber Secretary of the State to you all and especially to Dr. Urs Lustenberger, President of the Swiss-Asian Chamber of Commerce for the warm hospitality and excellent arrangements given to the Vietnamese delegation led by President Nguyen Minh Triet. I am also honoured to have this opportunity to meet with Swiss enterprises interested in doing business in Viet Nam.

As you can see, through this visit and this business forum, we would like you to realize that "Viet Nam is a land of golden opportunities for doing business". This, in particular, holds true for the Swiss business community.

In the general assessment of Viet Nam's economy and its business environment, many international organisations and consultancy firms have studied and come to an objective conclusion that Viet Nam is an emerging market with high and sustainable economic growth, many advantages and good potential for business activities, including foreign direct investment and trade. A recent report by Grant Thornton International at

the beginning of 2010 indicated that Viet Nam is the most optimistic market worldwide for investors in 2010, measured by forecasted revenue and profitability increase.

After more than two decades of implementing economic reform, these results have not only shown that Viet Nam is following the right path in terms of policy direction, but also indicated the importance of comparative and absolute competitive advantages, which have been creating a solid foundation for the rapid and sustainable growth of business activities. Viet Nam has a number of exclusive advantages, such as political stability; favourable geographic location in a dynamically developing region and main international transportation routes of goods and services trade; rich and diversified natural resources; abundant human resources that are young, motivated, educated, creative, eager to learn, and capable of absorbing new knowledge.

In terms of policy, the Vietnamese Government is continuously improving the legal system, regulating its business environment, towards removing barriers to investment and trade, creating a level playing field for both domestic and

foreign enterprises, complying with its commitments to integrate with international economies within the WTO framework as well as in accordance with other regional and bilateral agreements that Viet Nam has entered. Viet Nam is also making efforts to upgrade its infrastructures, develop supporting industries, educate and train the workforce, and reform administrative procedures.

All the above-mentioned factors are providing Viet Nam with favourable conditions and good opportunities to integrate with and operate most optimally in the global value chain of production and trade.

The Switzerland-Viet Nam bilateral relationship has developed steadily since the two nations established the diplomatic relation on 11 October 1971. Several high-level delegations have been exchanged, facilitating the understandings and cooperation of the two nations in all fields. Particularly, the Switzerland-Viet Nam Trade Agreement of 1993 helped considerably boost bilateral trade and investment.

In the development cooperation relation, Switzerland has considered Viet Nam as a priority in development aids for the Mekong River Delta. A

number of projects in the fields of environment protection, administrative reform, agriculture development, education, infrastructure improvement, building capacity and hierarchy reform etc have been financed with Swiss non-refundable aids and loans at preferential rates.

In the education and training, a considerable number of Vietnamese people have studied in the universities in Switzerland under the education cooperation programs between universities of the two countries. In addition, cooperation in culture, tourism, science and technology has been strengthened.

On investment, there had been 700 Swiss projects in effect in Viet Nam by the end of 2009, with the total registered capital and charter capital of 1.43 billion USD and 1.01 billion USD respectively. There have so far been many Swiss enterprises operating successfully in Viet Nam which create over 2,000 jobs, of which are Holcim, ABB, Alstom, Nestlé, Elca, Phonak, Zurich Securities Co., Swiss Re, HSBC, Credit Suisse, are a few examples.

On trade relations, the bilateral trade volume has increased steadily in recent years. Viet Nam's major exports are

seafood, coffee, textiles and apparels, footwear, handbags, etc. Switzerland's main exports to Viet Nam are chemicals, pharmaceuticals, iron and steel, nonferrous metals, parts and equipments, precision instruments, watches etc. Trade value of these major exports has seen the stable annual growth rate.

Despite the above-mentioned achievements, they have not matched with the potentiality of the two countries. Viet Nam's competitive advantage and attractive policies pose the good opportunities for Swiss enterprises to develop trade and investment in Viet Nam.

The two governments have worked extensively on the Feasibility Study of the Free Trade Agreement (FTA) between Viet Nam and members of the European Free Trade Agreement (EFTA) to create a necessary legal basis which facilitates trade and investment of enterprises of the two countries. I am glad to inform that on 19 May 2010, on the sidelines of this visit, representatives of the EFTA, including Switzerland and myself will sign a document which brings in the start of the Study Group.

In today's meeting, it is my pleasure to deliver the above information to reiterate that "Viet Nam is a land of golden opportunities for doing business".

I believe that Swiss enterprises will grab these opportunities to develop their business in their global value-added chain.

I hope I will see you all in Viet Nam. ■



President Doris Leuthard and President Minh Triet and to the right President economiesuisse Gerold Bühler

Green Development Offers Opportunities & Challenges

Viet Nam is one of five countries considered most vulnerable to the effects of climate change, according to Nguyen Thai Lai, Deputy Minister of the Natural Resources and Environment.

After 23 years of Doi Moi, Vietnam has gained important achievements in economic development, ensuring social equity and promoting international integration in concurrence with environmental protection. Vietnam is getting integrated more deeply into the world's economy and so, engagement in the Green development trend is unavoidable. This trend will bring about both opportunities and challenges to the country as a whole and enterprises in particular.

Opportunities may include:

First, green development creates new opportunities for businesses with the emergence of diverse new lines of production, new products and services.

Second, with the strong development of science and technology, developing countries like Vietnam have conditions to select appropriate and relevant partners and technologies, and also learn timely lessons of experience from other countries' practices.

Third, with economic growth, developing countries can gradually address social issues, such as employment, poverty reduction, and at the same time, make investments to address prioritized environmental issues, especially those relating to public health and product quality. Thus, mainstreaming three requirements economic, social, and environmental the three pillars of sustainable development can be possible.

However, challenges and difficulties are also recognized and include:

First, in order to pursue a green development strategy, enterprises have



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to comply with the laws on environmental protection, and develop for themselves an internal environmental protection plan, using environmentally friendly inputs and taking actions for efficient energy use, recycling, reuse and pollution reduction.

Second, most of Vietnamese enterprises are SMEs, which have constraints about capital, human resources and technology. These constraints bring quite a lot of difficulties to the enterprises in satisfying higher and stricter requirements from the domestic and international markets.

Furthermore, to develop a green economy, we will need to consider including necessary expenses for natural resources and environment in the cost

price of goods. Otherwise, under the pressure of international trade, our country, as well as other developing countries, will only focus on exploiting natural resources, and not take into account sustainability that will lead to other consequences in the future. But, on the other hand, the inclusion of expenses for resources and environment will make the cost price of goods increase.

Based on these requirements and orientations, in the recent years, the Government of Viet Nam issued many policies and mechanisms to encourage enterprises to re-orient their business activities in environmentally friendly directions. Enterprises will enjoy preferences in terms of tax, interest rate, land rental, and other administrative procedures, if they invest in the areas

relating to environmental protection and make environmentally friendly products. Programs and projects supporting enterprises through cleaner production solutions and efficient energy use are also a strong point in the Government's agenda.

With these policies, we can confirm that green development will become the orientation for economic development in Viet Nam, and the trend for investment and development for Vietnamese businesses in the coming time. It will also create opportunities for foreign enterprises to invest in environmentally friendly production and business areas in our country.

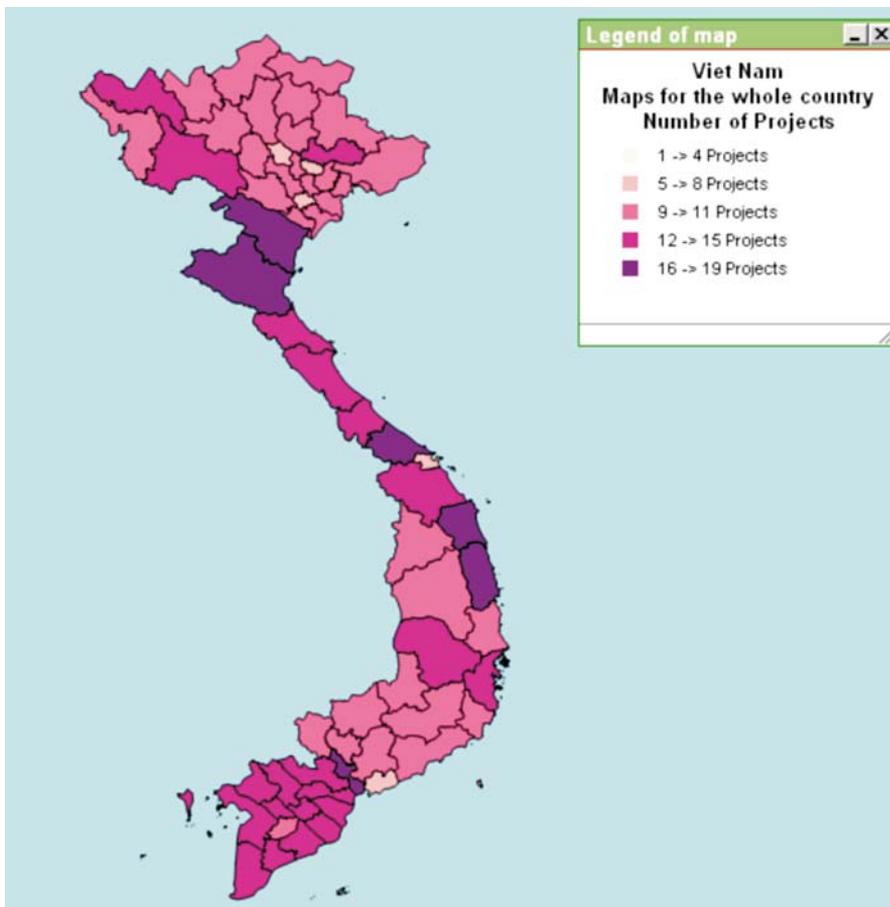
To cope with the climate change, Lai said: "We have short-term and long-term action plans and three high-level committees to implement the plans. The initiatives include the reforestation of five million hectares of land, stopping illegal logging, working with neighbouring countries to protect the Mekong River and supporting the environment protection activities of business enterprises. The country was upgrading its sea and river dyke systems, increasing public awareness. Viet Nam has also set up an environment protection fund of US\$200 million.

Many more initiatives are needed because the fight against climate change and environmental destruction is difficult.

Birth of Renewable Energy in Viet Nam

The World Bank report believes that it is possible to achieve huge energy efficiency and reduce reliance on high-carbon energy. The ambitious plan would require a combination of political will, institutional capacity, and transfer of financing and low-carbon technologies from developed countries. Under such a scenario, the total cost to bring sustainable energy to EAP countries is \$3.6 trillion over a 20-year period, or \$180 billion per year, which is

The map below shows where projects have been implemented in Vietnam.



As shown by projects above, Viet Nam is receptive to adopting sustainable energy policies
Source: World Bank.

an additional \$80 billion per year in investment compared to costs under current economic policies. Assuming that Vietnam needs a proportionate share of the remaining 15 percent of the investment, Vietnam would need approximately \$5.5 billion in investments per year.

Although current investments are quite distant from the World Bank's targeted investment level for sustainable energy development, Viet Nam has received significant financial and technical assistance. The Renewable Energy Development Project, which was approved in May 2009, is intended to invest in renewable energy projects, assist in developing the regulatory infrastructure, and develop a pipeline of projects. More recently, the First Power Sector Reform Development Policy Operation Program was created as part of a long term goal to reform the electric power sector and attract new investors. Finally, the Trung Son Hydropower Project, which would become the first hydropower project assisted by the World Bank in Viet Nam, will be presented to its Board of Executive Directors in September 2010.

As shown by projects above, Viet Nam is receptive to adopting sustainable energy policies. Nevertheless, much coordination and investments is still needed to guide Viet Nam in the direction toward energy sustainability, and Viet Nam should strive to reform its policies so it can reap the long-term benefits of these technologies.

SN Power and the International Finance Corporation (IFC) have entered into a Joint Development Agreement (JDA) to provide sustainable alternatives for meeting the growing demand for electricity in Viet Nam through renewable energy generation.

This Joint Development Agreement will enable IFC, acting through IFC InfraVentures, an early stage project development fund, and SN Power to develop an investment strategy, policy,

and guidelines to address Viet Nam's growing demand for power. The partners will acquire operating assets and invest in greenfield projects to build up a portfolio of renewable energy investments in the country. The project will be IFC's first investment in Viet Nam through IFC InfraVentures, and SN Power's first partnership in Viet Nam.

Viet Nam is desperate for electricity to feed its economy, which bucked the worldwide recession and grew more than 5.0 percent this year. Electricity demand is growing even faster, by more than 10 percent each year through 2030, according to forecasts.

Much of that electricity could come from wind. A recent World Bank study found Viet Nam could produce more than 500 gigawatts of electricity from land-based and off-shore wind farms 10 times the country's expected national demand in 2020.

But for now, the wind farm at Binh Thuan, a joint venture between the German wind power company Fuhrlaender AG and the Vietnamese renewable energy company REVN, is one of two operating in Viet Nam. The other, the 50-megawatt Phuong Mai 3 wind farm in the central province of Binh Dinh, opened in 2008. More wind farms are scheduled to come online in 2010 in the Central Highlands city of Dalat and on the southern islands of Con Dao. But for the most part, the promise of wind energy in Viet Nam has yet to materialize.

Viet Nam has embraced the idea that carbon emissions and global warming are a serious threat. The country is among the developing nations most likely to be harmed by climate change, according to the World Bank, largely because of its low-lying Mekong and Red River deltas, which would be largely submerged if predictions of sea-level rises prove correct.

And while Viet Nam itself, with its 85-billion-dollar economy, is hardly a major contributor to global emissions,

Vietnamese largely see themselves as part of any global effort to slow emissions. But it's not just wind power; other renewable energy technologies are lagging in Viet Nam, too. Conservation efforts have scarcely begun, and with energy demand growing so quickly, the medium-term forecast is more pollution and more carbon dioxide emissions.

Viet Nam currently lacks the funds to subsidize wind or other renewable energy sources on a large scale. Instead, to meet its urgent electricity needs over the next five years, Viet Nam is turning to an old, reliable solution: coal. Viet Nam plans to quadruple its coal-fired power capacity by 2015.

Historically, Viet Nam's electricity has come mainly from hydropower, meaning relatively little pollution from power plants. That seems likely to change as coal starts to supply more of the country's energy: 19 percent by next year and 34 percent by 2015. ■



A few words about the Swiss – Asian Chamber of Commerce

The **Swiss – Asian Chamber of Commerce** was formed by a merger of the Swiss - South East Asian Chamber of Commerce SEA and the Swiss - Korean Chamber of Commerce SKCC on Tuesday, May 24, 2005, in Zurich, Switzerland, as a private non-profit association. Its main purpose is to promote economic and business relations between Switzerland, Southeast Asia, Korea and Pakistan based on the principle of reciprocal benefit.

The Chamber serves as a forum for all firms, institutions, government bodies and individuals interested in the bilateral relations between Switzerland, Southeast Asia, Korea and Pakistan. The Chamber is a non-governmental association and receives no grants of financial aid of any kind. To maintain an efficient and member-oriented activity serving the interest of Swiss, Southeast Asian, Korean and Pakistan business, the Chamber depends on the financial support of a strong and growing membership base.

The Chamber's activities cover the following Asian countries:

Brunei	Laos	Pakistan
Cambodia	Malaysia	Singapore
Indonesia	Myanmar	Thailand
Korea	Philippines	Vietnam

SACC offers its members a comprehensive range of services at preferential terms:

- **Business Contacts** – SACC provides assistance in establishing business contacts in Southeast Asia, Korea and Pakistan or Switzerland and in locating suitable agents, representatives, manufacturers and suppliers. SACC acts as a contact point for Swiss industry whenever questions arise with regard to the bilateral economic relations. SACC offers Company Pools through its partners in Southeast Asia, Korea and Pakistan: In

order to realize large projects, small companies which do not compete with each other can join in a pool and benefit by sharing infrastructure.

- **Business Advice** – SACC gives you unique access to people and institutions which affect your business and offer you opportunities to meet with professional staff to discuss general or specific issues on the Southeast Asian, Korean and Pakistan markets. Chamber luncheons let you meet, learn from, and interact with CEOs of major corporations or with decision makers from the public sector.

- **Exchange of Experience** – SACC helps you to establish business relations with business people and official bodies in Southeast Asia, Korea and Pakistan. SACC offers its experience to link Swiss and Asian companies for rewarding business opportunities.

- **Information Services** – SACC offers you diversified, up-to-date information and documentation services including database access, enquiries about and from Southeast Asia, Korea and Pakistan.

- **Publication** – SACC members and subscribers benefit from the SACC Journal, a regular publication, which gives practical information about the way business is done in a country or economic sector in Southeast Asia, Korea and Pakistan. Each edition focuses on a specific and current topic. Members can publish their company news and experiences related to Southeast Asia, Korea or Pakistan and take advantage of advertising space at reasonable costs.

- **Government/Economic Relations** – SACC keeps regular contact with Swiss, Southeast Asian, Korean and Pakistan government agencies, economic organizations and private firms. Members may benefit from this network by obtaining access to these organizations through our Chamber.

- **Delegations** – SACC assists trade delegations from and to Southeast Asia, Korea and Pakistan in their visits and gives support to Swiss business people going to Southeast Asia, Korea and Pakistan. The Chamber is open to all kinds of business sectors and Swiss–Southeast Asian, Korean and Pakistan business activities – not only exports to and imports of Southeast Asian, Korean and Pakistan products, but also investments, license production, services and R&D. As part of its membership, a company is incorporated into a comprehensive network of contacts to which it may refer at any time.

- **All services of SACC** – are also available to non-members who will be charged with a time based fee. ■



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Yes, we would like to become a member of SACC. Please send us detailed information about your business activities including your company profile.

I / we apply for Membership as

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