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ON THE HORIZON — RENEWABLE ENERGY IN ASIA

A PRACTICAL GUIDE

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On The Horizon – Renewable Energy in Asia

A Practical Guide

Prepared by Meritas Lawyers in Asia

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About this Book

On The Horizon — Renewable Energy in Asia was prepared by lawyers in Asian Meritas firms. It offers practical insights targeting foreign investors and business people who are interested in pursuing opportunities throughout Asia. The twelve chapters provide general information, not legal advice. Do not rely upon the materials without prior consultation with legal advisors familiar with the specifics of your particular areas of interest.

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HKD	Hong Kong Dollar	SGD	Singapore Dollar
INR	Indian Rupee	TWD	New Taiwan Dollar
IDR	Indonesian Rupiah	THB	Thai Baht
JPY	Japanese Yen	USD	United States Dollar
KRW	Korean Won	VND	Vietnamese Dông
MYR	Malaysian Ringgit		

ON THE HORIZON — RENEWABLE ENERGY IN ASIA

As this book goes to press, the global economy is still struggling to climb out of its worst downturn since the Great Depression. At the same time, Japan faces its most significant crisis since 1945 as it deals with the impact of the tsunami and damaged nuclear reactors at Fukushima. While some countries such as China, Singapore, and India have successfully rebounded, most nations are facing dual threats of exceptionally slow economic growth combined with chronic levels of high unemployment. Unlike past recessions, this one has hit developed economies just as hard as less developed countries, which have traditionally borne the brunt of economic downturns.

No matter how the world economy performs over the next few years, two factors stand out that will strongly influence global economic prospects over the next decade. One factor is population growth. Most experts predict that the world's population will grow from 6.9 billion today[1] to 8 billion by 2025 and will add another billion by 2050. This projected increase is as many people who currently live in China and India. Continual population growth places high demands on the world's resources, as more people are demanding more goods and services. Equally significant, the large and rapidly growing economic powerhouses like China and India are accelerating their demand for energy and the goods and services it provides. Between just these two countries, over 3.5 billion people will be pushing their governments to promote rapid industrialization in order to meet the demands of their burgeoning middle classes. These are pressures that neither China nor India, nor any government for that matter, can resist for political reasons.

Economics aside, the combination of these two factors is also putting a heavy strain our world's delicate environmental balance. The problem is that the energy resources supplied today to meet a growing population's increasing needs for goods and services are mainly derived from carbon-based sources that have significant long-term impacts on the environment. Coal is the dominant fuel in Asia and accounts for 54 percent of energy used today. While this share will go down over time (to an estimated 44 percent share in 2030), the use of coal in developing Asia is expected to increase by nearly 40 percent by 2030.[2]

[1] U.S. Census Bureau estimate at www.census.gov/main/www/popclock.html

[2] Estimates from USAID ECO-Asia Clean Development and Climate Program, based on data from International Energy Agency, Asian Development Bank, and Asia-Pacific Energy Research Center

For example, the Peoples Republic of China in 2011 is over 70 percent dependent on coal for its total energy needs, and it is the fastest growing economy in the world. As energy needs increase, so does the degradation of the environment. Adding another 2.5 billion people over the next 40 years will magnify the imbalance even more.

Another consideration involves the political climate where carbon-based energy is extracted and consumed. For example, much of the global oil supply is located in geographic areas that regularly experience bouts of political instability. Think about Venezuela, Nigeria, Libya, and points throughout the Middle East. As we have seen time and time again since the oil crisis of the 1970s, any even minor disruption in the assured supply of oil, gas, or other energy sources can and will have a significant impact on global prices.

And the trends of oil import dependency are going in the wrong direction. Over the past decade, oil imports to Asia have increased by 140 percent, and in 2010 the Asia region imported 60 percent of its oil.[3] China's dependence on foreign oil is expected to keep rising, reaching 65 percent by 2015 and 80 percent by 2030.[4]

For all of these reasons, the current global energy mix, which is primarily carbon-based, is untenable over the long run. China, India, and other nations need to find alternate ways to fulfill their energy demands. The only real answer — and our best chance to bring balance back to the environment — is to turn toward alternative sources of energy, which can at least in part replace existing coal and oil sources.

The most cost-effective way of weaning ourselves from fossil fuels is through energy efficiency, and this can be done by taking actions to make homes, buildings, factories, and our transport systems more efficient.[5] But at the same

[3] National Association of State Energy Officials, "What's Hot in Trade and Imports," available at: http://www.naseo.org/committees/energyproduction/oil/Trade_Hot.htm#What's%20Hot:%20The%20Asian%20Magnet

[4] Estimates for China's oil import dependency in 2030 range from 75%-82% based on these references: The World Bank, "Winds of Change: East Asia's Sustainable Energy Future," available at: http://www.recoalition.com/re2010/userfiles/files/Winds%20of%20Change%20(Full%20Text).pdf and Japan Times, "What is Beijing willing to do to secure oil and gas supplies?" (stating US Dept. of Defense predicts oil imports will amount to four-fifths of oil consumption by 2030), available at: http://search.japantimes.co.jp/cgi-bin/eo20101227mr.html

[5] Based on estimates in International Energy Agency (IEA), World Energy Outlook 2010

time, it is also important to aggressively develop the most feasible alternatives for supplying sustainable fuel and power directly – through renewable energy. Some examples of renewable energy with real potential are solar, wind, hydro, biomass, biogas, and tidal. While some of these technologies have been commercialized and entered the market, none of them has yet reached anywhere near their full economic and market potential.

Such renewable energy sources cannot become commercially viable without long-term financial incentives and comprehensive pricing policies backed by national governments around the world. Just the sheer size of the capital investments required in order to develop and exploit renewable energy demands that governments underwrite part of those costs, at least initially. This includes government-backed targeted incentives and grants for research and development of these emerging technologies, funding renewable energy demonstration projects, and adopting tax regimes for renewable energy that will attract private investors over the long run. Without the right policies and regulatory incentives, renewable energy sources are unlikely to succeed in Asia or elsewhere.

Globally, investments in clean energy have quadrupled over the past five to six years, from USD46 billion in 2004 to USD173 billion in 2008, and then falling slightly to USD162 billion in 2009.[6] And the upward trend is expected to continue, as technological developments, in combination with the policies and incentives mentioned above, boost the market for clean energy. The total expected investment in clean energy, for just the G-20 countries alone, is expected to be USD2.3 trillion over the next 10 years.

The real growth in global energy demand will occur in developing Asia — most notably China and India — which will demand access to greater and greater levels of energy over the next several decades. The overall demand for energy in the developing Asia region is expected to increase by 65 percent in the next 20 years, and electricity consumption is expected to increase by 114 percent.

Given these strong trends, we wanted to find out where key countries in Asia stand now on renewable energy as a workable alternative and what we can expect in the future.

[6] UNEP, 2010, Global Trends in Sustainable Energy Investment 2010. Sustainable Energy Initiative (SEFI), in cooperation with Bloomberg New Energy Finance

In order to find the answers, we approached 12 of the leading Asian law firms and asked each to comment on 10 basic questions about renewable energy policies and the regulatory framework in their individual countries:

1. *What are the driving factors for increasing renewable energy production?*
2. *Which renewable energy sources are viewed as the best opportunity for your country and why?*
3. *What role does your government play in regulating the energy industry? Describe the regulating environment and trends in deregulation in your country.*
4. *What agencies or bodies of government oversee the energy sector? What goals or mandates has your government set for electricity generation or fuels production from renewable sources?*
5. *What are the opportunities for private ownership (vs. public ownership) in clean energy development and technologies?*
6. *What is the level of government investment or what incentives are in place to support these goals and targets?*
7. *What kind of emphasis is placed on researching and developing renewable energy technologies versus looking to outside energy resources?*
8. *Is your country on track to be a clean energy importer or exporter from the standpoint of power production supply and manufacturing?*
9. *How developed is your country's workforce to support innovation, development and the production of renewable energy?*
10. *What are the key barriers to increasing renewable energy as a part of your country's energy mix?*

Each chapter of this book is devoted to insights on a specific country in Asia. Our hope is that this book will spark the beginning of an ongoing dialogue among government officials and planners, venture capitalists, individual entrepreneurs, researchers, multinational corporations in the energy sector, and NGOs as they focus their attention on how best to accelerate the deployment of renewable energy resources in Asia and elsewhere. The stakes are high for all of us. We cannot afford to step back from the challenges and ignore the great opportunities renewable energy technologies offer.

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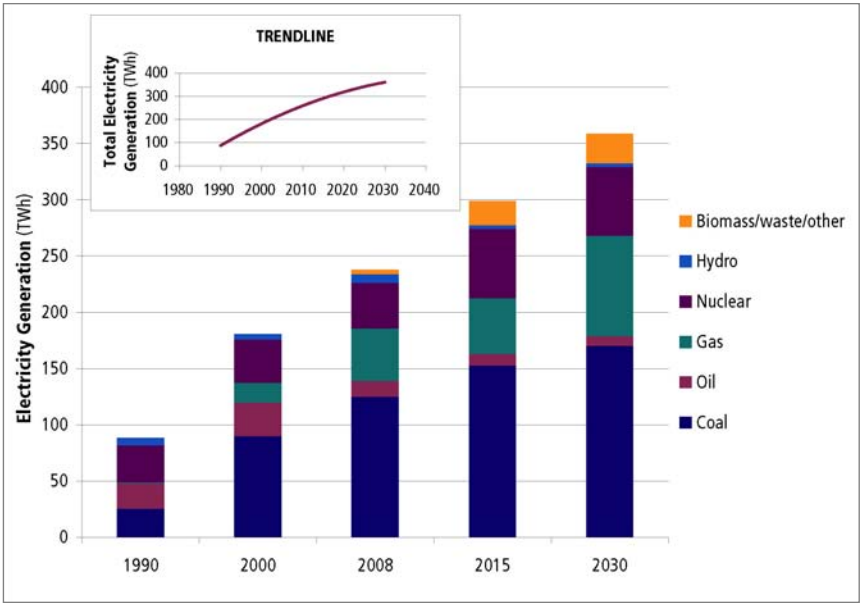
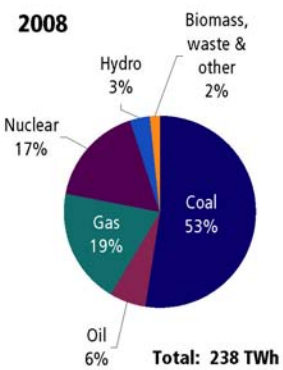
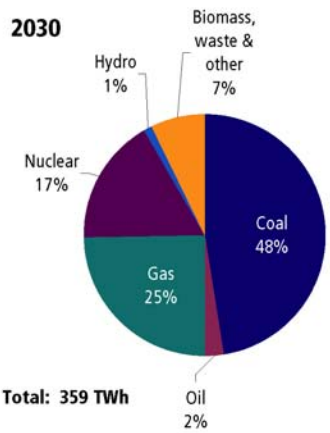
USAID's ECO-Asia CDCP program uses policy and market interventions to promote the scale up of investment and implementation in clean energy in developing Asian economies. The program is active in China, India, Indonesia, the Philippines, Thailand, and Vietnam. ECO-Asia CDCP partnered with Meritas in the development of this guide as part of its Asia Clean Energy Policy and Regulatory Dialogue, which is aimed at building capacity in the region to design and implement effective policy, regulatory, and legal frameworks for energy efficiency and renewable energy.

Electricity Generation by Fuel Type: Taiwan







Source: Asian Development Bank, International Energy Agency, Asia-Pacific Energy Research Center, and The World Bank

1. What are the driving factors for increasing renewable energy production in Taiwan?

Taiwan relies on imports for more than 99 percent of its energy, which leaves the island's energy supply vulnerable to external disruption. Nearly all oil and gas for transportation and power needs must be imported, making Taiwan particularly sensitive to fluctuations in energy prices. Taiwan's total energy consumption has grown considerably over the past two decades, going from consuming 134.906 billion kWh of electricity in 1996 to consuming 229.8 billion kWh of electricity in 2008. Taiwan uses 97.7 percent of its oil for energy use,[1] and Taiwan went from consuming 46.42 million kiloliters of oil equivalent in 1988 to 117.69 million kiloliters in 2008.[2] This represents an average annual growth of 4.76 percent. In 2009, Taiwan was the 17th largest oil importer in the world.[3]

To combat Taiwan's energy import dependency, Taiwan established The Sustainable Energy Policy Framework in 2008. The Framework outlines the following targets for reduction of carbon dioxide:

- Short Term: return to the 2008 level by 2016 to 2020
- Medium Term: return to the 2000 level by 2025
- Long Term: return to 50 percent of the 2000 level by 2050

In addition to the above targets, 15 percent of energy generation is to come from renewable energy sources by 2025. This would amount to 8,450 MW, which is capable of producing 28,700 GWh of electricity. Wind-generated power could create as much as 8,900 GWh of electricity by 2025, comparable to 2.3 times the capacity of Linkou's thermal power plants. Many domestic companies are now beginning to work on the development of solar energy and project that solar power will produce 1,200 GWh of electricity by 2025.

1 http://unfccc.epa.gov.tw/unfccc/english/_uploads/downloads/03_Mitigating_Climate_Change-What_Taiwan_is_Doing.pdf

2 http://unfccc.epa.gov.tw/unfccc/english/_uploads/downloads/03_Mitigating_Climate_Change-What_Taiwan_is_Doing.pdf

3 Central Intelligence Agency, "The World Factbook – Taiwan," last updated 24 January 2011, available at: https://www.cia.gov/library/publications/the-world-factbook/geos/tw.html.

Several laws have since passed to achieve this 15 percent goal, including the Renewable Energy Development Bill, a partial amendment to the Energy Management Law, the Green Energy Industry Development Program, and the 100,000 Solar Roofs Program. These laws provide for the government to invest in renewable energy programs and research and development. For instance, Taiwan's Sustainable Energy Policy calls for increasing its annual energy research budget from TWD5 billion to 10 billion over the next four years. The Green Energy Industry Development Program calls for the government to invest TWD25 billion to provide subsidies for implementing renewable energy and energy conservation measures at facilities. The government appears to be following its mandates as it has been continuing to invest heavily in renewable energy projects. In December 2010, the government announced plans to invest USD838 million in renewable energy promotion and an additional USD635 million for research and development over the next five years.

2. Which renewable energy sources are viewed as the best opportunity for Taiwan and why?

Taiwan mainly places an emphasis on the development of wind and solar energy with some wave energy projects currently underway.

Taiwan is an island with a total area of 35,801 square kilometers. Taiwan's most prominent geographic feature is its 270-kilometer central mountain range. Over 60 percent of the island is classified as mountainous.[4]

Due to the limited landmass, the government views offshore wind turbines and tidal power as the best opportunity for renewable energy development, with wind power generation offering the most economic value. Taiwan has already established various wind projects throughout the country and continues to seek opportunities for wind power development. For example, the government has invested TWD8 billion to develop Penghu County into Taiwan's first low-carbon emissions county. Taiwan Power Company (Taipower) plans to install offshore wind power facilities with a

[4] http://unfccc.epa.gov.tw/unfccc/english/_uploads/downloads/03_Mitigating_Climate_Change-What_Taiwan_is_Doing.pdf

capacity of 32 MW while the Penghu government will develop a wind-power capacity of 64 MW. By 2015, the Taiwan government projects renewable energy will account for 56 percent of the total energy supply in Penghu. Taiwan has also partnered with China to develop plans for two additional offshore wind farms that will generate between 5 to 8 MW of electricity each.

Taiwan's tropical climate is ideal for solar energy projects. Taiwan's current photovoltaic capacity was 19 MW in 2010, but the government expects it to increase to 2 GW by 2025.[5] Taipower currently plans to develop a new 4.7 MW solar plant in Youn'an, Kaoshiung and has plans to invest TWD9 billion in its 100,000 Solar Roof Program, which will install 20,000 solar panels by 2012. These panels will have a capacity of 60 MW and produce 72 million kWh of electricity annually.

With around 1,500 km of coastline, Taiwan has been investigating ocean energy development since 2005. One project is investigating Ocean Thermal Energy Conversion. Studies from this project have shown that the northeastern offshore region of Taiwan has a wave energy potential of several hundred MW, while the east coast's Kuroshio path off Penghu has tidal current energy that could theoretically be tapped at the gigawatt scale. Based on current studies, Taiwan hopes that wave energy projects will have a capacity of 200 MW by 2025.[6]

[5] Renewable Energy World, "Taiwan Initiates Energy Transition," 23 February 2011 available at: http://www.renewableenergyworld.com/rea/news/article/2011/02/country-profile-taiwan

[6] Wave Energy Today, "Aquatera chosen as technical and environmental advisor," available at: http://social.waveenergytoday.com/news/aquatera-chosen-technical-and-environmental-advisor, Renewable Energy World, "Taiwan Initiates Energy Transition," 23 February 2011 available at: http://www.renewableenergyworld.com/rea/news/article/2011/02/country-profile-taiwan

3. What role does the government play in regulating the energy industry? Describe the regulating environment and trends in deregulation.

Taiwan, through its Bureau of Energy, plays a heavy role in regulating the energy industry. The Bureau of Energy has authority to:

- Formulate energy policies and energy related regulations
- Evaluate and plan energy supply and demand
- Grant permission on the exploration, productions, transport, storage, transformation, distribution, marketing, and utilization of energy
- Review natural gas and electricity prices
- Grant establishment permits and undertake matters concerning the registration, administration, counseling, and oversight of energy enterprises
- Undertake matters concerning the registration and oversight of energy technical personnel
- Promote research and development of new and renewable energy technology and energy conservation technology[7]

The Renewable Energy Act, passed in 2009, calls for deregulation of the renewable energy industry. The Act provides that renewable generating facilities that reach a certain capacity are allowed to apply electricity industry regulations regarding acquisition of land-use rights, usage procedures, and disposition. Renewable energy generators may acquire land needed for renewable energy generating plants as a "qualified public utility" as provided in the Urban Planning Law, the Forestry Act, and the Fisheries Act. Tariff reductions or exemptions may also be applied to equipment imported for the construction and operation of the renewable energy facility.[8]

7 Bureau of Energy, Ministry of Economic Affairs, "Act of the Organization of the Bureau of Energy," available at: http://www.moeaboe.gov.tw/English/About/EnAbMain.aspx?Pageid=Functions

8 Council for Economic Planning and Development, "Renewable Energy Act Passes Legislature," 14 Jul 2009, available at: http://www.cepd.gov.tw/encontent/m1.aspx?sNo=0012048

4. What agencies or bodies of government oversee the energy sector? What goals or mandates has the government set for electricity generation or fuels production from renewable sources?

The Ministry of Economic Affairs is the head body of government that oversees the energy sector in Taiwan. The Ministry of Economic Affairs consists of 14 administrative agencies and 6 national corporations. The Ministry of Economic Affairs delegates authority to regulate the energy industry to the Bureau of Energy.

The Bureau of Energy is organized into several divisions all serving beneath the Director General, Deputy Director General, and Chief Secretary. These divisions include the Planning Division, Petroleum and Gas Division, Electricity Division, and Energy Technology Division. Beneath each division are specialized "sections" that oversee and manage various aspects of the energy industry. For instance, the Planning Division oversees the Energy Policy Section, the Energy Affairs Section, and the Energy Information Section; the Electricity Division oversees the Public Electric Affairs Section and the Private Power Generation Section; and the Energy Technology Division oversees the New and Renewable Energy Section and the Energy Conservation Section.

The Bureau of Energy's current priority is renewable energy development through administering several laws such as the Energy Management Act, the Electricity Act, the Petroleum Administration Act, and the Renewable Energy Development Act. These Acts are designed to reach the government's goal of renewable energy becoming 15 percent of the nation's primary energy source by 2025. In addition to administering these laws, the Bureau of Energy has the overall authority to guide the operations of energy enterprises by evaluating the country's energy supply and demand, establishing an energy database system, promoting energy conservation programs, encouraging development of renewable energy technologies, and promoting international energy cooperation.

The Ministry of Economic Affairs also oversees Taiwan Power Company (Taipower), a state-owned electric power utility. Taipower was organized on 1 May 1946 and currently dominates Taiwan's electric power sector with 12.4 million customers. Taipower's monopoly status technically ended after a 1994 measure allowed independent power producers to provide up

to 20 percent of Taiwan's electricity. However, independent power producers are required to sign power purchase agreements with Taipower, which distributes the power to consumers. Taipower's three main functions are power development, power supply, and investment in power-related businesses.

5. What are the opportunities for private ownership (vs. public ownership) in clean energy development and technologies?

Private companies are generally permitted, subject to licensing/approval requirements, to own power and clean energy production facilities. After Taiwan joined the WTO in 2001-2002, foreign firms were permitted 100 percent ownership of firms in the energy sector.

Foreign companies, in collaboration with the Taiwan government or local companies, have the opportunity for ownership in clean energy development and technologies. The Taiwan government currently encourages private investment in clean energy development and has in place incentives for investment through various programs. For example, Taiwan's International Innovation and R&D Base Plan encourages multinational corporations to collaborate with local Taiwanese firms with the aim of Taiwan establishing itself as a regional R&D center within the Asia Pacific region. Corporations who have ongoing energy research and development projects through this program include DuPont and Underwriters Laboratories. Other investors include GCE Clean Energy Technology, who announced in 2010 that it successfully developed and launched the world's first ever satellite-shaped vertical wind and solar hybrid turbine in Taiwan,[9] and Aquatera Ltd., which has partnered with Taiwan-based Industrial Technology Research Institute to begin assessing and installing wave energy projects in 2008.[10]

[9] http://www.allbusiness.com/energy-utilities/utilities-industry-electric-power-power/14597662-1.html

[10] Wave & Tidal Energy News, "Taiwanese study for wave energy project underway," 19 December 2008, available at: http://www.wave-tidal-energy.com/home/news-archive/36-research/140-taiwanese-study-for-wave-energy-project-underway

6. What is the level of government investment or what incentives are in place to support these goals and targets?

Taiwan's government has set up funds from which it will provide support for clean energy projects including the Energy Research and Development Special Fund and funds allocated by the Green Energy Development Plan.

Article 5 of the Energy Management Law established the Energy Research and Development Special Fund. There are three sources of income for this fund:

1) Up to 0.5 percent of income generated from vertical integrated utility, oil refinery, and oil importer businesses such as Taiwan Power Co. and Chinese Petroleum Corp.
2) Interest from this income
3) Technical service fees, royalties, remuneration, and other associated income[11]

The Green Energy Development Plan calls for the government to set aside 10 percent of its 2009 TWD500 billion budget for the four-year Expanding Investment in Public Works project to be directed toward green energy or eco-engineering.[12] The Plan also calls for the government to invest TWD25 billion additional funds in developing renewable energy saving devices and another TWD20 million in research and development of renewable energy technologies.

Aside from funding, other incentive measures for renewable energy include equipment subsidies and tax breaks. The Ministry of Energy has authority to exempt import and business taxes for imported renewable energy equipment. Seven percent of income tax can be deducted for the first five years on the investment of renewable energy equipment or technology, and the purchased equipment can qualify for accelerated depreciation.[13] Income tax can be deducted for 10 to 20 percent of renewable energy

[11] Taiwan Bureau of Energy, Ministry of Economic Affairs, "Energy Management Law," available at: http://www.moeaboe.gov.tw/English/laws/EnLMain.aspx?PageId=laws_01

[12] http://investtaiwan.nat.gov.tw/matter/show_eng.jsp?ID=999994&MID=4

[13] Industrial Technology Research Institute, "Renewable Energy: Government Promotion," available at: http://re.org.tw/Re2/Eng/promotion.aspx

stock owned by an individual or company. Low interest rate loans will be provided by the Renewable Energy Development Fund and the maximum annual interest rate no more than the Post Office's two-year fixed interest rate plus 2.45 percent.

In order to facilitate the utilization of renewable energy, Taipower announced in 2003 that it would offer a favorable renewable power purchase agreement for renewable electricity. Feed-in tariffs paid to generators by Taipower are at least TWD11.12 per KWh for photovoltaic solar panels and TWD2.38 for wind farms. This is compared to an average of TWD2.06 per KWh paid for coal and oil.

7. What kind of emphasis is placed on researching and developing renewable energy technologies versus looking to outside energy resources?

Under Taiwan's Green Energy Development Plan, Taiwan's policy is to become a key developer and producer of energy technologies. To accomplish this, Taiwan has collaborated with outside resources to research and develop renewable energy technologies. Companies like DuPont, Aquatera, Suntech, and Underwriters Laboratories are collaborating in projects with Taiwan's government.

8. Is Taiwan on track to be a clean energy importer or exporter from the standpoint of power production supply and manufacturing?

In the context of renewable energy technologies, Taiwan is looking to become a major solar and wind renewable technology exporter and manufacturer of photovoltaic cells and wind turbines. Taiwan and China accounted for 50 percent of the share of the global solar panel market in 2010.[14] Taiwan expects that its solar panel industry continues to expand

[14] Taipei Times, "Taiwan, China push green energy," 4 August 2010, available at http://www.taipeitimes.com/News/taiwan/archives/2010/08/04/2003479536

and that Taiwan and China will account for 60 to 65 percent of the world market share in 2011.[15] Currently, companies like Speed Tech Corp are working to establish the photovoltaic industry in Burkina Faso by building factories to produce photovoltaic devices and equipment.[16] Additionally, AU Optronics Corp, Taiwan's second largest LCD panel maker, recently received certification for its solar panels to be installed in the UK to pave the way for the company's entry into the British market.

9. How developed is Taiwan's workforce to support innovation, development and the production of renewable energy?

Through a combination of government initiatives and private sector projects, Taiwan is increasingly developing a manufacturing base for clean energy technology, particularly in the area of wind and solar power.

For example, the government-funded Industrial Technology Research Institute (ITRI), the premiere national research organization in Taiwan, is integrally involved in research and development on renewable energy technologies. ITRI has contributed to the innovation, development, and production of renewable energy by establishing projects such as the Southern Taiwan Innovation & Research Park, establishing and transferring solar cell technology to DeSolar Co., and founding the Industrial Technology Research Institute College.[17]

[15] Taipei Times, "Taiwan, China push green energy," 4 August 2010, available at http://www.taipeitimes.com/News/taiwan/archives/2010/08/04/2003479536

[16] Taipei Times, "Premier Wu says Taiwan willing to help Burkina Faso," 23 December 2010, available at http://taipeitimes.com/News/taiwan/archives/2010/12/23/2003491675

[17] ITRI, "About Us," available at: http://www.itri.org.tw/eng/about/article.asp?RootNodeId=010&NodeId=0103

10. What are the key barriers to increasing renewable energy as a part of Taiwan's energy mix?

Taiwan holds large potential for solar, wind, wave, and other renewable energy; however, one key barrier to increasing renewable energy as part of the country's energy mix is the expense of subsidizing renewable energy projects. In response to high solar energy costs, the government announced in December 2010 a new pricing policy for solar power that calculates feed-in tariff rates based on the completion date the solar power facility is completed. The previous policy fixed the feed-in tariff rate based upon the date the contract to build the facility was signed, and that rate would be guaranteed for 20 years. Any facility not completed by the end of 2010 is subject to the new policy. The Ministry of Economic Affairs justifies that this policy will save the government TWD432 billion over 20 years, which would in turn raise electricity costs. Shortly after the announcement of the new feed-in tariff policy, the government announced that it plans to reduce the wholesale price solar energy by 30 percent.[18] These factors have frustrated private investors and will likely decrease future investment.

Another key barrier is Taiwan's electricity prices, which are among the lowest in the world. Despite passing the Renewable Energy Act, weak electricity procurement rates have deterred investors from initiating large projects. The low price that state-run Taipower pays for renewable energy makes it difficult to make new wind and solar farms profitable for private investors. For example, in 2009, Taipower paid an average of TWD2.38 per kWh for wind-generated electricity but needs to pay TWD3.23 for wind energy operators to break even. This rate is below what other countries paid to purchase wind-generated electricity. In comparison, Germany paid an average of TWD4.1 per kWh, Spain paid TWD3.14 per kWh, and Ontario, Canada paid TWD4.04 per kWh.[19]

[18] Taiwan Today, "MOEA sets new renewable energy purchase prices," 31 January 2011, available at: http://www.taiwantoday.tw/ct.asp?xitem=148254&ctnode=421&mp=9

[19] Taipei Times, "FEATURE: Renewable energy chokes on price," 11 February 2010, available at: http://www.taipeitimes.com/News/taiwan/archives/2010/02/11/2003465704/2

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