

# APEC

## Advanced Biohydrogen and Green Growth Newsletter

*The food security, climate change, energy security, interlinked challenges, and green growth for the APEC region.*

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### Main Story

**§ 41<sup>st</sup> APEC-ISTWG Meeting §  
September 18-20, 2011  
San Francisco, USA**

Prof. SY Wu, from Feng Chia University, Chinese Taipei reported the progress of the implementation of the project "Green Energy Demonstration System of Biological Technology for APEC". One focus of this project is the "The 2011 APEC Forum on Green Growth and Short-term Training Course" to be held from Nov 2<sup>nd</sup>-5<sup>th</sup>, 2011 at Feng Chia University, Chinese Taipei.

Participation in the "2011 Asian Bio-Hydrogen and Biorefinery Symposium" held in Indonesia from October 13<sup>th</sup>-14<sup>th</sup>, 2011.

The 2011 APEC Forum on Green Growth and short-term training course will be held at Feng Chia University, Taichung, Chinese Taipei from November 2<sup>nd</sup>-5<sup>th</sup>, 2011. The forum will provide an opportunity for scientists and researchers interested in discussing the latest discoveries in the field of **Clean Energy and Green Growth**.

Topic of the Forum is "Green Growth". The following key issues are raised by the APEC member countries:

1. Policies and programs,
2. Best practices of open innovation in private sector,
3. International R&D cooperation programs.



The progress report of Green Energy Demonstration System of Biological Technology for APEC was presented by Prof. Wu (Feng Chia University).



Delegates of Chinese Taipei, Prof. Lin and Prof. Wu.

### Research Report

**§ Green World Investors: German Development Bank KfW (Kreditanstalt für Wiederaufbau) Joins ADB (Asian Development Bank) World Bank in**

## Funding Clean Energy in India §

Gopalakrishnan K<sup>1</sup>, Chyi-How Lay<sup>1,2</sup>, Chen-Yeon Chu<sup>2</sup>, Chiu-Yue Lin<sup>1,2</sup>

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In 2011-12 calendar year, German Development Bank KfW which is owned by the German government is planning to invest 800 million Euros in Indian Renewable Energy Sector (KfW is one of the biggest funding institutions in Germany for renewable energy projects giving concessional interest rates). The Bank will use its extensive expertise in the alternative energy and energy efficiency areas to extend its business in India as well. Renewable Energy in India is expected to see a massive expansion in the next decade and will require massive amounts of debt and equity. KfW along with other developmental institutions like ADB and World Bank have a big role to play (Debt is quite expensive in India and these institutions provide loans at a much cheaper rate making renewable energy projects viable). ADB has already formed many projects for renewable energy like development of 500MW station along with Japanese kyuden and further funding numerous clean projects in India following its developmental mandate as well.

### KfW earmarks 800 million Euros for Indian renewable energy projects

German government-owned development bank KfW plans to lend 800 million Euros in the 2011-12 calendar years to finance various renewable energy projects in India.

“We have already financed around 1.5 billion Euros in the energy sector in India. In addition to this, we plan to earmark another 800 million Euros to fund the green initiatives of India this year (CY’11),” KfW Director Oskar von Maltzan told PTI on the sidelines of the ‘Renewtech India Summit’ here.

The renewable Energy projects include wind energy, thermal energy, biomass energy.

**Wind power** has seen a phenomenal growth of around 33% **CAGR** (*Compound Annual growth Rate*) in the last 5 years and the total capacity at the end of 2009 was 10,892MW with most of the capacity installed in the State of Tamil Nadu which is the largest state in terms of Alternative Energy Capacity in India.

**Small hydro power** Plants of less than 25MW size are the second largest Green Energy Source in India though with a slow growth rate of around 9% CAGR and has around 2520MW of Capacity.

**Biomass Energy** has been showing a sharp growth of 27% CAGR in recent years and almost 2.1GW of Biomass Energy Capacity has been installed.

### Source:

<http://www.greenworldinvestor.com/2011/03/03/german-development-bank-kfw-joins-adbworld-bank-in-funding-clean-energy-in-india>

## § European Renewable Energy Plans §

Gopalakrishnan K<sup>1</sup>, Chyi-How Lay<sup>1,2</sup>, Chen-Yeon Chu<sup>2</sup>, Chiu-Yue Lin<sup>1,2</sup>

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The EU’s renewable energy plans, include various aspects of renewable energy production such as onshore

wind is set to have the largest installed capacity in the renewable sectors (35% of the total installed capacity),

followed by hydro at 28%. Solar photovoltaic installations will represent 17%, followed by offshore wind and biomass (8.9%, which had increased significantly when compared to the previous years). Importantly the directive requires each member state to submit a National Renewable Energy Action Plan (NREAP) detailing all legislation affecting renewable (from spatial planning to grids and support mechanisms) and explain what measures will be taken to streamline procedures and generally promote energy from renewable energy sources.

Europe has provided the power sector with a very clear trajectory over the next ten years. What is yet to be done is for the EU to provide the power sector with an equally clear trajectory to 2050. Currently the agreed framework for post 2020 consists of two elements: the heads of states commitment to reduce greenhouse gas emissions by 80-95% by 2050, and the directive on the EU emission trading systems which will continue to reduce the emissions cap for the ETS sectors by each year beyond 2020.

The most effective way of ensuring a carbon free power sector by 2050 would be to ban carbon emissions from new power plants installed after 2015. The simple way to do this would be to introduce a technology neutral missions performance standard (EPS) of zero grams of

CO<sub>2</sub>/kWh for new power plants thereby letting the market decide the most cost efficient way of delivering carbon free primary energy.

Each country is deploying different technologies and acting as a laboratory for the others. Some countries have set ambitious goals: Sweden already generates 40% of its energy needs from renewables. In 2007, Germany generated 14 % of its electricity from renewable energy, preventing 114 million tons of carbon emissions. Meanwhile the United States generates a paltry 6% of electricity from renewable.

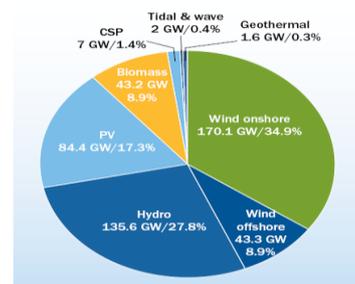


Figure: Various Renewable sectors of Europe.

**Source:**

[http://www.ewea.org/fileadmin/ewea\\_documents/documents/publications/reports/EWEA\\_EU\\_Energy\\_Policy\\_to\\_2050.pdf](http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/EWEA_EU_Energy_Policy_to_2050.pdf)

**§ Green Growth Paths for Sustainable Environment in Future §**  
**Gopalakrishnan K<sup>1</sup>, Chyi-How Lay<sup>1,2</sup>, Chen-Yeon Chu<sup>2</sup>, Chiu-Yue Lin<sup>1,2</sup>**

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Nowadays due to various environmental problems globe is facing hurdles to be overcome and everyone is focusing on the green energy. The green growth path includes the aspects like;

- a) **Sustainable consumption and production (SCP):** It favors countries to improve the eco efficiency of economic growth.

- b) **Greening business and markets (GBM):** Across the region corporations and small and medium sized enterprises (SMEs).
- c) **Sustainable infrastructure (SI):** Patterns of infrastructure development determine the environmental sustainability of economic growth and are critical to building low-carbon

economies.

- d) **Green tax and budget reform (GTBR):** It entails green taxation for environmental relevant products and green subsidy reform that gradually eliminating counterproductive subsidies that favor unsustainable development.
- e) **Eco-efficiency indicators (EEI):** It will strengthen the role of the public sector and will provide a powerful policy formulation tool to increase its influence on the pattern of economic growth at a national system-wide level.
- f) **Investment in natural capital (INC):** Any expenditure that results in the improved sustainable management of ecosystems that support socio-economic progress can be viewed as an investment in natural capital. Natural

capital, such as mangrove forests, act as carbon sinks and a buffer against the impacts of climate change, providing a crucial service to mankind to ensure that services such as carbon sequestration and watershed protection continue to benefit the local economy and communities, but also mitigate climate change.

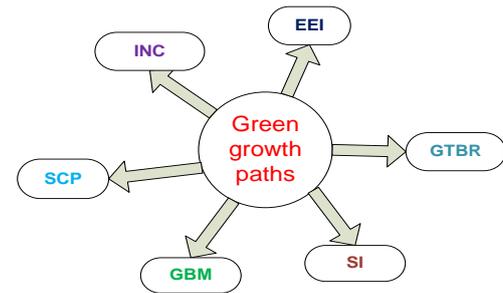


Figure: Green growth paths for sustainable future.

Source: <http://www.greengrowth.org/eco-ef.asp>

## Special Column

### 2011 APEC Steering Committee Meeting of Green Energy Technology and Asia Bio-HyLinks Meeting

2011 APEC Steering Committee Meeting of green energy technology and Asia Bio-HyLinks Meeting were held from October 13<sup>th</sup> -16<sup>th</sup>, 2011 in Bogor, Indonesia. It was organized by Green Energy Development Center, Feng Chia University, Chinse Taipei and LEMBAGA ILMU PENGETAHUAN INDONESIA-LIPI (Indonesian Institute of Sciences).

Prof. Chiu-Yue Lin and Jun Miyake co-chaired the meeting. Prof. Chen-Yeon Chu was the moderator who had reported the progress of the implementation of the project. APEC Steering Committee Meeting of green energy technology focused on Green Growth, Biohydrogen production, Biohydrogen applications, Biorefinery and its prospects.

Fifteen scientists and researchers from Chinese Taipei, Indonesia, Thailand, Malaysia, Korea, Japan, China and Vietnam participated in the meeting. They shared the latest research, solutions and future innovations in this field. During the meeting they also exchanged and advanced their knowledge to the fullest.

The meeting had provided an opportunity for the scientists and researchers of APEC regions to connect and learn from each other.



2011 APEC Steering Committee Meeting of green energy technology and Asia Bio-HyLinks Meeting