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EWG 19/2011A: Best Practices in Energy Efficiency and Renewable Energy Technologies in the Industrial Sector in APEC Region

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Project Overseer

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Duration

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Contractor

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Project Team

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Project Coverage and Tasks

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1. Assemble Examples of EE and RE in Industry,
2. Identify Obstacles to the introduction of EE & RE in industry,
3. Establish the Lessons Learned in APEC Economies
4. Formulate Best Practices for the introduction of EE & RE in industry throughout APEC,
5. Prepare a Roadmap for the introduction of EE and RE in Industry applicable to APEC economies.

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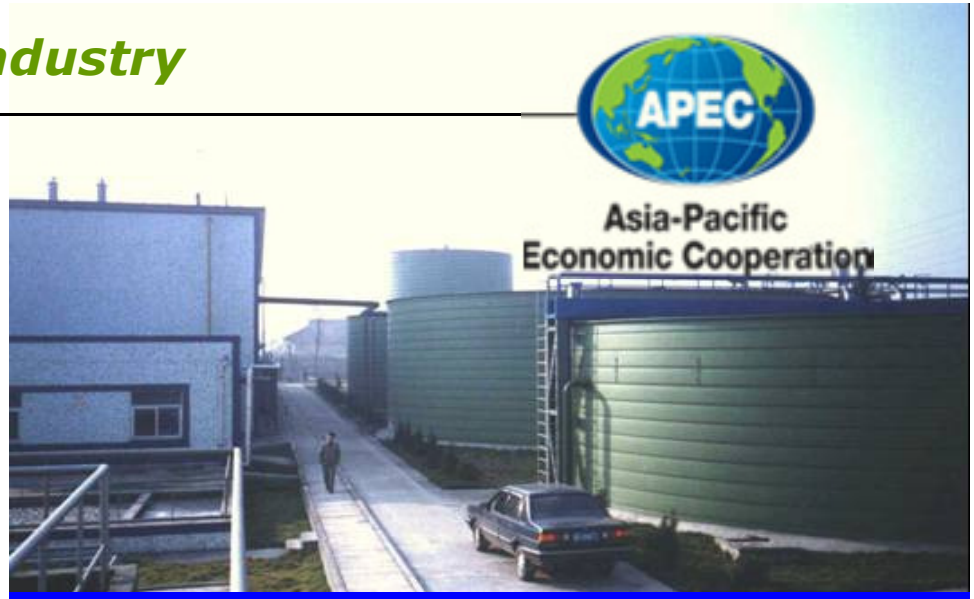
EE & RE Examples Selected

- **Bagasse** Power in Sugar Mills – **Australia**
- **Bagasse** Fired Cogeneration – **Thailand**
- **Bagasse** Power and Fuel Production – **USA**
- **Bagasse** Cogeneration in an Edible Oil Refinery – **India**
- **Biomass** Gasification in Ethanol Production – **USA**
- **Biogas** to Heat and Power – **Canada**
- Large Scale Industrial **Biogas – China**
- **Tallow** Fuelled Boilers **– New Zealand**
- Sawmill Powered by **Wood Waste – Australia**
- **Wood-waste** in Different End Uses **– Malaysia, New Zealand, Singapore**
  - ✓ Timber Drying.
  - ✓ Cogeneration of Heat and Power for Waste Processing
  - ✓ Maximizing the End Use Efficiency of Wood Waste.
  - ✓ Production of Briquettes for Boiler Fuel.
  - ✓ Combined Application of Several Energy Efficiency Initiatives.
  - ✓ Sewage Sludge Disposal.
- **Watermill** Upgrading **– Nepal**
- **Micro-Hydro** Electricity Generation **– Indonesia**
- **Solar** Crop Drying **– Indonesia**
- **Solar** Thermal Process Heat **– USA**
- Concentrated **Solar** Thermal Power Plant **– Thailand**
- Hybrid **Solar** Thermal and PV for Process Heat and Power **– USA**
- **Solar** Cooling and Process Heat **– Singapore**
- Changbin and Taichung **Wind** Farms **- Chinese Taipei**

Best Practices in EE and RE in Industry

- For each EE & RE Example
  - ✓ Project Description
  - ✓ Coupling with Energy Efficiency
  - ✓ Project Highlights
  - ✓ Economics
  - ✓ Obstacles Encountered
  - ✓ Lessons Learned
  - ✓ Contact Information

- From all EE & RE Examples
  - ✓ Identify obstacles
  - ✓ Establish lessons learned
  - ✓ Formulate *Best Practices*
  - ✓ Prepare *Roadmap*



Biogas system for treating wastewater on the 200,000-pig Hangzhou Dengta Farm.
Photo courtesy of Hangzhou Energy & Environment.

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Conclusion

✓ Overall conclusion

- RE and EE are the "twin pillars" of a sustainable energy future
- Already many successful applications of RE combined with EE throughout APEC
- Governments can create regulatory and business environments that promote development of RE and EE in industry
- No universal business model that can be used to introduce and sustain all different forms of RE and EE in industry.
- Successful introduction of RE coupled with EE improvement in industry often depends upon the people involved and the partnerships established.

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Conclusion

✓ Barrier & Obstacles

- Obstacles that can be addressed by Governments include:
  - lack of information about how the introduction of RE & EE can benefit specific industries,
  - insufficient capacity to implement the technology in a timely and cost effective manner,
  - high project establishment costs,
  - reduced economic viability due to competition with subsided fossil fuels,
  - difficulties in accessing capital,
  - institutional obstacles such as:
    - **lack, or inadequacy, of appropriate incentives,**
    - **ineffective regulatory regimes that are not supportive,**
    - **inadequate administrative structures and performance.**
- These issues have been addressed successfully in a number of APEC economies and industries and are diminishing with time as experience is gained, capacity built and costs reduced.

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Conclusion

✓ Best practices

- Many APEC economies already have policies and measures in place to promote the development of RE & EE in industry although their effectiveness differs considerably and most are still evolving.
- Tax incentives and benefits are the most common measures used by governments to promote the introduction of RE & EE improvement in industry.
- There are considerable variations between the incentive policies and measures employed throughout APEC. Differences are apparent between:
  - developed and transition economies,
  - Asian, Australasian and North American economies,
  - industrialized and agrarian economies.

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Conclusion

✓ Roadmap

- Intended to outline the steps that are required to plan and implement an RE & EE program in industry.
- Steps and actions required are largely generic and are applicable in all APEC economies; however, there are considerable differences between both economies and their industries,
  - so the actual implementation plan adopted, and mechanisms employed, will be different in each economy.
- Most APEC economies have already embarked on implementation programs so are currently at different points along the road.
- The role of governments is to create and manage an implementation program that will foster and support the development of RE & EE in industry

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Progress to Date

All research has been completed,

Findings have been analysed,

Outcomes have been categorised and evaluated,

Roadmap has been formulated,

The **Final Report** is in Draft ready for circulation for comments

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