


Criteria for Prioritizing New Energy Technologies Development

Criteria Item	Energy Supply		Industry Effectiveness		Technological Advancement			First Priority	Second Priority
	Security Enhancement	Clean & High Efficiency	Niches & Complete Systems	Reliance of Domestic Industry	Commercialization	Innovation	Advancement		
Renewable Energy	Solar PV	●	●	●	●	●	●	●	X
	Solar Thermal	●	●	●	●	○	○	●	
	Biomass Energy	●	●	●	●	●	●	●	V
	Wind Power	●	●	●	●	○	○	○	V
	Ocean Energy	●	●	○	○	○	○	○	
New Energy Conversion	Hydrogen & Fuel Cell	●	●	●	●	●	●	●	X
	Hybrid-Vehicles	●	●	●	●	○	○	○	
	Gasification	●	●	●	●	○	○	○	
	Carbon Sequestration	○	○	○	○	○	○	○	
	Methane Hydrate	●	●	○	○	○	○	○	
Energy Conservation	Refrigeration & HVAC	●	●	●	●	●	●	●	V
	LED Illumination	●	●	●	●	●	●	●	X
	Building Energy Management	●	●	●	●	○	○	○	
	Combustion & Heat Utilization	●	●	●	○	●	○	○	

High ● Mid ◆ Low ○


Intellectual Technology
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Targets of Renewable Energy Promotion

Year	2007 (Sep.)		2010	
	Status		Targets	
	Installed Capacity (MW)	Share of total (%)	Installed Capacity (MW)	Share of total (%)
Renewables				
1. Hydropower	1,922.5	4.26	2,179	4.22
2. Wind Power	277	0.6	2,150	4.20
3. Solar Photovoltaics	1.73	0.00	21	0.04
4. Geothermal Energy	—	—	50	0.10
5. Biomass	655.2	1.45	750	1.44
Total	2,856.4	6.33	5,150	10.0
Share of renewable energy in terms of total installed capacity		6.33%	10.0%	

"Renewable Energy Development Act" Under Review by the Congress (final draft)

- Setting a goal of 6,500MW for renewable energies utilization
- Adopting a fixed Feed-in Tariff Scheme :
 - Different tariff for different form of renewable energies
 - Purchase price for renewable energy shall be reviewed after every three years period
- A special-purpose Fund shall be set-up deriving from the following sources :
 - Electricity sectors
 - Government's fiscal year budget

Wind Power

- Current Status: 277 MW (Sep. 2007)
- Targets: 2,150 MW by 2010
- Strategies:
 - Remove obstacles for wind farm projects in progress.
 - Generate detailed wind resource maps to locate potential wind sites.
 - Review incentive measures for enhancing the development of wind energy.



Mailliao: 2.64 MW



Chungtun: 2.4 MW



Chupei: 3.5 MW

Solar Photovoltaic Systems

- Current Status: 1.73MW (Sep. 2007)
- Targets: 21 MW by 2010.
- Strategies:
 - Promote demonstration projects such as Solar City, Solar Top, Solar Campus, etc. and mandate development at public buildings.
 - Establish solar PV systems in remote areas
 - Develop PV industries.



Presidential Hall: 10.5kW
• Annual generation: 1,100 kWh/kW



Southern Taiwan U. of Tech: 10 kW
• Annual generation: 1,300kWh/kW



Penghu County Hall: 3 kW
• Annual generation: 1,200kWh/kW



A household: 4.2 kW
• Annual generation: 1,100 kWh/kW

Solar Thermal Water Heater Systems

- Current Status: The installed area of heat collectors has reached 1.6million m² with about 400,000 households installing, 5.4% of the total.
- Targets: Total installation area of 2.15 million m² (about 540,000 Installed households) by 2010.
- Strategies: Extend incentive measure to building-integrated and large-scale applications.



Hualien College, Hualien County
Solar Thermal Water Heater System
Installation area: 77m² (for 115 students)



Dinan College, Tainan County
Solar Thermal Water Heater System
Installation area: 307.5m² (for 450 students)

Biomass

- Current Status: 655 MW
- Targets: 750 MW by 2010.
- Strategies:
 - Promote district RDF systems for waste treatment and power generation.
 - Arrange for the sale of biogas power at a premium rate.
 - Assist private enterprises in establishing power plants fueled by agricultural wastes, such as rice husks.
 - Promote RDF systems fueled by industrial wastes for power generation.



RDF demon plant in Hualien
BOE Project, Tech. developed by ITRI



Biogas power plant,
Municipal waste landfill, Taipei

Bio-diesel

- Current Status: 18,000 KL (kilolitres) yielded from waste cooking oils in 2007
- Targets: 100,000 KL by 2010.
- Strategies:
 - Develop production technology for commercialization.
 - Establish Green County Demonstration Program
 - Utilize marginal agricultural lands to grow energy crops
 - Promote B2 supplied in all filling stations by 2011



3,000 kl/yr Bio-diesel demo plant in Chiayi
BOE Project, Tech. developed by ITRI



Road-test of bio-diesel truck in Taipei city

Leveraging Existing Technological Strengths

High-Tech Clusters

- Semiconductors
- ICT Hardware
- ICT Software
- LCD, PDP
- Precision Machinery
- Metal Peripherals
- LCD, PDP
- LCD & Components
- Semiconductors
- Fundamental Metals
- Multi-layer thin film materials
- Deposition processes (CVD, Sputtering)



Excellent potential for new energy industries

Goals: strong player in

- LED Illumination
- Solar PV
- H₂ & Fuel Cell

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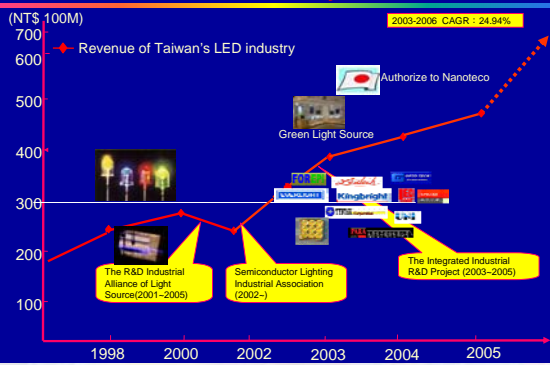
Status of LED Industry in Taiwan

- World ranking: No.1 in volume, No.2 in revenue.
- Strong infrastructure. Established nearly 100 key IPs.
- The competitiveness of solid state lighting industry will improve greatly by combining the ICT (Information and Communication Technology) industry's capabilities in design and manufacture.
 - develop high-efficiency LED (>100 lumens / Watt)
 - develop key patents
 - develop innovative applications

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Status of LED Industry in Taiwan



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White LED lighting Demonstration - LED Lamps



Social Education Hall of Taipei City



ITRI Exhibition Room

- 4W LED lamp replace 20W halogen lamps, saving: 80%
- 18W LED lamp replace 120 W PAR38 lamp, saving: 85%

- 6W LED lamp replace 50W halogen lamps

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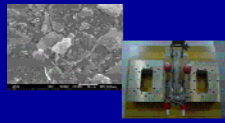
Status of PV Industry in Taiwan

				Upstream		Midstream		Downstream	
				Polysilicon	Ingot / wafer	Solar Cell	PV Module	PV System	
RANK	Co.	MWp/y	World Mark share						
Overseas Companies									
1	Sharp (JPN)	324	27						
2	Kyocera (JPN)	105	8.8						
3	BP Solar (UK)	85	7.1						
4,5	Mitsubishi (JPN)	75	6.3						
4,5	Q-Cells (DE)	75	6.3						
6	Shell Solar (NL)	72	6						

Establishing Fuel Cell & H₂ Energy Key Technologies

Hydrogen

- ❖ Pd membrane for enhanced hydrogen production
- ❖ Metal & chemical hydrides for hydrogen storage



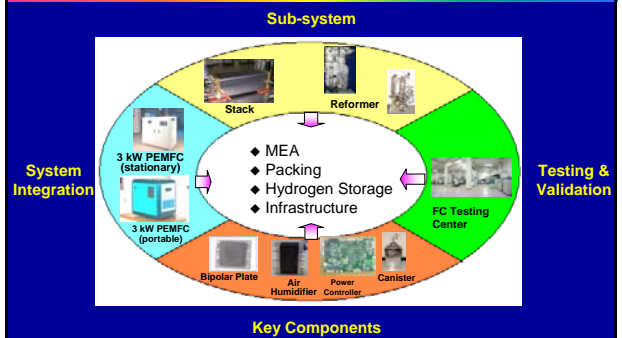
PEMFC

- ❖ Key components development in composite & metallic bi-polar plates, gas diffusion layer/electrodes and fuel reformer
- ❖ System integration
- ❖ Testing and Validation



Establish Taiwan Fuel Cell Industry

Key Elements for PEMFC Industry Development



ITRI's Fuel Cell Test Center



300~600 W In-House Test Stations and 2, 5 & 12 kW Industry-Standard Test Stations

Closing Remarks

- ❖ Energy security and global warming are global issues of great concerns and challenges. Development of clean energy is regarded as a vital part of Taiwan's energy policy. We will increase our usage of clean energy in an attempt to achieve a balance in environmental protection, energy security, and industrial development.
- ❖ In addition to on-going promotional programs, enhanced new initiatives to promote renewable energies and develop strategic green energy Industries have been proposed, which will initiate new investments and cooperative opportunities. We are looking for international partners to build up win-win cooperative models.

Thank you for your attention

