



Chinese Taipei



Electricity is one of the major supporting forces for the country's economic development, and is closely related to people's livelihood. The average growth rate of electricity sales for the past 3 years in Taiwan is 3.77%.

Being a part of global economy, Taiwan's GDP is expected to enjoy a stable growth in the coming years. Based on the forecasted GDP growth rate, Taipower estimated an annual average 3.65% growth of electricity sales for the coming two years.

In a long-term load forecast study, it is estimated that peak-load demand will grow by an average 3.0% per year from 33,966MW in 2008 to 50,921 MW in 2022.

The fastest growth in the load demand is the high-tech industry, especially in the electronic and information technology industries.

Reform of the Power Sector

Following the trends of globalisation and liberalisation, the government has adopted the policies of deregulation in the power sector as follows:

1. Introduction of Independent Power Producers (IPPs) to the Generation Sector

Phases 1 & 2

Through open biddings, 5 IPPs, in total 5,270MW, signed 25-year PPAs with Taipower in 1997.

Phase 3

3 IPPs, in total 1,905MW, signed 25-year PPAs

with Taipower in September 2000.

1 IPP, with a 480MW, signed a PPA with Taipower in September 2006.

Phase 4

The government announced new bidding rules for the 4th IPP Program on June 6, 2006 in order to get additional generation capacity to meet the load demand. However, no IPP won the bid and the government is reviewing the program again.

2. Revision of the Electricity Law

After the new Legislators was elected, the Executive Yuan submitted the Draft of the Electricity Law Amendment to the Legislative Yuan on February 15, 2008 for approval. The Draft is currently under the review of Legislative Yuan.

Electricity Demand

The percentage of the population with electricity supply in Taiwan is nearly 100%. The peak load in 2007 in Taiwan was 32,791MW, and the sales of electricity was 187,075 GWh.

The sales of electricity in 2009 is estimated as follows:

Type of Customer	Sales(GWh)
Residential	42,863
Commercial	35,357
Industrial	105,653
Others	17,501
Total	201,374

PROFILE

Capital Area	Taipei 35,980 km ²	Installed Capacity	38,082MW
Population	22.60 million	Population Electrified	nearly 100%
GDP	US\$576.2 billion	Main Voltages (kV)	345, 161, 69
Currency	New Taiwan Dollar (NT\$)	Natural Resources	small deposits of coal, natural gas

Power Transmission and Distribution

(I) Range of Transmission Voltages

Taipower's transmission network is composed of three voltage levels of substations and transmission lines:

1. 345KV in the main trunk system with EHV substations and transmission lines (E/S: 345/161kV).

2. 161KV in the primary transmission system with primary and distribution substations (P/S: 161/69KV, D/S: 161/22.8/11.4KV).

3. 69KV in the secondary transmission system with secondary substations (S/S: 69/22.8/11.4KV).

The Length of the Installed Backbone Network (unit: ct-km):

Voltage	Overhead	Underground
345KV	3,668	18.7
161KV	4,578.4	1,456.7
69KV	4,976.5	1,125.5
22.8KV	0.04	9,563
11.4KV	77,348	31,981
5.7KV	517	321
Under 600V	138,029	58,923

Deregulation of the Generation Sector

(II) The Future Development of Transmission Lines and Facilities.

Taipower has implemented 5 distribution projects since 1988 for the construction of distribution lines and substations. The sixth distribution project will be implemented from 2008 to 2011.

Demand

GHG Control Strategies

To deal with the GHG issues, Taipower has formulated "GHG Control Strategies" taking into account the considerations of international and domestic conditions and the practices of

prevailing power companies.

The strategies include 13 action plans:

Supply-side management:

- Adopting the best available technology for new generation units.
- Improving the average efficiency of thermal power generation in line with the upgrading of generation units.
- Increasing the share of natural gas power.
- Increasing the share of renewable energy.

Demand-side management

- Promoting energy conservation to reduce power load.
- Improving efficiency of power transmission and distribution system.
- Improving efficiency of transmission and distribution system and reducing line loss.
- Stepping up SF6 control to cut down its emissions.

Management, supervision and verification

- Speeding up the acquisition of know-how for establishing the GHG management system.
- Establishing the environmental accounting system and publishing the Corporate Sustainable Report.

Research and development

- Developing the technologies for GHG reduction and renewable energy.

Promoting tree planting

- Continuing afforestation and environmental and beautification tasks.

Domestic/international co-operation

- Signing cooperation MOU with government agencies.
- Participating in domestic/international CO2 reduction programs.

(II) The list of generation capacity expansion plan

Project	Capacity (MW)	Operation Year
First Phase Wind Power	56	2007
Hsikou Hydro(IPP)	12	2007
Chungway Taichung Wind Power(IPP)	26	2007
Luway Changbin Wind Power(IPP)	36	2007
Yunlin Biomass(IPP)	4	2007
Second Phase Wind Power	126	2007~2008
Tatan CC #1~ #6(LNG)	2,957	2007~2008
Purchase Renewable Energy(IPP)	2,410	2007~2017
Photovoltaic System	4	2007~2017
Offshore Islets(Oil)	104	2007~2017
Kukuan Hydro Rehabilitation	33	2007
Mingchien Hydro(IPP)	17	2007
Luway Lukang Wind Power(IPP)	30	2007
Penghu Huhsi Wind Power #1~#6	5	2007
Choshui Hydro Replacement	4	2008
Third Phase Wind Power	112	2008~2009
Chumen Hydro Replacement	3	2009
Bihai Hydro	61	2009
Shibao Hydro)	74	2009
Kinman Kinsha Wind Power	4	2009
Starbuck (LNG) (IPP)	490	2009
4th Nuclear #1~#2	2*1,350	2009~2010
Fourth Phase wind Power	60	2010~2011
Wanta Hydro Extension & Sunglin Hydro	41	2011
IPP	1,980	2011
Changgong #1~#2(Coal)	2*800	2012
Shenao Rebuild #1~#2(Coal)	2*800	2012~2013
TPC Planning Renewable Energy	140	2012~2016
Linkou Rebuild #1~#3(Coal)	3*800	2012~2017

Nankou Hydro	15	2013
Chungyueh Hydro	28	2014
Talin Rebuild #1(Coal)	800	2014
Tungshiao CC New #1~#4(LNG)	4*720	2014~2015
Meiyuan Hydro	27	2015
Hsinta CC #6(LNG)	720	2015
Taichung #11~#12(Coal)	2*800	2015~2016
Tatan CC #7~#8(LNG)	2*720	2015~2016
Chingchang & Wenlan Hydro	20	2016
Chuoqing Hydro	37	2016
Hsinta New #1~#2(Coal)	2*800	2017

(iii) The newly added generation project in 2007 is Tatan LNG-fired combined cycle #3 & #4, 1,449 MW

(iv) Generation Capacity by Fuel Types

Item		Installed Capacity (MW)
Pumped Storage Hydro		2,602
Thermal	Oil-fired	3,610
	Coal-fired	11,897
	LNG-fired	12,726
	Subtotal	28,233
Nuclear		5,144
Renewables	Conventional Hydro	1,921
	Wind	182
	Subtotal	2,103
Total Installed Capacity		38,082

Item	Current (April 2007)	Year 2008 (Planned)
EHV(345/161KV)	20	+2
Primary(161/69KV)	46	+1
Primary distribution(161/22.8/ 11.4KV)	179	+22
Secondary(69/11.4KV)	312	-5

The forecast of installed capacity and its mix-up up to 2016

Type Year	Hydro		Renewables			Nuclear		Coal		Oil		LNG		Total
	MW	%	Hydro (MW)	%	Others (MW)	MW	%	MW	%	MW	%	MW	%	MW
2007	2,602	6.8	1,921	5.0	182	5,144	13.5	11,897	31.2	3,610	9.5	12,726	33.4	38,082
2008	2,602	6.6	1,973	5.0	425	5,144	13.0	11,897	30.0	3,606	9.1	13,958	35.2	39,605
2009	2,602	6.2	1,976	4.7	439	6,494	15.5	11,897	28.4	3,344	8.0	15,173	36.2	41,924
2010	2,602	5.8	1,976	4.4	2,297	7,844	17.4	11,897	26.3	3,349	7.4	15,173	33.6	45,138
2011	2,602	5.5	2,037	4.3	2,476	7,844	16.5	12,497	26.4	3,390	7.2	16,553	34.9	47,399
2012	2,602	5.5	2,077	4.4	2,701	7,844	15.8	12,297	26.2	3,386	7.1	16,553	34.7	47,660
2013	2,602	5.2	2,077	4.2	2,871	7,844	14.9	14,297	28.8	3,389	6.8	16,553	33.4	49,633
2014	2,602	4.9	2,077	3.9	3,051	7,844	14.3	16,897	32.1	2,641	5.0	17,493	33.3	52,606
2015	2,602	4.7	2,083	3.8	3,241	7,844	13.8	16,897	30.7	2,641	4.8	19,653	35.8	54,962
2016	2,602	4.6	2,085	3.7	3,412	7,844	13.8	18,497	32.6	2,641	4.7	19,609	34.6	56,690

(II) Length of the installed backbone network

Voltage	Overhead	Underground
345KV	3,590	12
161KV)	4,601	1,308
69KV)	4,973	1,060
22.8KV	0.1	8,998
11.4KV	76,811	30,869
5.7KV	201	315
Under 600V	137,389	57,203

Greenhouse Gases Control Strategies and Action Plans

Control Strategy	Action Plan
Supply-side management	<ul style="list-style-type: none"> • Adopting the best available technology for new generation units. • Improving the average efficiency of thermal power generation in line with the upgrade of generation units. • Increasing the share of natural gas power. • Increasing the share of renewable energy.
Demand-side management	<ul style="list-style-type: none"> • Promoting energy conservation to reduce power load.
Improving efficiency of power transmission and distribution system	<ul style="list-style-type: none"> • Improving efficiency of transmission and distribution system and reducing line loss. • Stepping up SF6 control to cut down its emissions.
Management, supervision and verification	<ul style="list-style-type: none"> • Speeding up the acquisition of know-how for establishing the GHG management system. • Establishing an environmental accounting system.
Research and development	<ul style="list-style-type: none"> • Developing the technologies for GHG reduction and renewable energy.
Promoting tree planting	<ul style="list-style-type: none"> • Continuing environmental greenification and beautification tasks.
Domestic/international cooperation	<ul style="list-style-type: none"> • Signing cooperation MOU with government agencies. • Participating in domestic/international CO2 reduction programs.