



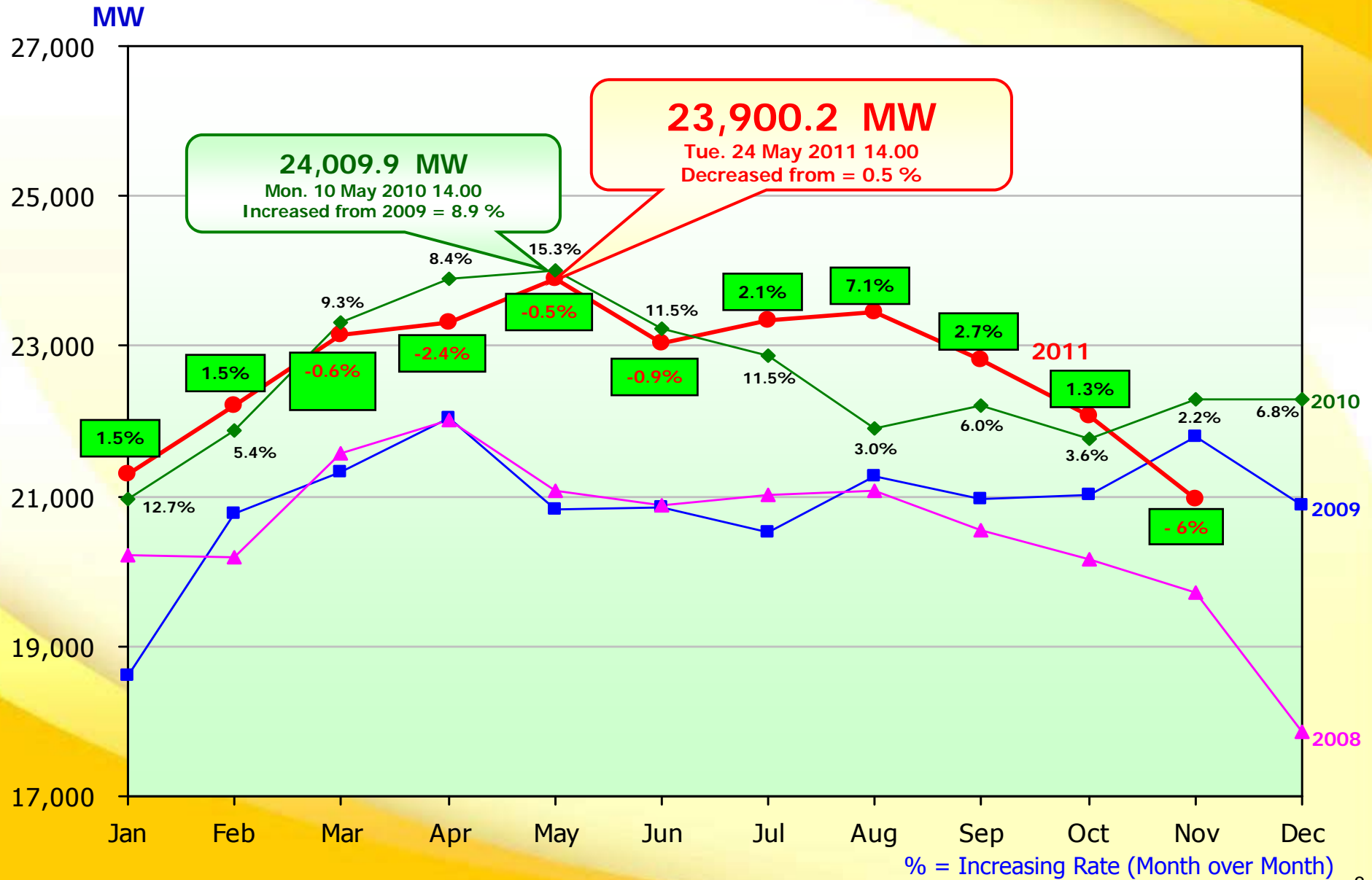
Thailand Power Development Plan (PDP2010) and Perspective

Dr. Suthep Chimklai
Assistant Governor - Planning
Electricity Generating Authority of Thailand

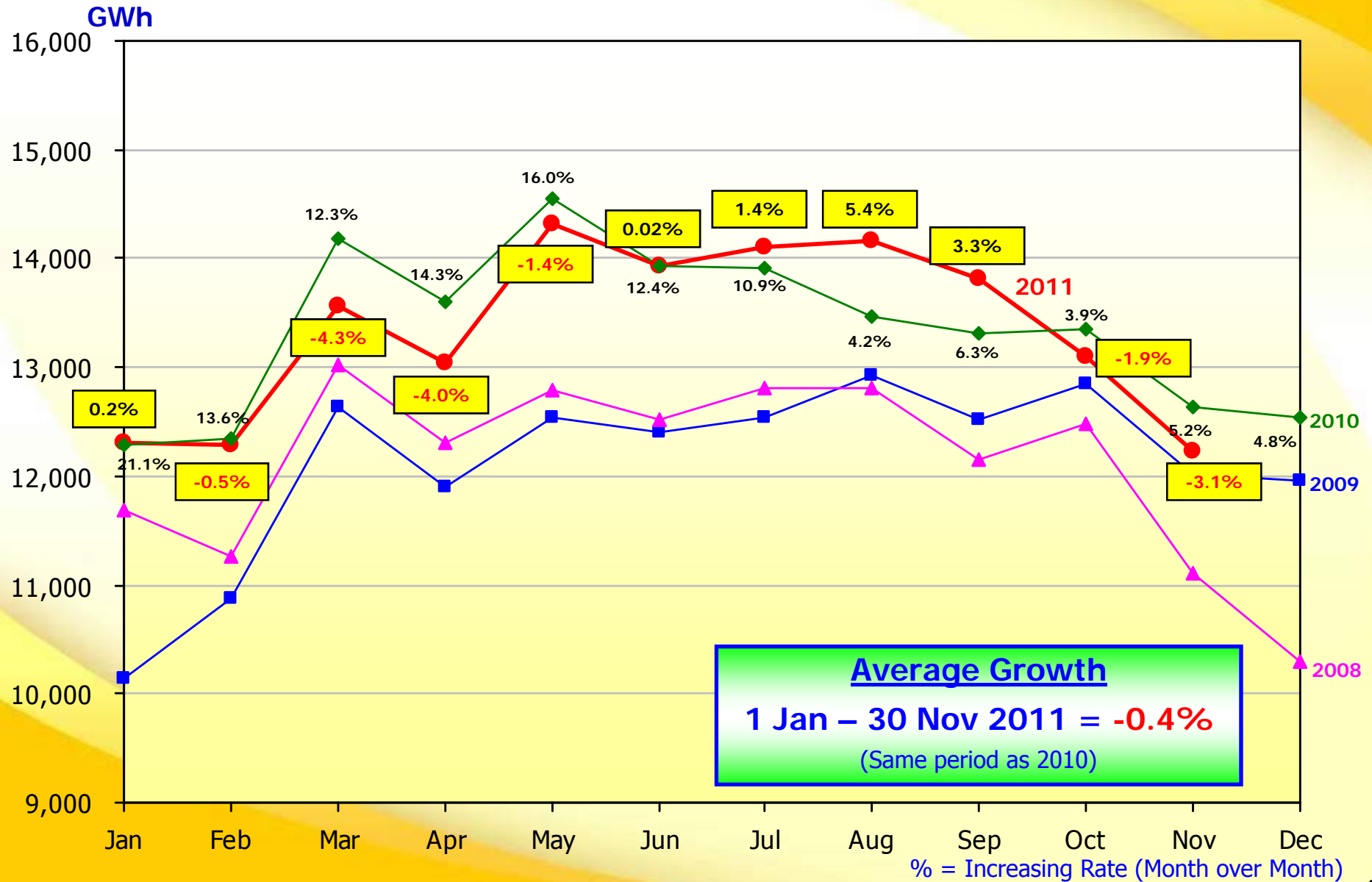
French-Thai Electricity Forum, French Embassy in Thailand
Swissotel Le Concorde Hotel
15 February 2012

Current Status

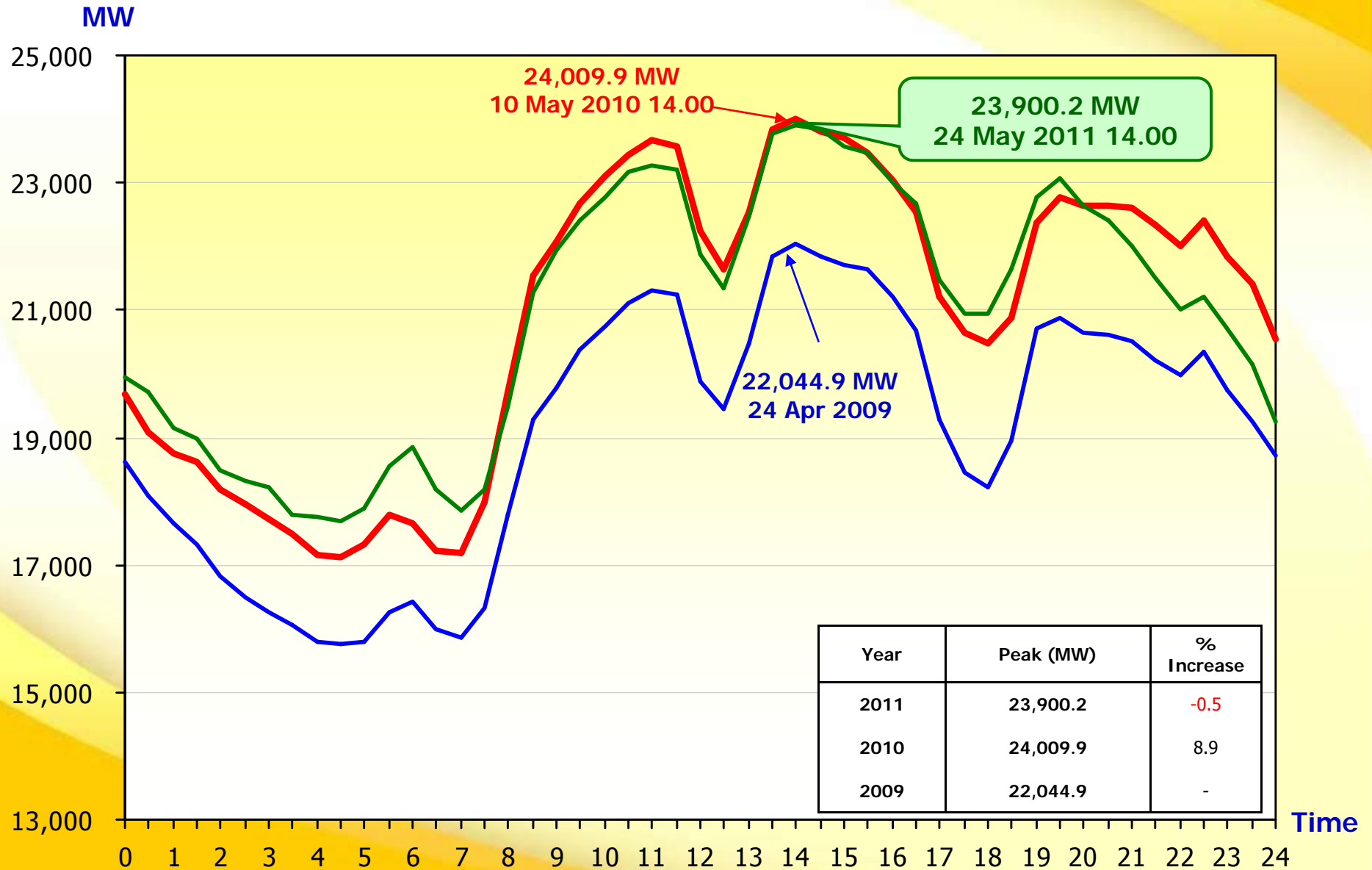
Monthly Statistics of EGAT's System (Net Peak Generation)



Monthly Statistics of EGAT's System (Net Energy Generation)



Hourly Net Generation (EGAT's Peak Day)

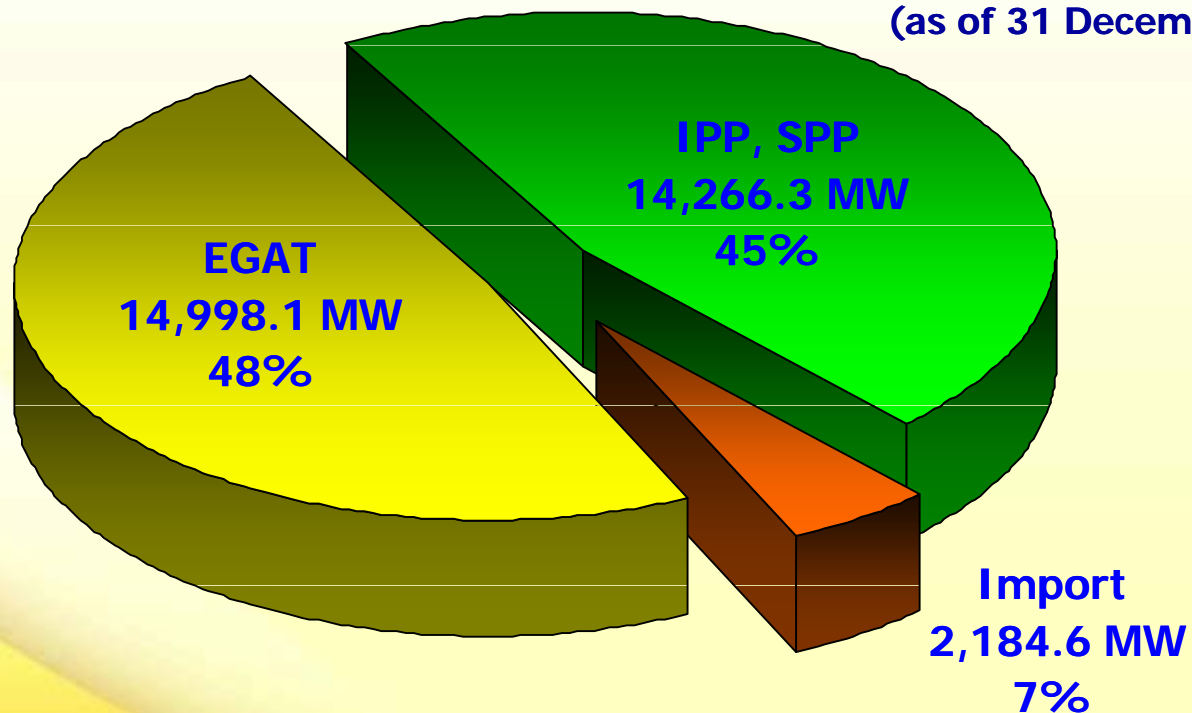


Generating Capacity

(classified by producer)

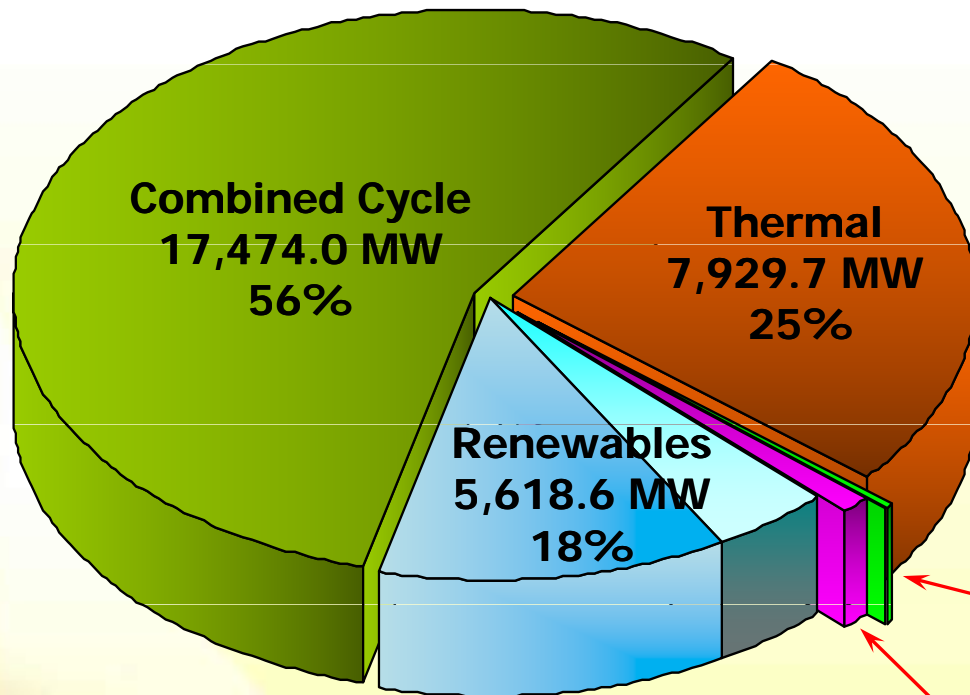
Peak Demand **23,900.2 MW**
(24 May 2011)

Total Contract Capacity **31,446.7 MW**
(as of 31 December 2011)



Generating Capacity

(classified by power plant type)



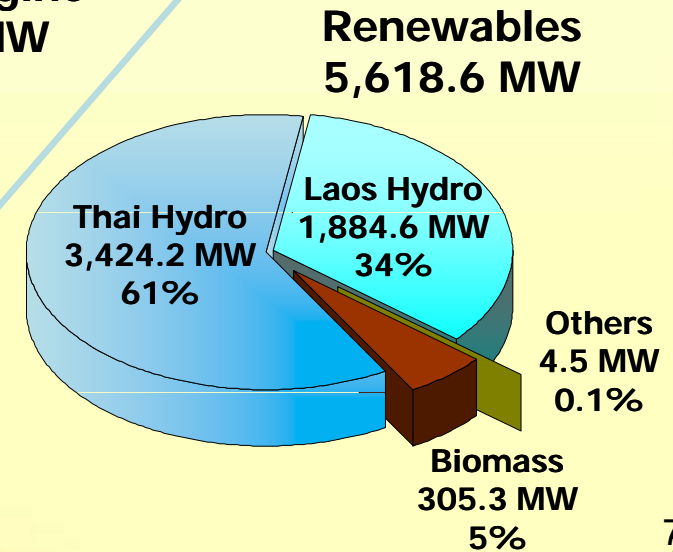
Peak Demand 23,900.2 MW
(24 May 2011)

Total Contract Capacity 31,446.7 MW
(as of 31 December 2011)

Domestic	3,734.0 MW	(12%)
Lao PDR	1,884.6 MW	(6%)

EGAT-TNB
300.0 MW
1.0%

Gas Turbine & Diesel Engine
124.4 MW
0.3%



Generation Mix 2011

Net Generation & Purchase 158,851* GWh

Note * Preliminary Figure



Renewables 13%
Domestic 6%
Lao PDR 7%



Imported Coal 8%



Fuel Oil 1%



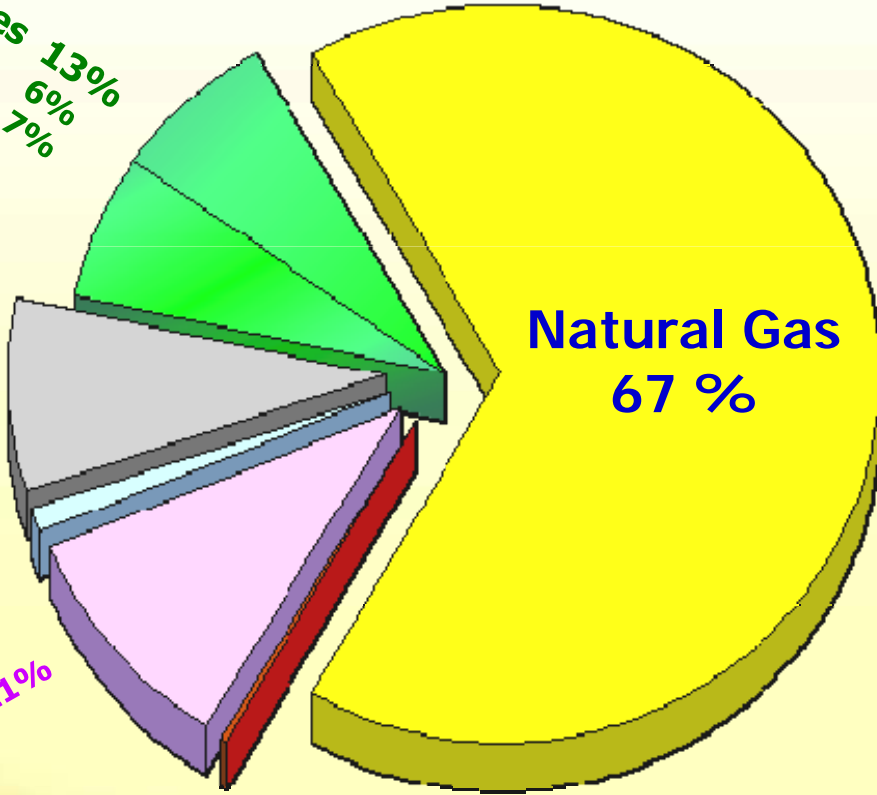
Lignite 11%



Malaysia 0.1%

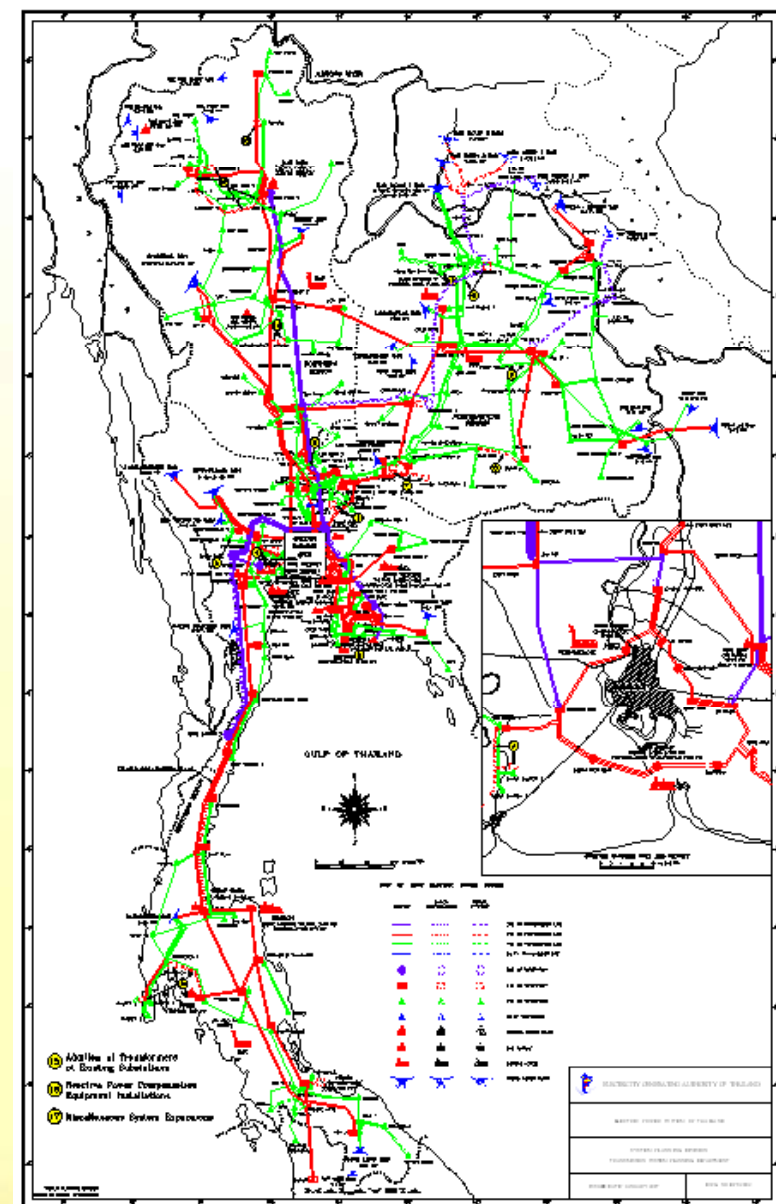


Diesel 0.02%



EGAT Transmission System (As of 31 December 2011)

- Substations: **210**
- Transformers: **83,430 MVA**
- Length: **30,518 Circuit-kilometers**



Thailand Power Development Plan (PDP2010)

Major Assumptions

Load Forecast

- In accordance with current situation

System Reliability

- Reserve Margin : 15%
- Fuel diversification to reduce dependence on natural gas

Power Import from Neighboring Countries

- Only projects with signed MOU

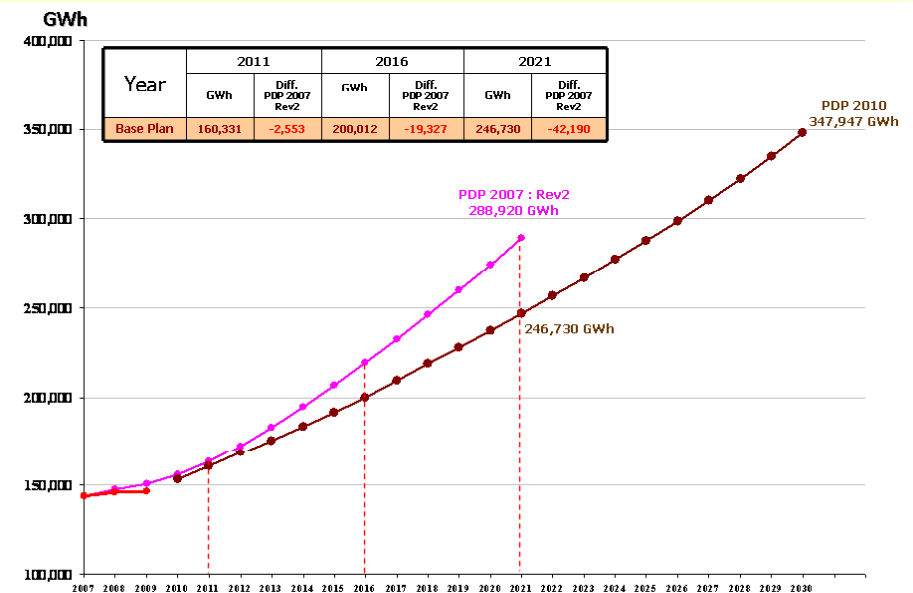
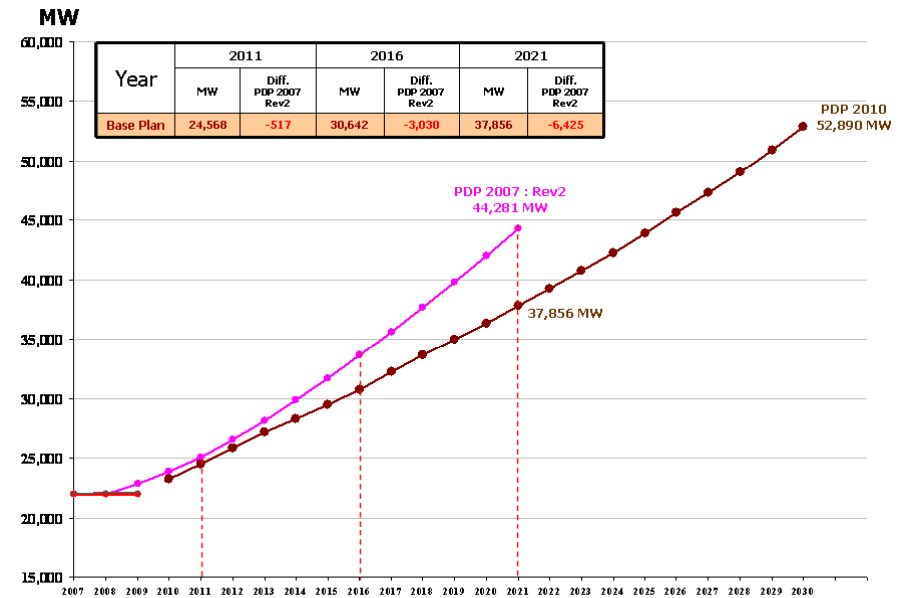
Clean Energy and Efficient Utilization

- Demand Side Management (DSM)
- Power generation from Renewable Energy
- Power generation with Cogeneration system
- Greenhouse Gas Emission Reduction

Load Forecast

Year	Peak			Energy			Load Factor
	MW	Increase		GWh	Increase		
		MW	%		GWh	%	
Actual : NET Generation							
2009	22,315.35	78.39	0.35	146,182.00	365.50	0.25	74.78
Forecast : NET Generation							
2010	23,249	934	4.18	152,954	6,772	4.63	75.10
2011	24,568	1,319	5.67	160,331	7,377	4.82	74.50
2012	25,913	1,345	5.47	168,049	7,718	4.81	74.03
2013	27,188	1,275	4.92	175,631	7,582	4.51	73.74
2014	28,341	1,153	4.24	183,452	7,821	4.45	73.89
2015	29,463	1,122	3.96	191,224	7,772	4.24	74.09
2016	30,754	1,291	4.38	200,012	8,788	4.60	74.24
2017	32,225	1,471	4.78	209,329	9,317	4.66	74.15
2018	33,688	1,463	4.54	218,820	9,491	4.53	74.15
2019	34,988	1,300	3.86	227,599	8,779	4.01	74.26
2020	36,336	1,348	3.85	236,956	9,357	4.11	74.44
2021	37,856	1,520	4.18	246,730	9,774	4.12	74.40
2022	39,308	1,452	3.84	256,483	9,753	3.95	74.49
2023	40,781	1,473	3.75	266,488	10,005	3.90	74.60
2024	42,236	1,455	3.57	276,805	10,317	3.87	74.81
2025	43,962	1,726	4.09	287,589	10,784	3.90	74.68
2026	45,621	1,659	3.77	298,779	11,190	3.89	74.76
2027	47,344	1,723	3.78	310,387	11,608	3.89	74.84
2028	49,039	1,695	3.58	322,427	12,040	3.88	75.06
2029	50,959	1,920	3.92	334,921	12,494	3.87	75.03
2030	52,890	1,931	3.79	347,947	13,026	3.89	75.10

Source: Thailand Load Forecast Sub-Committee, February 2000



Demand Side Management

- Appliance Efficiency: Label No.5 appliances, T8/T5 fluorescent tubes, etc.

Renewable Energy Development Plan

- Owned by EGAT, SPP, VSPP
- Including Solar, Wind, Biomass, Biogas, MSW, Small Hydro

Power Purchase from SPP Cogeneration

Summary

Unit : MW

Contracted Capacity

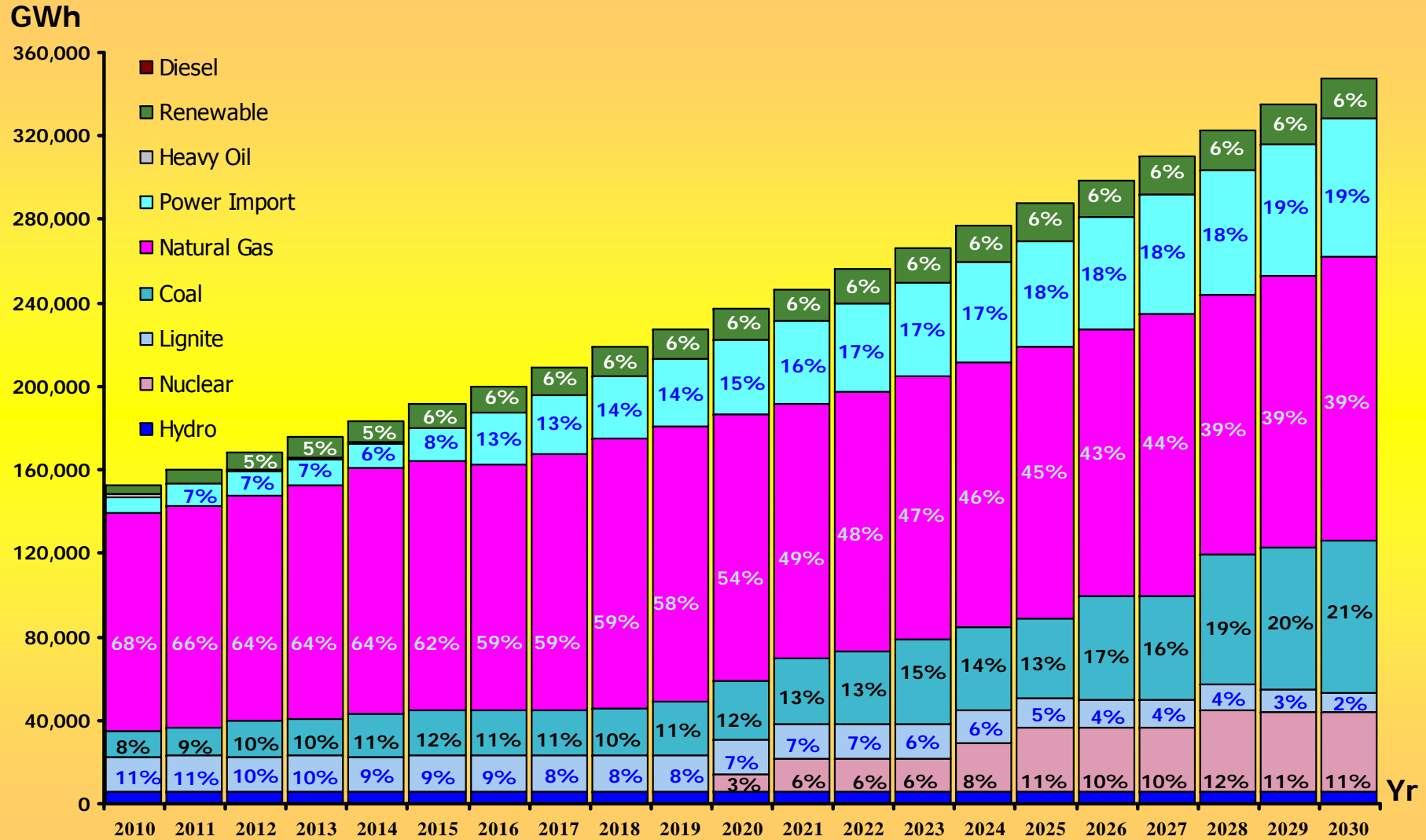
PDP2010

As of 2009	29,213
Added Capacity	54,005
Retired Capacity	- 17,671
Grand Total Capacity (2030)	<u>65,547</u>

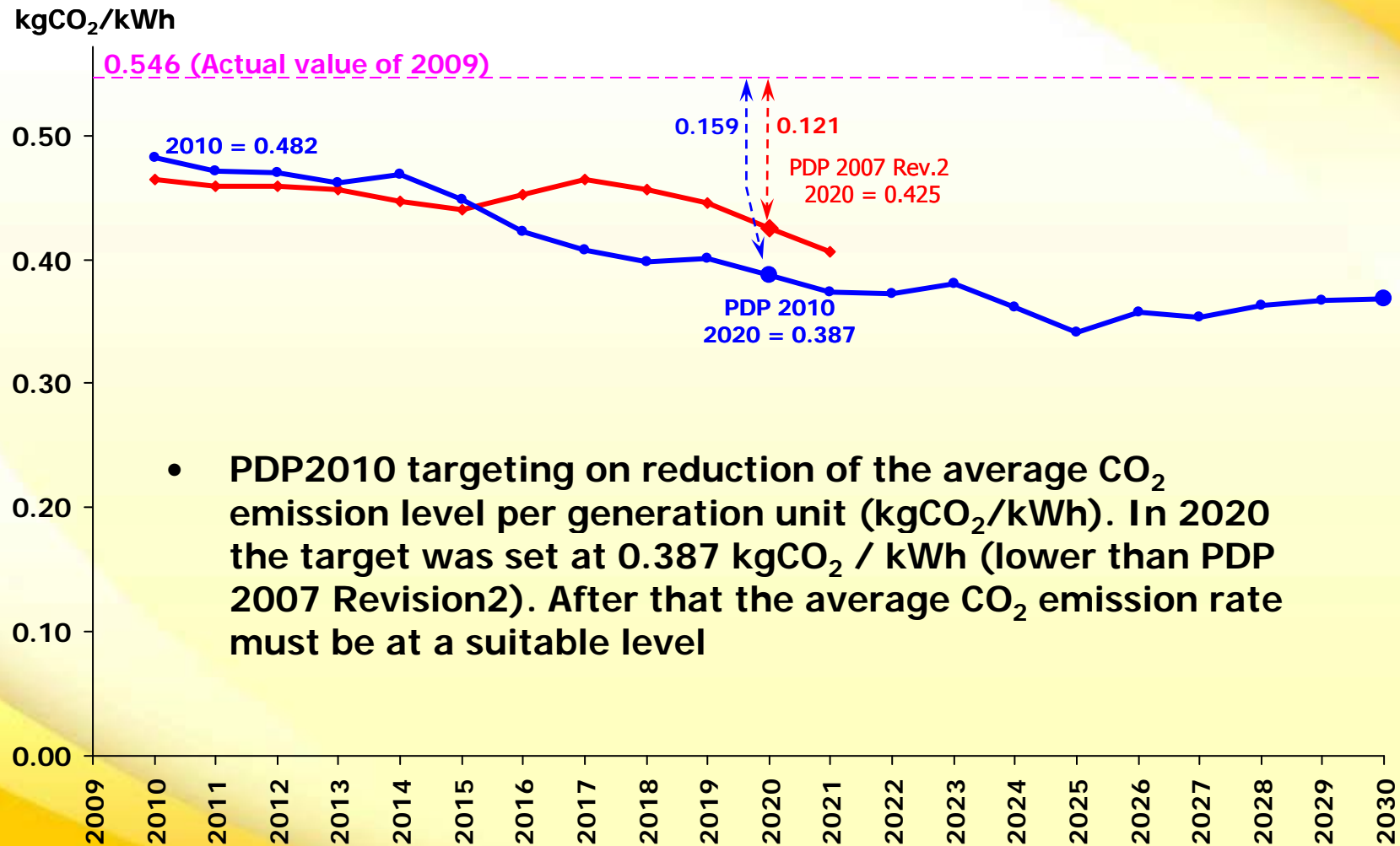
Grand Total Capacity (2010-2030)

- Nuclear Power Plant	5,000
- Combined Cycle Power Plant	16,670
- Coal Fired Power Plant	8,400
- Hydro Power Plant	512
- Co Generation	7,137
- Renewable (SPP, VSPP, EGAT)	4,617
- Purchase from Neighbouring Countries	11,669

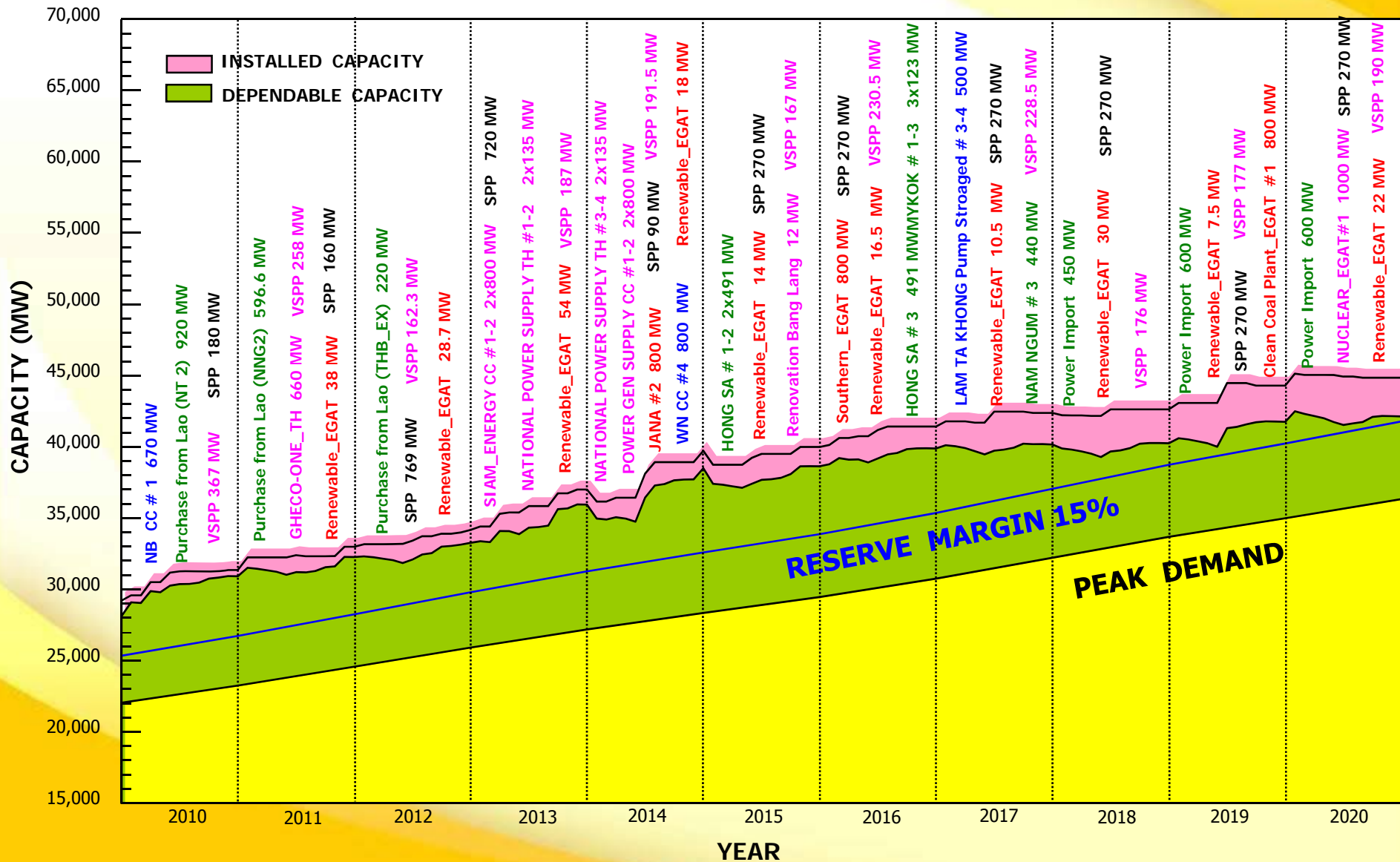
Energy Generation by Fuel Type



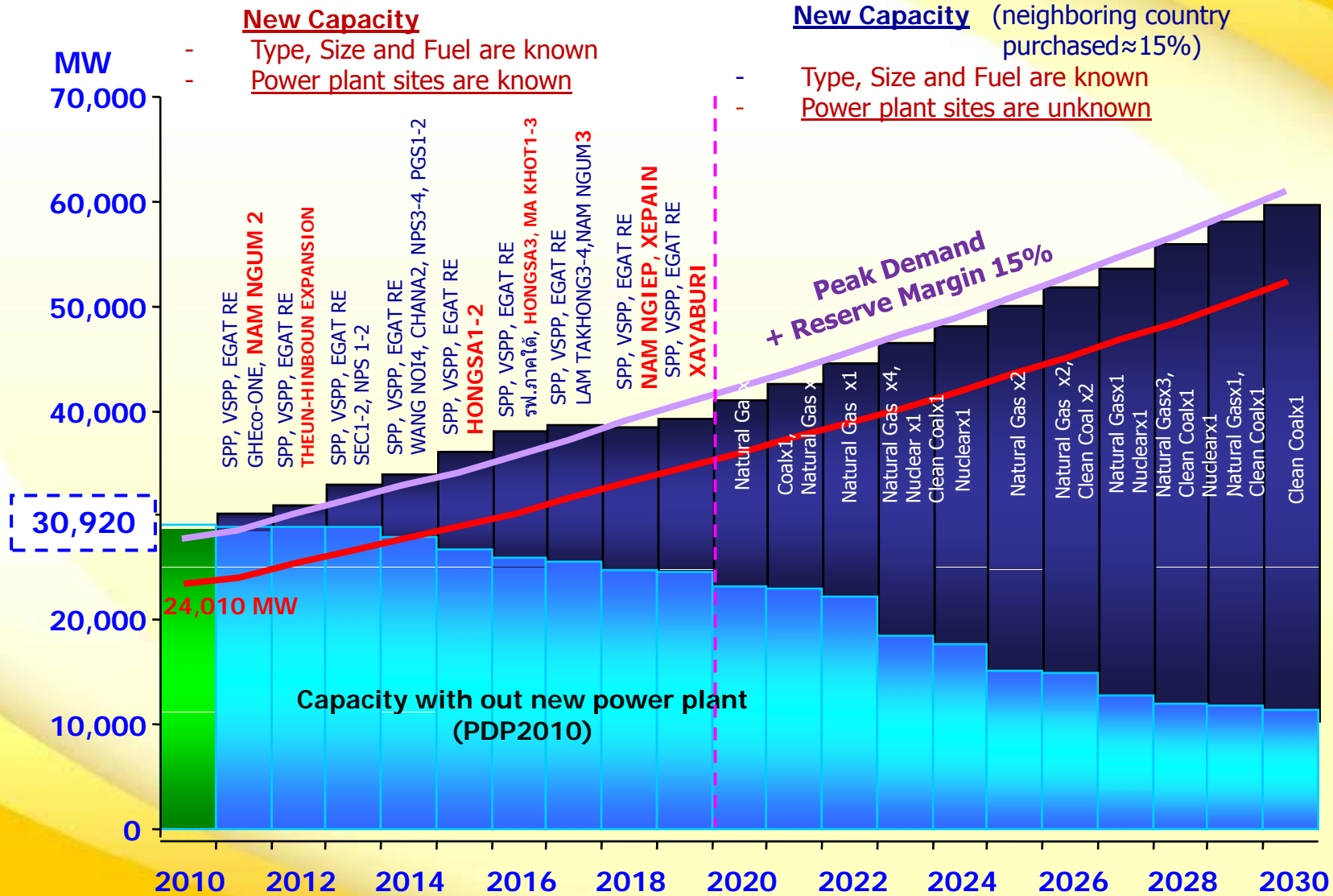
Mitigation of Greenhouse Gas



Power Development Plan (2010-2020)



PDP Chart : PDP2010 (NEPC 27 APRIL 2011)



Development of PDP2010

PDP2010

- ❑ Approved by the NEPC: 12 March 2010
- ❑ Endorsed by the Cabinet: 23 March 2010

PDP2010 : Revised for Short-Term

(PDP2010 Rev.1)

- ❑ Approved by the NEPC: 25 November 2010
- ❑ Endorsed by the Cabinet: 30 November 2010

PDP2010 : Postpone Nuclear Power Project for 3 Years

(PDP2010 Rev.2)

- ❑ Approved by the NEPC: 27 April 2011
- ❑ Endorsed by the Cabinet: 3 May 2011

Problems

1. Peak Demand of the year 2010 was higher than the forecast value.
2. Postponement of IPPs
3. Thus, RM of the year 2013 will be lower than standard.
4. Unreadiness of NPP projects: legislation, regulatory and stakeholders' involvement
5. Impacts from Fukushima Incident

Solutions

1. Expedite EGAT power projects (Wangnoi#4, Chana#2, North Bangkok#2)
2. Increase power purchase from SPP to 3,500 MW
3. Delay NPP projects by 3 years

EGAT's Projects

Projects Under Construction:

- | | | |
|--|-----|----|
| 1. Wang Noi #4 Combined Cycle Power Plants | 800 | MW |
| 2. Chana #2 Combined Cycle Power Plants | 800 | MW |

Projects On Request for Approval:

- | | | |
|---|-----|----|
| 1. North Bangkok #2 Combined Cycle Power Plants | 800 | MW |
|---|-----|----|

Projects Under EGAT Process:

- | | | |
|---|-------|----|
| 1. Lam Takong Pumped Storage | 2x250 | MW |
| 2. Mae Moh Power Plant #4-7 (Replaced) | 600 | MW |
| 3. Coal-Fired Power Plants #1 (Clean Coal Technology) | 800 | MW |
| 4. Nuclear Power Plant#1 | 1,000 | MW |

EGAT's RE Projects (1)

(As of January 2012)

EGAT's existing renewables capacity 534.626 MW comprising

- Pumped Storage 500.000 MW
- Small Hydro 30.080 MW
- Solar Energy 1.554 MW
- Wind Energy 2.692 MW
- Geothermal 0.300 MW



Fang
0.300 MW



Chao Phraya Dam
12.0 MW



Phromthep Peninsular WT
0.192 MW



Lam Takong WT
2.500 MW



Siridhorn Dam
1.0 MW



Lam Takong Pumped Storage
500 MW



Phromthep Peninsular WT
0.008 MW



San Kamphang
0.014 MW



Pha Bong
0.500 MW



Klong Chongklam
0.020MW

The up-coming EGAT's RE projects 2,402.80 MW (2012 - 2030) comprising

- Pumped Storage 1,960.00 MW
- Small Hydro 187.05 MW
- Solar Energy 46.00 MW
- Wind Energy 191.00 MW
- Municipal Solid Waste 18.75 MW



Tabsakae
5.0 MW



Lam Takong PS
500 MW



Lam Takong WT
18.0 MW



Naresuan Dam
8.0 MW



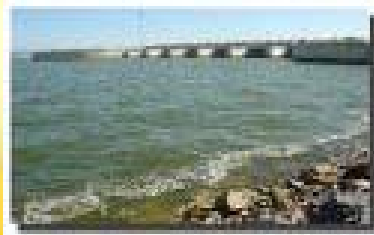
Kwae Noi Dam
30.0 MW



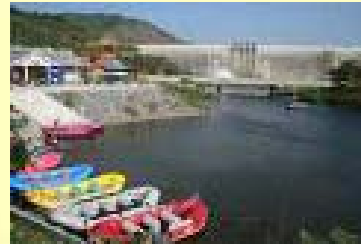
Chulabhorn PS
800 MW



RawaiWT
1.5 MW



Pasak Cholasith Dam
6.7 MW



Khundan Prakarnchol Dam
10.0 MW



Mae Klong Dam
12.0 MW



Khiridharn PS
660 MW

Perspective on the New/Revised PDP

Load Forecast

- ✓ Load forecast was done by the Load Forecast Working Group on new load forecast model and long-term Thailand GDP projected by the NESDB.
- ✓ As of today, the new load forecast is being carried out by the Thailand Load Forecast Subcommittee (TLFS).

Energy Efficiency Plan (2011- 2030)

- ✓ Revised 20-years Energy Efficiency Plan of the EPPO approved by the NEPC on 30 Nov. 2011 was incorporated.

Alternative Energy Development Plan (AEDP) 2012-2021

- ✓ New 10-years AEDP (2012-2021) of the DEDE approved by the NEPC on 30 Nov. 2011 was incorporated.

Clean Energy and Efficient Utilization

- ✓ Greener PDP (Greenhouse Gas Emission – CO₂ Reduction)
- ✓ Energy Efficiency Promotion
- ✓ Power Generation from Renewable Energy

Fuel Diversification

- ✓ Coal-fired power plants and Nuclear power plants
- ✓ Power import from neighboring countries with proper share



EGAT

Power for Thai Happiness

www.egat.co.th