

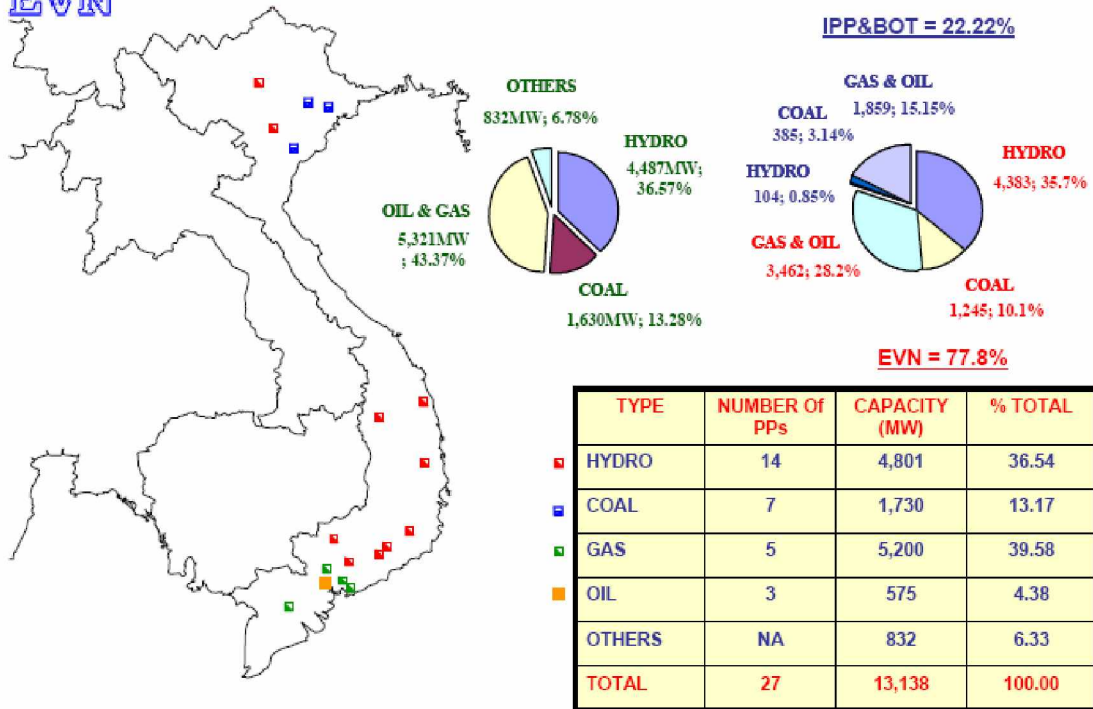
Hydroelectric Power in Vietnam

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GENERATION CAPACITY (12/2007)



Existing situation of power demand and power generation as per data collected in 2005 and 2006 with prospect to 2015:

ELECTRICITY PRODUCTION AND GENERATION

Year	2005	2006	2010	2015
Electricity production (Billion kwh)	53.50	60.60	124.00	257.00
Electricity sale (Billion kwh)	45.60	51.50	107.00	223.00
Total capacity of PP (MW)	11,286	11,837	26.000/27.000	60.000/70.000
Hydro PP (MW)	4,198	4,749	10,211	19,874
Percentage of hydropower in Total PP	37%	40%	38-40%	28-33%

Sources: Luong van Dai, EVN



Dai_Ninh Hydropower Plant in the Southern part of Central Vietnam, 300 MW

On the other hand, some information on electricity demands up to 2020 are given on EVN website but these values probably estimated before the issue of the last Master Plan VI and seem pessimistic compared to the production forecast by this Plan. To be in compliance with the Master Plan, we propose these following provisional figures calculated from the known figures of 2005 and with a growth rate of 17% /year as per the low assumption of the Plan:

Electricity demands (Billion kWh)	Power sales	E demands (source EVN)	E demands Growth 17% from 2005 figure	E produced (source LVD)	E commercial (source LVD)
Known figures 2005	44.9	47	47	53.5	45.6
2010		70	103	124	107
2015		110	226	257	223
2020		170			

Evolution of power generation can be estimated in details according to the Master Plan VI issued on July 18th 2007 by the Prime Minister of the Government, with mainly two alternatives in electricity needs growth rates of 17% (assumption low) and 20% (high assumption). An assumption of 22% was also considered in the Master Plan for exceptional circumstance but not specified in the said document.

Extracts of the calculation tables are given as follows:

MASTER PLAN VI (Assumption Hight)

MW	Additional Capacity/year as per Master Plan VI	Total Power	Additional Hydel Capacity/year as per Master Plan VI	Total Hydel Capacity	%Hydel in Total Power
Existing to 2005		11,286		4,198	37.2%
2006	861		551		
2007	2,096		746		
2008	3,271		1,551		
2009	3,393		1,239		
2010	6,160	27,067	2,190	10,475	38.7%
2011	6,001		1,901		
2012	7,154		2,754		
2013	8,309		1,759		
2014	10,977		2,227		
2015	10,922	70,430	1,022	20,138	28.6%
2016	10,067		767		
2017	12,025		625		
2018	12,150				
2019	13,782		1,582		
2020	14,250	132,704	1,300	24,412	18.4%
2021	15,500		1,500		
2022	16,450		1,450		
2023	17,850		850		
2024	18,450		1,450		
2025	18,150	219,104	1,150	30,812	14.1%
Total		219,104			



Yaly Hydropower Plant in the Western Highland of Central Vietnam, 720 MW

MASTER PLAN VI (Assumption Low)

MW	Additional Capacity/year as per Master Plan VI	Total Power	Additional Hydel Capacity/year as per Master Plan VI	Total Hydel Capacity	%Hydel in Total Power
Existing to 2005		11,286		4,198	37.2%
2006	861		551		
2007	2,096		746		
2008	3,271		1,551		
2009	3,393		1,239		
2010	4,960	25,867	2,190	10,475	40.5%
2011	5,401		2,201		
2012	6,554		2,754		
2013	7,309		1,759		
2014	7,177		1,752		
2015	7,722	60,030	1,022	19,963	33.3%
2016	9,317		767		
2017	10,025		625		
2018	10,150		0		
2019	10,982		1,582		
2020	11,250	111,754	1,300	24,237	21.7%
2021	11,700		1,500		
2022	12,650		1,450		
2023	13,850		850		
2024	15,450		1,450		
2025	16,150	181,554	1,150	30,637	16.9%
Total		181,554			

Comments:

1/Figures of 2005 are given by a document from M Luong Van Dai.

2/ It is sometimes not clear that Small Powers Plants and IPP are hydroelectric or not

3/Pumped storage power projects are accounted as hydroelectric.

4/These figures are given to initialize a discussion and need to be checked further with different sources.