APPENDIX 10-4-2

Handout of the third workshop

THE 3rd WORKSHOP
ON THE MASTER PLAN STUDY
ON
PUMPED STORAGE POWER PROJECT AND OPTIMIZATION FOR PEAKING POWER GENERATION

Venue: Fuji A, 2nd floor, Hotel NIKKO HANOI

25 February, Wednesday

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Objectives of the JICA Study

1. Optimization of Peaking Power Sources Development
2. Formulation of Master Plan of Peaking Power Sources
3. Contribution to Balancing of Electricity Demand and Supply in Vietnam

2

Particular conditions in Vietnam

1. Slender geography
2. Rapid increase in demand
3. Demand profile changes
4. Fluctuation of supply capability
5. Energy security

3

(1) Slender geography

Regional differences

- Demand scale and profiles
- Power sources composition

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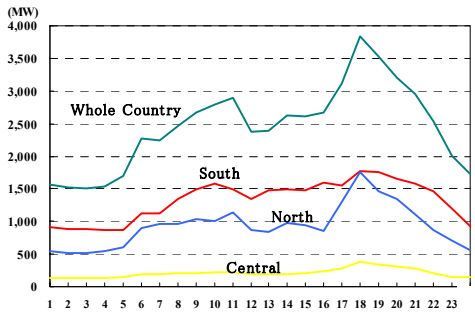
Demand scale and profiles



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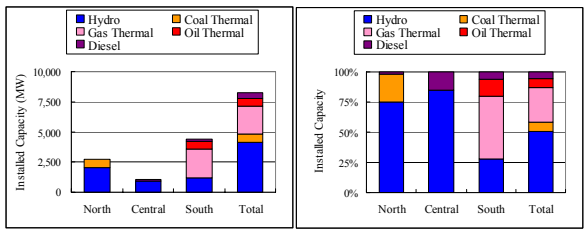
Power sources composition



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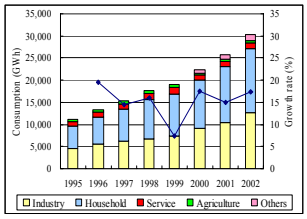
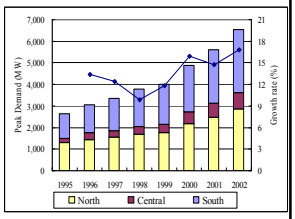
(2) Rapid increase in demand



Energy Consumption



Peak Demand

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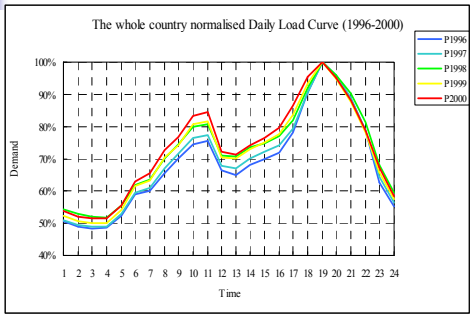
(3) Demand profile changes



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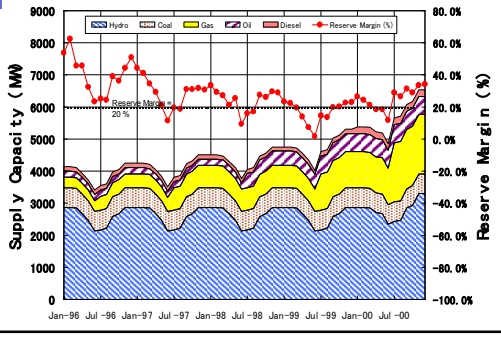
(4) Fluctuation of supply capability



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(5) Energy security

	Potential (upper:measured) (lower:inferred)	Exploitation Volume (2000-2020)	Residual Quantity	Exploitable years after 2020
Coal (mil. tons)	4,500	435	4,075	≧100
	10,000		9,575	≧200
Gas (bil. m^3)	330	162	168	≦ 10
	617		455	≦ 30

Based on the each primary energy reserve potential and exploitation plan

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Contents of Presentation

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25 February, Wednesday

[1] Demand Analysis & Forecasts

Japan International Cooperation Agency (JICA)

Study Components

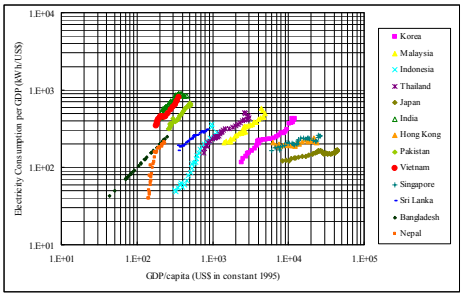
Part I : Confirmation of existing forecasts

Part II : Forecasts of daily demand profile

Part I

Confirmation of existing forecasts

Statistics of neighboring countries



Process of analysis

1. Identification of regression function
2. Calculation of GDP/capita based on GDP and population forecasts
3. Estimation of EI by regression function
4. Calculation of Consumption (EI x GDP)
5. Comparison with existing forecasts

Methodology

- Time trend analysis with quadratic function

$$e = \alpha + \beta y + \chi y^2 \quad (+\lambda_1 D_1 + \lambda_2 D_2 + ... + \lambda_{n-1} D_{n-1})$$

e = log of electricity per $ of GDP
Electricity Intensity (EI)
y = the log of GDP per capita
Di = the dummy variable for country i
n = the number of countries considered

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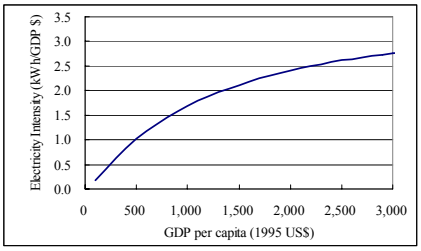
Results: Regression Function

$e = -0.368\ y^2 + 2.83\ y - 1.95$



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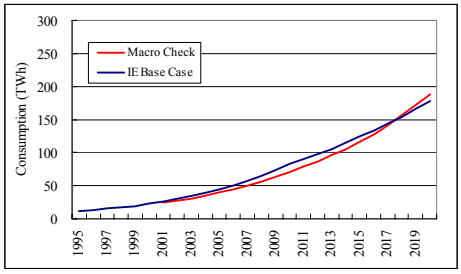
Macro-check: Base Case



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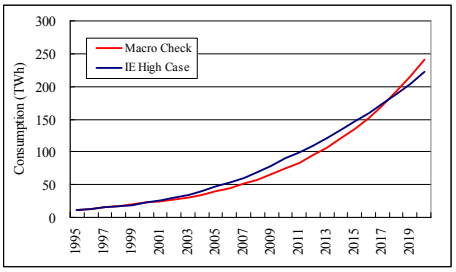
Macro-check: High Case



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Part II

Forecasts of daily demand profile

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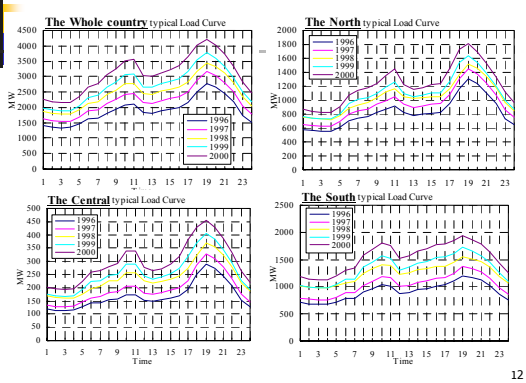
Demand profile: Past changes (1/2)



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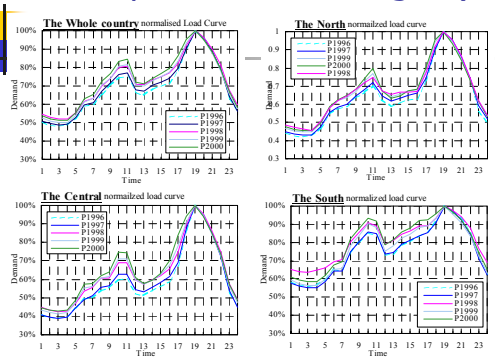
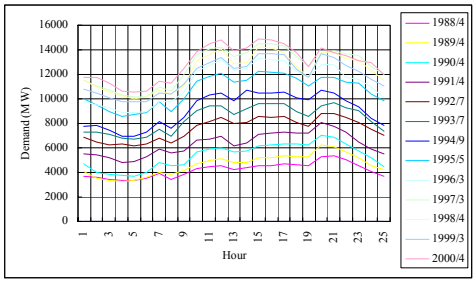
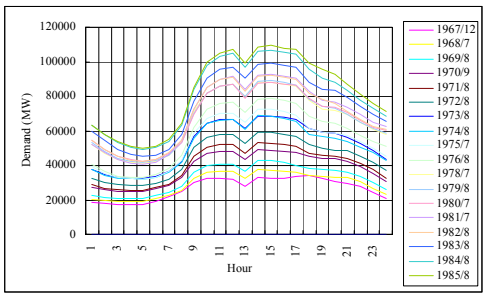
Demand profile: Past changes (2/2)



Demand profile: Thailand



Demand profile: Japan



Forecast methodology

- Hourly Demand
  - Regional (96-02)
  - Thailand (88-00)
  - Japan (67-85)
- Explanatory var.
  - Econometric index
  - Climate data
  - Electrification rate

Regression analysis

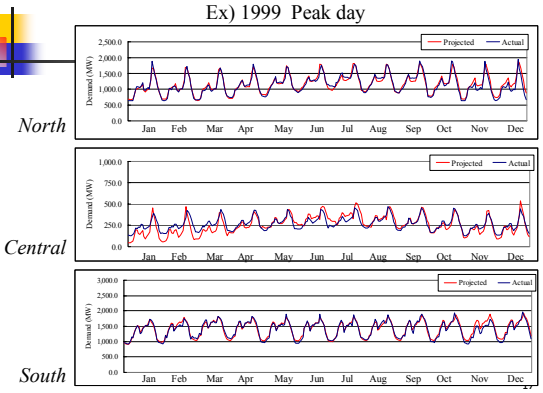
- Regression function
  Hourly, Regional, Typical (peak, weekday, holiday)

Forecast of explanatory variables

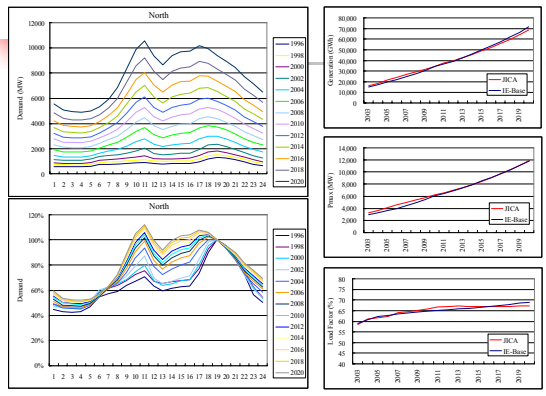
- Forecast of demand profile
  Hourly, Regional, Typical (peak, weekday, holiday)

Results: Regression analysis

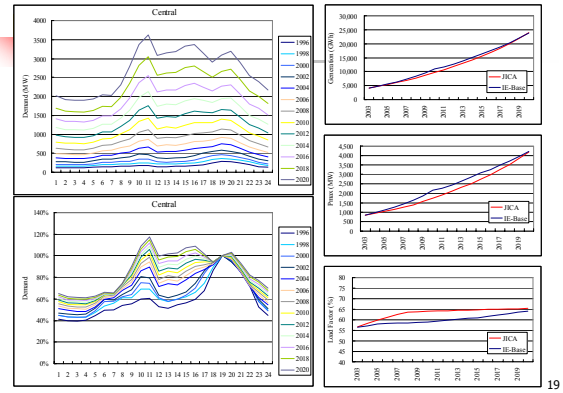
Ex) 1999 Peak day



Forecast results: North Region



Forecast results: Central Region



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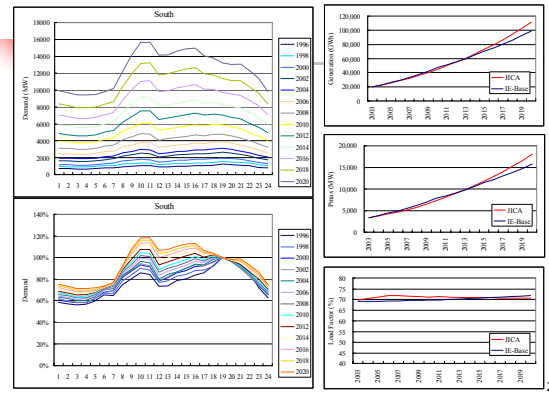
Forecast results: South Region



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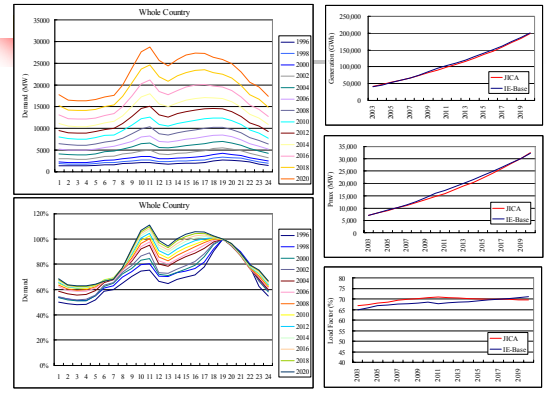
Forecast results: Whole Country



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Thank you for your attention.

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