

## [8] Environmental considerations

Japan International Cooperation Agency (JICA)

## Contents

1. Outline of environmental considerations
2. PSPP: What have we been doing?
3. Results
4. What do we need to do in the next stage?
5. Recommendations

## 1. Outline of environmental considerations

- What are environments?
- Why environmental considerations?
- Environmental considerations on power development

## What are environments?

- Social environment
  - Ethnic minorities
  - Land utilization
  - Water utilization
- Natural environment
  - Ecosystem (protected areas)
  - Species

## What are environments? Ethnic minorities



## What are environments? Land utilization



## What are environments? Ecosystem



## Why environmental considerations? (1/2)

- Development may cause significant negative impacts on social and natural environments.



- These impacts should be avoided and mitigated as much as possible.

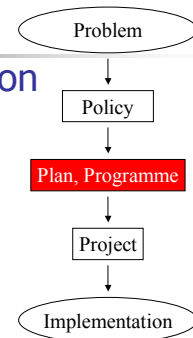
## Why environmental considerations? (2/2)

- Through environmental considerations,

Valuable resources can be saved.

- Human resources
- Natural resources
- Financial resources
- Time

## Environmental considerations on power development (1/4)



## Environmental considerations on power development (2/4)

	Effects	
	Social Environment	Natural environment
<b>Global effects</b>	<ul style="list-style-type: none"> <li>Emission of CO<sub>2</sub></li> </ul>	<ul style="list-style-type: none"> <li>Extinction of species</li> <li>Loss of terrestrial and aquatic ecosystems</li> </ul>
<b>Local effects</b>	<ul style="list-style-type: none"> <li>Involuntary resettlement</li> <li>Effects on fisheries caused by cooling water and warm discharged water</li> <li>Emission of Sox, Nox</li> <li>Disposal of coal ash (Coal-fired thermal power generation)</li> </ul>	<ul style="list-style-type: none"> <li>Submersion of terrestrial ecosystems</li> <li>Disruption of aquatic ecosystems</li> </ul>

## Environmental considerations on power development (3/4)

Local Negative Impacts

### LARGE

Hydropower (large scale) >  
hydropower (medium – small) = PSPP  
> coal-fired thermal > gas-fired thermal

### SMALL

## Environmental considerations on power development (4/4)

CO<sub>2</sub> Emissions: Global warming

### LARGE

Coal-fired thermal > gas-fired thermal  
> hydropower = PSPP

### SMALL

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## 2. PSPP: What have we been doing?

- First field survey (January - March)  
38 candidates → 4 candidates
- Second field survey (May - June)  
4 candidates: a detailed assessment

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## 3. Results

Important points for PSPP development

- Phu Yen East (JN3)
- Bac Ai (JS6)
- Important points

## Phu Yen East

- **Social environment**
  - Three villages will receive significant impacts.
    - 1. Involuntary resettlement
    - 2. Secondary impacts at resettled area(s)

## Phu Yen East



Rice fields in Thung Lang village (lower dam / reservoir site). They will be submerged.

## Bac Ai

### ■ **Natural environment**

- Internationally recognised important terrestrial ecosystem will receive impacts.
- The aquatic ecosystem of Cai river will receive significant impacts. The impacts may reach to the downstream of the river.

- 1. Detailed surveys on the natural environments  
2. Possible cancellation of the project at the site

## Bac Ai



A View from the upstream area of Cai river (lower dam / reservoir).

## Important points

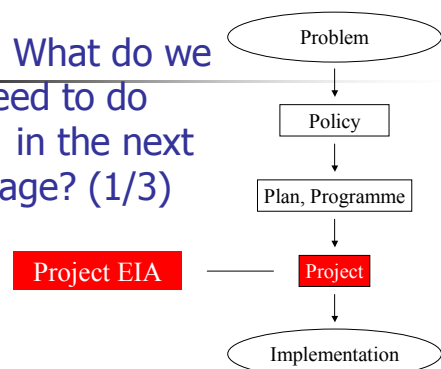
### ■ PRELIMINARY RESULTS

- More comprehensive survey in the next stage (e.g. feasibility study)
- Secondary impacts

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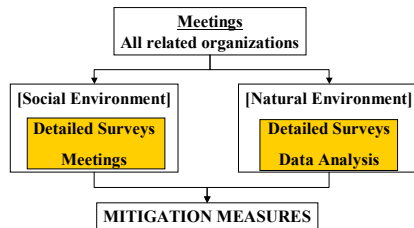
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## 4. What do we need to do in the next stage? (1/3)



#### 4. What do we need to do in the next stage? (2/3)

Full implementation of Project EIA



#### 4. What do we need to do in the next stage? (3/3)

Mitigation measures include:

- Possible cancellation of the project at the site
- Full consideration on the people concerned
- Full consideration on secondary impacts

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#### Recommendations (1/3)

1. Power Development
2. Implementation of EIA

#### Recommendations (2/3)

1. Power Development
  - Global warming and power development scenario
  - Realistic power development scenario
  - Requisite minimum development and DSM

#### Recommendations (3/3)

2. Implementation of EIA
  - Lessons learned from the past cases
  - Utilization of various references
  - Allocation of enough resources
  - Collaboration with other ministries and agencies



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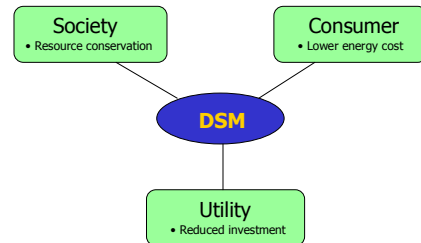
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## [9] Demand Side Management

Japan International Cooperation Agency (JICA)

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## What is DSM?



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## Contents

1. DSM in Vietnam
- 2-5. DSM in ASEAN countries & Japan
  - Thailand
  - Philippines
  - Indonesia
  - Japan
6. Conclusions and Recommendations

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## 1. DSM in Vietnam [ Overview ]

- Phase-I (2000-03)
  - TAs, Pilot Projects
- Phase-II (2003-05)
  - Major DSM Projects
- Phase-III (2005-10):
  - Expansion of the Projects
  - Commercial-based DSM programs

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## 1. DSM in Vietnam [ Phase-II ]

Program Name	Peak Cut (MW)	Energy Saving (GWh)	Note
TOU Metering	70	—	5,600 TOU meters
Pilot DLC Program	3	—	DLC for 2,000 users
CFL Program	33	39	Sales of 1 mil. CFL
FTL Program	14	25	Use of efficient FTL
Total	120	64	

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## 2. DSM in Thailand [ Major Programs ]

Type	Program	Note
Residential	E.E. fluorescent	Voluntary agreement & campaign
	E.E. Fridge/AC	Efficiency labeling
	Nutritious Brown Rice	Energy savings in milling process
Commercial	Energy Storage	Thermal energy storage system
	Green Leaf	Energy efficiency ranking
Industrial	Energy Consultant	Energy efficiency consulting by EGAT
	Factory Consultant	
	High Efficiency Motor	Promotion of efficient motor
	ESCO Project	4 pilot projects

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## 2. DSM in Thailand [ Achievements ]

Item	Initial Target (1993-1997)	Modified Target (1993-1997)	Achievement @ June 2000
Peak Demand Saving	238 MW	700 MW	755 MW
Energy Demand Saving	1,427 GWh	3,403 GWh	3,610 GWh
Investment	6,000 mil. Baht	6,000 mil. Baht	1,814 mil. Baht

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## 3. DSM in Indonesia [ LAC Programs ]

- **Peak-shift contract**

Reduction of peak consumption (kWh) × 25% × (1-0.025) × Peak energy charge (\$/kWh)

- **Peak-cut contract**

4 × Adjusted load (kVA) × (1-0.025) × Peak energy charge (\$/kWh)

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## 4. DSM in Philippines [ Major Programs ]

- Energy Management Service
- Information and Education Campaign
- Government Enercon Program
- Efficiency/Energy Labeling & Standard

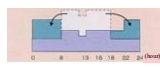
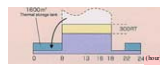
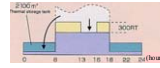
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## 5. DSM in Japan [ Major Programs ]

Category	E.E. equipment	Contract options (LAC)
Peak-shift	<ul style="list-style-type: none"> <li>■ Thermal storage AC</li> <li>■ Thermal storage tank</li> <li>■ Financial incentive</li> </ul>	<ul style="list-style-type: none"> <li>■ Annual load adjustment</li> <li>■ Thermal storage load adjustment</li> <li>■ Load management</li> </ul>
Peak-cut		<ul style="list-style-type: none"> <li>■ Interruptible contract</li> </ul>
Bottom-up	<ul style="list-style-type: none"> <li>■ Electric water heater</li> <li>■ Thermal storage floor heaters</li> </ul>	<ul style="list-style-type: none"> <li>■ Night-only service</li> </ul>

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## 5. DSM in Japan [ LAC Programs ]

Category	Outline	Image
<b>Annual Load Adjustment</b>	<ul style="list-style-type: none"> <li>■ Detailed rate-setting for each season and time</li> <li>■ Advantageous for those who can shift consumption considerably</li> </ul>	
<b>Thermal Storage Load Adjustment</b>	<ul style="list-style-type: none"> <li>■ Energy stored at a rate about 1/8 of that in daytime</li> </ul>	
<b>Load Management</b>	<ul style="list-style-type: none"> <li>■ Rates reduced through adjustment of peak consumption</li> <li>■ Discounts for a shift of operation</li> </ul>	

## 6. Conclusions and Recommendations

- **DSM in Vietnam**

- ✓ Phase-II : appropriate for initial stage
- ✓ Expected to maintain current framework

- **Implications from other countries' practice**

- ✓ **E.E. labeling program**
- ✓ **E.E. consulting**
- ✓ **Load Adjustment Contract**

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Thank you for your attention.

## [10] Recommendation

Japan International Cooperation Agency (JICA)

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## Recommendation (1)

### 1. Short-term Power System Development Plan

- Movement of **GT (DO Fired)** TPP from the South to the North
- Rush Expansion of **2<sup>nd</sup>** 500kV North-South Interconnection Line

### 2. Long-term Power System Development Plan

- Steady Development of Hydropower Plant
- Installation of **PSPP** in the Northern Power System (Around 1500MW in 2020)
- Expansion of **3<sup>rd</sup>** 500kV Center-South Interconnection Line
- Installation of **Coal TPPs** in the Southern Power System

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## Recommendation (2)

### 3. Individual Power Sources Development

- Acceleration of Development of Individual **Pumped Storage Power Project**
- Expansion of **Tri An** Hydropower Plant under the Integrated River System Management
- Optimization Study on the Development of **HPP** in the Da River in Full Consideration under the Integrated River System Management
- Project Finding Study or Pre-Feasibility Study on **Coal TPP in the South**

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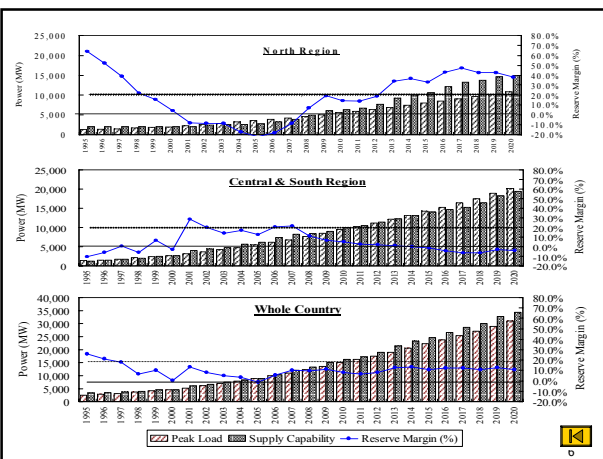
HAND IN HAND TOGETHER  
Vietnam



JICA

THANK YOU

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