ELECTRICITY OF VIET NAM
POWER COMPANY 3

SYSTEM EFFICIENCY IMPROVEMENT, EQUITIZATION AND RENEWABLE PROJECT (SEIER)

ENVIRONMENT IMPACT ASSESSMENT (EIA) (REVISED)

110kV SUBSTATION AND TRANSMISSION LINE
CENTRAL REGION OF VIET NAM

FILE COPY

Nha Trang, November 2001
SYSTEM EFFICIENCY IMPROVEMENT, EQUITIZATION AND RENEWABLE PROJECT (SEIER)

ENVIRONMENT IMPACT ASSESSMENT (EIA) (REVISED)

110kV SUBSTATION AND TRANSMISSION LINE
CENTRAL REGION OF VIET NAM

Project Manager: BUI VIET HA

Nha Trang, November 2001

DEPUTY DIRECTOR
POWER ENGINEERING CONSULTING COMPANY 4

NGUYEN HUU TAP

12-2001
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CHAPTER I: INTRODUCTION

I.1. General

The project “System Efficiency Improvement, Equitization and Renewable Project (SEIER)” in Central region for the purpose of:

Developing the power supply reliably and being economic value in Central region. Central region has gone through many hardships for lack of the power supply, therefore, the project means a great deal to the development of infrastructure and there is force in socio-economic and cultural development of Central region. Developing the distribution power network for power supply to HHs that are poor and far from the existing power system.

Decreasing the power loss.

Co-ordinating the small and moderate energy sources, for example, hydropower sources in Central region.

Making the premise of power system connection between Viet Nam and other nations.

Because the project is located on the land area of provinces in Central region (including 07 provinces), the project implementation will impact to the physical environmental action, ecological and biological conditions, however, because the substation location is not large, T/L is not long and voltage level reaches to 110kV, the impacts are unnoticeable affected.

I.2. Management institution organization:

E VN had decided for using WB financial resource in the fiscal year 2002-2003 for the project investment “System Efficiency Improvement, Equitization and Renewable Project (SEIER)”

Power Company No.3 is on behalf of EVN as a developer of the project.

Base on the above instruction, Power Company No.3 (PC3) will make a contract with PECC3 and PECC4 to establish feasibility study report, environment impact action and resettlement action plan for the project.

Making a contract with PC3, PECC4 and PECC3 had carried out the F/S report, EIA and establishment of the project.

The EIA study of the project will be carried on the co-ordination and guideline of PC3.

For greater convenience of the construction and management works, the project “System Efficiency Improvement, Equitization and Renewable Project (SEIER)” in Central region consists of the following sub-projects:

1. 110kV Dien Sanh substation and 110kV T/L to the substation (of Quang Tri province). (number sign: 0118)
2. 110kV Khe Sanh substation and 110kV T/L to the substation (of Quang Tri province). (number sign: 0109)
3. 110kV Phu My substation and 110kV Phu Cat-Phu My-Hoai Nhon T/L (of Binh Dinh province). (number sign: 0115)
4. 110kV Krong Buk substation and 110kV T/L to the substation (of Dak Lak province). (number sign: 0121)
5. 110kV Van Ninh (Van Gia) substation and 110kV T/L to the substation (of Khanh Hoa province). (number sign: 0108)
6. 110kV Dien Khanh substation and 110kV Nha Trang-Dien Khanh T/L (of Khanh Hoa province). (number sign: 0114)
7. 110kV Phong Dien substation and 110kV T/L to the substation (of Thua Thien-Hue province). (number sign: 410014B)
8. 110kV Dai Loc substation and 110kV Da Nang-Dai Loc T/L (of Quang Nam province). (number sign: 41001A)

PC3 is a Developer of the above sub-projects.

Design Company: Pecc4 (from the sub-project No.01 to No.06)
Pecc3 (from the sub-project No.07 and No.08)

For greater convenience of the table establishment, the column “sub-project” will mark in number sign.

1.3. Objectives of report

According to the stipulation (TT No.490/1998/TT-BKHCNMT issued on 29 April 1998) of Ministry of Science-Technology and Environment (MOSTE) of Viet Nam, the 110kV substation and 110kV T/L are classified as the project of type II on environmental field. For classified project in type II, it is required to analyze the impacts of the project on environment. The main objectives of report are:

• Description the current environment of the proposed areas.
• Identification of potential impacts to the Environment in the case of the project will be developed (In the period of construction and operation)
• Classification the categories of environment impact.
• Suggestion for the mitigation measures of the negative impacts causing from the project development (In the period of design, construction and operation).
• Proposal for the monitoring and evaluation program
• Identification for cost of mitigation measures.

1.4 Methodology

The project “System Efficiency Improvement, Equitization and Renewable Project (SEIER)” in Central region make the impacts for the environment.
The methods of the environmental assessment of this project are mainly based on: The checklist method and the similar method of designed projects.

The potential environmental impacts are identified as follows:

a. Small impacts or unnoticeable impacts:
   It is not necessary to have mitigation and prevention measures

b. No significant impacts:
   It is necessary to have mitigation and prevention measures

c. Significant impacts:
   It is necessary to study carefully prevention measures.
CHAPTER II : PROJECT DESCRIPTION

II.1. Scope of the project:

The project is located on the land area of the provinces: Quang Tri, Thua Thien-Hue, Da Nang city, Quang Nam, Binh Dinh, Dak Lak, Khanh Hoa, consists of:

+ Double circuit 110kV T/L: 14,309m
+ Single circuit 110kV T/L: 59,500m
+ 08 110kV substations with total capacity: 08 substations × 25MVA = 200MVA
+ Support: Centrifugal concrete and tower
+ ROW: 15m (including 02 sides of the center of the route)

* + The safety distance is from conductor to the ground:

  + Densely populated area: ≥ 7m (according to the norm of electrical equipment 11TCN-19-84, Chapter II.5, Clause II.5.107)

  + Little populated area: ≥ 6m (according to the norm of electrical equipment 11TCN-19-84, Chapter II.5, Clause II.5.93)

  + Temporary service road is coordinate with the existing road and is built 4m wide from the main national road if necessary.
  
  + Road into the substation is 4m wide
  + Temporary camp for workers.

  + The proposed land of the project is cultivation land of paddy, crops, coffee, cashew, fruit tree and forestry land of eucalyptus and pine forest.
### TABLE: SCOPE OF THE PROJECT INVESTMENT

<table>
<thead>
<tr>
<th>Sub-project</th>
<th>Scope</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quang Tri province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 110kV Khe Sanh substation and branch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 110kV Dien Sanh substation and branch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>Scope</td>
<td>Branch (T/L)</td>
</tr>
<tr>
<td>Capacity (MVA)</td>
<td>Voltage (kV)</td>
<td>Length (m)</td>
</tr>
<tr>
<td>1x25</td>
<td>11/35/22</td>
<td>35</td>
</tr>
<tr>
<td>1x25</td>
<td>110/35/22</td>
<td>1292</td>
</tr>
<tr>
<td><strong>Thua Thien-Hue province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 110kV Phong Dien substation and branch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>Scope</td>
<td>Branch (T/L)</td>
</tr>
<tr>
<td>Capacity (MVA)</td>
<td>Voltage (kV)</td>
<td>Length (m)</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>1388</td>
</tr>
<tr>
<td><strong>Quang Nam province- Da Nang city</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 110kV Dai Loc substation and Da Nang-Dai Loc T/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>Scope</td>
<td>Branch (T/L)</td>
</tr>
<tr>
<td>Capacity (MVA)</td>
<td>Voltage (kV)</td>
<td>Length (m)</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>6000</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>9150</td>
</tr>
<tr>
<td><strong>Binh Dinh province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 110kV Phu My substation and Phu Cat-Phu My-Hoai Nhon T/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>Scope</td>
<td>Branch (T/L)</td>
</tr>
<tr>
<td>Capacity (MVA)</td>
<td>Voltage (kV)</td>
<td>Length (m)</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>50,350</td>
</tr>
<tr>
<td><strong>Dak Lak province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. 110kV Krong Buk substation and branch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>Scope</td>
<td>Branch (T/L)</td>
</tr>
<tr>
<td>Capacity (MVA)</td>
<td>Voltage (kV)</td>
<td>Length (m)</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>110/35/22</td>
</tr>
<tr>
<td><strong>Khanh Hoa province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 110kV Van Gia substation and branch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. 110kV Dien Khanh substation and Nha Trang-Dien Khanh T/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substation</td>
<td>Scope</td>
<td>Branch (T/L)</td>
</tr>
<tr>
<td>Capacity (MVA)</td>
<td>Voltage (kV)</td>
<td>Length (m)</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>110/22</td>
</tr>
<tr>
<td>1x25</td>
<td></td>
<td>110/35/22</td>
</tr>
</tbody>
</table>
II.2. Site of the project:

According to the selected alternative, the site of the project is agreed by People's committee of provinces and listed in the following table:

<table>
<thead>
<tr>
<th>Sub-project</th>
<th>Location</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quang Tri province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 110kV Khe Sanh substation and branch</td>
<td>Cluster 4-Khe Sanh town-Huong Hoa district-Quang Tri</td>
<td></td>
</tr>
<tr>
<td>2. 110kV Dien Sanh substation and branch</td>
<td>Tan Dien hamlet-Hai Tho commune-Hai Lang district-Quang Tri province</td>
<td></td>
</tr>
<tr>
<td><strong>Thua Thien-Hue province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 110kV Phong Dien substation and branch</td>
<td>Tan Lap hamlet, Phong Dien town, Phong Dien district</td>
<td></td>
</tr>
<tr>
<td><strong>Quang Nam province-Da Nang city</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 110kV Dai Loc substation and Da Nang-Dai Loc,T/L</td>
<td>Group 6, Ai Nghia town, Dai Loc district</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hoa Tho, Hoa Phong, Hoa Khuong communes (Hoa Vang district)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dai Hiep commune, Dai loc district</td>
<td></td>
</tr>
<tr>
<td><strong>Binh Dinh province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 110kV Phu My substation and Phu Cat-Phu My-Hoai Nhon T/L</td>
<td>Chanh Tuan hamlet-My Trinh commune-Phu My district</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Running through Phu My, Phu Cat and Hoai Nhon districts.</td>
<td></td>
</tr>
<tr>
<td><strong>Dak Lak province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. 110kV Krong Buk substation and branch</td>
<td>Pong D’Rang commune-Krong Buk district</td>
<td>(nearby the existing 220kV Krong Buk substation)</td>
</tr>
<tr>
<td><strong>Khanh Hoa province</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 110kV Van Gia substation and branch</td>
<td>Tan Dan hamlet-Van Thang commune-Van Ninh district.</td>
<td></td>
</tr>
<tr>
<td>8. 110kV Dien Khanh substation and Nha Trang-Dien Khanh T/L</td>
<td>Dien Thanh commune-Dien Khanh district</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vinh Thanh,Vinh Trung commune (Nha Trang city)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dien An, Dien Toan, Dien Thanh commune (Dien Khanh district)</td>
<td></td>
</tr>
</tbody>
</table>
II.3. Resettlement plan or development plan of ethnic minority:

From the survey and valuation of the project shown that it is not necessary to have a resettlement plan or an ethnic minority development plan because of the following reasons:

+ The project only carries out the compensation and rehabilitation works
+ Only very few ethnic minorities are in the proposed area of the project and no PAPs are of ethnic minority.

Acquisition land as required is estimated:

**Table II.3.1: Permanently acquisition land for tower**

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub-project</th>
<th>Substation (m²)</th>
<th>T/L (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0118</td>
<td>3886.00</td>
<td>354.00</td>
</tr>
<tr>
<td>2</td>
<td>0109</td>
<td>4991.00</td>
<td>79.00</td>
</tr>
<tr>
<td>3</td>
<td>0115</td>
<td>3939.00</td>
<td>6528.00</td>
</tr>
<tr>
<td>4</td>
<td>0121</td>
<td>6281.25</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0108</td>
<td>3337.00</td>
<td>200.00</td>
</tr>
<tr>
<td>6</td>
<td>0114</td>
<td>4696.75</td>
<td>2700.00</td>
</tr>
<tr>
<td>7</td>
<td>41001B</td>
<td>5098.00</td>
<td>500.00</td>
</tr>
<tr>
<td>8</td>
<td>41004A</td>
<td>3946.00</td>
<td>3362.00</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36175.00</td>
<td>13723.00</td>
</tr>
</tbody>
</table>

**Table II.3.2: Temporary impacted land area.**

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub-project</th>
<th>ROW</th>
<th>Temporary service road</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0118</td>
<td>18595</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0109</td>
<td>446</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0115</td>
<td>59002</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0108</td>
<td>1180</td>
<td>276</td>
</tr>
<tr>
<td>6</td>
<td>0114</td>
<td>79815</td>
<td>16503</td>
</tr>
<tr>
<td>7</td>
<td>41001B</td>
<td>20305</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>41004A</td>
<td>223888</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>934062</td>
<td>16779</td>
</tr>
</tbody>
</table>
II.4. The proposed schedule for the project implementation

Base on the conference’s minute between EVN and WB on 17 April 2001 at Ha Noi and the requirement for power supply of Developer, the proposed schedule of the project implementation is prepared as follow:

* Project preparation schedule:

+ Completion and submission for authorized level July 2001.
for getting approval for F/S, RAP, EIA
+ Signature of credit convention and projected convention March 2002.
+ Taking effect of credit convention and projected convention June 2002

* Implementation schedule of the project:

+ Completion and submission for authorized level for getting approval of technical design and total estimation December 2001- December 2003
CHAPTER III

LEGAL REGISTRATION, POLICY AND ADMINISTRATION MANAGEMENT

1. According to the plan, the feasibility study report will be approved by EVN in the end of the year 2001. Developer, Power Transmission Company and concerned parties will carry out the measures to mitigate the negative impacts of environment, protect the resources of forest, limit and compensate the crops and assets of project affected people.

2. Guideline of environmental assessment supplied by WB.
   + Environmental assessment OP/BP/GP 4.01
   + Natural population area OP/BP/GP 4.04
   + Forest OP/GP 4.36
   + Cultural values OP4.11
   + Ethnic minority OD 4.20
   + Compelling resettlement OD 4.30
   + Information Book BP 17.50.

3. The feasibility study report will be inspected by EVN.

4. Agreement minutes of route and substation location of provinces with the project.

5. Law on environment:
   + Environmental law
   + Decree No.175-CP on the guideline of law implementation


7. Decree No.54-1999/ND-CP issued on 8 July 1999 by GOV on the safety of HV system.

8. Based on the standard : "Permittance level of power frequency withstand voltage intensity and the regulation of supervision at working site " issued with the decision No.183 NL/KHKT dated 12 April 1994 by Ministry of Energy.

9. Investigation report is made by PECC4 and PECC3.

10. Organization arrangement:
    - MOSTE will be directly responsible to the government for management implementation of environmental protection : issue and organization.
arrangement for law documents on environmental protection, environmental standard system...

- Ministry of industry in co-ordination with MOSTE will carry out the environmental protection in directly management institutions.

- DOSTEs will be responsible for local environmental protection

- EVN will supply guidance to the environmental protection in total area of EVN.

- EVN will entrust Power Company No.3 that will be directly responsible for the management of total the project program, the submission of a registry form for environmental standard for DOSTEs and local with project.

- Layout Clearance Boards in local (provinces and districts) will be responsible for compensation to PAPs.

- Power Transmission Company will be responsible for inspection in power network operation.
CHAPTER IV : CURRENT ENVIRONMENT OF THE PROJECT AREA

IV.1 The physical Environment

IV.1.1 Topography, geomorphology, geology and meteo-hydrology.

The proposed area of the project will run through 11 districts of 07 provinces in Central region: Quang Tri, Thua Thien-Hue, Da Nang city, Quang Nam, Binh Dinh, Dak Lak and Khanh Hoa provinces. The projected areas run through the different terrains with little varied altitude. Hill and coastal delta with an even and flat terrain are mainly paddy and crop field and industrial trees.

The proposed site is of an accumulative kind, relative even terrain. The soil and rock components of topology are cumulates of the Q4 Neolithic Period consist of a sandy, grit and clay layer with block soil...

Meteorology:

Quang Tri and Thua Thien-Hue provinces are located within the tropical and humid climate area with monsoons. Maximum air temperature is more 40°C due to the influence of hot and dry westerly wind (from Laos to Central Viet Nam). In Winter season, minimum air temperature is under 10°C due to the influence of North-East wind. The rainy season lasts from August to September, takes up 65-70% of total rainfall in a year. Other months are little rainy.

Dak Lak province is located within the tropical and humid climate area with monsoons. There’re two seasons: rainy season and dry season.

The rainy season lasts from May to November, takes up 80% of total rainfall in a year. Dry season lasts from July to April, popular wind direction is North-East, it is little cold.

Due to beyond distance of coast and the wind stopping at Truong Son mountain, the proposed areas will be little under the effect of storm, however, the rains and big wind are mainly occurred.

Quang Nam, Binh Dinh and Khanh Hoa provinces are located within the tropical and hot and humid climate area with monsoons. There’re two seasons: rainy season and little rainy season. The rainy season lasts from September to December, takes up 70-80% of total rainfall in a year.

In summer season, maximum air temperature is more 39-40°C. Winter season is little cold, air temperature is not under 10°C.

The features of topological condition and basic climate element of the proposed region of the project are listed in the following table:
### SUMMARY ON TOPOLOGICAL AND CLIMATIC CONDITION OF THE PROPOSED AREA OF TRANSMISSION LINE

#### TOPOLOGICAL AND CLIMATIC CONDITION

<table>
<thead>
<tr>
<th>Project</th>
<th>Topology</th>
<th>Wind</th>
<th>Rainfall</th>
<th>Humidity %</th>
<th>Thunderstorm</th>
<th>Air temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>0118</td>
<td>Even and flat terrain. The botanic carpet is mainly eucalyptus.</td>
<td>V-IX: SW, X-IV: N, SW</td>
<td>Average rainfall in the years: 2650mm, Max. rainy intensity: *15 minutes: 40mm, *30 minutes: 60mm, *60 minutes: 100mm</td>
<td>Relative average humidity: 85%, Relative minimum humidity: 19%</td>
<td>Amount of days with thunderstorms in the year: 70 days, Time with thunderstorms in the year: 135 hours</td>
<td>Average air temperature: 25.5°C, Minimum air temperature: 9°C, Maximum air temperature: 41.5°C.</td>
</tr>
<tr>
<td>0109</td>
<td>Relative even and flat terrain. The botanic carpet is mainly coffee.</td>
<td>IV-IX: S, X-III: W</td>
<td>Average rainfall in the years: 2600mm, Max. rainy intensity: *15 minutes: 40mm, *30 minutes: 60mm, *60 minutes: 100mm</td>
<td>Relative average humidity: 84.5%, Relative minimum humidity: 15%</td>
<td>Amount of days with thunderstorms in the year: 25 days, Time with thunderstorms in the year: 175 hours</td>
<td>Average air temperature: 25.2°C, Minimum air temperature: 8°C, Maximum air temperature: 42.8°C.</td>
</tr>
<tr>
<td>0115</td>
<td>Relative even and flat terrain. The botanic carpet is mainly eucalyptus, paddy and crops.</td>
<td>V-IX: E, NE, XII-IV: S, SE, SW</td>
<td>Average rainfall in the years: 1710mm, Max. rainy intensity: *15 minutes: 47.5mm, *30 minutes: 72.5mm, *60 minutes: 97.5mm</td>
<td>Relative average humidity: 80%, Relative minimum humidity: 12%</td>
<td>Amount of days with thunderstorms in the year: 57 days, Time with thunderstorms in the year: 100 hours</td>
<td>Average air temperature: 26.5°C, Minimum air temperature: 15.5°C, Maximum air temperature: 41.5°C.</td>
</tr>
<tr>
<td>0121</td>
<td>Relative even and flat terrain. The</td>
<td>IV-IX: W, WS, X-III: N, EN</td>
<td>Average rainfall in the years: 1600mm, Max. rainy intensity:</td>
<td>Relative average humidity: 81%, Relative minimum</td>
<td>Amount of days with thunderstorms in the year: 94 days</td>
<td>Average air temperature: 25.5°C, Minimum air</td>
</tr>
<tr>
<td>Location</td>
<td>Climate and Vegetation</td>
<td>Average Wind Speed</td>
<td>Average Rainfall</td>
<td>Humidity</td>
<td>Temperature</td>
<td>Other Climate Parameters</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td>----------</td>
<td>-------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>0108 Bang phang. Thuc vat chu yeu la hoa mau</td>
<td>- X-IV: S, SE - V-IX: W, NW - Average wind speed: 3.4 m/s. - Calculated wind pressure: 82 daN/m2.</td>
<td>- Average rainfall in the years: 1360 mm</td>
<td>- Relative average humidity: 81%</td>
<td>- Relative minimum humidity: 22%</td>
<td>- Maximum air pressure: 82 daN/m2.</td>
<td>- Time with thunderstorms in the year: 175 hours</td>
</tr>
<tr>
<td>0114 Relative even and flat terrain. The botanic carpet is mainly crops, fruit trees.</td>
<td>- IX-XII: E, NE - I-VIII: S, SE - Average wind speed: 2.9 m/s. - Calculated wind pressure: 82 daN/m2.</td>
<td>- Average rainfall in the years: 1360 mm</td>
<td>- Relative average humidity: 80%</td>
<td>- Relative minimum humidity: 22%</td>
<td>- Maximum air pressure: 82 daN/m2.</td>
<td>- Time with thunderstorms in the year: 105 hours</td>
</tr>
<tr>
<td>41004B Relative even and flat terrain. The botanic carpet is mainly eucalyptus.</td>
<td>- IV-IX: S - X-III: W - Average wind speed: 3.5 m/s. - Calculated wind pressure: 82-95 daN/m2.</td>
<td>- Average rainfall in the years: 2560 mm</td>
<td>- Relative average humidity: 84.5%</td>
<td>- Relative minimum humidity: 15%</td>
<td>- Maximum air pressure: 82 daN/m2.</td>
<td>- Time with thunderstorms in the year: 175 hours</td>
</tr>
</tbody>
</table>

EIA

110kV substation and transmission line in central region
IV.1.2. Land area in ROW:

Area of categories of land in ROW (15m) is listed as follow:

+ Total area of impacted land: 1001039m². In which:
  - Annual land for tree cultivation: 443,393.25m². In which:
    * Paddy land: 364,250m²
    * Crops land: 79,143.25m²
  - Land area of long-term trees: 167,599m². In which:
    * Fruit tree land: 77,352m²
    * Coffee land: 11,797m²
    * Cashew land: 78,450m²
  - Area land of forestry: 348,954m². In which:
    * Pine land: 4,500m²
    * Eucalyptus land: 261,054m²
    * Forestry land: 81,000m²
    * Wild land: 2,400m²
  - Total residence land: 40,733m².

List of land and crop categories is shown in the following table:
### Table IV.1: IMPACTED LAND BY THE PROJECT

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub-project</th>
<th>Impacted land (m²)</th>
<th>Permanently impacted land (m²)</th>
<th>Temporary impacted land (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Annual</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paddy</td>
<td>Crops</td>
</tr>
<tr>
<td>1</td>
<td>118</td>
<td>22666</td>
<td>200</td>
<td>54</td>
</tr>
<tr>
<td>2</td>
<td>109</td>
<td>5516</td>
<td>5070</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>115</td>
<td>600469</td>
<td>1490</td>
<td>1080</td>
</tr>
<tr>
<td>4</td>
<td>121</td>
<td>6281.25</td>
<td>6281.25</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>108</td>
<td>4963</td>
<td>3537</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>114</td>
<td>104014.75</td>
<td>6096.75</td>
<td>400</td>
</tr>
<tr>
<td>7</td>
<td>41004B</td>
<td>25903</td>
<td>5598</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>41004A</td>
<td>231196</td>
<td>2945</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1001039</td>
<td>10732</td>
<td>5017.25</td>
<td>1150</td>
</tr>
</tbody>
</table>
IV.2. History and culture vestiges

No history and culture vestiges are on the proposed regions of the project. Management Institutions of local history and culture vestiges have consulted in the design stage and selection of the route and substation location and agreed by 07 provinces. However, construction parties will inform to Management Institutions of local history and culture vestiges when knowing any historical and cultural vestiges of great worth.

IV.3. The socio-economic condition

a. Economy:

In Central regions, the economy is being based by the combination of industry and agriculture mainly, forestry and fishing, handicraft and commercial services are being strongly developed for the purpose of economic stable development. Income level gets more and more increasing to make a significant change of people’s living-standard and condition. In Central provinces, the average income per head in the year 1995 is 222 USD, in which:

- Quang Tri province : 80 USD
- Thua Thien Hue province : 293 USD
- Quang Nam province and Da Nang city : 286 USD
- Khanh Hoa province : 310 USD
- Dak Lak province : 260 USD
- Binh Dinh province : 167 USD

b. Agriculture:

Cultivation gets a large proportion of agriculture, in which mainly trees for food production. Total area of paddy cultivation in provinces in 1995 is 368,700ha. In which, in Phu Yen province, paddy field with 22,000ha area is the largest paddy of the provinces of coastal Central-Southern part. And several industrial trees besides are developing such as coffee, rubber in Dak Lak, Gia Lai, Kon Tum provinces; cinnamon tree in Quang Nam province; sugar cane, peanut, crops and other fruit trees in provinces.

Breeding : in the provinces of high land, grass cultivation area takes up 2,100,000ha of natural land area, besides also annual by-product source of agriculture will improve the breeding for buffalo, cow and pig. In coastal provinces, breeding mainly breeding for pig and domestic fowls in a small scope being dispersed in households. In the recently years, the central coastal provinces are paid attention in the development of sea-food production.

c. Forestry:

Forest is very important in development strategy in central region, especial is in highland provinces. Industrial trees will be developed quickly due to the large fat Bazan soil. Forming farms and enterprises are responsible for management, exploitation, forest cultivation and processing forest. Forestry work is also important. Through the delivery of 110kV substation and transmission line in central region
land and hire of forest, almost mountainous ethnic groups carried out forest work in combination with agricultural work, more employment, improved living-standard and burning old forest is limited. In the recent years, according to the 327-program implementation, province mobilized mountainous districts to cultivate forest, cover empty land and shaven hill. In first stage, changing forest mainly resource exploitage into forestry, mobilizing the masses to do forest, changing the economic structure of mountainous rural. However, forest processing is still low in development, backward technology, and primitive production with low value.

d. Industry and handicraft

The industry and handicraft of communes are not developed yet because of the difficult mountainous regions, the limitation of capital, the difficulty of product consuming. Nowadays, main production is processing of timber, coffee, rubber latex, tea, see food, foods. Actually, equipment is very old and primitive, only partly sugar cane made by modern equipment. Including mechanical and grinding workshops to serve demands in each local.

Traditional handicraft is not developed yet. It is spontaneous and primitive development. The quality of product is still weak. Production for consume could not, have an influence on production development and leisure labor settlement in rural.

In the recent years, due to the open door policy of Government, some large industrial zones with foreign capital are made projects and carried out, such as Dung Quat oil filtering zone, industrial zone of Thua Thien-Hue province; Hoa Hiep industrial zone of Phu Yen province; Ky Ha and Chu Lai industrial zones of Quang Nam province.... The industrial zones put a new face on industry in province (a poor province in Central area of Viet Nam), are premise of industrial development and follow general developing impetus in whole the country.

e. Culture, health service and education:

Cultural and musical activities have new development points; public and national cultural shapes are restored; cultural holidays of mountainous ethnic minorities of Central province is maintained and its quality gets more and more exciting.

Health service: Apart from provincial hospital of the center of province, there’re hospitals of districts, regional general overhauling department, health service stations of communes for people’s health service.

Education: The quality of children carefulness is very good in city but in mountain and rural is very low. Most teachers are not educated at school. The diversification of hope education is very low. Nowadays, a difficult problem is to be lacking in teacher and room at schools of rural and mountainous communes. Many children are still illiterate.

Generally, the socio-economic field of Central region in general and of 07 provinces in separate are not still developed in synchronism with other regions in the whole country.
Specially, the economic development of the proposed districts is still low, the infrastructure is very weak, public living standard is difficult.
CHAPTER V

THE POTENTIAL ENVIRONMENTAL IMPACT OF THE PROJECT.

The detailed environmental impact of the project is:

V.1 Physical Environmental Impact.

As above-mentioned scope of the project, the project of power supply for 12 districts of 07 provinces is not impacted or unnoticeable impacted to physical environmental action.

According to the environmental standard for water, air and soil, the project is not made the pollution for water (surface water, underground water), air and soil in surrounding areas of the project. When the structures of the project are in construction and take into operation after finishing, it is required to no make changes the nature of water, air and soil.

Also, including some impacts as follow:

It is possible that the impacts for the surrounding environment due to the faults of transformer, in case the oil is flowed from transformer will impact to the surrounding environment causing water source pollution or a burst of flame.

Construction of foundation and equipment support structure and leveling the surface of substation will impact to soil form.

V.2. The biological impact.

+ For the 110kV T/L, the ROW that is limited by two vertical planes of the T/L sides, parallel the T/L, is of 4.0m from the outer conductor to each side as stationary form (according to item 1 clause 6 of decree No.54-1999/ND-CP issued by GOV on the protection of HV system).

According to part a, item 1, clause 7 of decree No.54:

* Paddy and crops will be 0.5m far from the edge of tower foundation and tension foundation.

* Other trees will be sure that the distance between conductor (stationary form) and the highest point of trees is not under 3m.

* Types of trees that develop in short-term (eucalyptus, bamboo, neohouzeauxa, bamboo tube...) cause the damage will be close-cut the foot of the trees and not to grow.
According to item 2, clause 7 of decree No.54:

All trees even out of the ROW in the case of trees fallen (≥ 1m from any parts of tree to any parts of T/L) will have to be cut.

+ For substation:

According to part b, item 1, clause 14 of decree No.54:

ROW is 0.5m wide from the outer of fence.

According to part b, item 2, clause 14 of decree No.54:

No trees (including liana) will be in ROW of substation with the exception of crops and trained trees under 2m.

As above regulations, affected trees are in the proposed area of T/L and substation will be cut. Therefore, the project implementation will impact to the unbalance of ecological environment and land erosion.

The proposed area of the project consists of: cultivation land: paddy, crops, coffee, fruit trees and forestry land: eucalyptus and pine forest.

* Total area of permanently impacted land for tower foundation and substation: 49,898m².

* Total area of temporary impacted land: 950,841m².

Under the experienced design of substation and T/L, the selection of the route and substation location will be ensure the economy, technique and no much impact to the environment.

According to the survey of the proposed area, the project will not run through the forests of economic and ecological value, the national protection forests and valuable natural resources. Not to impact to valuable animals and botanies.

V.3 Impact for population area:

It is considered that the route and substation location will avoid to run through population areas.

However, some households will be impacted because their house/structure is in ROW. No households will remove to new sites, but will be settled in their old land area, mainly temporary house and house level 4.

+ Total affected houses: 43 houses. (house level 4 and temporary house).

+ Total affected house area: 3910m².

No ethnic minority is in PAPs.
Affected level of house and land is shown in the following table:

**Table 3: No. of impacted houses as results:**

<table>
<thead>
<tr>
<th>No.</th>
<th>Sub-project</th>
<th>Quantity</th>
<th>Demolished house area</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0118</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0109</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0115</td>
<td>27</td>
<td>3007</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0121</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0108</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>0114</td>
<td>10</td>
<td>486</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>41004B</td>
<td>6</td>
<td>417</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>41004A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>43</td>
<td>3910</td>
<td></td>
</tr>
</tbody>
</table>

A separately report of compensation and resettlement plan is required: the current situation of PAPs and the compensation measures will be mentioned in RAP report.

**V.4. Impact of electro-magnetic field on human and animals:**

Based on the standard: “Permittance level of power frequency withstand voltage intensity and the regulation of supervision at working site” issued with Decision No.183 NL/KHKT dated 12 April 1994 by Ministry of Energy on the regulation of permittance level of power frequency withstand voltage intensity depending on working hour and electric field, and the regulation of supervision of working site.

The permission of working hour in one day and night depends on electric field intensity, the regulation is stipulated as below:

<table>
<thead>
<tr>
<th>Elected Intensity (KV/m)</th>
<th>&lt; 5</th>
<th>5</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>15</th>
<th>18</th>
<th>20</th>
<th>20&lt;E≤25</th>
<th>&gt;25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working time permission in one days and night (h)</td>
<td>No limit</td>
<td>8</td>
<td>4.25</td>
<td>3</td>
<td>2.2</td>
<td>1.33</td>
<td>0.8</td>
<td>0.5</td>
<td>1/6</td>
<td>(10 minute)</td>
</tr>
</tbody>
</table>

The table shown that, the electric field impact for the case of intensity over 5 kV/m (> 5 kV/m), for population area under the T/L and nearby the projected area, the permission of the electric field intensity without human impact is ≤5 kV/m.
After carrying out the resettlement measures out of ROW and the design work according to the process and norm, above mentioned impacts will not affect to human health: Height from conductor to the earth is $\geq 7m$ (density population area) and $\geq 6m$ (little population area).

Substation is covered with solid fence, only the operating workers will be done in the substation.

For operating workers in substation and route will conform to the regulations of operation and working hour in electric field as above mentioned stipulated hour.

Therefore, the project will not impact to human health and animals.

V.5. The impact of electro-magnetic field on communication systems.

V.6. The impact of landscape, cultural and historic vestiges:

According to the survey work, no cultural and historic vestiges are in the proposed areas of the project. Local Management Institutions of cultural and historic vestiges have consulted in design stage of T/L and substation location.

V.7. Temporary service road and road into the substation:

+ Temporary service road will be coordinated with the existing road and built about 4m from the main national road if necessary.

+ The road into the substation is 4m wide.

The above mentioned roads will not impact to the existing traffic system.

Because the proposed area of the project doesn’t run through the valuable forests of economy and ecology, the regions of rare animals and botanies, moreover temporary service road and road into the substation are short, therefore, nobody could sabotage a forest or cut trees as possible.

The construction work of the temporary service road and road into the substation will cause land erosion and result in compensation for impacted crops and industrial trees, permanently or temporary land acquisition.

V.8. Transmission line and tower impacts for planes

Conduction suspension and tower height (under 50m) will not impact to the planes.
V.9 Impacts for people when contacting the power station, tower and shock in power fault.

V.10. Impact by consequence of wars.

Because the proposed area of the project will run through the different regions, when carrying out the construction work, impacts caused by consequence of wars could not avoid such as bomb, mine in ROW. During the survey, selection design of routes and substation location as well as construction work, it is necessary to pay attention to the problem to mitigate the negative impacts for human and surround environment.

Only 110kV Phu Cat-Phu My-Hoai Nhon T/L is possible that mine and bomb remain on the ground. (According to the letter No.82/CV-BCH dated August 1, 2001 by Military Management Board of Binh Dinh province).

V.11. Safety for fire:

Explosive measure will be not applied in the T/L and substation construction but soil digging and filling measures are the main construction activity. However, it is considered that a cause for forest fire because of use of cooking fire during the construction stage.

V.12. Noise, vibration and pollution:

In operation, there may be noises from electrical equipment and construction equipment in substation. However, the projected area is far from population area, therefore, it will not be a significant impact.

V.13. Safety and health of workers:

Labor safety measures for construction and operation workers will be applied in conformity with labor safety laws of Viet Nam. Apart from the safety measures for worker, there’re medicine measures to prevent the endemic diseases such as malaria, diarrhea, waterborne diseases..., there’re positive measures to mitigate impacts on worker’s health.

V.14. Environmental impacts due to the resettlement work

No environmental impacts are caused because the project don’t carry out the resettlement work.
CHAPTER VI

MITIGATION MEASURES FOR THE PROJECT IMPACTS

Mitigation measures for the project impacts will carry out on the selection of substation location and in 3 stages: design, construction and operation stages.

VI.1. Selection standard of substation location:

Consultant Company will apply the following selection standards of substation, define the route and substation location to avoid the following regions:

- Dense forest
  - According to the forest protection law of Viet Nam, the tree cutting is managed strictly; therefore, the selection of route and substation location will avoid going through the regions with dense trees.
  - The forests that the route runs through are secondary forests, scattered forests, are a low value on economy and ecology.
- Population area
- Forbidden forest, historic or cultural vestiges, national park, pagodas...
- Parallel or near by phone cable.
- Airport, militarized zone.

The routes and substation location will be analyzed on 2 alternatives. The alternative that is selected is impacted at least to the environment.

VI.2 Design stage:

<table>
<thead>
<tr>
<th>IMPACTS OF ENVIRONMENT</th>
<th>MITIGATION MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Impacts of noise due to equipment operation</td>
<td>During the equipment design period, manufacturers ensure that the permitted maximum noise level for equipment will be in accordance with present standards.</td>
</tr>
<tr>
<td>2. It is possible that the impacts for the surrounding environment due to the faults of transformer in case the oil is flowed from transformer will impact</td>
<td>Based on the standard of manufacture factory and the experienced operation of the 110kV substation with capacity of under 63MVA, power equipment will be in the smallest fault. To contain total</td>
</tr>
</tbody>
</table>

110kV substation and transmission line in central region
System Efficiency Improvement, Equitization and Renewable Project (SEIER)

<table>
<thead>
<tr>
<th>to the surrounding environment</th>
<th>amount of transformer’s oil as possible, however, in case transformer is in fault, building an oil container with 22m³ capacity inside fence of the substation (installing underground an oil pipe and oil container) is necessary. Oil will be carried to factory by oil-truck to be re-done.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Impact of electro-magnetic field on human</td>
<td>T/Ls will be designed in a regulated height and ensure that the electric intensity under 5 KV/m &lt; 5 KV/m),</td>
</tr>
<tr>
<td>4. Impacts of voltage in single phase, short-circuit fault</td>
<td>The earthing systems in the substation ensure that voltage in or out of the substation or contacting voltage is less than permitted level.</td>
</tr>
<tr>
<td>5. Across sections to other structures</td>
<td>At acrossing sections with power line and others, the safety distance will conform to the present process. The section across the North-South railway : double tension. Section across through communication line : pole and insulation string, stable conductor suspending (clamping)</td>
</tr>
<tr>
<td>6. Avoiding the damage for people due to the contact of power substation, tower and an electric shock.</td>
<td>There will be a warning plate at substation with covered fence and tower.</td>
</tr>
<tr>
<td>7. Preventing the earth erosion surround tower and substation.</td>
<td>Leveling the soil, growing grass and building stone embankments for foundation.</td>
</tr>
<tr>
<td>8. Temporary service road</td>
<td>Mainly using the existing roads, mitigating the new road. Only building new small road if necessary.</td>
</tr>
<tr>
<td>9. Mitigating the risky because of electric faults in power supply areas.</td>
<td>- Carrying out the protection for substation and T/L : Transformer, busbar and T/L protected by digit relay. - The protection for risky room in the substation : Installed equipment will use the high safe types and prevent a burst of flame. - Other rooms will be installed chemical froth pots or CO2 pot. - Substation will install the modern burst</td>
</tr>
</tbody>
</table>

110kV substation and transmission line in central region
preventable equipment. Therefore, the fault that affects to environment due to a burst of flame is no impact.

10. The technical solutions

The design will be carried out in accordance with the process and the norms, optimum arrangement for tower distance, the tower position will be located on empty land. Application of different dimensions for tower foundation to be suitable with the selected position. Area of foundation size will vary from 12.96 – 100m².

VI.3 Construction stage:

1. Construction method:

- Mitigating the time for temporary land acquisition.

- Mine and bomb clearance

- Tree cutting work, ROW clearance

- Optimum arrangement for the construction measures, some working shifts in a day is scheduled for the construction in order to increase capacity and decrease the land acquisition time. Each item of project or each of items, each of route section will be finished at a given moment so that the land acquisition schedule is considered in a short time.

- According to the survey data, only 110kV Phu Cat-Phu My-Hoai Nhon T/L is possible that mine and bomb remain on the ground. In order to be ensure the safety, the minimum mitigation, before handing over the route to construction party, the mine and bomb destroying work will be contacted with specialized armed forces.

During the construction period, keeping the responsible institutions informed of what happens. Not to be careless in construction.

- being applied the limitation measures of tree cutting, soil filling for growing tree, grass after the construction period to minimize the impacts in the future. In the areas of soil erosion, after cutting all high trees in ROW, other trees which is not higher than the permitted limitation of T/L will be maintained to restore land and not to be deserted. Developer will be responsible in the compensation for affected crops and assets, carry out the measures for
- Temporary service road: Environmental impact mitigation due to the project construction.

Definition on the temporary service road in construction period is considered in design stage and accurated before carrying out the construction work. To mitigate the environmental impacts, the main mitigation measures:

  * Temporary service road will be from the existing road, it is convenient in traffic.
  * To avoid running through forests, pond, lack...
  * Filling the road to avoid the land erosion
  * In agreement with local authorities in the proposed area of the project.

2. Safety measures and worker's health in construction

To ensure the construction safety, the regulations and norms will be carried out strictly, as follow:

- Before taking into the operation, the quality and quantity of equipment and instrument will inspected routinely.
- Workers carry out their responsibilities above take care of their health routinely. Before carrying out their works above, workers will check labor instruments and safety cord. The instruments will be light, snug and in easily operation. When it is dark, foggy, rainy and thundery, workers don’t do above.
- Workers will bring the safety hat when doing on the ground and stand far from the damage sites.
- The cord and ligament will be carefully checked when craning the equipment and materials.
- It is necessary to have a ready fire engine when installing transformer
- It will have a warning plate and prohibition plate in closing operation.
- It will have the measures of health service to prevent the endemic diseases such as malaria, diarrhea and waterborne diseases...

3. The safety of fire

Explosive measure will be applied in the substation

\[110kV\text{ substation and transmission line in central region}\]
construction but digging and filling measures are the main construction activity. Construction crews will be supplied with alternate cooking fuels, and will not be allowed to use forest resources for cooking.

4. The camps for the project construction

| 4. The camps for the project construction | The camps will be located on the abandon land, nearby the proposed area, withdrawable structure. It is convenient to supply foods, drinking water... The camps will not be mixed with local communities. Mainly using kerosene for cooking. |

**VI.4 Management and operation stage:**

| 1. Management, operation, repair and maintenance works | Management, operation and repair of the T/L and substation include repair work, routine maintenance work, the faults directed by Power Transmission Company. Workers are in conformity with the regulation of main safety measures as follow:

+ Safety measure when working at the substation.
+ Safety measure when contacting with power equipment
+ Safety measures in management, operation, and repair of power network. |

2. Management of land, trees in ROW | Power Transmission Company (PTC) will be responsible in:

- Inspecting the land and structures in ROW (15m).
- Timely discovering the land erosion surround tower, leveling the soil, growing grass, building the edge of foundation are necessary. Cutting trees due to ROW violation will be carried out routinely.

Discovering and preventing the construction of other structures in ROW and the violation of the regulations of T/L operation safety, human life and health safety.

The inspection will not impact to the surrounding 110kV substation and transmission line in central region.
| 3. Examining the temporary service roads | Almost all temporary service roads will be demolished after finishing the project, however, the temporary roads along the route will be kept for the purpose of routine inspection, repair and maintain. Keeping the roads will be convenient for stealers and hunters, however, the impacts will be mitigated by forestry inspection staff. |
CHAPTER VII: ANALYSIS OF REPLACEMENT ALTERNATIVE

For T/L, one of the most important references for the mitigation of environmental negative impacts is the valuation of the selection alternatives of route and substation location.

Based on the comparison of selection alternatives, route and substation location will impact to the environment at least and be ensured the economy – technique of the project.

VII.1. Site selection of route and substation:

Consultant Company will apply the following selection standards of substation, define the route and substation location to avoid the following regions:

+ Dense forest

According to the protection law of Viet Nam, the tree cutting is managed strictly; therefore, the selection of substation location will avoid going through the regions with dense trees.

+ Population area

+ A forbidden forest area, historic or cultural vestiges, national park, pagodas...

+ Parallel or near the phone cable.

+ Airport, militarized zone.

The route and substation location will be analyzed on 2 alternatives. The alternative that is selected is impacted at least to the environment and be ensured the economy – technique of the project.

1. 110kV Phu My substation and 110kV Phu Cat-Phu My-Hoai Nhon T/L (of Binh Dinh province).

   + T/L: the route will be analyzed on 2 alternatives. The alternative is selected on strong point more than other: avoiding the training-school for shooting, running through people’s houses at least, being convenient in construction and no running nearby the signal line of railway.

   + Substation: substation location will be analyzed on 2 alternatives. The alternative is selected on strong point more than other is: no being flooded, leveling the surface is small and being convenient in compensation and clearance work.

2. 110kV Dien Sanh substation and 110kV T/L to the substation (of Quang Tri province)

   + Substation: substation location will be analyzed on 2 alternatives.
The alternative is selected on strong point more than other is: avoiding the population areas, there are not the surrounding civil projects, branch into the substation is short.
+ T/L into the substation: the route will be analyzed on 2 alternatives. The alternative is selected on strong point more than other is: compensation and clearance are less than, length of T/L is shorter.

3. 110kV Khe Sanh substation and 110kV T/L to the substation (of Quang Tri province).
Substation location and branch will be analyzed on 01 alternatives. According to the selection of power network connection alternative and the map, the substation location and branch will be selected 01 position. The alternative is selected on strong point: there're not several people's houses, the site is convenient in construction and traffic.

4. 110kV Krong Buk substation and 110kV T/L to the substation (of Dak Lak province).
+ Substation: substation location will be analyzed on 2 alternatives. The alternative is selected on strong point more than other is: nearby the 220kV Krong Buk substation, impact to the environment at least, it is convenient to transport equipment from Quy Nhon port. If selecting the alternative, the branch with 1.3km long is not necessary, therefore impact to the population area at least.

5. 110kV Dien Khanh substation and 110kV Nha Trang-Dien Khanh T/L (of Khanh Hoa province).
+ Substation: substation location will be analyzed on 2 alternatives. The alternative is selected on strong point more than other: there're not the surrounding civil projects, it's convenient in compensation work, length of T/L into the substation is short (5.5km), in the meanwhile, length of T/L of the unselected alternative is 14km (there will be carried out the compensation and clearance much).
+ T/L: The route will be analyzed on 2 alternatives. The alternative is selected on strong point at the same the selected alternative of substation location. It's convenient in power network connection.

6. 110kV Van Ninh (Van Gia) substation and 110kV T/L to the substation (of Khanh Hoa province).
+ Substation: substation location will be analyzed on 2 alternatives. The alternative is selected on strong point: it is very convenient in compensation, the surface leveling and operation management. The road into the substation is shorter.

7. 110kV Phong Dien substation and 110kV T/L to the substation (of Thua Thien-Hue province).
System Efficiency Improvement, Equitization and Renewable Project (SEIER) -34-

+ Substation: substation location will be analyzed on 2 alternatives: The alternative is selected on strong point: Impact of electro-magnetic field on human and animals is less than and no impact of the regional landscapes.
+ T/L: The route will be analyzed on 2 alternatives: the alternative is selected on strong point: no running through the regions for mine exploiting and being suitable with the development plan in future.

8. 110kV Dai Loc substation and 110kV Da Nang-Dai Loc T/L (of Quang Nam province).
+ Substation: substation location will be analyzed on 2 alternatives: The alternative is selected on strong point: it is convenient to build the road into the substation, no impact much to the people’s living activities.
+ T/L: The route will be analyzed on 2 alternatives: the alternative is selected on strong point: mitigating the across through the people’s houses (mitigating 09 houses) and mitigating no. of times (2 times) across through the 35kV T/L.

VII.2. Technical solutions for route and substation selection

Apart from the best alternative for route and substation location selection, the technical solutions for T/L and substation selection is also important to overcome the environmental negative impacts of the project.
+ Alternative selection of power network connection, distribution voltage level:
  Based on the load demand, current power resource and local power network
+ Conductor: is selected on the geological condition, economic current density condition and wave inspection in fault, voltage loss.
+ Insulator and accessories: depend on the voltage level, conductor size and the climatic condition of the proposed area of the project.
+ Earthing: is accordance with the current norms of power field to ensure the safety operation and the safety to population area.
+ T/L and substation will be equipped with modern equipment to avoid the faults.
+ Pole: Centrifugal concrete support and tower
+ Foundation: Block foundations on the spot
+ Arm: is made in the coated-zinc sharp steel.
+ Substation structure: 110kV switchgear is installed outdoor, 22kV switchgear is indoor.

VIII: POLYRINATE BIPHENYL RECOVERY (PCB)

In the project, transformers and capacitors will be not replaced. The project will be installed all new and modern equipment without PCB.
Chapter IX

PUBLIC PARTICIPATION AND CONSULTANT

World Bank (the Bank) policy regarding community involvement provided in detail in the WB Environmental Assessment Source Book, Vol. 1 (1991). It is summarized as follows.

Bank policy directs the borrower to publicly solicit, hear and consider the concerns of the local community, other affected groups and local NGOs (non-governmental organizations) and to fully incorporate into the design and implementation of the project and the Environmental Assessment (EA). The rationale for consideration and incorporation of the concerns affected parties is to assure community acceptance and enhance the viability of the project. The Bank has found that where such views have been successfully incorporated into the design and plan of implementation, the projects are more likely to be successful. The Bank has not found community participation to be an impediment to project execution. On the contrary, projects in which affected parties views have been excluded are more likely to suffer from delay and issues resulting from community resistance.

Vietnam is a socialist country. The State is determined by the fundamental principle "of people, from people and for people". The democratic approach to the social management of GOV is expressed in the basic principle of principle "people know, people discuss and people control" all activities of the Government.

To avoid negative impacts on project affected people. Governmental Decree N 175/CP issued on 18 April 1994 requires that all projects in the development of industry: energy, transport, water resource, agriculture, etc. should conduct a compliant EIA study meeting the requirements of the environmental management authorities and the contents of EIA reports include predicted impacts and mitigation measures must be discussed with the PAP.

The PAP should submit their comments and concerns to the project proponents through their authorized representatives, e.g. governmental agencies (the people Committee. People Council) and/or socio-political organizations (Fatherland Front, Farmers Association, Women Union etc.) or non-governmental organizations (e.g. Vietnam Association for the Conservation of the Nature and Environment, Biological Association, Economic Association, Foresters Association etc.). These organizations should collect all comments from the local people and send them to the environmental management authorities DOSTE at provincial level or MOSTE at central level or even to provincial People’s Council or National Assembly. During the environmental review process, all comments and requirements of the PAP should be discussed and conclusions

110kV substation and transmission line in central region
reported to the project proponents, so that the project can develop proper alternatives and implement measures for mitigation of the negative impacts. The project will receive an investment license, only after appropriate modification of location, design, capacity and/or technology of the project to meet the requirement of environmental protection and resettlement.

Involving affected people, especially the poor, often requires additional expenditures. The costs include travel and subsistence for attendance at meetings. Translation and expert advice that the community needs to help to formulate a response to the proposal, etc. Such costs should be systematically budgeted. The EA team must ensure that issues raised in affected communities are communicated to the other participants in the EA process, including various public agencies and NGOs that may be in the larger process of public consultation.

As the EA proceeds, the people in the affected area should be kept informed routinely and systematically. Written material must be translated into local languages. Where many are unable to read, oral discussion and visual presentations sessions (often, by the resident social promoters or facilitators) should be used. Throughout the EA process, the project agency should continue seeking views from and providing feedback to the affected community.

Contents of Public Consultation meetings.
- PECC4 will inform the participants of the major technical and environmental issues of the project and mitigation measures.
- In the meetings all questions of PAP should be addressed, all recommendations and concerns of PAP and PC should be recorded.
- List of participant should be noted with their signatures.
- The use of drawings, pictures and recorders is recommended.

Materials to be presented in the meetings.
The Consultants will present the following materials:
- Booklet/summary of F/S Report and EIA Report
- Maps of the project site
- Figures, tables, photos, pictures, etc. presenting the project activities.

IX.1. Aims of public consultation and information dissemination

Information dissemination to, consultation with and participation of affected people and involved agencies (i) reduce the potential for conflicts, (ii) minimize the risk of project delays, and (iii) enable the project to design the resettlement and rehabilitation program as a comprehensive development program to fit the needs and priorities of the

110kV substation and transmission line in central region
affected people, thereby maximizing the economic and social benefits of the project investment.

Aims of public consultation and information dissemination are:
- Share all project descriptions, components, purposes as well as project negative impacts on environment and restoration and mitigation measures.
- Collect information on project environment, local people’s concern on project in general and on environmental aspects in particular.
- Find coordination and participation of local people in realizing impact risks as well as supervising the project activities.
- Reduce probability for social conflicts.
- Reduce risk for project delay.
- Help to establish a comprehensive environment management plan and thus, maximize the project socio-economic benefit.

Public consultation and information dissemination are scheduled for 2 stages: project preparation and project implementation. Refer to the meeting list attached for details.

IX.2. Public consultation and information dissemination during project preparation stage:

During project preparation stage, the following activities were carried out sequentially:

Phase I-Activity 1: Information & discussion with local authorities on the line route.

After studying maps and visiting the site, PECC 4 had envisaged a preliminary route on 1/50,000 scale map. This map was sent to all locations passed by the line and relevant local authorities. The local authorities have agreed on the project line routes. This activity was carried out in 4÷10/2001.

Phase I - Activity 2: Impact survey and statistics

Based on the agreed line route, survey teams had realized the route at site, made the piling and coordinated with the commune officials to make a list of PAPs' affected land and crops. The socio-economic survey forms were delivered to affected households (for each commune) as basis for SLS. This activity was carried out in 4÷10/2001.

Phase I - Activity 3: Meetings with PAPs

When the survey finished, PECC 4 in coordination with the commune officials held meetings with PAPs having land in the line ROW and with village representatives. In these meetings, PECC 4 officials informed the participants of the project purposes;

110kV substation and transmission line in central region
presented the project impacts on land and crops in detail; introduce the principles and policies of compensation and advised people not to build new structures in the line ROW. PAPs were consulted on the entitlement policy and the compensation in cash had been accepted.

Phase I - Activity 4: Meetings with the concerned PPCs

After working with the communes, in 4-10/2001 PECC 4 had sent missions to work with the provincial functional agencies such as Financial and pricing service, Planning and investment service, Agriculture and rural development service, DOSTE, etc. and make the project purposes clear to PPCs; at the same time discuss with local officials on the aims and principles of ground clearance, on the proposed policies of EIA, legal and illegal issue and the local organization working on resettlement and compensation; collect the local compensation rates for land and crops.

Phase I - Activity 5: Consultation on EIA

Basing on the survey result, PECC4 shall prepare draft EIA to submit to EVN, WB and concerned PPCs for revision. All comments shall be taken into consideration, incorporated in the next version for approval by relevant authorities.

Phase I - Activity 6: Approval of EIA

In 9-10/2001, PECC4 had sent missions to work with the district people’s committees, DOSTEs on draft EIA. The revised EIA shall be submitted to WB for approval. This shall be legal basis for EIA implementation. After preparation, the draft EIA report has been made available at DOSTEs for reference.

IX.3. Public consultation and information dissemination during project implementation stage:

Public consultation and information dissemination during project implementation is of great importance as the project impacts on the environment and people at the stage would be worst. The following information campaign should be carried out:

* General description of project:

Right after signing of credit agreement and preparation of project commencement, the first task for PMB is to held meetings with involved PPCs, DPCs so as to inform them of the project policy and ask them for coordination in resettlement activities.

* Information on RAP:

Information campaigns on and public consultation about RAP should be carried out continuously as envisaged in RAP report including: information on RAP report, delivery
of asset and crop inventory list, meetings with PAPs on compensation, information on project schedule for local people and authorities, etc.

* Information on EIA:

Another information campaign on environment impact mitigation shall also be lounched beside the information campaign on RAP, the campaign shall include:

1. **Notification on local means of communication:**

PMB shall coordinate with the local authorities in notifying on local newspapers and television channel about project general information such as: project implementation schedule, project components, information on RAP such as project impacts on local people and compensation policies. Besides, information on project environment should also be mentioned such as project impacts on environment and mitigation measures.

2. **Environment information booklet**

An environment information booklet (EIB) on impact and mitigation measures will be prepared by CPPMB basing on the approved EIA report. The booklets will be displayed at offices of involved commune and district people’s committees, and will be distributed to local unions such as farmers’ association, women’s association, all heads of project villages, all PAPs in the project area in the initial duration of the implementation stage of the project.

The EIB contents are outlined below:

- Project basic description
- Description of the main project components to be constructed in the area
- Project design objectives
- Implementation schedule
- Project impacts
- Mitigation measures
- Institutions Responsible for EMP
- Monitoring
- Description of the detailed impact of the project on the specific household
- Compensation rates for each types of impact

110kV substation and transmission line in central region
3. Notification for local authorities about environment impacts:

All environment impacts induced during construction as well as operation of the project, if any, will be announced in meetings with local authorities so as to find prompt solution in order to avoid conflicts and implementation delays. All problems will be solved in monthly meetings between local authorities, PMB, contractors and consultants.
Chapter X: ENVIRONMENT MANAGEMENT PLAN (EMP)

Environment management plan (EMP) of the project consists of all institutional measures, supervision and mitigation will be carried out in the development period of the project in order to reject the negative social and environmental action, overcome or mitigate the action in acceptable measures. The EMP also consists of necessary actions to carry out the measures.

During the construction and operation period, 08 sub-projects will impact to environment.

+ Mitigating the noise, dust... during the construction period will be carried out:
  - Use of adequate machinery
  - During working day only (in working hours)
  - Construction work (foundation building) will use the prefabricated mixture concrete if possible.
  - Watering the surfaces and covering to mitigate dust impact
  - Substation Location will be far from population area
  - Use the existing roads to avoid the damages for cultivation land if not, building the temporary service roads (Van Gia substation and T/L into the substation; Dien Khanh substation and T/L into the substation).
  - It is necessary to pay attention to Phu Cat-Phu My-Hoai Nhon T/L: Compensation for tree cutting followed by afforestation
  - Citizens will be informed about the scope and purpose of this construction.
  - During the meeting with NGO and PAGs from affected areas, no concerns regarding environmental issues were raised from audience.

+ Mitigating the noise, oil of transformer ... during the operation period:
  - Substation Location will be far from population area
  - Substation will have concrete oil pit, big enough to absorb complete content of oil from transformer to prevent the leakage of oil into soil. Using an oil-truck to carry the oil to factory for re-done.
  - Technical characteristics, to be given in tender documents, shall strictly request transformer oil without PCBs.
### X.1. MITIGATION PLAN

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigating Measure</th>
<th>Cost</th>
<th>Institutional Responsibility</th>
<th>Comments (e.g. secondary impacts)</th>
</tr>
</thead>
</table>
| Construction| * Noise                                    | - Arrange suitable working time  
- Use adequate machinery  
- Dispose waste in proper areas  
- Treat waste water before draining out |     | Contractor                   | Contractor                        |
|             | * Water pollution                          | - Water construction sites  
- Cover load trucks  
- Prefabricated mixture concrete if possible |     |                             |                                   |
|             | * Dust                                     | - Control tree cutting  
- Forbid using material from forest for cooking or heating purpose  
- Collect and dispose waste properly from the substation site  
- Avoid discharge waste from construction camp into water |     |                             |                                   |
|             | * Deforestation                            |                                      |     |                             |                                   |
|             | * Waste                                    |                                      |     |                             |                                   |
| Operation   | * Noise caused by operating equipment      | - Use equipment with permitted noise level  
- Build pit to treat leaking fuel or lubricants before draining out  
- No use of PCBs  
- There's no impact as electric field density is lower than permitted level | Province Power Services | Province Power Services |                                   |
|             | * Pollution caused by fueling or lubricants spillage | - Plant trees that could not grow over height limit to avoid trees cutting (soy bean trees or other types of vegetable trees) |     |                             |                                   |
|             | * Electric field                           |                                      |     |                             |                                   |
|             | * ROW clearance                            |                                      |     |                             |                                   |
|             | * Hazardous conditions                     | * Maintain fence for safety; install warning signs  
* Collect and dispose oil leakage at the substation site  
* Install vibration equipment |     |                             |                                   |
|             | * Oil leakage                              |                                      |     |                             |                                   |
# X.2. MONITORING PROGRAM

<table>
<thead>
<tr>
<th>Phase</th>
<th>What parameter is to be monitored</th>
<th>Where is the parameter to be monitored</th>
<th>How is the parameter to be mentioned/ type of monitoring equipment</th>
<th>When is the parameter to be mentioned frequency of measurement or continuous</th>
<th>Why is the parameter to be mentioned (optional)</th>
<th>Cost</th>
<th>Institutional Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td>* Noise</td>
<td>- At construction sites</td>
<td>- Measuring devices</td>
<td>- During material delivery, construction and on complain</td>
<td>Assure compliance of performance with environment, health and safety requirement</td>
<td>Supervision Contractor Province Power Services DOSTE</td>
<td>Supervision Contractor Province Power Services DOSTE</td>
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<tr>
<td></td>
<td>* Water pollution</td>
<td>- At construction sites</td>
<td>- Specialized instruments</td>
<td>- During material delivery, construction and on complain</td>
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<td></td>
<td></td>
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<td></td>
<td>* Dust</td>
<td>- At construction sites</td>
<td>- Inspection</td>
<td>- During material delivery, construction and on complain</td>
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<tr>
<td></td>
<td>* Deforestation</td>
<td>- At construction sites</td>
<td>- Supervision</td>
<td>- During material delivery, construction and on complain</td>
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<td></td>
<td>* Workers safety</td>
<td>- At construction sites</td>
<td>- Inspection</td>
<td>- During material delivery, construction and on complain</td>
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<tr>
<td><strong>Operation</strong></td>
<td>* Noise caused by operating equipment</td>
<td>- At substation locations</td>
<td>- Inspection and on complain</td>
<td>- Once a month</td>
<td>Assure compliance of performance with environment, health and safety requirement</td>
<td></td>
<td>Province Power Services DOSTE</td>
</tr>
<tr>
<td></td>
<td>* Pollution caused by fueling or lubricants spillage</td>
<td>- At substation locations</td>
<td>- Inspection and on complain</td>
<td>- During maintenance activities and on complain</td>
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<tr>
<td></td>
<td>* Electric field</td>
<td>- At substation locations</td>
<td>- Inspection and on complain</td>
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<tr>
<td><em>ROW clearance</em></td>
<td><em>Hazardous conditions</em></td>
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<tr>
<td>- Substation locations or locations</td>
<td>- Measuring devices</td>
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<tr>
<td>traversed by T/Ls</td>
<td>- Once per 6 months</td>
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<tr>
<td>- ROW areas</td>
<td>- Supervision</td>
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<tr>
<td>- Substation locations or locations</td>
<td>- Once per 6 months</td>
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<tr>
<td>traversed by T/Ls</td>
<td>- Inspection</td>
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<tr>
<td>At substation site</td>
<td>- Once a year</td>
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<tr>
<td><em>Oil leakage</em></td>
<td>Regular checking</td>
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</tbody>
</table>

![Table content]

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X.3. INSTITUTIONAL STRENGTHENING

1. Equipment purchases

There will be no equipment purchase because Monitoring Contractor will perform such activities. Monitoring Contractor will be selected after procurement process during which Contractor should provide evidence on possession of necessary equipment and previous experience in such works.

2. Training/Study tours

Training courses should be held with following environmental related activities:

During Construction /Operation, maintenance, reparation phase:
1. Environmental monitoring & management during construction/operation
2. Mitigation measures on environmental impacts
3. Safety methods

Training of the two phases will be carried out in one short course of about 01 week as it aims on general environmental issues: pollution of water, air, lands; protection and mitigation measures on environmental impacts. However, the project covers 7 provinces with different project sites, training course may be organized 1 or 2 times in the 7 provinces.

The course would be realized for staff that will be responsible for environmental management. Participants should be from constructors' teams, Provinces' power services, representatives from EVN, PC3 and PNPMB. The objectives of the training is to train staff so that they could successfully provide law enforcement in the field of environmental protection, especially pollution may caused during construction/operation phase

Approach to the formal training program will be to provide an educational experience that will help the trainees to better accomplish their on-the-job responsibilities. The emphasis of the program should be pragmatic and practical. Strong emphasis should given to on-the-job training which would include an explanation of what is to be done and the trainees will be expected to put these procedures in practice under the supervision of the training personnel.

All training activities could be carried out under guidance of experts from Ministry of Science-Technology and Environment (MOSTE), DOSTE, the World Bank or other professional institutions.

Study tours should be the back up activity for training. They could be recognized as study visit to substations and network sites. Through those study tours participants would become acquainted with environmental management, policies, procedures and practices utilized in those Environmental Agencies and with monitoring activities that are conducted in 110kV substation and transmission line in central region.
order to provide necessary information for environmental management. Participants of the study tours would be the same ones as those that would participants as trainees.

**Estimation cost:**

* Training cost is included (cost for travel, accommodation, per diem, document and other) will be 5,000,000 VND/ person x 43 persons = 215,000,000 VND equivalent amount in USD is **14,333,000 USD** (in which: EVN: 1 person; PC3: 2 persons; PPSs: 1 person x 7 provinces = 7 persons; Provinces: 1 person x 7 provinces = 7 persons; districts: 2 persons x 11 districts = 22 persons; PNPMB: 1 person; Contractors: 3 persons)

* Cost for Monitor, supervision, implementation of environmental protection measures in construction stage :3,000,000 VND/ sub-project x 8 sub-projects = 24,000,000 VND equivalent amount in USD is **1,600 USD**.

* Annual cost for Monitor, supervision, implementation of environmental protection measures: 1,000,000 VND/year x 25 years x 8 sub-projects = 200,000,000 VND equivalent amount in USD is **13,333,000 USD**.

**Total cost:**

(14,333,000 + 1,600 + 13,333,000) USD + 10% contingency cost = **30,434,360 USD**

In construction stage, the cost will be included in total investment capital. Until operation stage, the cost will be included in operation cost.

Capital resource for implementation will receive from EVN’s capital.

3. **Consultant Services**

Consultant Services would not be included in the project.

4. **Special Studies**

Special studies are not necessary.

X.4. **SCHEDULE**

During design phase of the Project, mitigation measures will be applied parallel to technical design for construction. It is expected to start from 30/12/2001 to 30/3/2002 (1st stage) and from 30/5/2002 to 30/10/2003 (2nd stage).

Mitigation and monitoring activities during construction phase will be carried out along with construction phase. It is planned to start in 8/2003 and finished in 7/2004.

Mitigation and monitoring activities during operation will run together with maintenance activities. These activities will be planned and started after the project completion.

Training activities and study tours are planned. would be started before construction phase.
Implementation Schedule:

<table>
<thead>
<tr>
<th>Sub-project</th>
<th>Start date</th>
<th>Finish date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation action</td>
<td>Construction: 8/2003</td>
<td>Finish date: 7/2004</td>
</tr>
<tr>
<td>Monitor action</td>
<td>Construction: 8/2003</td>
<td>Finish date: 7/2004</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-project</th>
<th>Start date</th>
<th>Finish date</th>
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<tbody>
<tr>
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<tr>
<td>Monitor action</td>
<td>Construction: 8/2003</td>
<td>Finish date: 7/2004</td>
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110kV substation and transmission line in central region
Mitigation action | Construction 8/2003 | 7/2004 |
<table>
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<tbody>
<tr>
<td></td>
<td>Operation 7/2004</td>
<td>25 years</td>
</tr>
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</table>

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<tbody>
<tr>
<td></td>
<td>Operation 7/2004</td>
<td>25 years</td>
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<table>
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<td>Mitigation action</td>
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</tr>
<tr>
<td></td>
<td>Operation 7/2004</td>
<td>25 years</td>
</tr>
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</table>

**X.5. INSTITUTIONAL ARRANGEMENTS**

1. **Institutions’ responsibilities**

The institutions and offices that have been responsible for the preparation of this EIA or will be in charge of its implementation are:

- Electricity of Vietnam (EVN)
- Power Company No. 3 (PC3)
- Power Network Project Management Board (PNPMB)
- Provincial Power Services (PPS)
- Provincial People’s Committee (PPC)
- District People Committee (DPC)
- Commune People Committee (CPC)
- Construction Contractor

Besides, the project will be implemented under guidance of the Ministry of Science-Technology and Environment (MOSTE), Department of Science, Technology and Environment (DOSTE) in the field of environmental management.

The responsibilities and roles of the above institutions is specified as following:

* **Ministry of Science-Technology and Environment (MOSTE)**

Establishing in 1991, the MOSTE’s mandate is to set policies and guidelines for environmental management, develop standards, coordinate research, provide technical back up and support to the line ministries, and provide support and training to provinces. MOSTE is divided into number of divisions dealing with planning, EIA, pollution control, waste management, environmental monitoring, inspection, information and training.
* Department of Science, Technology and Environment (DOSTE)
Recently the DOSTE as the provincial level have been instructed to add environmental protection to their mandate. However most of provincial institutions are suffering the lack of capacity to conduct EIAs and environmental monitoring of more complex projects and have to rely on the national institutions. The provincial DOSTEs are funded from provincial budgets and report directly to the People’s Committees.

* Electricity of Vietnam (EVN)
Electricity of Vietnam is an Employer of the project and is responsible for evaluation of F/S, technical design for construction, approval of bidding plan, bidding documents... In addition, within EVN there’s a department of informatics, technology and environment will be in charge of all matters related to EIA of the project.

* Power Company No. 3 (PC3)
Power Company No. 1 is the owner of the project and responsible for the whole project including environmental management program. PC3 will supervise the establishment of specialized bodies in charge of the preparation and implementation of the project and will have to approve all decisions taken by PNPMB

* Power Network Project Management Board (PNPMB)
The PNPMB is established by PC3 to coordinate all project activities including environmental management such as mitigation measures, monitoring. The PNPMB is also in charge of:
- Overall planning, management and monitoring of the environmental management
- Ensuring that all environmental protection and mitigation measures of environmental impacts are carried out in accordance with policies, regulations on environment and other relevant laws.
- Coordinating with provinces’ people committees, provinces’ power services, districts’ people committees... in environmental management activities.
- Being in charge of organizing training courses of local staff (provinces, districts) and contractors’ teams on mitigation measures and safety methods (inviting professional expert on environment shall be included).
- Carrying out internal monitoring and independent monitoring (may be contracted with Power services or consulting units) of the project.
- Supervising and providing budget for monitoring activities.
- Reporting on the environmental information to PC3 and the WB

* Provincial People’s Committee (PPC)
- Guiding and monitoring environmental management planing and implementation within the province

110kV substation and transmission line in central region
- Approving method of environmental protection and impact mitigation including estimated costs after the method was appraised by DOSTEs.
- Reviewing document on environmental activities and granting within the province area.

* Provincial Power Services (PPS)
  - Directly implementing process of environmental impact mitigation and protection during and after construction phase.

* District People’s Committee (DPC)
  - Ratifying methods of environmental protection and management
  - Directly supervising implementation process of environmental impact mitigation and protection during and after construction phase.

* Communes’ people committees (CPC)
  - Confirming impact caused by the project in the commune
  - Monitoring environmental impact mitigation and protection process within the commune.
  - Organizing meetings at commune level on matters concerning environment

* Contractor
  - Directly applying environmental impact mitigation and protection
  - Being responsible for project safety during construction phase
  - Ensuring all regulations, policies on environment and other relevant laws to be strictly complied.

2. Reporting system

A proposal on environmental protection and impact mitigation measures to be applied will be prepared by the contractor and sent to PNPMB for ratifying before construction. The proposal should be included safety of persons associated with the works and also the public, during construction period. Main points of the proposal are as following:
  - Mitigation measures to be taken on and off site avoiding damage or nuisance to persons or to property arising.
  - Safety methods to maintain conditions of safety for all persons entitled to be on site and
  - Provision and maintenance of all lights, guards, fencing, warning signs and watching for protection of the works and other property and for the safety and convenience of the public.
Construction Contractor will provide monthly reports to the PNPMB in which describing all the environmental mitigation and protection measures carried out in the month.

Monthly report also applies to the Independent Monitoring Contractor and Provinces’ Power Services for their part of mitigating and monitoring activities. In case of accident or endangerment of environment, an unusual report must be done immediately and sent to PNPMB, PPCs, DOSTes, DPCs for consideration and settlement.

Monitoring Contractor will be selected before construction phase starts. Monitoring Contractor will monitor environment quality (air, water and soil quality, noise levels and equipment supply) through those report monthly to the PNPMB and the WB. These reports will encompass list and explanation of all undertaken activities at the site and results of the field research, as well as recommendations for future field activities and protection measures.

Basing on received data from these monthly reports, PNPMB will prepare quarterly Environment Monitoring Reports for submission to the PC3 and the WB for consideration. The quarterly report shall resume information gathered at the field and evaluate effectiveness of the mitigation program in the light of monitored parameters. In additional, the report will concentrate on possible future mitigation and monitoring activities that could be utilized to assure better quality of the environment.

An annual Environmental Report sent to EVN and the WB will be made by the PC3 in which summarizes the environmental protection measures implemented, problems encountered, actions taken to resolve environmental problems and results of environmental monitoring.

PNPMB under instruction of PC3 will have the authority to spend, shutdown change operations according to recommendation of the DOTEs. This will be the case if environment conditions of the site clearance or construction included in project are not in accordance with environmental standards and regulations or if works are not perfumed according to technical specifications and contract requirements related to the environment. This will be proved by Monitoring Contractor reports to DOSTes.

PNPMB are authorized to supervise and check all expenditures referring to mitigation and monitoring activities through recommendation of Environmental Unit after ratified by the PPCs.

Environment Inspection Department of the MOSTE will have the authority for immediate suspension of works if performance is not in accordance with environmental standards and regulations. Inspection will then inform PC3, PNPMB about suspension and order to proceed according to their directive.

Institutional arrangements flow chart is enclosed with all briefly relations presented as controlling and reporting activities.
During implementation of this Project public has the right to participate either directly or indirectly which introduces the possibility to present its interests and opinion in process of decision making. In order to reach the best option during this process, state should enable for each individual to get appropriate knowledge connected with basic relation between nature and human health, activities with harmful influence on nature and importance resulting from it. Public or each individual will be allowed to bring legal action at competent court if it considers that its claim for participation or information is ignored, groundlessly refused or provided information is inadequate.

**Proposed measures:**

* Detailed measures in the RAP will mitigate significantly the environment impacts for population area.

* Construction and operation management workers will carry out the regulations of the safety in their work.

* Developer and Layout Clearance Boards will inform to construction unit, management unit to be in accordance with the regulations on the environment protection and to carry out the compensation and resettlement policies for the safety in construction and operation period.
Consultation with Local NGOs and PAGs

Consultant Company will represent the content of the project and the environmental impacts to get opinion of local NGOs and PAGs.

1. Khe Sanh substation and T/L into the substation:
Location for meeting: at main office of people’s Committee of Quang Tri province
Time: March 10, 2000

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Organization/Occupation</th>
<th>Address</th>
<th>Tel.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Le Huu Phuc</td>
<td>Vice chairman of Provincial People’s Committee</td>
<td>Dong Ha town</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Thai Vinh Quoc</td>
<td>Vice head of Power Technical Department</td>
<td>Dong Ha town</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Nguyen Vinh</td>
<td>Director of Lao Bao Open Economic Zone</td>
<td>Khe Sanh town</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Nguyen Van Binh</td>
<td>Expert of Lao Bao Open Economic Zone</td>
<td>Khe Sanh town</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Nguyen Van A</td>
<td>Vice chairman of District people’s Committee</td>
<td>Khe Sanh town</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Le Van Ba</td>
<td>Farmer</td>
<td>Khe Sanh town</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Nguyen Thi Mai</td>
<td>Women Union</td>
<td>Khe Sanh town</td>
<td></td>
</tr>
</tbody>
</table>

During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.
Location of the project agreed by Quang Tri People’s Committee

2. Dien Sanh substation and T/L into the substation:
Location for meeting: at main office of people’s Committee of Hai Lang district
Time: June 6, 2000

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Organization/Occupation</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Le Huu Phuc</td>
<td>Vice chairman of Provincial People’s Committee</td>
<td>Dong Ha town</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Trang Dung</td>
<td>Vice Director of Industrial Department</td>
<td>Dong Ha town</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hoang Tien Dung</td>
<td>Expert of Industrial Department</td>
<td>Dong Ha town</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Bui Hai Vong</td>
<td>Expert of Construction Department</td>
<td>Dong Ha town</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tran Duc Tam</td>
<td>Chairman of District People’s Committee</td>
<td>Hai Lang district</td>
<td></td>
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<tr>
<td>6</td>
<td>Le The Thanh</td>
<td>Expert of district</td>
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<tr>
<td>7</td>
<td>Nguyen Thu Ha</td>
<td>Women Union</td>
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<tr>
<td>8</td>
<td>Tran Duc</td>
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<td>Tan Dien hamlet</td>
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</tbody>
</table>

110kV substation and transmission line in central region
During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

Location of the project agreed by Quang Tri People’s Committee

3. **Phong Dien substation and T/L into the substation:**

Location for meeting: at main office of people’s Committee of Quang Tri province

Time: February 9, 2001

<table>
<thead>
<tr>
<th>No</th>
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<tr>
<td>1</td>
<td>Nguyen Viet Hoach</td>
<td>Vice chairman of District People’s Committee</td>
<td>Phong Dien town</td>
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<tr>
<td>2</td>
<td>Nguyen Van Tien</td>
<td>Expert of construction department</td>
<td>Phong Dien town</td>
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<tr>
<td>3</td>
<td>Tran Duc Loc</td>
<td>Expert of industrial department</td>
<td>Dong Ha town</td>
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<tr>
<td>4</td>
<td>Hoang Thi Phuong</td>
<td>Women Union</td>
<td>Phong Dien town</td>
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<td>5</td>
<td>Chau Van Loan</td>
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<td>Phong Dien town</td>
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</tbody>
</table>

During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

Location of the project agreed by People’s Committee of Thua Thien-Hue province

4. **Dai Loc substation and T/L into the substation:**

Location for meeting: at industrial office of Quang Nam and Da Nang city

Time: March 30, 2001

<table>
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<tr>
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<tr>
<td>2</td>
<td>Le Minh Anh</td>
<td>Vice chairman of Quang Nam</td>
<td>Tam Ky town</td>
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<tr>
<td>3</td>
<td>Nguyen Van Lien</td>
<td>Vice director of Da Nang industrial department</td>
<td>Da Nang City</td>
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<td>4</td>
<td>Tran Phi Hung</td>
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<td>Tam Ky town</td>
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<td>5</td>
<td>Dinh Van Thu</td>
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<td>Tran Huu Nhien</td>
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<td>Tran Thi Ha</td>
<td>Women Union</td>
<td>Hoa Khuong commune</td>
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</table>

During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

110kV substation and transmission line in central region
Location of the project agreed by People’s Committee of Quang Nam province and Da Nang City.

5. **Phu My substation and T/L into the substation**:

Location for meeting: at People’s Committee of Phu My district.


<table>
<thead>
<tr>
<th>No</th>
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<td>2</td>
<td>Vo Van Hoa</td>
<td>Construction expert of district</td>
<td>Phu My town</td>
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<tr>
<td>3</td>
<td>Thai Xuan Nhuoc</td>
<td>Investment expert of district</td>
<td>Phu My town</td>
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<tr>
<td>4</td>
<td>Phan Thanh Mung</td>
<td>Expert of district office</td>
<td>Phu My town</td>
<td></td>
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<tr>
<td>5</td>
<td>Nguyen Thanh Son</td>
<td>Expert of district land office</td>
<td>Phu My town</td>
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<tr>
<td>6</td>
<td>Vuong Thai Hoa</td>
<td>Head of technical department in Binh Dinh Power Company</td>
<td>Quy Nhon City</td>
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<td>7</td>
<td>Tran Nghiem Bang</td>
<td>Power subsidiary of Bong Son district</td>
<td>Hoai Nhon district</td>
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<td>8</td>
<td>Nguyen Viet Xuan</td>
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<td>My Trinh commune</td>
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<td>9</td>
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</table>

During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

Location of the project agreed by People’s Committee of Binh Dinh province.

6. **Krong Buk substation and T/L into the substation**:

Location for meeting: at Pong D’Rang town.


<table>
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<tr>
<th>No</th>
<th>Name</th>
<th>Organization/ Occupation</th>
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<tr>
<td>1</td>
<td>Nguyen Thi Ngoc Le</td>
<td>Vice chairman of District People’s Committee</td>
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<tr>
<td>2</td>
<td>Nguyen Van Hoa</td>
<td>Chairman of Pong D’Rang town</td>
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<tr>
<td>3</td>
<td>Tran van Hai</td>
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<td>Pong D’Rang town</td>
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<tr>
<td>4</td>
<td>Nguyen Dinh Lap</td>
<td>Director of Industrial Department</td>
<td>Buon Ma Thuot City</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Vo Thanh</td>
<td>Expert of Industrial Department</td>
<td>Buon Ma Thuot City</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ngo The Tung</td>
<td>Expert of Industrial Department</td>
<td>Buon Ma Thuot City</td>
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<tr>
<td>7</td>
<td>Nguyen Thanh Nhat</td>
<td>Expert of Construction Department</td>
<td>Buon Ma Thuot City</td>
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<tr>
<td>8</td>
<td>Tran Ky Son</td>
<td>Director of Power Company</td>
<td>Buon Ma Thuot City</td>
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</table>

110kV substation and transmission line in central region
During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

Location of the project agreed by People’s Committee of Dak lak province.

7. Van Gia substation and T/L into the substation:
Location for meeting: at Van Gia town.

<table>
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<tr>
<th>No</th>
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<th>Organization/Occupation</th>
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<tr>
<td>1</td>
<td>Huynh Quang Van</td>
<td>Vice chairman of District People’s Committee</td>
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<tr>
<td>2</td>
<td>Nguyen Thi Thuan</td>
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<td>Tran Van Thang</td>
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<tr>
<td>4</td>
<td>Duong Tru</td>
<td>Chairman of Commune People’s Committee</td>
<td>Van Thang commune</td>
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<tr>
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<td>Nguyen Thi Hai</td>
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<td>Van Thang commune</td>
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<td>6</td>
<td>Pham Quang</td>
<td>Farmer</td>
<td>Van Thang commune</td>
<td></td>
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</tbody>
</table>

During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

Location of the project agreed by People’s Committee of Khanh Hoa province.

8. Dien Khanh substation and Nha Trang-Dien Khanh T/L:
Location for meeting: at Dien Khanh town.

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Organization/Occupation</th>
<th>Address</th>
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<tbody>
<tr>
<td>1</td>
<td>Luong Van Sau</td>
<td>Vice chairman of District people’s Committee</td>
<td>Dien Khanh town</td>
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</tr>
<tr>
<td>2</td>
<td>Nguyen Cot</td>
<td>Officer of district</td>
<td>Dien Khanh town</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Thieu Rua</td>
<td>Expert of Khanh Hoa Power Company</td>
<td>Nha Trang City</td>
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</tr>
<tr>
<td>4</td>
<td>Nguyen Van Hiep</td>
<td>Farmer</td>
<td>Dien Thanh commune</td>
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<tr>
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<td>Nguyen Tuan</td>
<td>Farmer</td>
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<td>6</td>
<td>Nguyen Thi Chon</td>
<td>Women Union</td>
<td>Dien Tho commune</td>
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</table>

During the meeting held with PAGs from affected areas, no concerns were raised regarding environmental issues of constructions.

110kV substation and transmission line in central region
System Efficiency Improvement, Equitization and Renewable Project (SEIER)

Location of the project agreed by People's Committee of Khanh Hoa province.

Appendix : List of the participants of the EIA project :

1. Tran Hoai Nam : Electrical engineer
2. Bui Viet Ha : Electrical engineer
3. Vu Ngoc Thu : Electrical engineer
4. Huynh Quoc Vinh : Electrical engineer
5. Bui Van Tien : Electrical engineer
6. Nguyen Van Hoan : Geological engineer
7. Nguyen Kim Dong : Environmental – Hydro engineer
8. Nguyen Quang Khoi : Civil engineer
9. Nguyen Xuan Phuong : Civil engineer
10. Nguyen Duc Hoa : Topological engineer
11. Huynh Anh Tuan : Electrical engineer

110kV substation and transmission line in central region
Appendix: CHECKLIST OF ENVIRONMENTAL IMPACT

<table>
<thead>
<tr>
<th>Action Effecting Environmental Resources</th>
<th>Potential Environment Impacts</th>
<th>Initial Environmental Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No impacts</td>
<td>Significant Impact</td>
</tr>
<tr>
<td></td>
<td>Small</td>
<td>Moderate</td>
</tr>
<tr>
<td>A. Project Sitting</td>
<td>1. Natural area</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>2. Historical, cultural features.</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>3. Settlements.</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>4. Land value and use changes.</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>5. Land form, drainage alternation.</td>
<td>X</td>
</tr>
<tr>
<td>B. Project Design</td>
<td>1. Ecologically-sensitive areas.</td>
<td>X</td>
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<tr>
<td></td>
<td>2. Historical, cultural features.</td>
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</tr>
<tr>
<td></td>
<td>3. Settlements and resettlement.</td>
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</tr>
<tr>
<td></td>
<td>4. Land value and use changes.</td>
<td>X</td>
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<td>5. Land form, drainage alternations.</td>
<td>X</td>
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<td>6. Safety of explosion, hazardous spills.</td>
<td>X</td>
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<td>7. Noise, vibration, pollution.</td>
<td>X</td>
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<td></td>
<td>8. Worker health and safety.</td>
<td>X</td>
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<td>9. Temporary service road.</td>
<td>X</td>
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<tr>
<td>C. Construction</td>
<td>1. Construction methods.</td>
<td>X</td>
</tr>
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<td></td>
<td>2. Hunting, poaching, woodcutting</td>
<td>X</td>
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<td></td>
<td>3. Construction camps</td>
<td>X</td>
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<tr>
<td>D. Operation</td>
<td>1. Project maintenance.</td>
<td>X</td>
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<td></td>
<td>2. Management of land and trees in ROW.</td>
<td>X</td>
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<td>3. Checking the temporary service road</td>
<td>X</td>
</tr>
</tbody>
</table>

110kV substation and transmission line in central region
Attention: Power Engineering Consulting Company 4(PECC4)

Subject: Agreement on the line direction and the site for construction of 110kV Phu Cat – Phu My – Hoai Nhon transmission line of Binh Dinh Province

Based on the planning and rehabilitation of the power network development of Binh Dinh Province in stage of 2000-2005 with considering up to 2010 approved by Ministry of Industry

According to the proposal of the Binh Dinh Industry Services in the statement No.376/CN dated August 8, 2001 about the agreement on the line direction of 110kV Phu Cat – Phu My – Hoai Nhon transmission line, the People’s Committee of Binh Dinh Province has the following opinions:

+ Agree to choose the alternative 1

+ The topography of 110kV transmission line is too complicated, it will cross the inhabitant areas and there is no communication system in many sections.

Suggest the PECC4 to have a thorough investigation for the purpose of lessening the cost of compensation and creating the favorable conditions for the implementation of the project.

PP. BINH DINH PEOPLE’S COMMITTEE

Standing President

PHAM BA
(Signed and stamped)

CC: - As above
    - File
DAK LAK PEOPLE'S COMMITTEE

Dated 11 July 2001
Our Ref. No.1610/CV-UB

Attention: Power Engineering Consulting Company 4(PECC4)
Subject: Agreement on the site for construction of
110kV Krong Buk substation

After receiving the circular No.322 EVN/TVXDD4-5 dated June 18, 2001 and the document No.304 EVN/TVXDD4-5 dated June 11, 2001 of the PECC4 about the agreement on the site for construction of 110kV Krong Buk substation.
According to the proposal of the Dak Lak Industry Services on the document No.332/CV-SCN dated June 21, 2001, the People’s Committee of Dak Lak Province has the following opinions:

1/ ALTERNATIVE 1:
The site location of 110kV Krong Buk substation is intended to construct on the plantation of coffee (near the existing 220kV Krong Buk substation) of Pong Drang commune, Krong Buk district, Dak lak province.
North adjacent to garden land of coffee and the house for operating workers of 220kV Krong Buk substation
South adjacent to garden land of coffee
East adjacent to garden land of coffee and distant of the National Route 14 about 100m
West adjacent to 220kV Krong Buk substation
This alternative approved by the different levels of local authorities; the People’s Committee of Dak Lak Province accepted the agreement on the site for construction of the substation and the route layout of 110kV transmission line connected to the substation upon the proposal of PECC4.

2/ ALTERNATIVE 2:
The site location of 110kV Krong Buk substation is intended to construct on the plantation of coffee (near the existing 35kV Koreas Vina substation) of hamlet 12, Pong Drang commune, Krong Buk district, Dak lak province.
North adjacent to the accessing road of 35kV Koreas Vina substation (F9 substation)
South adjacent to garden land of Mr. Hung under Hamlet 12
East adjacent to garden land of Mr. Cu, Mr. Thuat, Mr. Nhu, Mr. Ba Ky, Mr. Hung under Hamlet 12.
West adjacent to garden land of coffee.
The alternative has not yet accepted of the concerned Units and there were not any opinions. In order to creating a favorable conditions for the PECC4 to submit and approve the project, the People’s Committee of Dak Lak Province temporary agreement on the site for construction of the substation and the route layout of 110kV T/L connected to the substation. If the position is chosen, the PECC4 will work with the relevant authorities for investigating and unifying the alternative chosen.
PP. DAK LAK PEOPLE'S COMMITTEE
Standing President

DANG DUC YEN

(Signed and stamped)

CC: - As above
    - Industry Services
    - Construction Services
    - Electricity of Dak Lak
    - File
QUANG TRI PEOPLE'S COMMITTEE

Dated 8 June 2001
Our Ref. No.872/UB-CN

Attention: Power Engineering Consulting Company 4(PECC4)

Subject: Agreement on the site for construction of 110kV Dien Sanh substation and 110kV transmission line connected to the substation.

In response to the document No.271/EVN-TVXDD4-5 dated May 24, 2001 of the PECC4 under Electricity of Viet Nam about the agreement on the site for construction of 110kV Dien Sanh substation and 110kV transmission line connected to the substation.

Considering the proposal of Hai Lang People’s Committee and related Units, the People’s Committee of Quang Tri Province agreed with two alternatives as PECC4’s proposal.

PP. QUANG TRI PEOPLE’S COMMITTEE

Standing President

LE HUU PHUC
(Signed and stamped)

CC: - As above
    - Industry Services
    - Construction Services
    - Electricity of Quang Tri
    - File
Attention: Power Engineering Consulting Company 4 (PECC4)

Subject: Agreement on the site for construction of 110kV Dien Khanh substation and 110kV transmission line connected to the substation

Considering the proposal of Construction Services on the document No. 473 XD/QH dated May 11, 2001 about the agreement on the site for construction of 110kV Dien Khanh and 110kV transmission line connected to the substation, the People's Committee of Khanh Hoa Province has the following opinions:

Accepting the agreement on the site for construction of 110kV Dien Khanh substation and 110kV transmission line connected to the substation upon the following contents:

Name of project: 110kV Dien Khanh substation and 110kV transmission line connected to the substation.
Investor: Power Company No. 3 under Electricity of Viet Nam.

The site for construction of 110kV Dien Khanh substation and the line direction of 110kV transmission line connected to the substation with geographical situation is as follows:

**Alternative 1**: It is situated on the rice fields area of Dien Thanh commune, Dien Khanh district, Khanh Hoa province:

- East adjacent to rice fields area
- West adjacent to National Route 1
- South adjacent to rice fields area
- North adjacent to rice fields area (distant of 60m from Cau Lung bridge)

The surface land of 5,000 m² (the concrete scope according to the approved decision of the relevant authorities)

The 110kV transmission line connected to the substation consisting of:

- **Departure - point**: at the section of tower No. 246-247 of the existing 110kV Da Nhim-Nha Trang transmission line.
- **End - point**: at the 110kV Dien Khanh substation.
- **Length of the line**: about 350m belongs to the area of Dien Thanh commune, Dien Khanh district, Khanh Hoa province.
Alternative 2: It is situated on the area of crops land, behind the 35kV Cau Doi substation belongs to Dien Tho commune, Dien Khanh district, Khanh Hoa province.

Its geographical situation is as follow:

East adjacent to Dien Tho market
West adjacent to the area of crops land
South adjacent to the area of crops land
North adjacent to 35kV Cau Doi substation

The surface land of 5,000m² (the concrete scope according to the approved decision of the relevant authorities)

The 110kV transmission line connected to the substation consisting of:

Departure - point : at the 220kV Nha Trang substation
End - point  : at the 110kV Dien Khanh substation
Length of the line : about 14km, it will cross the areas of Dien Phu, Dien Dien, Dien Son, Dien Tho communes - Dien Khanh district - Khanh Hoa province and Vinh Phuong commune - Nha Trang city.

The general layout of 110kV Dien Khanh substation and the line direction of 110kV transmission line connected to the substation as specified by norms.

Request the investor and concerned Units to implement the compensation, clearance works and the land acquisition according to the current regulations.

PP. KHANH HOA PEOPLE’S COMMITTEE

Standing President

TRAN MINH DUAN
(Signed and stamped)

CC: - As above
    - EVN
    - PC3
    - Construction Services
    - Land Services
    - PC of Dien Khanh District
    - File
Attention: **Power Engineering Consulting Company 4 (PECC4)**

**Subject:** Agreement on the line direction of 110kV Nha Trang-Dien Khanh transmission line

Based on the document No.67 TT/UB dated May 21, 2001 of Dien Khanh People’s Committee. Considering the proposal of Construction Services on the document No.664/XDQH dated June 18, 2001 about the agreement on the line direction of 110kV Nha Trang – Dien Khanh transmission line, the People’s Committee of Khanh Hoa has the following opinions:

Assenting to the agreement of the line direction of 110 kV Nha Trang – Dien Khanh transmission line upon the following contents:

- **Name of project:** 110kV Nha Trang – Dien Khanh transmission line
- **Investor:** Power Company No.3 under Electricity of Viet Nam
- **Line route:**
  - Departure point: at the section of tower No.20 of 110kV transmission line from 220kV Nha Trang substation to Ma Vong substation.
  - End-point: at the busbar of 110kV Dien Khanh substation
- **Length of the line:** about 5,500m, it will crosses the area of Dien An, Dien Thanh, Dien Toan communes - Dien Khanh district - Khanh Hoa province and Vinh Trung commune - Nha Trang city.

Request the investor and relevant authorities to implement the compensation, clearance works and the land acquisition according to the current regulations.

PP. KHANH HOA PEOPLE’S COMMITTEE

President

PHAM VAN CHI
(Signed and stamped)

CC: - As above
- EVN
- PC3
- Construction Services
- Land Services
- PC of Nha Trang City
- PC of Dien Khanh District
- File
KHANH HOA PEOPLE’S COMMITTEE

Dated 4 Jan. 2001
Our Ref. No.27/UB

Attention: Power Engineering Consulting Company 4(PECC4)
Subject: Agreement on the site for construction of 110kV Van Gia substation and 110kV transmission line connected to the substation

Based on the document dated December 20, 2001 of Van Ninh People’s Committee.
Considering the proposal of Construction Services on the document No.1037/XDQH dated December 8, 1997 about the agreement on the site for construction of 110kV Van Gia substation, the People’s Committee of Khanh Hoa has the following opinions:
Assenting to the agreement of the site for construction of 110kV Van Gia substation and the line direction of 110kV transmission line connected to the substation upon the following contents:

Name of project: 110kV Van Gia substation and 110kV transmission line connected to the substation.
Investor: Central Power Project Management Board (CPPMB)
The site for construction of 110kV Van Gia substation: on the area of crop plantation and fruits land belonging to Tan Dan town, Van Thang commune, Van Ninh district, Khanh Hoa province, with geographical situation as follows:
- Distant of 60km from National Route 1A to the east.
- West adjacent to crop plantation and 110kV Nha Trang – Tuy Hoa OHL
- South adjacent to crop plantation
- North adjacent to Ke mountainous
Surface land: about 4,000m²
The general layout of 110kV Van Gia substation as specified by current regulations.
110kV transmission line connected to 110kV Van Gia substation:
Departure – point: at the section of tower No.368 belongs to the existing 110kV Nha Trang – Tuy Hoa transmission line about 50m to the south
End – point: at 110kV Van Gia substation
Length of the line: 100m belongs to the area of Tan Dan town, Van Thang commune, Van Ninh district, Khanh Hoa province.
Request the investor and competent authorities to implement the compensation, clearance works, as well as have proper plans of land acquisition and other properties for the inhabitants in the area at the construction of 110kV Van Gia substation and 110kV transmission line connected to the substation according to the current regulations.

PP. KHANH HOA PEOPLE’S COMMITTEE
Standing President
TRAN MINH QUAN
(Signed and stamped)
CC: - As above
    - EVN
    - CPPMB
    - Construction Services
    - Land Services
    - PC of Van Ninh district
    - File
Attention: Power Engineering Consulting Company 4(PECC4)

Subject: Agreement on the site for construction of 110kV Phu My substation

Based on the planning and rehabilitation of the power network development of Binh Dinh Province in stage of 2001-2005 with considering up to 2010 approved by Ministry of Industry

Based on the document No.501EVN/TVXDD4-5 dated September 11, 2001 of PECC4 under EVN about the agreement on the site for construction of 110kV Phu My substation

According to the statement No.454/CN dated October 5, 2001 of the Binh Dinh Industry Services about inspecting the site for construction of the substation, the People’s Committee of Binh Dinh Province has the following opinions:

+ For both alternatives for the site location of 110kV Phu My substation belongs to Chanh Thuan town, My Trinh commune, Phu My district, Binh Dinh province are feasible

+ To reduce the cost of compensation and creating the favorable conditions for the implementation of the project. Suggest the PECC4 should choose the best alternative.

PP. BINH DINH PEOPLE’S COMMITTEE

Standing President

PHAM BA
(Signed and stamped)

CC: - As above
- Binh Dinh Industry Services
- File
QUANG TRI PEOPLE’S COMMITTEE

Dated 7 Nov. 2001
Our Ref. No.1746/CV-UB

Attention: Power Engineering Consulting Company 4(PECC4)

Subject: Agreement on the site for construction of
110kV substation at Huong Hoa area

Considering the proposal of PECC4 on the document No.621/EVN-TVXDD4-5 dated October 19, 2001 about the agreement on the site for construction of 110kV substation, the People’s Committee of Quang Tri province has the following opinions:

+ Accepting the site location of two 110kV substations : Khe Sanh and Lao Bao as your request.
+ In order to conform to the general planning of socio-economic development in Quang Tri province in general and Huong Hoa in particular. Quang Tri People’s Committee would like to forward its suggestions to related authorities to grant every favorable conditions for the 110kV Khe Sanh substation to be carried out in this stage ( alternative 1).

PP. QUANG TRI PEOPLE’S COMMITTEE

Standing President

NGUYEN MINH KY
(Signed and stamped)

CC: - As above
    - File
Attention: Power Engineering Consulting Company 3 (PECC3)

Subject: Choosing the line direction of 110kV Da Nang – Dai Loc transmission line

Considering the proposal of PECC3 in the circular No.604/EVN-PECC3-NT dated March 15, 2001,
According to the proposal of the Construction Services in the circular No.138/SXD-QLQH dated April 12, 2001 (enclosed the minutes of the meeting dated April 6, 2001), the People’s Committee of Da Nang city has the following opinions:

+ Unifying the line direction of 110kV Da Nang-Dai Loc transmission line prepared by PECC3 on the document No.604 EVN/PECC3-NT dated March 15, 2001.

+ During the preparation of Feasibility Study Report and detailed engineering design this route line, the PECC3 must pay attention:

Departure point: goes along the 35kV Cau Do – Ai Nghia route in order to restrain the safety corridor of two routes and compensation works.

According to planning and rehabilitation of the power network development of Da Nang city, the 110kV route from 500kV Da Nang substation to Hoa Khuong Industrial Zone approved by Ministry of Industry and the small scale industry with the surface land of 40ha approved by the People’s Committee of Da Nang city.

So the line direction of 110kV Da Nang – Dai Loc transmission line need to combine with the planning construction above mentioned.

PP. DA NANG PEOPLE’S COMMITTEE

Standing President

TRAN PHUOC CHINH
(Signed and stamped)

CC: - As above
    - Construction Services
    - Industry Services
    - CPPMB
    - File
DA NANG PEOPLE’S COMMITTEE

Dated 23 April, 2001
Our Ref. No.668/CV-UB

Attention: Power Engineering Consulting Company 3 (PECC3)

Subject: Agreement on the site for construction of 110kV Dai Loc substation and 110kV Da Nang – Dai Loc transmission line

Based on the document No.2937/QD-KHDT dated December 15, 1999 of Ministry of Industry about the approval of planning and rehabilitation of the power network development of Quang Nam province in stage of 1999-2005 with considering up to 2010.

Considering the proposal of PECC3 on the document No.00604/EVN-PECC3-NT dated March 15, 2001 about the agreement on the site for construction of 110kV Dai Loc substation and 110kV Da Nang-Dai Loc transmission line (encoded the scheme of the line route approved by the People’s Committee of Dai Loc district), as well as the document No.173/SCN dated March 30, 2001 of the Quang Nam Industry Services and the circular No.404/TT-SXD dated May 14, 2001 of the Quang Nam Construction Services.

The People’s Committee of Quang Nam province agreed with the site location of 110kV Dai Loc substation and the line direction of 110kV Da Nang – Dai Loc transmission line according to the drawing layout No.41004C-MB01 prepared by PECC3.

With above content, We wish the PECC3 to work in combination with the People’s Committee of Dai Loc district to amend the concrete schemes about the site location of the substation and the surface land so that the People’s Committee of Quang Nam province can carry out the clearance layout and compensation works according to the decree No.54/1999/ND-CP dated July 8, 1999 of the Government about the safety protection of high voltage electric network.

PP. QUANG NAM PEOPLE’S COMMITTEE

Standing President

LE MINH ANH
(Signed and stamped)

CC: As above
    - File
HOMECRAFT AND INDUSTRIAL SERVICE

Dated 21 April, 2001
Our Ref. No.97/CV-CN

Attention: The People's Committee of Thua Thien Hue Province

Subject: Agreement on the site for construction of 110kV substation and 110kV transmission line connected to the substation

The Homecraft and Industrial Service has received the circular No.00606 EVN/PECC3-NT about the agreement on the site for construction of 110kV Lang Co substation and 110kV route line connected to the substation as well as the circular No.00607 EVN/PECC3-NT about the agreement on the site for construction of 110kV Phong Dien substation and 110kV route line connected to the substation dated March 20, 2001 of PECC3.

Investigations for preparation of Feasibility Study in view of construction of 110kV substation and the route line connected to the two 110kV Lang Co and Phong Dien substations are necessary to the socio-economic development of Thua Thien Hue province in coming years, conforming to the planning on electric network development of the province till 2005, with regard to 2010 which has been approved by the Ministry of Industry in Decision No.1068 QD/KHDT dated June 2, 1998.

After having taken investigations in association with the Services of Construction, Tourism, Cadastral Office, Management Board of Chan May new urban area and Phu Loc, Phong Dien districts at the sites for construction of two substations, the Homecraft and Industrial Service of Thua Thien Hue province has the following opinions:

1) 110kV Lang Co substation
The site proposed by PECC3 is situated on land tenure in Lap An village, Loc Hai commune, Phu Loc district.
In the south-west: adjacent to National Route 1A
In the north: adjacent to Phu Gia mountain and 110kV transmission line
In the east: adjacent to ricefields
Distant of 30m from National Route, convenient for execution work but will have influence on the touristic landscape.

The site according to the planning of Lang Co Tourist resort set up by the Rural – Urban Environment Planning and Investigation Center is situated at 50m from National Route 1A, under the existing 110kV transmission line. If this transmission line is not transferred, the execution work will meet difficulties and will directly influence to the distribution for power load of the province. This alternative is not highly practicable.
To choose a site conforming to the short-term as well as long-term planning, the existing as well as future 110kV power grid. The 110kV Lang Co substation is situated on a land of eucalyptus plantation at Lap An village, Loc Hai commune, Phu Loc district.

In the north and west: adjacent to Phu Gia mountain
In the south: adjacent to rice fields and 110kV transmission line (distant of 20m).
In the east: adjacent to rice fields

Distant of 100m from National Route 1A, line connection: 20m (enclosed drawings).

- The site is in conformity with the global planning of Lang Co touristic resort and outgoing feeders, convenient to the medium voltage electric network development for Lang Co touristic resort.

- Meet the technical requirements for the connection from existing 110kV transmission line and the future project on transfer of 110kV Hoa Khanh – Hue transmission line through Lang Co touristic resort.

2) 110kV Phong Dien substation

Agree with the site proposed by PECC3 and the circular of People’s Committee of Phong Dien district No.82/CV-UB dated March 28, 2001 about agreement on the site for construction of 110kV substation and 110kV route line connected to the substation.

The site is situated on a land of eucalyptus plantation at Tan Lap village, Phong Dien town.
In the east, adjacent to an earth road distant of 150m from National Route 1A
In the west, adjacent to uncultivated hill (distant of 800m from existing 110kV transmission line).

In the south and north, adjacent to unhabited land

The line from the connection point to the substation has 800m length, crossing the hill of eucalyptus plantation (see drawing, real investigation document and agreement of Phong Dien district attached herewith). This area is not situated on urban planning development of the district, convenient for medium voltage electric network development in the future.

To settle basis for the Feasibility Study on construction of the 02 substations and route line in connection to the two 110kV Lang Co substation and Phong Dien substations of PECC3. The Homecraft and Industrial Service submit to the People’s Committee of Thua Thien Hue province the agreement on the site for construction of 110kV Lang Co and Phong Dien substations for consideration and giving guidelines.

PP. HOMECRAFT AND INDUSTRIAL SERVICE

Director
TON THAT BA  
(Signed and stamped)

CC:  - As above  
  - PC of Phu Loc, Phong Dien districts  
  - Construction, Tourism, Cadastral,  
    Communication, Cultural& Information Services  
  - PECC3  
  - Electricity of Thua Thien Hue  
  - Manager of the Services  
  - File
THE PEOPLE’S COMMITTEE OF PHONG DIEN DISTRICT

Dated 28 March, 2001
Our Ref. No.82/CV-UB

Attention: Power Engineering Consulting Company 3(PECC3)

Subject : The opinions of Phong Dien People’s Committee about the site for construction of 110kV Phong Dien substation and the line direction of 110kV transmission line connected to the substation.

After study the circular No.00608 EVN/PECC3-NT dated March 20, 2001 of PECC3 about the agreement on the site for construction of 110kV Phong Dien substation and 110kV transmission line connected to the substation. During thorough investigation, the People’s Committee of Phong Dien district has the following opinions:

Agree with the site location of 110kV Phong Dien substation is situated on the plantation of short-day trees belonging to Tan Lap village, Phong Dien town.

For 110kV route connected to the substation, the departure-point and the line direction will cross the area of Phong Dien district according to the chose alternative of the PECC3 (Document No.00608 EVN/PECC3-NT dated March 20, 2001).

So the People’s Committee of Phong Dien district have this opinion for Company’s consideration so that the PECC3 can conduct the next steps of the project.

PP. THE PEOPLE’S COMMITTEE OF PHONG DIEN DISTRICT

Standing President

NGUYEN VIET HOACH
(Signed and stamped)

CC: - As above
   - PC of Thua Thien Hue province
   - Land Services
   - Industrial Services
   - File
02 sites for 110kV substation and direction of 110kV TL in Hai Lang region agreed by People’s Committee of Hai Lang district as shown in the drawing.

Hai Lang, 28 July 1987
People’s Committee of Hai Lang district
Chairman
The People's Committee of Dai Loc district agreed to the site location of the substation and the line direction.
Existent 110kV Nhi Thang - Toy Nua OHL
Existent 110kV Nhi Thang - Van Gia OHL
Existent 22kV OHL
Existent 25kV OHL

E 110kV transmission line connected to the substation

E 110kV substation will be built according to the project.

E 110kV transmission line connected to the substation