

Chapter 2

Public Acceptance of Coal-fired Power Plants

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Chapter 2

Public Acceptance of Coal-Fired Power Plants

2.1. Impressions and public survey results on Coal-Fired Power Plants

The World Energy Council/World Energy Resources 2016 enumerates the following facts about coal in electricity generation worldwide:

- Coal is the second most important energy source, covering 30% of the global primary energy consumption.
- Coal (hard coal and lignite) is the leading energy source in power generation. About 40% of the globally generated power relies on coal.
- 75% of coal plants worldwide utilize subcritical technology. An increase in the efficiency of coal-fired power plants throughout the world from today's average of 33% to 40% could cut global dioxide emission by 1.7 billion tons each year.
- The United States is closing or replacing coal with gas in power plants (more stringent environmental regulations).
- Coal power in Western European is facing considerable opposition as the public's current concern is how to mitigate climate change.

1) The Trend in Thailand

In Thailand, people often have a negative opinion towards coal-fired power plants because they have been taught that 'coal has the most contaminating power plants' from their elementary to their college years and beyond. Hence, the general public trusts neither the government nor coal plant operators. City dwellers, including intellectuals, who were exposed to the air pollution caused by the coal-fired power plant in Mae Moh were some of those who joined the oppositionist movements. Also, one of the major reasons for the rise of such movements is the argumentative nature of Thais.

The movement against coal-fired power plants could have strong political undertones. Opposition parties, for example, want to differentiate themselves from the ruling parties and

therefore, have to naturally ‘oppose’ coal-fired power plants. The ruling parties in Thailand have promoted coal-fired power plants, whereas the opposition such as the Democrat Party, Thai Nation Development Party, and Rak Thailand Party opposed the construction of new coal-fired power plants.¹ The Democrat Party leader even announced in February 2017 that if the party wins the next general election, it would ban new coal-fired power plants and instead promote the use of liquefied natural gas and renewable energies for power generation. However, they have no objections to existing coal power stations.

In addition, the different culture between the southern regions and urban areas of Thailand cause differing opinions. In the southern part of Thailand, it is the NGOs—not the locals—who protest for political reasons. Locals who do not consume as much electricity as those were were willing to proceed with the construction of new power plants, do not want any disruption in their current lifestyle, which depends entirely on the Mekong River. Biomass and biogas are energy sources derived from locally produced raw materials such as wood and are, therefore, easily accessible to the locals. Meanwhile, these residents strongly oppose CPPs as they believe these will contaminate the seawater and air.

It is important to set the provincial agencies of the central government’s ministries apart from the elected local district governments that rely on popular support from the locals. That is, provincial government agencies show no explicit resistance against coal power plants. On the other hand, local/district governments can resist the establishment of coal power plants depending on the information they receive. The dissemination of inaccurate information regarding coal is more prevalent in the southern provinces of Thailand.

The trends in either the views on or actual constraints to coal power plant development in Thailand are summarized as follows:

¹ On 4 February 2017, Democrat Party leader Abhisit Vejjajiva said that if his party becomes the coalition leader, he will cancel the Krabi power plant project in the South and suggested that the government should focus instead on alternative sources of energy (*The Nation*, 5 February 2017). On 19 February 2017, Democratic Party delegates led by Mr Korn Chatikavanij called on the government to scrap its coal-fired power plant projects in the Songkhla and Krabi provinces for fear that these will severely damage the environment and affect the residents’ livelihoods.

Mr Thavorn Sennien, former Democrat MP, noted how the air pollution near the Mae Moh coal-fired power plant in Lampang, Northern Thailand in the 1990s caused the local community to be sick (PressReader-www.PressReader.com, 19 February 2017).

- More stringent environment standards, which include
 - Air emission (i.e. SO₂, NO_x, particulates and other toxic heavy metals)

| | Before Mae Moh Incident | Today |
|--------------------------|-------------------------|-------|
| SO ₂ (ppm) | 320 | 180 |
| NO _x (ppm) | 500 | 200 |
| TSP (mg/m ³) | 120 | 80 |

- Ambient Air Quality Standard for SO₂ (particularly after the Mae Moh incident)

| | 1-hr Avg | 24-hr Avg | Annual Avg |
|----------------------------------|----------|-----------|------------|
| Before 2000 (ug/m ³) | 1300 | 300 | 100 |
| After 2000 (ug/m ³) | 780 | 300 | 100 |

- The coal-fired development project requires undertaking an EHIA, which includes public hearing and public involvement in the process. The recent EHIA on the Krabi and Thepa development projects found that the projects lacked (i) adequate data; (ii) meaningful participation; and (iii) transparency in the process (ONEP, n.d.).
- Coal-fired development is often a major project; it will change the way of life of the local community.
- Coal-fired development impacts the tourism industry.
- Electricity generation from coal produces huge CO₂ emission and contributes to global climate change.
- Coal-fired power plants affect marine ecosystems and fisheries.

The Mae Moh sulphur dioxide (SO₂) incident caused the anti-coal-fired power plant movement to spread throughout the region. This gave Thais a permanently negative impression on coal plants.

Figure 2-1. Past and Ongoing Projects

| Project | Capacity (MW) | Location | Year | Note |
|-------------------|---------------|-------------------------------|-----------|--|
| Thap Sakae (EGAT) | 700 | Thap Sakae, Prachuapkhirikhan | 1995 | - Opposed by local communities and NGOs. |
| Gulf Power | 2x367 | Bo Nok, Prachuapkhirikhan | 1997 | - Opposed by local communities, local NGOs, and Greenpeace. - Shifted to natural gas. - Relocated to another site. |
| Union Power | 2x700 | Hin Krut, Prachuapkhirikhan | 1997 | - Opposed by local communities, local NGOs, and Greenpeace. - Shifted to natural gas. - Relocated to another site. |
| Tha Sala (EGAT) | 1,000 | Tha Sala, Nakhon sit thammrat | 2012-2013 | - Opposed by local communities, local and International NGOs - Cancelled |
| Si Chol (EGAT) | 1,000 | Si Chol, Nakhon sit thammrat | 2012-2013 | - Opposed by local communities, local and International NGOs - Cancelled |
| Krabi | 800 | Klong Pakasia, Krabi | Present | - EHIA Stage |
| Thepha | 2x1,000 | Thepha, Songkla | Present | - EHIA Stage |

Source: Electricity Generating Authority of Thailand.

2) Opinion Poll on Coal-fired Power Plants

During its presentation on the power development plan of Thailand 2015–2036 (PDP2015), the subcommittee on Electricity Forecast and Power Development Plan noted that the electricity consumption in Southern Thailand has been increasing at about 3% per year. Thus, there is a need to construct three additional coal-fired power plants: These are the Krabi coal-fired power plant with a capacity of 800 MW in 2019; and Thepha coal-fired power plant Unit 1 with a capacity of 1,000 MW by 2021 and Unit 2 with a capacity of 1,000 MW in 2024, for a total capacity of 2,800 MW.

The Cabinet and National Energy Policy Council approved the PDP2015 on 30 June 2015. However, the public opposed the coal fuel construction in Southern Thailand. The representative from the Protect Andaman from Coal Network, an NGO in Southern Thailand that previously staged a lengthy protest against these projects at Government House in Bangkok, proposed three courses of actions: (i) cancellation of Environmental Impact Assessment (EIA) and EHIA of coal-

fired power plants and coal transportation ports; (ii) cessation of an auction of coal-fired power plants; and (iii) establishment of a committee to consider the network's proposal. Initially, the government accepted the proposal to establish a committee consisting of representatives from three groups of stakeholders and unless EIA and EHIA have been complied with, the coal-fired power plant cannot be constructed anywhere in Thailand.

On 18 August 2015, the National Reform Council organized a public hearing forum entitled, 'Suitable and Sustainable Power Production in Southern Thailand'. It consisted of the academe, EGAT representatives, the president of the tourism industry of Krabi province, and representatives from biomass power plant owners. There were 269 participants from the members of the committee and subcommittee of National Reform Council, the public and private sectors, the press, people's networks from 14 Southern Thailand provinces, and residents from Bangkok and nearby provinces. The questionnaire survey conducted at the end of the seminar gathered 132 respondents.

A. Basic information on respondents

a. Sex

| | | | |
|--------------|----------------|----|---------|
| Male | 57 Respondents | or | 43.94 % |
| Female | 66 Respondents | or | 50 % |
| Not identify | 8 Respondents | or | 6.06 % |

b. Age

| | | | |
|-----------------|----------------|----|---------|
| 20-30 years old | 24 Respondents | or | 18.15 % |
| 31-40 years old | 25 Respondents | or | 18.94 % |
| 41-50 years old | 45 Respondents | or | 34.09 % |
| 51-60 years old | 17 Respondents | or | 12.88 % |
| 61- years old | 15 Respondents | or | 11.36 % |
| No response | 6 Respondents | or | 5.55 % |

B. Development of Thailand's Power Sector

a. Decrease reliance on natural gas as fuel

| | | | |
|-----------|----------------|----|---------|
| Agree | 48 Respondents | or | 36.36 % |
| Not agree | 71 Respondents | or | 53.79 % |
| No answer | 13 Respondents | or | 9.85 % |

b. Increase proportion of clean coal technology in electricity production

| | | | |
|-----------|-----------------|----|---------|
| Agree | 12 Respondents | or | 9.09 % |
| Not agree | 113 Respondents | or | 84.85 % |
| No answer | 8 Respondents | or | 6.06 % |

c. Purchase electricity from neighbouring country

| | | | |
|-----------|-----------------|----|---------|
| Agree | 11 Respondents | or | 8.33 % |
| Not agree | 107 Respondents | or | 81.06 % |
| No answer | 14 Respondents | or | 10.61 % |

d. Increase proportion of renewable energy

| | | | |
|-------|-----------------|----|---------|
| Agree | 104 Respondents | or | 78.79 % |
|-------|-----------------|----|---------|

| | | | |
|--|-----------------|----|---------|
| Not agree | 20 Respondents | or | 15.15 % |
| No answer | 8 Respondents | or | 6.06 % |
| e. Include number of nuclear power plants in PDP2015 | | | |
| Agree | 9 Respondents | or | 6.52 % |
| Not agree | 119 Respondents | or | 89.3 % |
| No answer | 5 Respondents | or | 3.79 % |

C. Do you agree to build coal-fired power plant in the South?

| | | | |
|-----------|-----------------|----|---------|
| Agree | 12 Respondents | or | 9.09 % |
| Not agree | 117 Respondents | or | 88.64 % |
| No answer | 3 Respondents | or | 2.27 % |

D. Why do you agree to have a coal-fired power plant in the South? (multiple answers)

| | |
|---------------------------------------|---------|
| System security | 8.33 % |
| Improvement of regional economy | 53.33 % |
| Lower electricity price | 6.82 % |
| Using environment-friendly technology | 8.33 % |
| No response | 71.97 % |

E. Why do you not agree to have coal-fired power plant in the South? (multiple answers)

| | |
|---|---------|
| Affects the environment | 90.91% |
| Affects tourism | 88.87 % |
| Using renewable energy | 65.61 % |
| Do not trust the Ministry of Energy to manage coal-fired power plant | N.A. |
| No answer | 3.39 % |

F. Renewable energy development in the South (multiple answers)

| | |
|---------------------------------|---------|
| Wind energy | 66.67 % |
| Hydropower | 53.03 % |
| Solar energy | 77.77 % |
| Municipal solid waste to energy | 54.55 % |
| Biomass | 66.67 % |
| No answer | 1.51 % |

G. Recommendations

- Conduct meaningful public participation
- Elicit public involvement in EIA and EHIA
- Improve the PDP preparation process

3) Public Attitude on Coal-Fired Power Plants

On 20-26 March 2017, a TV program broadcasted on Thai Rath TV (Channel 32) featured the coal-fired power plants in Southern Thailand. Moderated by Mr. Suparp Klikajai, the program had two invited guests: Pinyo Meechamni, Ph.D., a professor on clean coal technology from Chulalongkorn University, representing the affirmative side on the coal-fired power plant issue;

and Renu Vecharatpimol, Ph.D., professor at the Department of Biology at Silpakorn University, representing the negative side of the topic.

The discussion covered the Power Development Plan, state of the electricity industry in the South, sources of electricity, the need for a new power plant in the South and the type of power plant, the location, environmental impact, and the coal versus renewable energy comparison.

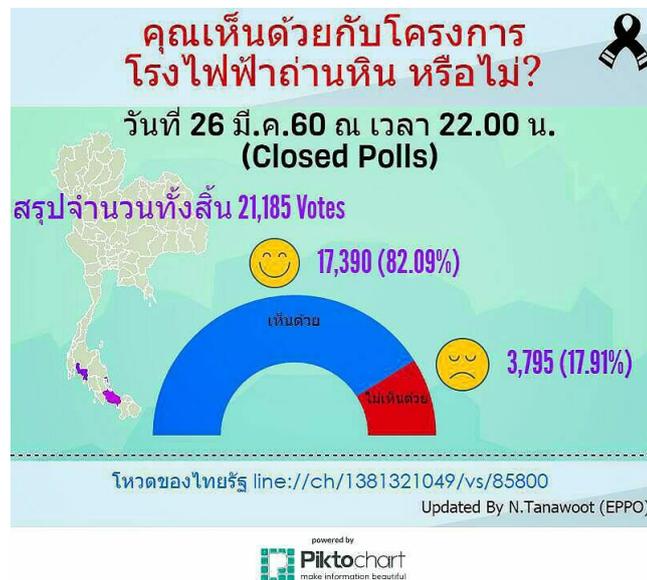
The program offered viewers all over the country a chance to vote based on the question, 'Should government proceed to construct the coal-fired power plant in Southern Thailand'? Results of the survey, collected via the Thai Rath Facebook Page, were (Figure 2-2):

- Support coal-fired power plant 17,390 votes
- Do not support coal-fired power plant 3,795 votes

Note that the voting results showed the people's sentiment at that specific time, and it is difficult to conclude that this is representative of the opinion of the whole population in Thailand.

Figure 2-2. TV Viewers* Vote on the Coal-fired Power Plant in the South (top)

Results: 17,390 for 'support' and 3,795 for 'do not support' (bottom)



Source: Thai Rath TV Channel 32 (26 March 2017).

*Note: There are 36 digital TV channels in Thailand. Channels 4-9 and 11-12 are still in the bidding process, and channels 15 and 17 have been off the air due to financial problems. The rest continue to broadcast nationwide. Table 2-1 shows the top 10 TV ratings during primetime as culled from a poll done during the broadcast of a program on coal-fired power plants. The viewers were considered to be from the educated class and know how to use Facebook.

Table 2-1. Average TV Ratings – Primetime (18.00-22.30) (1-30 April 2017)

| Nationwide | | | Bangkok | | |
|------------|--------------|--------|---------|--------------|--------|
| Rank | Channel | Rating | Rank | Channel | Rating |
| 1 | 7 | 5.65 | 1 | 23 | 4.573 |
| 2 | 23 | 3.623 | 2 | 3 HD | 4.216 |
| 3 | 3 | 3.281 | 3 | 7 | 4.206 |
| 4 | 31 | 1.536 | 4 | 29 | 1.407 |
| 5 | 29 | 1.406 | 5 | 31 | 1.343 |
| 6 | 8 | 1.271 | 6 | 34 | 1.042 |
| 7 | 34 | 0.871 | 7 | 8 | 0.624 |
| 8 | 32 Thai Rath | 0.643 | 8 | 32 Thai Rath | 0.695 |
| 9 | 3 HD | 0.586 | 9 | 3 HD | 0.496 |
| 10 | 26 | 0.533 | 10 | 36 | 0.484 |

Source: www.llcdtvthailand.com.

2.2. Movements against Coal-Fired Power Plants

1) Case Study 1: The Mae Moh Power Plant

The Mae Moh coal-fired power plant is located in the Mae Moh valley of the Mae Moh district in Lampang province, Northern Thailand. The fuel source for its power plant is lignite, a low-grade coal, from a lignite mine located near the plant. The power plant consists of 13 generating units, has a capacity of 2,625 MW, and is owned and managed by EGAT.

a. Effect of the Mae Moh power plant

The increase in electricity demand in the early 1980s resulted in plants expanding towards local villages. These structures are situated 800 metres only from at least one of 16 communities. According to the Mine Master Plan, the expansion of the Mae Moh mine supported the power plants, and this resulted in more than 30,000 villagers being evacuated to a resettlement site.

In October 1992, air emission from stacks from the Mae Moh power plant was trapped due to inversion conditions, resulting in a large amount of SO₂ accumulating from the south of the power plant. There had been reports that more than a thousand villagers living within 7 kilometres of the plant suffered from respiratory irritation, aside from effects on their plants and livestock.

The power plant had to take immediate measures to improve the air condition. It installed fuel gas desulphurization (FGD) equipment with 98% efficiency for Units 4-13 as well as a continuous emission monitoring system in all generating units.

To ensure the air quality around Mae Moh, EGAT established an ambient air quality monitoring network and disclosed the results to the public.

The second incident at the Mae Moh Power Plant occurred because the FGD system had not been installed in all units. Also, two units continued to operate despite having FGD systems that were out of service. This led to an abrupt change in the atmospheric conditions (i.e. temperature inversion). Thus, a high hourly concentration of SO₂ was observed and in fact affected human health, crops, and livestock in the area.

By February 2000, the installation of the last FGD system was completed. The SO₂ emission was reduced, and ambient SO₂ concentration was gradually lowered to the acceptable level.

However, the villagers still claimed that they had suffered from respiratory diseases.

In an attempt to deal with the problems caused by the pollution, local activists, with the support of an occupational health specialist from Bangkok, organized the Network of Occupational Health Sufferers of the Mae Moh Power Plant in 2002 to assist those negatively affected by the plant's operations.

b. Villagers' lawsuit against EGAT

Because of the air pollution incidents, the residents of Mae Moh starting a legal battle against EGAT in 2003. They asserted that the power plant used low quality lignite in its production of electricity and neglected to treat the emission before it gets into the atmosphere. They claimed damages for the decline of their health, both physical and mental, and demanded compensation for medical expenditures and damaged farm crops.

In May 2004, EGAT was ordered by the Thai province court to pay the villagers approximate ฿5.7 million for the crops destroyed by the power plant.

Consequently, in March 2009, the Chiang Mai Province Administrative Court decided on the 35 lawsuits filed by residents in 2004 with the assistance of the council of Work and Environment-Related Patient Network of Thailand. It ordered EGAT to compensate 130 Mae Moh villagers who had suffered severe health distress due to the toxic emission from the lignite-fired power plant.

In its decision, the court considered the air quality report by the Pollution Control Department from November 1992 to August 1998, which showed that the level of SO₂ emitted by the power plant exceeded the legal standard.

The court ordered EGAT to rehabilitate the environment around the power plant and pay each affected family about ฿246,100. It also ordered EGAT to relocate 400 affected families to at least five kilometres away from the power plant and provide each family with a house and farm land. Electricity Generation Authority of Thailand appealed the case at the Highest Administrative Court for consideration.

The crisis faced by the Mae Moh residents captured the nation's attention because of Greenpeace's involvement when it published information on the hazards of coal fuel. The Greenpeace also asked the Asian Development Bank (ADB) to exercise caution in financing EGAT for projects that severely impact people's health and the environment.

The crisis also paved the way for government agencies to set more stringent environmental standards as well to recognize the importance of community involvement, good governance, and effective communication with the public.

2) Case Study 2: Bo Nok Coal-Fired Power Plant

a. Background and outline

The Bo Nok power plant was the first project developed by a private entity under the IPP program in 1997, and not by EGAT. It was supposed to have a generation capacity of 700 MW of electricity and covered 162 hectares along the coast of the Bo Bok Sub-district, Meung District, Prachuapkhirikhan province. It used to be owned by Gulf Power Generation Co. Ltd, an entity shared with Gulf Power Generation Co, Ltd (60%) and Edison Mission Energy (40%).

The Union Power of EGAT started to purchase a large piece of land along the beach in Bo Nok. It went through the process of informing local communities, conducting a project feasibility and environmental impact assessment and started a public involvement program.

However, when large parts of the land started changing hands in 1995, the locals were told that the developers were planning a new golf course and resort. At around the same time, residents started hearing about plans for a coal-fired power plant on the same site. They immediately

became suspicious of the project, having heard horror stories about the Mae Moh incidents in 1992 and 1998.

b. Incorrect perception

The villagers in Bo Nok believed that the coal-fired power plant project and the power plant itself have negative effects on their community, such as:

- Pollution from a coal-fired power plant, especially SO₂ and particulates will impact health, livestock, and crops.
- Threats to the local fishery and coastal biodiversity
- Threats to the breeding grounds of whales and dolphins, which are considered endangered species
- Creation of acid rain
- Global climate change
- Effect on the tourism industry in Prachuapkhirikhan province
- Destruction of the villagers' livelihood

The villagers thus formed the 'Love Bo Nok' group to oppose the coal-fired power plant. They were well supported by Greenpeace, the academe, national NGOs, and students. The series of protests as well as the government shifts in policies that ensued in 1995-2004 are as follows (Greenpeace, 2002) :

- **1995** - The first protest against the emerging threat of power plants draws 4,000 people.
- **1997** - Love Bo Nok, a grassroots power plant opposition group is formed after getting confirmation that a coal-fired power plant, instead of a golf course, would be built in the area.
- **May 1997** - The Thai Government approves Gulf Power group's EIA despite the latter's major shortcomings.
- **June 1997** - Villagers gather at a local Buddhist temple to protest the project.
- **20 August 1997** - Opponents file a complaint with the Human Rights Committee of Thailand's House of Representatives.

- **8 December 1988** - Thousands block Thailand's south highway in protest against the power plant.
- **February 1999** - Gulf Power runs the first of many full-page ads in a Thai newspaper aimed at improving its image.
- **10-12 September 1999** - the first public hearing on the Prachuapkhirikhan province plants are held a year after they were approved. Opponents boycott the hearing, demanding that the government revoke the plant's approval and make the power purchase agreement.
- **7 December 2001** - Greenpeace urges the government to pull the plug on the proposed coal-fired power plant in Prachuapkhirikhan province and to instead direct the country's attention towards clean energy sources.
- **January 2002** - Five hundred and thirty-three academics sign a petition that calls on the government to review the contracts on the Prachuapkhirikhan province plants.
- **April 2002** - the government allows developers to relocate the plants and shift to natural gas.

3) Observations on the Project Implementation Process

- Project implementation was not carried out with sufficient transparency.
- Local villagers were not involved during the early stage—e.g. during deliberations on site selection.
- Less effective public information disclosure, especially about the project.
- Local villagers lack knowledge—e.g. on project development cycle, the content of the EIA study, etc.
- Ineffective communication among stakeholders, especially power developers, government agencies, and villagers.
- Inadequate public participation.
- Anti-coal-fired power plant movements were gradually formed by local villagers and supported by international and national NGOs, academic professors, and the general public.

a. A look at the opposing organizations and individuals

The anti-coal-fired power plant movement can be divided into two groups; (i) organizations; and (ii) individuals. Organizations consist of active and well-known international and regional groups such as

At the international level:

- Greenpeace International, USA (operating activities worldwide)
- Greenpeace Southeast Asia (head office in Thailand for operating activities in Southeast Asia)

At the national level:

- Greenpeace Thailand (with its head office in Bangkok for activities in Thailand)
- Environmentalist groups in universities and colleges
- Foundations based in Bangkok such as the Healthy Public Policy Foundation
- Other national NGOs

At the local level:

The anti-coal-fired power plant movements at the local level mostly stem from local communities that have common concerns on sustainability and environmental impact. Some local anti-coal-fired power plant groups are the Mae Moh anti-coal power movement, Love Hin Krut, Love Bo Nok, Love Tha Sala, and Save Pakasai groups. The anti-coal power plant network is actively against the Krabi project.

Members of the Protect Krabi Network include: (i) The Protected Krabi Network; (ii) Love Lanta Group; (iii) Lanta Island Tourism Association; (iv) Hotel Association of Koh Lanta; (v) Andaman Foundation; (vi) Center of Ecological Building Awareness; (vii) Greenpeace Southeast Asia; (viii) Association of Thailand Small scale Fisher-folks Federation; (ix) NGOs – Coordination Southern Region; (x) Food Security Network – Southern Region; (xi) Protect Trung Group; (xii) Save Andaman Network; (xiii) Pakasai Environmental Network Protection; (xiv) Public Health Volunteer Krabi; (xv) Krabi Fisherfolks Network; (xvi) Andaman Organization for Participatory; (xvii) Restoration of Natural Resources; (xviii) Phang-nga Fisher folks of Andaman Network; (xix) Mae Moh Anti-coal Movement; (xx) Khoa Hin Son Anti-coal Movement; (xxi) Thailand Coal

Network; (xxii) Healthy Public Policy Foundation; (xxiii) Southeast Asia Coal Network; (xxiv) EIA/EHIA Watch Thailand; (xxv) Rak Lae Krabi Association; (xxvi) Wetland Foundation; and (xxvii) Ban Koh Klang Environmental Group.

The Network of People formed against Thailand's PDP2015 consists of: (i) Save Andaman from Coal Network; (ii) Krabi Sea Loving People Association; (iii) Prathew Conservation Network; (iv) Bang Son Conservation Network; (v) Lamae Conservation Network; (vi) Network of Songkla-Pattani Against Coal Power Plant; (vii) Traditional Fishing Association-Tha Sala Bay; (viii) Tha Sala Local Conservation Network; (ix) Hua Sai Traditional Fishing Association; (x) Kanab Nak Crab Bank Group; (xi) Bang Saphan Natural Resource and Environmental Network; (xii) Eastern People Network; (xiii) Network to Monitor Impact of Coal Power Plant in Tambon Khoa Hin Son; (xiv) Sanam Chai Khet Organic Farmer Group; (xv) Sustainable and Just Energy Study Group – Ubon Ratchathani; (xvi) Salween Basin Resource Network; (xvii) Network of Thai People in Eight Mekong Provinces; and (xviii) Hug Nam Khong Group.

Meanwhile, the individuals against CPPs are mostly environmental academics from universities, colleges, and institutes in Bangkok and upcountry, as well as national and local politicians. Most of the academic scholars are from the fields of social science, political science, literature, and psychology, and not from engineering or managerial economics.

b. Who oppose and their reasons

As mentioned in an earlier section, the reasons for the public's opposition to coal-fired power plants are:

- i. Local coal-fired power plants emit a huge volume of CO₂ to the atmosphere and cause temperatures to rise. Although advanced technologies such as high-efficiency ultra supercritical (USC) boilers that can minimize CO₂ emission by 10% to 20% and the carbon capture storage are being developed, these are expensive options.
- ii. Sulphur dioxide, nitrous oxide, carbon dioxide, particles, and heavy metals are air pollutants with negative effects on the environment.
 - Mae Moh Lignite power plant in Northern Thailand released a high level of SO₂ and caused the respiratory problem of thousands of people.

- Pollution threatens to destroy local ecosystems and poses risks to public health.
- iii. There are adverse effects on the marine ecosystem.
- The RAMSAR site (i.e. Krabi) may affect the breeding ground of endangered species such as whales and dolphins (in Bo Nok and Hin Krut). Cooling water discharges can affect larvae and planktons in the area, too.
 - Villagers who rely on fishing for their livelihood worry about the decrease in fish volume.
- iv. The plant will decrease the number of tourists to the area.
- v. During the project's early stages, the public felt they did not have enough involvement and meaningful participation in such activities as EHIA studies.

The following analysis is provided by one political science expert in Thailand:

There are five major reasons groups are against coal-fired power plants: (i) Technical or complexity factors (i.e. some people have difficulty understanding the technology); (ii) Personal beliefs and prejudices (i.e. some people have their own biases and preferences, possibly due to misinformation from such sources as TVs, newspapers, magazines); (iii) Political (local and national) interests (i.e. some have complex political reasons); (iv) Religious issues (for example, some people, such as Muslims living in the southern regions, have reasons related to their own religions and/or ethnic interests); (v) Organized protests funded by international and local environmental organizations (that is, some parties or individuals are funded by such international NGOs as Greenpeace). However, note that this is not an all-inclusive list. There could be other reasons behind the protest movements.

An expert once said that no other real social groups has more strongly opposed coal power generation than did environmental activist groups. As part of the fifth category mentioned earlier in this study, these groups stage rallies and organize protest activities. They propose the use of renewable sources of energy such as solar, wind, biomass, and even liquefied nitrogen gas. The reasons behind their protests, however, are multi-faceted. Some of these are:

- Stopping coal projects means business opportunities in other alternative sources of energies: liquefied nitrogen gas, solar, wind, and biomass.

- Some local and national political leaders have businesses in renewable energies such as palm oil plantations, and solar and wind power projects. These political leaders may have vested interests in funding the protests against coal energy.
- Other competing power plants (e.g. natural gas, biomass) that are privately invested stand to gain if EGAT cannot develop new coal-fired power plants in Krabi, Thepa, and elsewhere in Thailand. These private investors are waiting to step in and fill the gap in energy supply.
- Key players in these protests hope to make a name for themselves and enter local politics when the opportunities arise.

Most people do not have any interest in global-scale issues such as climate change caused by CO₂. They, however, are very—maybe too—sensitive to issues that will affect their own turfs. The threat of sulphur oxide (SO_x) and nitrogen oxides (NO_x) in the air is one of such issues. Opposition movements know how to take advantage of such sentiments to pursue their own cause.

c. When the resistance all started

The opposition to the coal project started during the policy, planning and implementation stages. Because the public had limited participation during the policy planning stage, there was a lot of misunderstanding as well as resistance to the plan. For example, the Krabi Network protested against the Power Development Plan 2015 in January 2017, hoping the government would withdraw the plans for the Krabi power plant from PDP2015.

During the project planning and implementation stage, the opposition activities centred on the choice of site, engineering and economic feasibility, EHIA study, engineering detail design, and project approval.

2.3. What Are Power Plant Developers Aware of?

Meanwhile, below is a summary of facts that developers had to deal with:

a. Domestic situation

- The current energy mix in Thailand depends too much on natural gas. Accordingly, increasing the proportion of coal use is vital in securing various sources of energy and advantageous for its low cost.
- The government in the short term wants to spread the use of renewable energy and stabilize the electric power system. Biomass is currently about twice as costly as coal-fired power plants, but its domestic supply sources may reduce its cost in the future. Too great an increase in its use, however, may result in decreased agricultural production. Hence, the government has introduced a 'quota' system to limit the development of biomass power generation. Similar policies have been introduced for solar-power energy, which currently depends mostly on imports from China; and for large-scale hydropower, which may cause environmental destruction.
- The Power Development Plan in Thailand does not have the luxury of time to take on a very lengthy but transparent route.
- Solar panels consume a great amount of energy during their manufacturing process. Placing too many of these in a narrow area will raise the temperature of the surrounding area, too. Moreover, at the end of their lifespan, how to dispose of these panels in an economical and environmentally friendly way is an issue.

Plant developers and owners have disseminated and shared these types of information to the public; unfortunately, their level of success at creating some noise over their concerns was nowhere near the attention that the opposition had attained for their own causes.

b. Advantages of introducing electric power infrastructure

- People living around the gas-fired power plant in Southern Thailand have witnessed an improvement in their quality of life. Even in the Mae Moh region, the site of well-known contamination incidents, the many employment opportunities and new highways in their community allowed the residents to have a more comfortable life.

c. Provision of information

- The EGAT believes that while it has sufficiently provided the general public with information on the effects of power plants on the environment, many have still failed to understand the

project properly.

- Residents from different regions have different requirements. People living in southern regions mainly demand that they be able to continue their livelihood in fishing and agriculture and that the environment be protected.

In response to such demands, the EGAT has been explaining to residents that not only does a power plant's construction offer various benefits; there is also no risks of environmental contamination. It has assured residents that the government will protect the environment so that locals can maintain their livelihood, and that the power plant is ready to cease operating should there be an event that would put lives at risk. It commits to look after the people's security of tenure. After all, power plants employ more than half of their workers locally.

d. Challenges

- Thailand has a law governing subsidy for residents living within five kilometres of a power plant. Every year, the Energy Regulatory Council evaluates the applications (including the amount and use) of these subsidies and decides who will be the beneficiaries and how much to grant. The amount of funds depends on the type and output of the power plant.
- An expansion of the policy targeting residents within five kilometres of a power plant is now under examination, including the participation criteria, which may be covered by the Energy Regulatory Council's rules and ordinances. Such expansion may be on a case-by-case basis. It should be noted, however, that funds for such purposes may be insufficient. The Energy Regulatory Council, which evaluates and distributes funds to individuals, places the highest priority on improvements in job opportunities and the environment.
- In discussions with locals, it is ideal to ask the residents about the kind of life they want and allow them to consider and make their own choices.
- For the government, an important principle behind their energy policy is the balance among the four *Es* (i.e. Economic, Environment, Energy Security, and Engineering). It is believed that the opposition, who ignore such principle, emphasizes the disadvantages in certain fields and sways a general public that knows little about these movement/s to take up their

cause against power plants.

- Although the general public knows about the Japanese technology used for high-efficiency coal-fired power plants, there is a more fundamental misconception that needs to be corrected. That is, the perception that ‘coal-fired power plants are bad’ has to first be set straight to pave the way for public acceptance of coal energy. Such public acceptance is crucial in preventing further delays in the CPP’s construction.
- If the government wants to proceed to develop the energy sector, it must present a consistent policy to the general public and promote it repeatedly. Currently, the focus of policies tend to swing—for example, from one that aims to enhance the competitiveness of IPPs, to one that focuses on importing electric power from neighbouring countries, etc. Governmental agencies have complex interests in energy, the environment, and public health, etc., which explain the inconsistency in their statements over a certain project. Thus, people have no idea which of these different explanations to trust. All these indicate a need for a strong organization whose role is to align and/or calibrate the interests of various governmental agencies.
- Behind the opposition movements in Thailand are complex and regional characteristics as well as various religions and cultures. Hence, no solution can be achieved by just providing correct and fair information. Rather, it is necessary to first set up a locally based committee with professionals from a various fields and let them hold discussions from a macro-perspective. Such committee is important when dealing with decisions on relevant policies.

2.4. Dealing with Major Opposition Players

1) The Value of Study Trips and Study Visits

Stakeholders who regularly deal with oppositions to certain energy projects are the MOE, EGAT, and the IPPs. Other agencies such as regulators and venders are also involved, but to a lesser degree.

These agencies are responsible for making oppositionists understand and accept the project. Past experiences on coal-fired power plant development in Thailand indicate that power plant

developers:

- Should involve local villagers at an early stage of the project development—e.g. site selection—to help avoid turning the residents into protesters.
- Should provide project information, including a fact sheet with easy-to-understand and consistent information
- Should create effective communication plans on the concerned issues with local villagers and protesters.

Study visits to similar or, better yet, successful power plant projects can help improve visitors' appreciation of coal-fired power plants. The EGAT, in fact, organized a series of study visits to the Mae Moh Lignite coal-fired power plant in Lampang Province, North Thailand. The group included villagers, local governmental officials, representatives of the opposition, and media, all of which participated in a plant tour to learn about the infrastructure's technology, plant operation, air pollution control equipment, and environmental management strategies. The group also met the affected villagers in the Mae Moh vicinity area.

The EGAT, in collaboration with the Ministry of Energy, also organized a study visit to Japan and Germany. The study trip aimed to learn about advanced clean coal technology, and the successful coexistence between power plants and the surrounding community.

In fact, there were a series of trips to Japan organized during the past few years by representatives from the MOE, EGAT, academic professors, villagers from the affected areas, and media.

On 18-23 March 2017, the permanent secretary of the MOE, Areepong Poocha-um, Ph.D., led a delegation that included senior EGAT officials and senior media members, to the Mitsuura power plant in Nagasaki, Japan. The Mitsuura power plant uses imported bituminous and sub-bituminous coal with USC, which is a clean coal technology that can reduce CO₂ emission and other pollutants. This is particularly significant since the USC technology is planned to be adopted for the proposed Krabi power plant.

2) Lessons Learned from Opposition Movements

a. Importance of telling the truth to build trust

Project developers should be upfront about the details of their project. This is because local villagers may quickly lose their trust in a project if they only get to learn about the truth later. A good example is the case of the Bo Nok project, wherein local villagers were initially told that the purchased property was meant to be turned into a golf course but found out later that the land would be the site of a planned coal-fired power plant.

b. Community involvement

Effective communication among stakeholders—especially power developers, local villagers, and protesters—is necessary to avoid conflict. Local residents should be engaged at an early stage of the project’s development so as to prevent any misunderstanding about the project.

c. Meaningful public participation

Public participation in project development can usually create mutual understanding among stakeholders during the decision-making process. The public participation process needs to be improved.

d. Failed public hearing: How to avoid

Public hearings on proposed projects must be conducted, per the EHIA regulations. The current public hearing on the Krabi and Thepa projects revealed that there was insufficient consultation done with stakeholders such as the residents. Other hearings failed to resolve disputes between local communities and NGOs on one end, and the project proponent (i.e. EGAT) on the other end. In some cases, NGOs boycotted the meetings, such as those on the Krabi and Thepa projects.

e. Dangers of a growing opposition

The network of opposition groups became more and more influential as it rapidly expanded. More NGO members joined, allowing the network to gain more support from both national and international NGOs.

f. Transparency in project implementation

Project developers must learn how to assure those who resist any new power project that there is transparency in the implementation process.

g. Coal information clearing house needed

There is a need for a clean coal technology centre to be the clearing house for all information on

coal energy. Such information includes sources of coal, coal utilization and its impact, clean coal technology, and coal economics.

3) Working with Communities Around Power Plant Sites

Thailand's economy, which once centred on agriculture, has been industrialized. Its manufacturing sector currently accounts for about 34% of GDP and 90% of the country's exports. On the other hand, agriculture is still an important industry as it employs about a little less than 40% of the workers and is a major trading source. In addition, tourism is now an important industry. Thailand is, thus, in a unique situation: That is, while industrialization and economic growth move forward, it also has to protect the environment, on which the lives of the agricultural and tourism workers depend on.

In general, large-scale infrastructure projects such as nuclear power plants and dams are not unanimously accepted. To get a plan to advance while managing anxieties of those against the project, it is important to disseminate accurate information about the project early on—i.e. before the opposition movement becomes stronger. As described in Chapter 2., it is necessary to identify who is against the project and on what grounds, and find the points where all relevant parties can agree upon. Government and big companies who push for the construction of power plants in a high-handed manner sometimes drive the opposition to take a harder line and to eventually block the project.

a. Selection of site

During site selection, power project proponents must carry out both a thorough environmental and marine impact assessment, and survey of the needs and feelings of the locals.

In the past, there was a case where opposition groups—after the project proponents had already decided on the project's location—came in to request for a safety evaluation against such disasters as earthquakes, tsunamis, and fires. To avoid such a scenario, project proponents need to maintain a close partnership with the site's local government so as to understand existing local regulations. Local residents' participation during this stage may prove favourable to the project, too.

b. Identifying who is against

Generally, opposition may be of one of two types: (i) the locals who are against a project; and (ii) citizens' groups and opposition parties not related to the locals but are taking the lead.

Opposition groups that band together can become one large-scale force working against a project, even derailing it. Thus, one needs to understand who are against the project and to take appropriate measures quickly on such opposition.

If a movement is composed mainly of citizens' groups and/or activists who have no relation to the residents, the needs of the locals might be inadvertently disregarded. In such a case, any long and complicated campaign against the project will stop not only the project itself but the residents' sources of income as well, thus increasing the locals' woes. This is further complicated when those who join the fray have either no connection to locals or have no professional knowledge about the opposition movement.

c. Clear understanding of objections

People or organizations oppose a project for any of the following reasons:

- Concerned over the effect on one's livelihood: e.g. the construction of a plant requires residents to relocate; negative effects on agriculture and fishery
- Negative effects on the ecosystem and environment; damage to the landscape
- Health hazards
- Safety issues
- Effect of harmful rumours, resulting in poor sales of agricultural products
- Simply 'taking the oppositionist stand' is the main objective

As a counter measure, the government and investors of a project should tackle the questions and problems raised by those who oppose and find solutions. This shall lessen the anxiety of those who are against the project.

Disseminating accurate information can correct the perception that 'power-plant construction = destruction of nature.' It is possible for power plant construction to take place while conserving

the environment. In the communication process, the key is to divulge to stakeholders—at the most appropriate time—only accurate information (on say, measure and schedules) they are looking for. Providing insufficient or incorrect information only invites distrust; so will sudden changes in initial plans.

There will naturally be differences in opinions and sentiments between residents nearest to the project's location who receive compensation from the project developers, and residents in the peripheral areas who are not covered anymore by such financial support. Arbitrarily setting the compensation, however, will create dissatisfaction among the people. Rates should be as explicable as possible. A compensation set too high, for example, can still impede power projects.

d. Holding an early briefing

Movements that started out as opposition groups could morph into anti-authority protesters. Thus, holding briefings as early into the project as possible can mitigate the growth of any protest movement. In fact, briefings are an avenue to establish a trusting relationship with varied interest parties. Briefing may be about:

- Explaining to interest parties such details as the municipality where the plant will be located, and affected companies.
- Soliciting residents' active participation, where necessary; holding study visits.
- Disclosing information and gathering opinions
- Explaining to media
- Inviting experts to inspect other plants that are smoothly operating.

For mass media to produce accurate and fair reporting, project proponents should inspire media to cover both sides of an issue and to analyse the merits and demerits of arguments put forth by interest groups. Project proponents must also be willing to disclose the bases for decisions on the project and welcome an open discussion. In fact, such discussion is an important part of the policy decision-making process.

Another key strategy for project proponents is to invite local public executives, residents, and the media to inspect other coal-fired power plants. Getting the visitors to listen to local folks talk

about why they support the inspected coal power plant is more effective than listening to individuals who are connected to the facility as investors, administrators, or employees.

e. Points of explanation

The topics to be discussed depend on one's target audience. Nonetheless, in all cases, information provided must be consistent. The topics to cover could include:

- The background and rationale for the choice of site
- The object, implication and necessity for such an infrastructure
- Overview of the power plant, such as its scale
- Schedule for the construction work
- Advantages and disadvantages of a coal-fired power plant
- Effects on the environment
- Effects on local industries such as fisheries and agriculture
- Safety improvements made based on lessons learned from the case of the Mae Moh power plant.

f. Advantages and disadvantages of power plant construction

Power plant construction projects can affect the community's employment, tax revenue, welfare, and regional development. Such positive effects—not just the disadvantages—should be highlighted in discussions. If the concerns centre on emissions in the environment, then demonstrate how various measures are being taken to keep the amount of emissions down to a minimum, and how regular monitoring is being carried out. Show that all these steps are taken to keep the disadvantages at an acceptable level.

When project proponents have been transparent at the onset, interest groups and locals would not feel deceived should some unexpected issue arise during construction. It is necessary, too, to demonstrate that the success of the project is not only an achievement of the public but one that will improve the welfare of the residents in the surrounding area. Finally, project proponents need to make the locals understand that the power plant is not something that is forced onto the populace, but will instead have a symbiotic relationship with the locals.

g. Building trust with the locals

Building the trust of the people requires, first and foremost, that one should never violate any domestic or international laws.

Earning the trust of the locals is a long-term relationship-building process. People tend to gravitate towards an individual who is perceived to be reliable than to some expert who talks in technical jargons most of the time.

The individual who will liaise with key stakeholders must have connections within the locals, the power plant facility itself, the local government, and NGOs. He will be responsible for explaining to residents why the power plant project is necessary; provide an update on the progress; discuss the plant's safety level, etc. Likewise, he should be able to convey the residents' needs or demands to the government.

h. Construction and operation stages

Any problem or accidents during the construction or full-operation stage will result in an outright loss of long-term trust. Prevention of problems/accidents is the highest priority. However, in case a problem/accident does happen, there should be immediate and honest disclosure on the circumstances. Necessary measures should be taken to prevent a recurrence.

