

Case Introduction: Dawei/Tasan/Hutghi

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1. Analytical Framework
2. Case Introduction
3. Barrier Summary

Analytical framework: Typology of Benefits and Barriers

- Typological framework indicated by
The United Nations Department of Economic and
Social Affairs (UN DESA, 2005)

*Multi-dimensional Issues in International Power
Grid Interconnection*

Analytical framework: Typology of Benefits and Barriers

- Six dimensions
 - (1) Technical
 - (2) Economic
 - (3) Legal
 - (4) Political
 - (5) Social
 - (6) Environmental

Analytical framework: Typology of Benefits and Barriers

- Six dimensions
 - (1) Technical
 - options for creating electrical links
 - types of information and modelling capacity which improved grid performance
 - (2) Economic
 - (3) Legal
 - (4) Political
 - (5) Social
 - (6) Environmental

Analytical framework: Typology of Benefits and Barriers

- Six dimensions
 - (1) Technical
 - (2) Economic
 - costs and benefits to the electricity generation systems
 - costs and benefits of an interconnection
 - (3) Legal
 - (4) Political
 - (5) Social
 - (6) Environmental

Analytical framework: Typology of Benefits and Barriers

- Six dimensions

- (1) Technical

- (2) Economic

- (3) Legal

- the agreements required for planning, building, and operating power lines used to buy and sell electricity across borders

- (4) Political

- (5) Social

- (6) Environmental

Analytical framework: Typology of Benefits and Barriers

- Six dimensions

- (1) Technical

- (2) Economic

- (3) Legal

- (4) Political

- the political characteristics that favour or make more difficult interconnection agreements

- (5) Social

- (6) Environmental

Analytical framework: Typology of Benefits and Barriers

- Six dimensions

- (1) Technical

- (2) Economic

- (3) Legal

- (4) Political

- (5) Social

- benefits and costs of improved electricity supply

- resource incomes for the interconnected societies

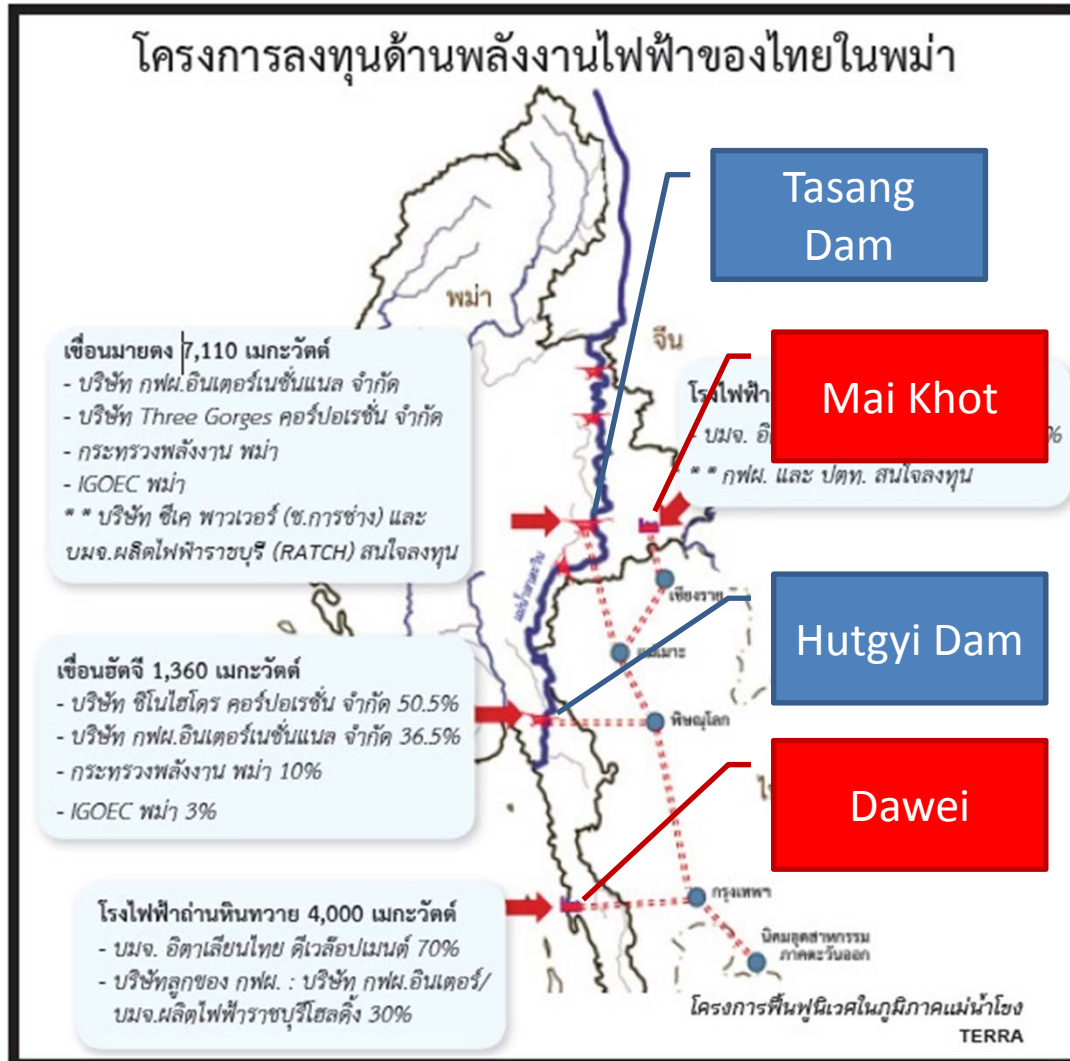
- liabilities of construction and operation infrastructure

- (6) Environmental

Analytical framework: Typology of Benefits and Barriers

- Six dimensions
 - (1) Technical
 - (2) Economic
 - (3) Legal
 - (4) Political
 - (5) Social
 - (6) Environmental
 - external aspects such as pollutions, environmental and human health

Analytical framework: Typology of Benefits and Barriers



- The Salween river Projects

- ✓ Hutgyi dam (1190 MW)

- ✓ Ta Sang dam (6,300 MW)

- The coal power projects

- ✓ Dawei (600 × 3 MW)

- ✓ *Mai Khot (390 MW)*

currently halted

What we are going to do...

	Dawei	Hutgi	Tasan
Technical			
Economic			
Legal			
Political			
Social			
Environmental			

Understand various dimensions of benefit/barrier in each case!

Technical Dimension

<i>Technical benefit</i>	<i>Technical barrier</i>
<ul style="list-style-type: none">- Capital and technological development (Teush, and others, 2012)- Capacity development in human expertise (Nakayama and Maekawa, 2012)- Minimized electricity losses through more reliable and productive power infrastructure (Teush, and others, 2012)	<ul style="list-style-type: none">- Infrastructural unreadiness such as technical loss, incapable grid adjusting seasonal ups and downs, unfunctioning interconnection between regional and national grids (Teush, and others, 2012)- Geographical remoteness (Ciao, and others, 2012)

Myanmar/Thai Specific

- Aged grid inadjustable to seasonal peaks up to 20% (ERIA, 2014; JBIC, 2013; MOEP, 2013)
- System insecurity and power losses – 19.43% of distribution loss (EGAT, 2013; MOEP, 2013)
- Uncoordinated high-voltage grid, whether AC or DC, (EGAT, 2013) and the varied voltage level ranging from 0.4kV to 500kV (MOEP, 2013)
- Remotely located substations (MOEP, 2013)

Economic Dimension

Economic benefit

- Improved economic efficiency with better supply condition (WB, 2008)
- Economy of scale by larger market access (Eberhard, 2003; UN DESA, 2008; Canadian Electricity Association, 2013)
- Reduced fiscal strain of the national government, when deregulation adopted (WB, 2008, Teusch, and others, 2012)

Economic barrier

- Uncoordinated internal electricity market in a line with regional integration (Francois, 2004)
- Generated risk perception if WITHOUT the competitive participation, appropriate economic and financial architecture (DESA, 2005; Teusch, and others, 2012)
- Infacilitated network access, compatible pricing and congestion management, wholesale market arrangement in transparent manner (Teusche and others, 2012; SEETEC, 2006; ERGEG, 2006)

Myanmar/Thai Specific

- Initial cost to invest in the new transmission system (EGAT, 2013; MOEP, 2013; JBIC, 2013)
- A lack of guaranteed competitive pricing mechanism; alternative option > electricity purchase price at border + costs of new transmission system in Thailand (EGAT, 2013)
- Speed down of the global economy (WB, 2013)

Legal Dimension

<i>Legal benefit</i>	<i>Legal barrier</i>
<ul style="list-style-type: none">- Improved legal human capacity (Haggblade and others, 2013)	<ul style="list-style-type: none">- Appropriate legal arrangement in PPAs, liability for supply failures, environmental responsibility, and agreement on security of transmission operation (Haggblade, and others, 2013; DESA, 2005)- Preventative coordination against rent-seeking activity (Rustad, and others, 2012; DESA, 2005)- Lack of monitoring system such as civil society and independent judiciary initiations (DESA, 2005)

Myanmar/Thai Specific

- Knowledge and skill loss due to the lack of proper legal regulatory system in intellectual property rights under Myanmar's fragmented regulatory institutions (EGAT, 2013; MOEP, 2013)
- An weak judicial system, currency control and unclear property rights (Bissinger, 2012)
- No labour and environmental regulations (JIOI, 2013)

Political Dimension

<i>Political benefit</i>	<i>Political barrier</i>
<ul style="list-style-type: none">- Capacity development to commit long-term projects with stable political environment (DESA, 2005)- Scale up the existing policy (DESA, 2005)- Political stability in interdependent regional cooperation and security (EGAT, 2013; Eberhand, 2003)	<ul style="list-style-type: none">- Lack of the political will and organizational capacity to commit the long term projects- National security concerns, given the highly politicized nature of electricity/energy especially with powerful interest groups (DESA, 2005)- National rivalries among regional actors (DESA, 2005; Teusch and others, 2012)- Generated risk perception of political instability, unreliability and uncertainty

Myanmar/Thai Specific

- Domestic political turmoil in Thailand and delayed planning (interview to Utility, 2014)
- Perceived political corruption in changing regime (JIOI, 2013)
- Uncertainty in political sanction (JIOI, 2013)

Social Dimension

<i>Social benefit</i>	<i>Social barrier</i>
<ul style="list-style-type: none">- Improved social quality of life such as less indoor air pollution (UNESCAP, 2013)- Better access to power for productive usage (UNESCAP, 2013)	<ul style="list-style-type: none">- Lack of the social acceptance of affected local population (Teusch, and others, 2012)- Insufficient understanding of locals' demand (Teusch, and others, 2012)- Lack of productive usage for affected people (Krupa, 2012)

Myanmar/Thai Specific

- 40% of ethnically diverse population against the major power plants projects where they inhabit (JIOI, 2013)
- Little distribution to locals whereas 80% of generated electricity exported to Thailand (ERIA, 2014; Arakan, 2012)
- Ongoing social unrest in Myanmar more than 60 years (Haggblade, and others, 2013)

Environmental Dimension

<i>Environmental benefit</i>	<i>Environmental barrier</i>
<ul style="list-style-type: none">- Cleaner environment by replacing biomass energy usage (DESA, 2008)- Shared resource usage (EGAT, 2013)- Positive impact on fossil fuel costs and emission savings (Teusch and others 2012, Canadian Electricity Association, 2013)	<ul style="list-style-type: none">- No environmental regulation (EGAT, 2013)

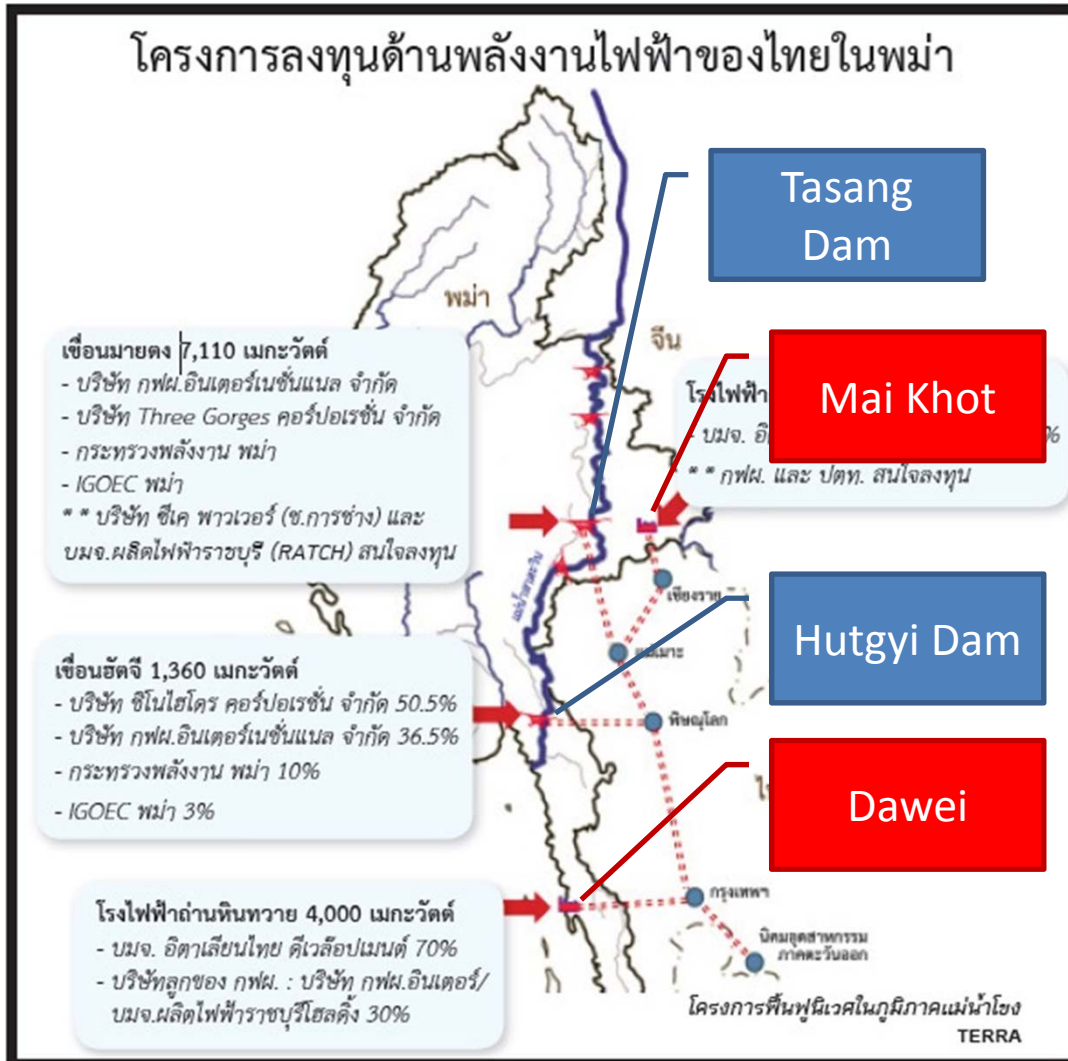
Myanmar/Thai Specific

- No environmental regulation and legal arrangement in Myanmar (EGAT, 2013; MOEP, 2013)
- The highest Deforestation rates than anywhere else (Talbot and others, 2012)

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Three Cases: Dawei, Hutgi, Tasan



- The Salween river Projects

- ✓ Hutgyi dam (1190 MW)

- ✓ Ta Sang dam (6,300 MW)

- The coal power projects

- ✓ Dawei (600 × 3 MW)

- ✓ *Mai Khot (390 MW)*

currently halted

Data collection

Literature
survey

Statistical data of
stakeholders

Publication review

Interview
Hearings

Public research
institutes

Thai business
stakeholders

Dawei

Overview: Dawei

Capacity 1,800 MW, starts : 2018

2010,

- Italian-Thai Development public co. ltd. (ITD) got the MOU with the share of 70% and 30% for EGAT

2012,

- Thousands of people refused the coal power plant in Dawei
- Ministry of Energy cancelled the coal power plant project in Dawei
- Dawei Development Association (DDA) sent environmental and social issues to Japanese government and related organizations

Overview: Dawei

2012 (cont.),

- MOU of the development in economic and related projects in Dawei has been set up
 - 1,000 MW will be used in Dawei
 - 4,000 MW will be sold to Thailand

2013,

- In the Japan-ASEAN Summit, DDA sent a request to Japanese government to stop all investments in Dawei
- Due to some issues, the joint venture of Thailand and Myanmar companies was set up and replaced ITD

Overview: Dawei

2014,

- EGAT planned to support the Electricity Generating public co. ltd. (EGCO), EGAT holds 25.41% stake, to take care the coal power plant projects in Dawei

Barriers: Dawei

- Issues: recent cancelation of plan utilizing the coalfired plant
- Inappropriate electrical grid usage and not-well optimized electric power distribution system on the west side area
- SEZ plans to construct the large scale coalfired plants but no expert firms on this in local and lack of operation management skills
- no economic/demand planning to use the generated electricity in Dawei, and the costs to land will be fairly high and no planning to distribute it to domestic usage
- Lack of the comprehensive master plan – inappropriate planning which doesn't apply their domestic economic forecast

Barriers: Dawei

- Ambiguous legal framework over the foreign direct investment revised in 2012, no secured legal framework for the foreign companies' investment with ratio >51%
- Externality entailed with the coal-fired plant makes the total costs higher
- Current offtake price is too low especially lower subsidy on hydro than thermal
- Lack of the project clarity
- Social opposition against Chinese firms
- No detailed master plan and grand design required to be revised and these plan should be in a line with policy direction with all concerned countries

Barriers: Dawei

- Share holdings on Thai's side reduce from 100->??

Hypothesis: Barrier Summary

Dawei

Technical	<ol style="list-style-type: none">1. Not-well optimized electric power distribution system2. No technical skill
Economic	<ol style="list-style-type: none">1. No economic/demand planning2. Off-take price is quite low3. Fix costs are high (land, 10% free electricity)4. Difficulty to find a lender
Legal	<ol style="list-style-type: none">1. No new MOU2. No legal framework for the foreign companies' investment3. No legal for social and environmental safeguards
Political	<ol style="list-style-type: none">1. Energy policy is unclear<ol style="list-style-type: none">a) Agreement contract (BOO->BOT)?b) Benefits & costs and information sharingc) Interconnection operationd) Firms selection and payment

Hypothesis: Barrier Summary

Dawei

Social	<ol style="list-style-type: none">1. Abuse of human rights especially forcing migration2. Unclear of how to treat the social movements3. Social conflicts from not enough compensations4. Diverse ethnicity5. Social opposition against Chinese firms
Environmental	<ol style="list-style-type: none">1. Coal technology is questioned

Ta Sang

Overview: Ta sang

Capacity 6,300 MW, starts : 2026

1996,

- Burma's army eliminated Shan people; about 300,000 civilians had to migrate out of that area which is a part of Ta Sang dam. Later, there were still having fights in this area

2006,

- MDX public co. ltd. had a first MOU with the share of 85% to Myanmar 15%
- Shan Sapawa Environmental Organization reported that 60,000 civilians were migrated, tortured, raped and killed

Overview: Ta sang

2007,

- The Chinese company joined the joint venture with MDX and Myanmar with the shares of 51-24-25, respectively

2009,

- The conference “Abuse of human right in Hutgyi and Ta Sang projects” was held

2011,

- Chinese workers were missing but finally the Shan State Army (SSA) sent them back
- Myanmar sent more army into this area and caused several fights which made civilians could not get back to their home

Overview: Ta sang

2013,

- EGATi came to take place MDX and reform the share structure to 30% or 56.5%
- RATCH was interesting in this project
- The president of EGATi confirmed to proceed the Ta Sang project with 30% share

2014,

- EGAT planned to support RATCH to take care all Salween River projects

Barriers: Tasan

- Lack of G to G business
- Lack of the comprehensive master plan
- Lack of the capacity of Myanmar or the plan by IOs which introduce the secured direct opportunity for IPPs
- 10% free electricity to Myanmar
- The policy change influenced by the political instability
- Share holdings on Thai's side reduce from 85->51->30
- Ambiguous legal framework over the foreign direct investment revised in 2012
- Lack of the project clarity

Barriers: Tasan

- Social opposition against Chinese firms
- No detailed master plan and grand design required to be revised and these plan should be in a line with policy direction with all concerned countries
- How to share the benefits & costs and also the information?
- How to select and pay the firms?

Hypothesis: Barrier Summary

Ta Sang

Technical	-
Economic	<ol style="list-style-type: none">1. Off-take price is quite low2. Fix costs are high (land, 10% free electricity)3. Difficulty to find a lender
Legal	<ol style="list-style-type: none">1. No new MOU2. No legal framework for the foreign companies' investment3. No legal for social and environmental safeguards
Political	<ol style="list-style-type: none">1. Energy policy is unclear<ol style="list-style-type: none">a) Agreement contract (BOO->BOT)?b) Benefits & costs and information sharingc) Interconnection operationd) Firms selection and payment2. Political instability due to policy change

Hypothesis: Barrier Summary

Ta Sang

Social	<ol style="list-style-type: none">1. Abuse of human rights especially forcing migration2. Unclear of how to treat the social movements3. Social conflicts from not enough compensations4. Diverse ethnicity5. Social opposition against Chinese firms
Environmental	-

Hutgyi

Overview: Hutgyi

Capacity 1,190 MW, starts : 2023

2005,

- EGAT had a first MOU

2006,

- Shares between EGAT, Chinese company and Myanmar are 45-40-15
- EGAT's exploration team stepped on a bomb so the survey was aborted till 2007
- EGAT hired Environmental Research Institute, Chulalongkorn University (ERIC) to study the effects of the dam and transmission lines
- EGATi was set up

Overview: Hutgyi

2007,

- National Human Rights Commission verified the abuse of human right and report to Thai's government
- EGAT officer's camp was bombed

2008,

- The study of the propriety and Environmental Impact Analysis (EIA) by EGAT was complete
- EGAT is going to set up a joint venture in 2009

2009,

- The subcommittees had been set up to study and report the various impacts due to the Hutgyi dam project

Overview: Hutgyi

2009 (cont.),

- Reform the shares between EGATi, Chinese company and Myanmar are 39-51-10
- Myanmar's army and Democratic Karen Buddhist Army (DKBA) attacked the Karen National Union (KNU) which made 3,500 civilians migrated to Thailand
- The conference "Abuse of human right in Hutgyi and Ta Sang projects" was held

2011,

- A hearing was held in Maehongsorn, lots of people joined and they were very concerning about environment, lifestyles and impacts but there is no answer from this hearing

Overview: Hutgyi

2011 (cont.),

- MOU was updated and the details are
- EGATi and Chinese company will reduce their own share of 0.5% each and give it to Myanmar's investment company to be finally 4%
- EGATi will manage and maintenance the project
- The Chinese company will take care the engineering design, purchasing and construction
- EGATi and Chinese company will give 10% share for free to Department of Hydropower Planning (DHPP) as a fee
- The 1st – 17th year, 10% of the capacity and the rest of the concession, 15% of the capacity will be given for free

Overview: Hutgyi

2012,

- Even there are several negotiations with KNU but EGAT and Chinese company still did the exploration without any notice or hearing which will make the peace conference more difficult

2013,

- EGATi changed the shareholding to 36.5%

2014,

- EGAT planned to support the Ratchaburi Electricity Generating Holding public co. ltd. (RATCH), EGAT holds 45% stake, to take care all Salween River projects

Barriers: Hutgi

- Lack of G to G business
- Ambiguous legal framework over the foreign direct investment revised in 2012
- Free electricity to Myanmar
 - 1st-17th year : 10% (136MW)
 - 18th + year : 15% (203MW)
- Free shares to Myanmar => Share holdings on Thai's side reduce from 45->39->36.5
- No detailed master plan and grand design required to be revised and these plan should be in a line with policy direction with all concerned countries

Barriers: Hutgi

- Threat of the minority groups
- 40% of population consists of diverse ethnicity
- Abuse of human rights especially forcing migration
- Unclear of how Myanmar's government will treat the social movements
- Social opposition against Chinese firms

Hypothesis: Barrier Summary

Hutgyi

Technical	-
Economic	<ol style="list-style-type: none">1. Off-take price is quite low2. Fix costs are high (land, 10% free electricity)3. Difficulty to find a lender
Legal	<ol style="list-style-type: none">1. No new MOU2. No legal framework for the foreign companies' investment3. No legal for social and environmental safeguards
Political	<ol style="list-style-type: none">1. Energy policy is unclear<ol style="list-style-type: none">a) Agreement contract (BOO->BOT)?b) Benefits & costs and information sharingc) Interconnection operationd) Firms selection and payment

Hypothesis: Barrier Summary

Hutgyi

Social	<ol style="list-style-type: none">1. Abuse of human rights especially forcing migration2. Unclear of how to treat the social movements3. Social conflicts from not enough compensations4. Diverse ethnicity5. Social opposition against Chinese firms
Environmental	-

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Hypothesis: Barrier comparison

	Dawei	Hutgyi	Ta Sang
Technical	◎	○	○
Economic	◎	△	
Legal	△	○	△
Political		◎	○
Social		○	◎
Environmental	△	○	◎

Double circle: Confirmed as *critical*, circle: *confirmed* by experts, triangle: *indicated* by experts

Conclusions and Implications

- Coal fire power plant runs costly due to its resource cost, which causes difficulty for IPPs to secure an economic benefit in a longer term. With few lenders, **economic/technical** barriers should be inevitable. (Dawei)
 - Solid *PPA* with a credible purchaser
 - Initial/effective use of *donors* adding to private banking

Conclusions and Implications

- On the other hand, with much lower resource cost, mega-hydro projects can enjoy economic benefits thanks to the scale of economy. The huge scale, however, is the source of **social/environmental** barriers. (Ta Sang)
 - Too big to implement? How big should it be based on *B/C*?
 - Implementation of and compliance with *EIA*.

Conclusions and Implications

- What is worse, the response from local society is much more complicated if it is entangled with a power / social struggling in its nation-building. This complication may possibly cause severer **legal/political** barriers. (Hutghi)
 - Sufficient *consultation process* with civil/local society.
 - Project can ease the struggling by securing the “*Left-over*” benefit for locals.

Current Condition

