CASE

Mainstreaming environment into power planning: SEA for the power development plan VII VIET NAM

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From the publication

Strategic Environmental Assessment for Sustainable Development of the Hydropower Sector

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Mainstreaming Environment into Power Planning: SEA for the Power Development Plan VII

Viet Nam

Lothar Linde

Authorities	Ministry of Energy and Trade, Institute of Energy, Min. of Natural Resources and Environment, Prime Minister's office
Type of plan	National power development plan 2011-2020
Scope of SEA	National future energy supply
Key SEA issues	Assessment of alternatives concerning fuel mix, including hydropower
Stakeholder engagement	Consultation of private actors in the energy sector and all relevant authorities at national and provincial level
Duration and year	24 months; 2009 - 2011
Influence of SEA	• Most sustainable alternative is selected through a major cut in coalfired power generation (-22,000 MW) and a seven-fold increase in the amount of planned renewable energy, including hydropower • Policy adopted; Payment of ecosystems services included (2010)
Link to SEA report	https://gms-eoc.org/resources/two-seas-on-power-development-planning-in-viet-nam

1.1 Introduction

Power generation in Viet Nam currently relies on three main primary energy sources: hydropower, coal, and oil and gas. Electricity is distributed through a high voltage transmission line system running from the North to the South of Viet Nam.

The Viet Nam Power Development Plan VII provides a long-term strategic framework to guide the development of the power sector for the period 2011-2020. Guided by the 2006-2010 Socio-economic development plan (SEDP), the 2011-2015 SEDP, and the Viet Nam 2020 Vision, it analyses future economic and social development trends *(=economic growth scenarios)*, summarises related energy requirements *(=energy demand scenarios),* and evaluates the cost and benefits of a preferred supply option *(=power development scenario or "base case")*.

To date, Viet Nam has developed seven Power Development Plans. The geographic scope of the PDP is national and the temporal scope 10 years forward with an outlook for another 10 years. Revisions are usually done every 5 years, mainly focusing on reviewing which economic growth scenario has come true and if that has repercussions on the energy demand scenarios and supply choices previously selected and followed.

Focus of this case study

Strategic Environmental Assessments (SEA) for the PDP have been applied since the PDP VI (2006-2015), after SEA became a legal requirement in Viet Nam in 2005. At that time, the PDPs were not sufficiently developed in the following three areas:

- no systematic accounting of environmental and related social costs into cost-benefit analysis of thermal power plants (TPP), hydropower projects (HPP), and distribution infrastructure (transmission lines);
- focus on a narrow energy mix (fossil fuel, hydro) with limited consideration for other supply options (renewables – small hydro, wind, solar);

- little consideration of demand side management (DSM) options in energy demand and power development scenarios.

1.2 BACKGROUND: CONTEXT AND ISSUES

Governance situation; social and environmental setting

To ensure Viet Nam's energy security for the coming decades, the Power Development Plan has to respond to a wide range of national and sector strategies and their implications on power demand and development. The most important orientation for the PDP is the Socio-Economic Development Plan for the period 2011-2020 with 2030 vision. Growth trajectories in other key development sectors are studied to inform the PDP growth and energy demand scenarios, including urban plans, land use plans, industrial park development, Transport Development Strategy, tourism plans, conservation plans, Regional Multipurpose Water Resources Management Plans, etc. Lastly, the PDP needs to be aligned to the energy sectors' own strategies and sub-plans: a) the National Energy Development Strategy until 2020 with 2050 vision, b) the National Program for Energy Efficiency and Conservation, c) the Master Plan for the Development of the Coal Sector in Viet Nam until 2015 and vision to 2025, and d) the Master Plan for the Development of the Oil and Gas Industry until 2015 and direction to 2025.

Despite the countries size and diversity, a few common environmental and socio-demographic characteristics can be identified:

- Viet Nam's N-S coastline and the Red River and Mekong Delta are largely flat, dominated by agriculture, industry and urban development, and hold most of the countries' population. Consequently, the country's major energy demand falls into these areas, supplied by TPPs concentrated in the area (which are also there for short distances to import and distribution hubs for coal, oil and gas).
- Viet Nam's North and Centre region features large mountain ranges with much lower population density, infrastructure and productive assets, but a dominance of forest resources and environmental tourism sites. These areas not only focus on hydropower development and distribution into the coastal areas and deltas but are also critical for water supply and regulation for the downstream areas (agriculture, disaster protection).

For the purpose of baseline analysis, the PDP sub-divides the country into seven geographic regions with distinct (and distinctively different) environmental and socio-economic features and characteristics. These are: 1) North-West, 2) North-East, 3) Red River Delta, 4) North Centre and South-Central Coast, 5) Central Highlands, 6) South-East, 7) Mekong Delta. Comprehensive environmental and socio-demographic profiles were developed for each of these regions to identify and compare environmental and social issues.

Role of the SEA and how it is linked to the decision-making process

The requirement to conduct SEA in Viet Nam's strategic planning was included in the Law on Environmental Protection 2005 and reaffirmed in the law's update in 2014. That makes Viet Nam the first country in South-East Asia that has made SEA mandatory for over 15 years now.

While the legal requirement for SEA was in place since 2005, SEA implementation capacity was not. Systematic institutional capacity building on SEA did not start before it was becoming a legal requirement, leaving many government organisations struggling with fulfilling their SEA obligations without SEA-trained/experienced staff nor additional/dedicated financial resources for conducting SEAs.
Consequently, Viet Nam government organisations turned to international agencies, in particular the Asian Development Bank (ADB), the World Bank, GIZ, Dutch RIVM/PBL, the Netherlands Commission for Environmental Assessment and others to provide on-the-job SEA capacity development.

In the case of the PDP, the first full SEA exercise was conducted by the ADB on the PDP VI. This SEA was an ex-post assessment with a focus on the national hydropower sub-plan. Although the influence of the SEA of the PDP VI on the plan was very limited due to its ex-post nature, it was fundamental in building conceptual understanding, appreciation and commitment with the involved government agencies.

Box 1 Legal requirements SEA
Framework law: Law on Environmental Protection 2005 (update in 2014).
Additional legal and guiding documents informing SEA implementation are:

a) Government Decree No 80/2006/ND-CP of dated 09th Aug 2006 on Instruction of the Law of Environmental Protection (LoEP) implementation,
b) Government Decree No 21/2008/ND-CP dated 28th Feb 2008 on amendment to Decree 80/2006/ND-CP and
c) Circular No 05/2008/TT-BTNMT dated on 08th Dec 2008 of MONRE on Instruction of EIA, SEA and Environmental Protection Commitment implementation. The latter is the main guiding document to SEA.

In response to that IoE requested support for the preparation of the SEA of the PDP VII, the first ex-ante SEA of the PDP in Viet Nam.

1.3 Approach and methods used

Institutional setting

There are four main actors related to SEA of the PDP in Viet Nam:

1. the Ministry of Industry and Trade, in charge of developing the Power Development Plan, for which it set up a PDP working group;
2. the Institute of Energy, a subsidiary of MoIT, which is tasked with the implementation of the SEA of the PDP, for which it set up an SEA working group;
3. the Ministry of Natural Resources and Environment, which assesses the SEA throughout the process and the end results in close collaboration with IoE (and the SEA working group);
4. the Prime Minister's office, which issues the final decision on both SEA and PDP.

The SEA working group consisted of 25 members from different backgrounds, including environment, economics, electricity etc. The SEA working group was the main body to steer the design and implementation of the SEA. It was composed of three groups of contributors:

1. IoE staff taking a supervisory and steering role and acting as the main link with the MoITs PDP working group;
2. National experts from IoE, line ministries and independent consultants, providing important national knowledge and analytical inputs;
3. International experts, including staff of the Greater Mekong Subregion (GMS) Environment Operations Centre supported by ADB, providing SEA process guidance and selected technical inputs and capacity building.

Five members of the SEA group were also members of the PDP VII working group. The SEA working group was headed by the Director of the IoE, who is also the chairman of the PDP VII.

The SEA working group engaged closely with a wide range of additional organisations for data and knowledge support, including electricity consulting companies, Electricity of Viet Nam, National Petroleum Corporation, Viet Nam Coal & Mineral Resources Corporation, Forestry Bureau, Institute of Strategic Development (under Ministry of Planning and Investment), Institute of Ecology and Biological Resources, Ministry of Natural Resources and Environment, and of course the Institute of Energy itself.

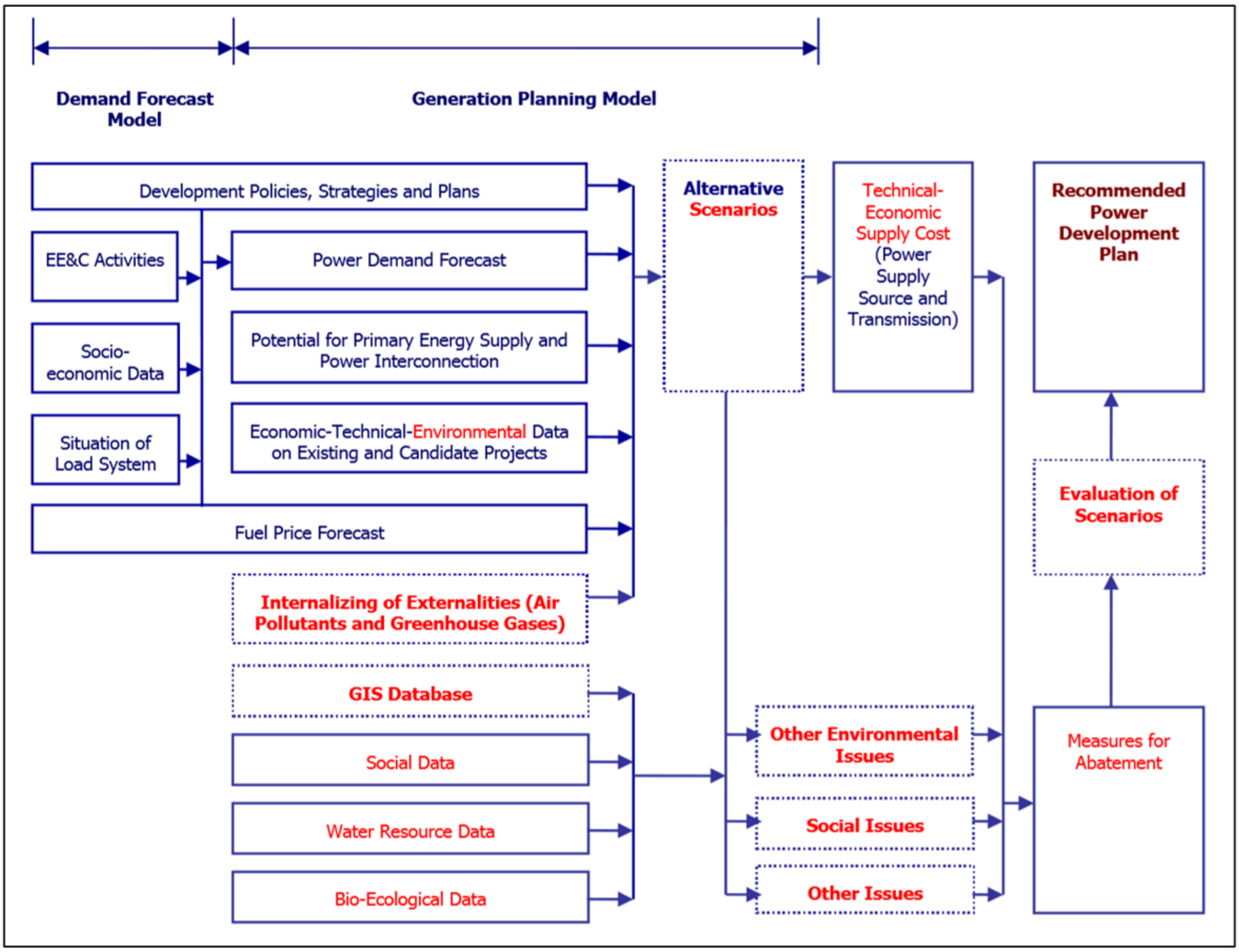
The SEA process

The SEA of the PDP VII followed the commonly recognised SEA steps.

The analytical framework (step 1) was developed during an inception workshop held in Qui Nhon city in July 2010. Key socio-economic and environmental issues relevant to the sustainability of the PDP were identified and form the basis for the impact analysis later.

Data collection and definition of the baseline analysis (step 2) started soon after that inception workshop. Data that was still valid from the SEA of the PDP VI – in particular, the GIS analysis on HPPs – was reused. For other aspects added to the analysis of the SEA PDP VII, new statistical and spatial data was collected, and criteria identified.

Figure 1: Overview of the PDP process (solid boxes) and the contributions of the SEA (dotted boxes).



Stakeholder consultations happened regularly throughout the SEA (parallel process – not really a separate step 3). This comprised of official workshops (inception workshop, final workshop), coordination between the SEA working group with the PDP working group, and the individual engagement of SEA working group members/SEA technical staff with line agencies for data and knowledge (one-to-one meetings and interviews). A broad summary of stakeholders engaged is provided in chapter 3.1 and 3.7.

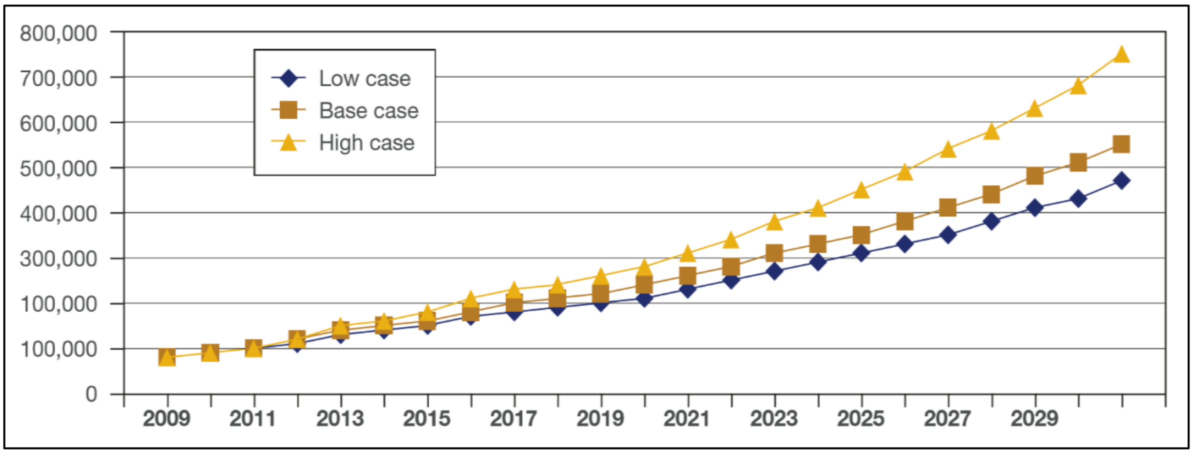
The impact analysis and weighting (step 4) were complex given the variety of factors involved and related data gaps and compatibility constraints. Regardless, it did follow four key steps a) a quantitative analysis of the physical quantities of different impacts – e.g. how many pollutants emitted, how much forest lost, how many people exposed, b) an economic valuation of these impacts, and c) the weighing of each impact according to its influence on sustainability of a power supply scenario, and d) the comparison and ranking of the three power supply scenarios (base case and two alternatives) (ref chapter 3.6).

For residual impacts of the optimal scenario, options for **mitigation and compensation (step 5) were discussed** – e.g. polluter pays, payment for ecosystem services etc. – and reflected in the SEA's conclusions and recommendations submitted to MoIT and the Prime Minister's Office (step 6), which concluded the SEA exercise (ref. chapter 3.6). The SEA was officially approved on 22 April 2011 (document No. 615/TCMT-TD).

Development of alternatives

Based on national and sector growth forecasts, the Power Development Plan developed three energy demand forecasts: base case (growth following past trend), high case (higher than expected growth), and low case (lower than expected growth) – Figure 2.

Figure 2: Power demand forecast until 2030 (MW)



Based on these power demand scenarios, the PDP developed a power development scenario (supply options). This scenario was sent to the SEA working group for assessment and analysis, forming the starting point for the SEA.

The SEA working group's analysis of the PDP power development scenario revealed several concerns of this initial power development scenario:

1. Strong focus on thermal power and related fuel imports challenges Viet Nam's energy security (market price fluctuation, political dependence);
2. Shift from oil/gas to coal further worsens the environmental footprint of thermal power production;
3. Location of TPPs in high population areas increases risk of environmental and social impacts.

Accordingly, the SEA working group proposed adjustments to the power development scenario, which - after endorsement by the PDP working group - became the new base case scenario. Key adjustments were:

1. Maintain and expand (instead of reducing) gas fired TPPs and look for LNG import sources;
2. Increase share of renewable energy to 4%, mainly from small hydro;
3. Add three additional nuclear power plants.

While this adjusted scenario was now considered the PDP base case scenario, the SEA working group and the PDP VII working group continued to consider more possibilities to optimise the base case scenario, leading to two alternatives scenarios being analysed by the SEA (Table 1).

These alternative scenarios tried to capture additional optimisation options not yet fully captured in the base case scenario, in particular: 1) increase energy efficiency in power production, 2) reduce energy loss in power distribution (transmission grid) and 3) increase share of renewable energy.

Table 1: Overview of main characteristics of SEA alternative power development scenarios

Scenario	Measure (compared to base case)	Expected results by 2030
Alt. 1	Increase energy efficiency to 5-8% by 2030 compared with 1-3% in the base case scenario (in production and distribution)	• Reduce energy loss of the whole system to <7% through upgrade to high efficiency thermal and development of super-voltage transmission lines (1000-1100kV) • Saves approx. 56.3 mil, tons of coal imports • Estimated avoided env/social cost: 3.893 mill USD
Alt. 2	Increase the rate of renewable energy to 8-10% by 2030 compared with 3,8-4% in the base case scenario.	• Further increase the ratio of gas turbine instead of coal fire TPP • Reduction of 6200MW from coal, saving about 9 coal fired TPPs and approx. 10,6 mill tons of coal, • Estimated avoided env/social cost: 1.868 mill USD

Table 2: Overview of key issues and related impact indicators, by generating source

Generating source	Type of env. and social issue	Impact indicators
Thermal	Climate change	Total tonnes of GHG emissions
	Acidification of soils and water	Ph values of vulnerable water bodies Total SO2 & NOx emissions
	Human health impacts	Number of people exposed to health risks from atmospheric pollution (SO2, NOx, PM) Total disease-adjusted life years lost because of pollution impacts
	Habitat loss & displaced people	Total area of valuable ecosystems lost (ha) Number of people resettled
	Cooling water impacts	Area of valuable ecosystems vulnerable exposed to cooling waters
	Solid waste disposal	Tonnes of waste products from power generation
Hydro	Resettlement of displaced people	Number of people resettled
	Social & livelihoods impact on local people	Number of people affected by hydropower projects
	Forest & habitat loss	Total area of forest lost (ha) Protected areas land lost (ha)
	Hydrological impacts	Reduced water availability to downstream water users Length downstream of aquatic ecosystems affected (km) Minimum environmental flow not maintained
	Biodiversity loss	Area of valuable ecosystems vulnerable to impacts
Nuclear	Disaster vulnerability	Impacted extent and numbers of radiation exposed people
	Management of radioactive materials	Infrastructure & regulations for radioactive material management not in place
	Cooling water impacts	Area of valuable ecosystems vulnerable exposed to cooling waters
Renewable energy	Land area lost for generating sites	Total area of forest & valuable ecosystems lost (ha)
	Noise & visual pollution	Noise level and height of wind turbine towers
Transmission lines	Forest & habitat loss	Total area of forest lost (ha)
	Ecosystem fragmentation	Number & total area of protected areas fragmented by transmission lines
	Land area lost for transmission lines	Total area lost for clearing for transmission lines (ha)

Selection of issues and indicators (scoping)

All three power development scenarios – optimised base case scenario and two alternative scenarios – were subject to impact analysis. For the impact analysis, relevant socio-economic and environmental issues were identified during the inception/scoping.

Impact analysis: methods and tools

Besides the use of national and provincial summary data for a broader assessment of environmental and socio-demographic state and trends, the impact analysis of the SEA of the PDP was characterised by two main innovations new to SEA in Viet Nam and the GMS at that time:

- extended use of spatial analysis to quantify different environmental and socio-demographic assets (proxies for impact indicators) within the perimeter of the TPPs, HPPs and transmission lines;
- application of cost factors/coefficients (US$ per impact unit) to translate statistics into economic values broadly compatible with cost-benefit analysis.

For TPPs, an Euclidean distance buffer (straight line distance) was applied to each TPP subdivided into 3 zones of impacts around the plant site (Figure 3). While this approach does not model an exact plume at a certain time and wind direction, it is a deliberate and valid abstraction given the long analytical horizon (20 years), the lack of detailed atmospheric data for such a time horizon, and the strategic nature of the assessment.

For transmission lines, an Euclidean distance buffer was used to calculate impacts with regard to forest/ecosystem loss and fragmentation (Figure 3).

workshop (July 2010) and following individual consultations with and by the SEA working group. The result is a list of strategic environmental and social issues and related indicators, constituting the assessment framework of the SEA of PDP VII. A brief summary is given in Table 2

For HPPs, a slightly different approach was used. The dam inundation areas were calculated using a "bathtub approach" with the base elevation and the average water level (height) at dam site as benchmarks to extract the approximate reservoir from a digital elevation model. Further impacts around the dam site are expected through dam construction (incl. necessary support infrastructure, in-migration (laborers)) and the ecological changes triggered by the same (e.g. changes in hydrology). This was recognised through creating a second, wider outline (zone of influence) around the dam site based on accessibility (Least-cost path calculation). Both inundation zones and zones of influence were overlaid on relevant indicator layers for a zonal summary of the assets within (e.g. population density map, forest map etc) (Figure 4).

In a final step, the statistical data produced by the government and from the GIS analysis were multiplied with cost coefficients to arrive at values compatible with the cost-benefit analysis.

As a result of this accounting each individual power plant (thermal, hydro) and distribution infrastructure (transmission line, by section) could be transparently ranked and compared for its costs and benefits. This led not only to the reduction in number of coal-gas fired TPPs but also the suspension of two HPP falling into protected areas.

Figure 3: Left: GIS-bases TPP zone of influence around a TPP site overlaid on population density map, Right: transmission lines overlaid on PA and forest areas (% showing size of fragments compared to original patch without transmission line).

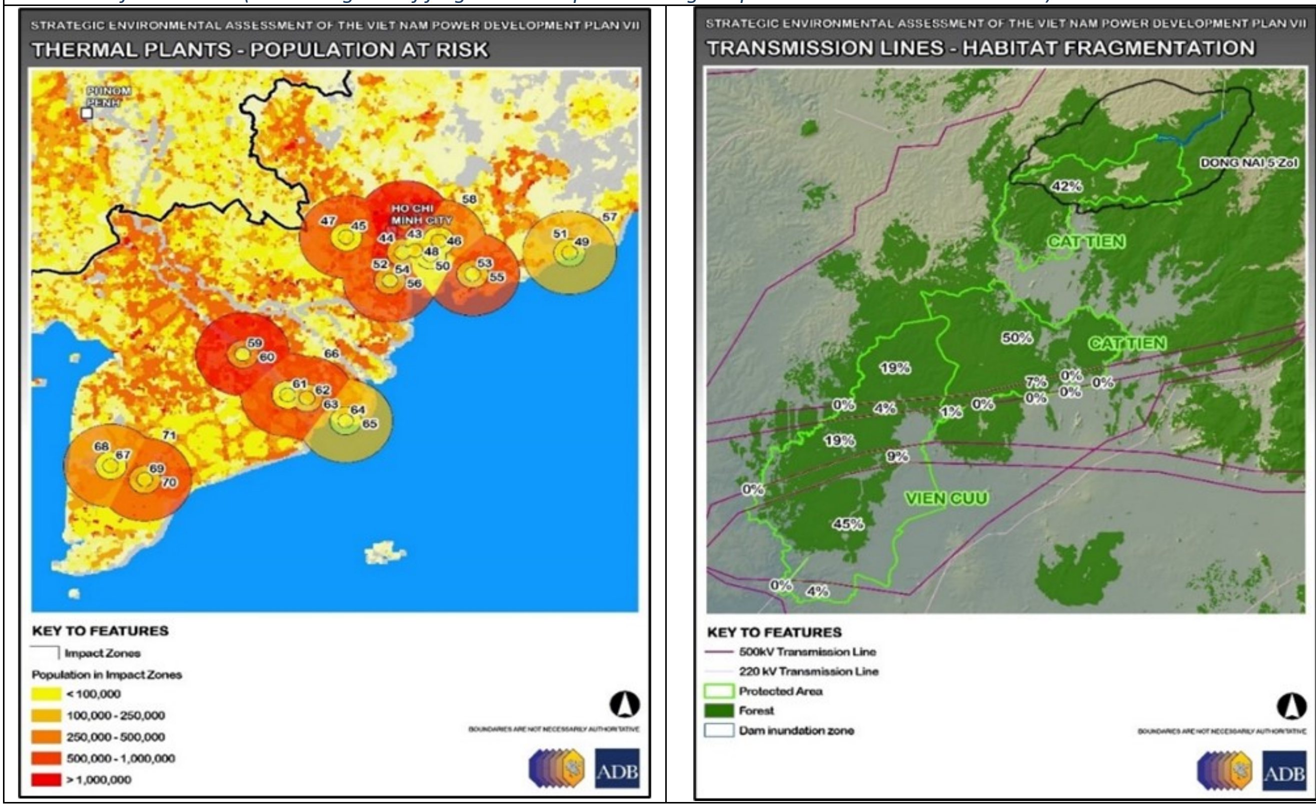
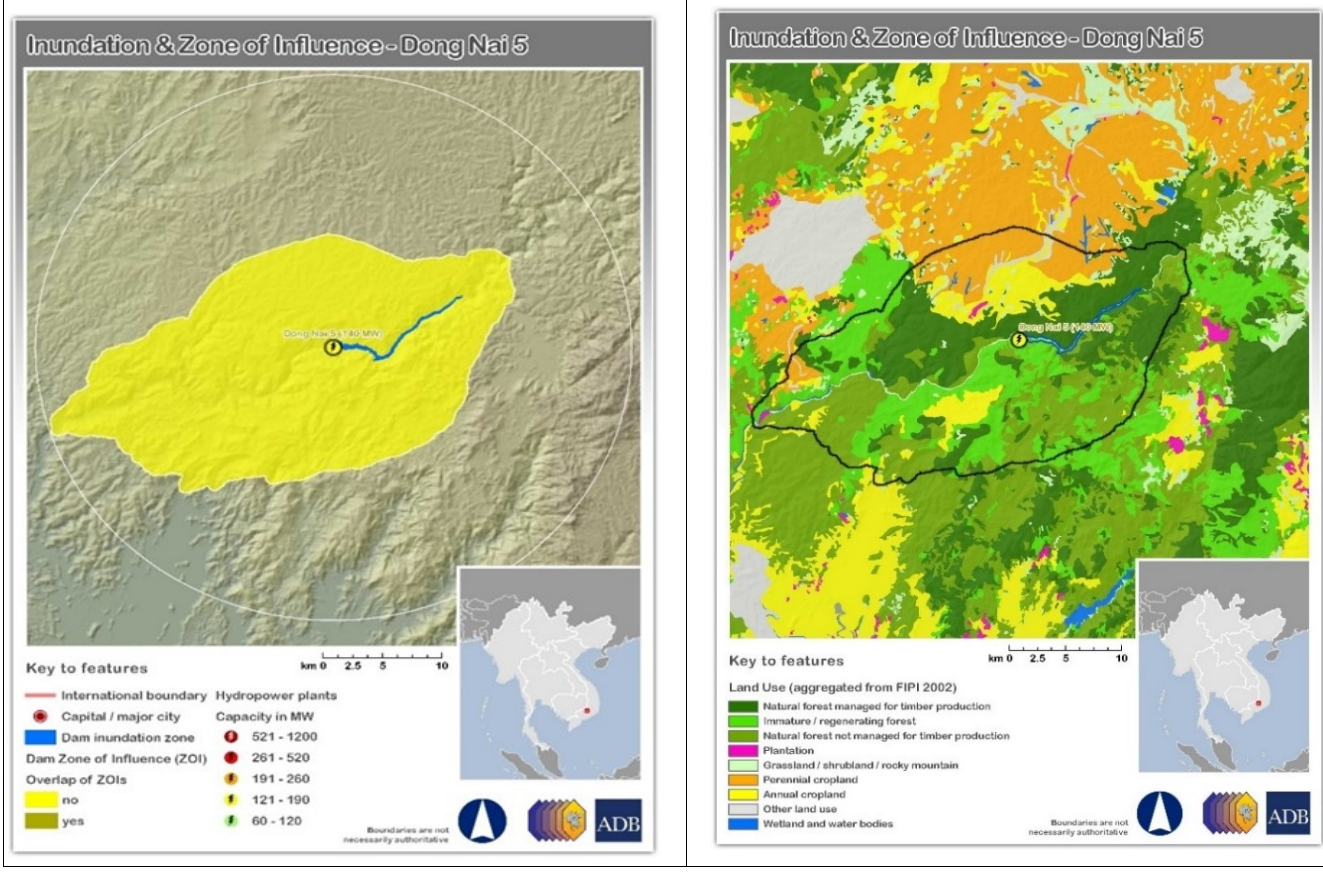


Figure 4: Above: GIS-based inundation zone (blue) and zone of influence (yellow) around a dam site, Under: overlay on land use to identify assets at risk (zonal statistics).



Comparison of alternatives: how, criteria, who was involved

The impact analysis of the SEA of the PDP VII strongly pushed to provide reliable and relevant quantitative data to the cost-benefit analysis as the foundation of the comparison of the power development scenarios (comparison of alternatives). It was established that both alternative scenarios (Alt 1 - energy efficiency, Alt 2 – more renewables) are reducing the environmental and social impacts compared to the base case scenario. Examples of the impacts of both scenarios are provided in Figure 5 and 6.

Figure 5:

Results of alternative scenario 1 (INCREASED ENERGY EFFICIENCY) compared to base case: TOP: Reductions in demand for coal 2011-2030, MIDDLE: Reductions in atmospheric pollution (Unit: ton, CO2: 1,000 tons), BOTTOM: Reduction in health costs (Unit: million US$)

Year	2011	2015	2020	2025	2030
Coal (10^6 tons)	10.90	28.2	57.9	89.6	135.1
Domestic	10.60	26.2	39.8	53.2	69.5
Imported	0.34	2.0	18.1	36.4	65.6
Coal reduction (10^6 tons)	**0.60**	**3.8**	**19.2**	**26.9**	**56.3**

Year	2011	2015	2020	2025	2030
PM	312.91	995.04	3,552.45	4,933.26	9,873.90
SO_2	4,538.23	5,837.31	22,184.68	32,609.93	72,868.86
NO_x	12,140.97	113,65.97	20,593.53	29,154.38	41,291.30
CO_2	6,921.10	115,08.16	39,806.59	49,275.07	104,685.02

Year	2011	2015	2020	2025	2030
PM	-45.05	9.72	73.19	101.65	203.47
SO_2	13.19	17.21	65.59	96.41	215.45
NO_x	31.55	36.14	66.38	93.97	133.09
CO_2	644.4	791.7	1,578.7	2,195.8	3,348.1

Figure 6:

Results of alternative scenario 1 (EXPANDED RENEWABLE ENERGY) compared to base case: TOP: Reductions in demand for coal 2011-2030, MIDDLE: Reductions in atmospheric pollution (Unit: ton, CO2: 1,000 tons), BOTTOM Reduction in health costs (Unit: million US$)

Year	2011	2015	2020	2025	2030
Coal (10^6 tons)	11.20	31.9	75.8	111.9	177.5
Domestic	10.80	29.9	46.2	61.9	64.8
Imported	0.38	2.0	29.7	50.0	112.7
Coal reduction (10^6 tons)	**0.00**	**0.1**	**1.2**	**4.6**	**10.6**

Year	2011	2015	2020	2025	2030
PM	-7.03	35.23	223.81	849.02	1,941.73
SO_2	377.61	818.72	940.08	4,865.65	13,575.04
NO_x	12,356.55	11,253.20	10,166.70	13,561.26	14,575.81
CO_2	7,440.86	6,635.29	7,056.78	14,736.98	26,264.91

Year	2011	2015	2020	2025	2030
PM	-57.42	-15.65	4.59	17.48	40.00
SO_2	0.87	2.34	2.76	14.37	40.12
NO_x	31.33	35.43	32.77	43.71	46.98
CO_2	638.50	694.20	938.80	1,472.50	1,739.90

Despite their potential reduction of impacts, residual impacts remain for both. Consequently, the SEA team proposed to consider development of a range of power source specific mitigation and compensation options as summarised in table 3. Particularly the nationwide upscaling and adoption of Payment for Forest Ecosystem Services was recommended by the SEA and prioritised by the government in the following years. In addition, investing in science & technology to reduce emission, and improving the collaboration of inter-area power development through the Regional Power Trade Coordination Committee was proposed as source-independent measures.

Table 3: Overview of proposed mitigation and compensation options

Generating source	Proposed mitigation or compensation option
Thermal	Introduce polluter pays for emissions and waste discharges
	Promote renewable energy and energy efficiency to reduce dependence on coal-fired generation
Hydro	Reduce deforestation through introduction of Payment for Forest Environmental Services
	Strengthen the management of and awareness on Protected Areas
	Aquaculture development to mitigate fisheries losses
Nuclear	Careful site selection for deposit of radioactive waste to minimise environmental and social impacts
	Develop infrastructure and management systems for handling radioactive materials
Renewable energy	Careful site selection to minimise environmental impacts (e.g. bird migratory routes, proximity to protected areas)
Transmission lines	Transmission line routes to minimise environmental impacts and avoid protected and residential areas
	Develop super voltage transmission lines (1100kV)

Public participation and quality review

During the SEA, 2 national conferences were organised with the participation of about 70 experts from various ministries, relevant government management agencies, and businesses in the electricity sector, consulting companies, and provincial Departments of Natural Resources and Environment and Departments of Industry and Trade. The provincial departments played an important role in making the SEA consultation a success. They provided technical information and data, as well as their expertise opinions to complete the SEA.

One shortcoming of the consultations was the lack of direct involvement of local communities. Despite this, especially provincial authorities were aware of the environmental and social risks and raised them explicitly, therefore raising many concerns that local communities and non-governmental organisations would have brought forward.

Quality control of the SEA happened by 3 separate groups: the PDP working group, the MONRE SEA appraisal team (working directly with the SEA working group and not through the PDP working group), and the Prime Minister’s office.

Monitoring and follow up

The GMS Core Environment Program was only mandated to support the SEA preparation and implementation until approval. Consequently, the activity ended with the approval and the consultant team (not EOC core staff) disbanded after April 2011.

While the expert team did not stay beyond the completion of the SEA, the EOC core team continued to engage with IoE and MoIT after the end of the SEA exercise. In the case of the SEA of the PDP VI, this ex-post engagement helped to further deepen the appreciation and commitment to SEA resulting in the request for ex-ante support of the PDP VII. In the case of the SEA of the PDP VII, the ex-post engagement was critical to request for advice for the revision of the PDP VII, leading to even more ambitious energy efficiency and renewable energy targets and SEA “champions” at IoE.

The SEA did not develop or support the development of an ESMP for the PDP. However, the SEA recommended that environmental management plans for individual hydropower projects "should specify environmental water releases, including for dams owned or operated by the private sector". Since the ESMP is "traditionally" an instrument of EIA, which Viet Nam also has a legislation for, this was not considered a priority under the SEA.

However, the need for thorough SEA "aftercare" remains an important topic. While the strong commitment of MoIT and IoE to the SEA of the PDP meant that in this case it was not a critical component, there are many SEA cases in Viet Nam and elsewhere in the GMS where there is less commitment which – due to a common lack of clear accountability mechanisms in with regard to SEA – promotes SEA reports and their results being "shelved" instead of being used.

Expertise, duration & costs

ADB supported mainstreaming environmental and social concerns into the PDP over a period of 12 years stretching over three SEA's: the SEA of the PDP VI, the SEA of the PDP VII and the revision of the PDP VII. The support period also includes continued engagement with the Regional Power Trade Coordination Committee (RPTCC) which continues to date.

Overall, the "average" cost of the SEAs has reduced significantly over that period. Reason for this is growing commitment and capacity of IoE and MoIT, allowing the stepwise reduction of international inputs. At this point the SEA is led by IoE staff with international support is only taking an advisory role. Because of the increase in scope, analytical depth and impact of the SEA of the PDP VII (ex-ante) compared to the SEA of the PDP VI (ex-post), the costs were slightly higher for the first, but in terms of "value for money" (impact on PDP), the costs was arguably lower. A brief comparison of the duration, costs and key expertise in the three SEAs is provided in table 4.

Table 4: Comparison of duration, cost and key expertise between SEAs for PDP

SEA	PDP VI	PDP VII	PDP VII revision
Duration	2006-2007	2010-2011	2015
Total cost in US$*	500,000	<500,000	
Man-months (intl./natl.)*	~140 days intl./~200 days natl.	~90 days intl./~200 days natl.	~30 days intl.
Key expertise (intl.)	Team leader SEA, environment specialist, env. economist, hydropower specialist, GIS	Team leader SEA, energy economist, GIS	SEA advisor

** The numbers provided in this section are broad estimates.*

1.4 Results and Lessons Learnt

Contribution to decision-making

The contributions of the SEA of the PDP VII should not be viewed individually, but in combination with the previous SEA of the PDP VI and the following SEA advice to the Revision of the PDP VII.

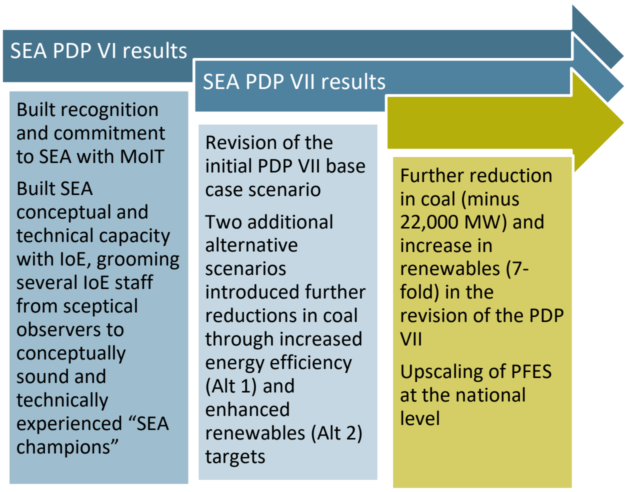
Through this continuous engagement during and between SEAs it was possible to trigger decisions that culminated in a significantly more sustainable PDP (PDP VII revision), in particular through:

a) a major cut in coalfired power generation (-22,000 MW) and
b) a seven-fold increase in the amount of renewable energy (table 5).

Table 5: Generation mix of Viet Nam's PDP VII and revised PDP VII (MW)

Source	PDP VII 2011	Revised PDP VII 2014
Coal	77,160	55,252
Natural gas and oil	17,465	19,078
Hydropower and pumped storage	21,125	21,871
Other renewable energy (incl small hydro)	4,829	27,199
Nuclear	10,700	4,600
Imported	6,109	1,508
Generation capacity 2030	137,388	129,508

Figure 7: Sequence of SEA's for Viet Nam's PDP VI and VII and their individual (and accumulated) achievements.



These changes alone account for a reduction greenhouse gas emission of 100 million tons of CO2 equivalent a year by 2030, and a cost-saving of about $1 billion a year, based on the price of $10 a ton of CO2 equivalent price used in the revised PDP VII.

In addition, from 2006 to 2012, IoE staff had grown from SEA sceptics to active promoters of SEA in 2012, attending and presenting in the IAIA 2012 in Porto. In 2014, the PDP VII revision was executed entirely by IoE – except for a few select advisory services by ADB – and resulted in revisions that made the PDP VII even more sustainable (ref. Table 5). Indirectly, the SEA process contributed to nationwide upscaling and adoption of Payment for Forest Ecosystem Services.

The government is further integrating SEA in its PDP process with the currently ongoing SEA of the PDP VIII for 2021-2030 (with a vision to 2045). It builds on the commitment and capacity built through the previous SEAs (PDP VI, VII and revision of VII) and deepens it through the introduction of additional and new methods and technologies, for instance to assess the impact of solar and wind, cost of GHG emission (shadow pricing), and revisions of coefficients for air pollution impacts on health, to name a few. The SEA of the PDP VIII has also advanced the stakeholder consultation process compared to previous SEAs of the PDP. This latter SEA is currently being finalized.

Conclusions for SEA good practice

The SEA support to the PDP VI, VII and VII Revision yielded a few important lessons to be considered in designing future SEA exercises in Viet Nam and in other low- and middle-income countries:

1. The SEA should be developed jointly with the target plan and support the development of feasible alternatives in this plan.
2. SEA should carefully balance between SEA good practice requirements and the flexibility to adjust to case-specific context and needs. A rigidly executed SEA might not get the support of the ministry responsible for the plan, while too much adjustment and customisation might undermine the value of the SEA.
3. Hands-on capacity development and ownership of the process and its results is important to establish and sustain true commitment to SEA in the target ministry.
4. Continuous engagement covering several consecutive rounds of SEA might be essential to arrive at a level of skill and trust that makes significant changes to target plans possible.
5. Making SEA a legal requirement also requires the government to set aside sufficient resources (capacity building, additional staff, funds) to get the task done timely and effectively. In practice that is often not done, relying not only on the conceptual and technical, but also the financial support of international agencies.
6. Even with the legal tools, funds and staff capacity for SEA in place, there is often no formalised process for quality control and related accountability mechanisms. That allows less committed ministries to fulfil their SEA requirement "for the record" only, without considering or building SEAs recommendations into their plan(s). Amending SEA legislation with clear quality control, accountability and monitoring procedures is therefore instrumental for SEAs being able to perform as intended.

References

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About the author

Lothar Linde (MSc) is an Environment and Spatial Planning Specialist with over 20 years of research and work experience. He holds a MSc degree in Geography and Landscape Ecology from the University of Leipzig, Germany. Between 2002 and 2006 he worked as a researcher on joint projects of the University of Leipzig and the Helmholtz Centre for Environmental Research (UFZ), and the United Nations Environment Program (UNEP) Reginal Resource Center for Asia and the Pacific. Since 2006 Lothar has worked as an independent expert on over 20 long and short-term projects of the Asian Development Bank, UNDP, the World Bank, and the African Development Bank. Lothar has been involved in over 10 Strategic Environmental Assessments in the Greater Mekong Subregion, supported the environmental analysis for the Greater Mekong Subregion Regional Investment Framework 2012-2022, and lead the development and piloting of several innovative spatial decision support tools on land use change projection, pollution estimation, and spatial multi-criteria evaluation for sustainable investments. Lothar is currently also pursuing a PhD at the Center for Development and Environment of the University of Bern, Switzerland. lothar.linde@yahoo.de

Colophon

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