

**Support Vietnam EREA/MOIT to Conduct a Strategic Environmental Assessment (SEA) of the National Power Development Plan 8 in the Period 2021-2030 with Vision to 2050 (PDP8)**

**Assignment No GT#69/SEAoPDP8-VIE (Southeast Asia – Vietnam)**

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**MODULE 1: INTRODUCTION TO STRATEGIC ENVIRONMENTAL ASSESSMENT AND SEA IN THE STRATEGIC PLANNING PROCESS.**

**Learning Goals**

- To understand the key concepts and characteristics of strategic environmental assessment.
- To identify the steps involved in the preparation and commissioning of an SEA, including the links to the overall strategic planning process.
- To understand the stages in the implementation of an SEA.
- To identify the steps in and criteria for the review of an SEA.
- To understand the evolution of SEAs in PDPs in Vietnam.

**Module Outline**

1. What is an SEA?
  - a. Review of the origins of and key concepts behind SEA
  - b. Identification of the characteristics of an effective SEA, based on international good practice and experiences
2. Why an SEA?
  - a. Policy and regulatory background in Vietnam
  - b. Links to good practice in strategic planning
3. Preparing and Commissioning an SEA
  - a. Role of the Commissioning Agency
  - b. Role of the Executing Agency
  - c. Role of the Review Agency
4. Stages in the Execution of an SEA
  - a. Scoping and initial consultations
  - b. Baseline preparation and data identification/acquisition
  - c. Scenarios and alternatives
  - d. Impact assessment
  - e. Weighting and trade-off analysis
  - f. Reporting
5. Reviewing an SEA as part of a PDP
6. Vietnam's Experiences in SEAs as part of PDPs
  - a. SEA of Hydropower in PDP 6
  - b. SEA of PDP 7
  - c. SEA of Revised PDP 7

## 1. WHAT IS A STRATEGIC ENVIRONMENTAL ASSESSMENT?

Strategic Environmental Assessment (SEA) is a process of evidence-based analysis of the social and environmental implications of proposals put forward within a strategic plan and should present a balanced assessment that aims to establish a consensus among stakeholders of the most effective planning outcome. It is tool to assist decision-makers in considering the benefits and impacts of proposed development policies, strategies or plans in a more comprehensive manner; in other words, to assess the sustainability consequences of such development.

The preparation of an SEA should be based on an established methodology that builds on past experiences, national regulations and international good practice. For the preparation of the SEA of a PDP in Vietnam, there is considerable experience accumulated over 15 years and previous PDP cycles (see Section 6).

SEA has been defined as follows: *"SEA is a process directed at providing the authority responsible for policy development and the decision-maker with a holistic understanding of the environment, social and economic implications of the policy proposal, expanding the focus well beyond what were the original driving forces for new policy"*<sup>1</sup>.

Although it is a method used in other contexts, SEAs were developed to be, and are most effective as. an integral part of a strategic planning process: *"The main purpose of strategic environmental assessment (SEA) is to facilitate early and systematic consideration of potential environmental impacts in strategic decision-making. It is intended to be used on policies, plans and programmes"*<sup>2</sup>.

An SEA is a procedure that is integrated into a strategic planning process. It is based on three basic principles. For a given strategic plan, the SEA should **predict** what the potential impacts, positive and negative, of the different planning options will be, **evaluate** whether these impacts are significant enough to need actions to **mitigate** them, reducing negative ones and enhancing positive ones. The relationship between these elements is shown in Figure 1. The significance of these elements is that they lead to both an understanding of the wider implications of planning decisions and also help to identify where this leads to the need to change the choices made in the original plan.

An SEA is not just about assessing strategic plans, it is also about improving them. This has been a real need in the context where many plans, including PDPs, have traditionally not taken account of the full range of social and environmental impacts of their proposals. These have been treated as "externalities", the consequences of which have not been regarded as the responsibility of the agencies making and implementing the plans.

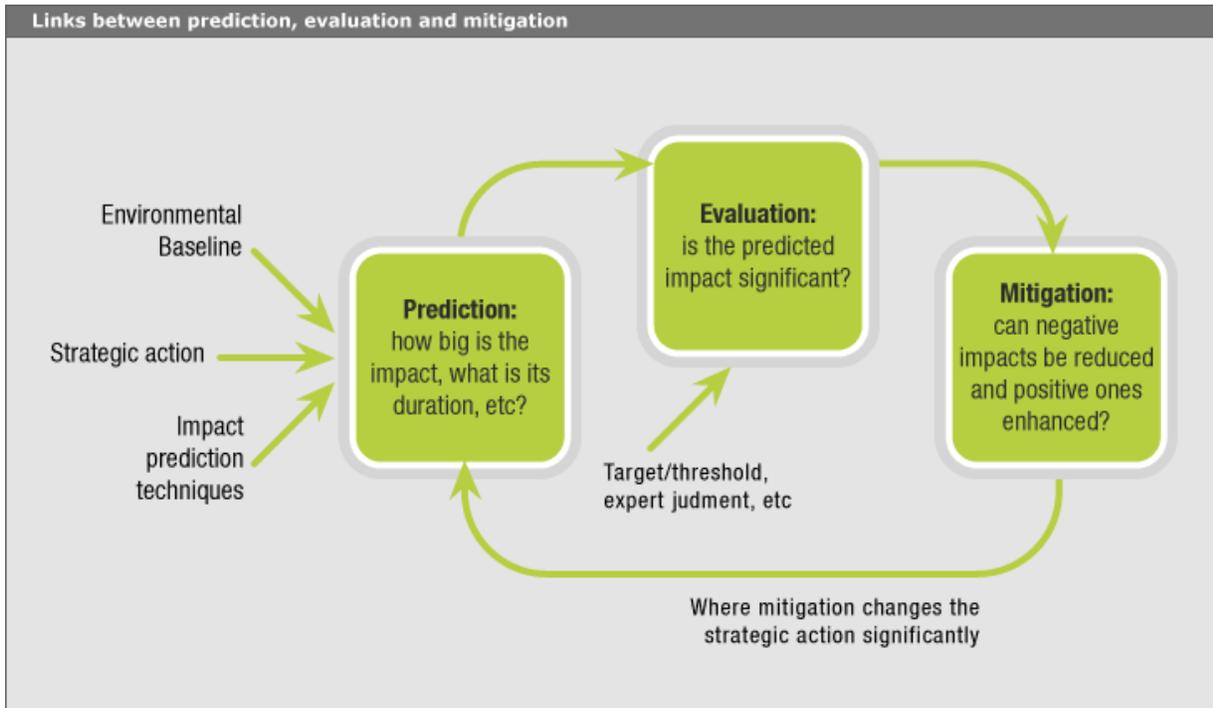
The result of this limited approach to planning has been key national plans that are sub-optimal and inefficient as they do not understand or take account of the full range of changes to and impacts on the people, economy and environment of the country that the implementation of the plan will create.

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<sup>1</sup> Brown, A L and R Therivel (2000) *Principles to guide the development of SEA methodology. Impact Assessment and Project Appraisal*, 18(3), 183–190.

<sup>2</sup> Finnvedan, G. et al (2002) *Strategic Environmental Assessment Methodologies: applications within the energy sector* Environmental Impact Assessment Review 23 (2003) 91–123

Figure 1: Key Elements of an SEA



**Source:** Prepared by the author and reflecting materials used in the capacity development activities of past support to SEAs in the Vietnamese power sector.

## 2. WHY AN SEA?

The decision to include an SEA as part of a strategic planning process has implications. There have been concerns that an SEA makes the planning process more complex, lengthy and expensive and that it can distract decisions from the fundamental purpose for which the plan is being prepared. Similarly, concerns exist that it can create conflict between different interest groups and expose the plan outcomes to external influences that are in contradiction to national policies and aspirations. Such concerns are often found when SEAs are first introduced and were certainly present when the first SEA in Vietnam's power sector took place some 15 years ago.

Experience in relation to SEAs in Vietnam and elsewhere is that these concerns diminish as experience and understanding are gained and SEAs themselves become more effective and more integrated into the strategic planning process. But it is still important to clearly explain why SEAs should be included in plan preparation and how this makes the whole planning process better. This section discusses a number of factors that help to understand why this is true in relation to SEAs as part of PDP preparation in Vietnam.

The first factor is that **it's the law!** Vietnam has a legal requirement that strategic plans such as a PDP must include an SEA. The requirement to include an SEA in the preparation of strategic plans was first introduced with the 2005 **Law on Environmental Protection (LEP)**, with this requirement further clarified and supported in the 2014 LEP. Decree No. 18/2015/ND-CP developed the system further by defining in detail the issues that must be included in an SEA report. More recently Decree 40/2019/NĐ-CP on amendments to decrees on guidelines for the

Law on Environment Protection, including Decree No. 18/2015/ND-CP, has reinforced the role of SEAs in plan preparation.

The requirement for an SEA was very strongly reinforced by the **2017 Law on Planning**. This law acts as the framework for the reform of the planning system of Vietnam and has the full authority of the government and the Communist Party behind the reform process it has catalyzed. It specified the requirement to include an SEA in strategic plans. Article 18 of the Law on Planning states that “*the plan formulation agency assumes the responsibility for organizing the formulation of the strategic environmental assessment report...[that] must be formulated and appraised in parallel with the formulation and appraisal process of such plan*”.

This was further elaborated in Decree No. 37/2019/ND-CP on Elaboration of the Law on Planning, and in particular Article 16 regarding the requirement of strategic plans to include an SEA in accordance with regulations on environmental protection. The validation of SEA in the overall reforms of the planning system of Vietnam is no accident. The implementation of an SEA in strategic planning is seen as one of the main mechanisms through which changes to planning envisaged in the Law on Planning would be achieved. This includes the SEA as a vehicle through which sectoral plans are able to give a clear, specific and quantifiable explanation on how the plan is reflecting and contributing to the achievement of overall national development plans, policies and aspirations on sustainable, climate resilient development. Similarly, the SEA is seen as important in ensuring sectoral and regional plans are integrated with the plans and policies of other sectors as well as the overall national and sub-national master plans.

Consequently, Vietnam has had a requirement for including an SEA in strategic plan preparation for some time and experience on how to prepare SEAs has been growing in the last decade or more. The power sector is regarded as a leading sector in this, as it has a longer and more established SEA process than other sectors. We briefly run through this experience from successive PDPs below. Before doing this, the justification for the inclusion of an SEA need further elaboration, as it is important to demonstrate that the execution of an SEA is more than a bureaucratic requirement that does little to make the planning process better.

As discussed above, an SEA is a systematic, structured methodology that provides a mechanism to predict, evaluate and mitigate potential social and environmental impacts. These characteristics of the approach are reflected in a number of fundamental factors that a good SEA should reflect:

- It should present a **balanced analysis to build consensus**, including recognising trade-offs and linking sector goals to national development. The purpose of an SEA is to give decision makers evidence to inform and improve their decisions, providing a complete picture that takes into account the full effects of the choices made. This includes social and environmental implications that have traditionally been treated as externalities but within an SEA are integrated into the overall analysis of the implications of different planning choices.
- An SEA is the mechanism for the development of a **full economic cost** analysis of planning options. The valuation of the impacts traditionally treated as externalities is, where possible, undertaken in an SEA and is consequently the basis for moving from a traditional financial analysis of the costs and benefits of planning options to a full economic cost assessment. This is a means for comparing the full implication of different planning options (for example coal thermal versus solar power) the have inherently different characteristics and allows rational, evidence-based planning decisions.

- A structured programme of **stakeholder consultations and participation** is built into an effective SEA. It is essential that all and affected stakeholders participate in key stages of strategic planning and the scope of the SEA, which includes social and environmental issues that concern many stakeholders, means it is an effective vehicle for this. Added to this is that the consultation mechanism is a required component of the SEA but is not a formal requirement of overall strategic planning processes which means that the SEA is a means to ensure that consultation is a core element of the strategic planning process.
- The SEA is the basis for identifying **mitigation actions** that will reduce adverse impacts and maximise the potential of beneficial ones. As has been true for Vietnamese PDPs, it can be the basis for adjusting the balance between planning options once the full implications of the initial proposals are understood.
- The SEA plays a key role in understanding how the plans relate to **national development priorities** and will contribute to **national targets** in areas such as environmental sustainability, climate change adaptation and mitigation and social equity that are not directly plan targets but that are significantly affected by the plan's content. The requirement that this is done set out in the 2017 Law on Planning has amplified the significance of and attention paid to the results of the SEA.
- The identification of potential **adverse impacts** at the strategic planning stage means that actions to address them can be taken very early in the planning cycle. Such adverse impacts are otherwise only likely to be identified at the environmental impact assessment (EIA) stage of individual investment proposals. All too often this is too late and can lead to conflicts and controversies that delay the implementation and add considerably to the costs of the investments.
- A further problem with waiting for the EIA is that they deal with individual investments in isolation so that the **cumulative impacts** of investments are not picked up. For the power sector this can be a critical issue where, for example, there are multiple hydropower schemes in one river basin or where there are several thermal power stations built in or around a city. The SEA is the mechanism through which such cumulative and sector wide impacts can be identified at the earliest stage in the planning process and, where needed, mitigation actions put in place to address them.

These factors, along with the general character of an SEA, mean that the inclusion of an SEA in the preparation of a strategic plan means that the overall process of planning and developing investments in a sector is more comprehensive, more inclusive and much less likely to experience delays and controversies over the impacts of individual investments. This is reflected in Vietnam's experiences of SEAs in PDPs, experiences that we review in Section 6 but that are set out in more detail in the Desk Study Report of this assignment.

### **3. PREPARING AND COMMISSIONING AN SEA**

One key issue for an SEA is that there must be clarity in the institutional responsibilities for the different aspects of an SEA and the strategic plan of which it is part. There are usually three key institutions involved in an SEA process, each of which has distinct responsibilities:

1. **The SEA Commissioning Agency:** the Institution that is responsible for preparing and submitting the strategic plan and the associated SEA to the government or other higher authorities. This agency the plan and the SEA owner. They are responsible for supervising

and approving the work of the executing agency. For PDPs in Vietnam, the commissioning agency is the Electricity and Renewable Energy Authority (EREA) of the Ministry of Industry and Trade (MoIT);

2. **The SEA Executing Agency:** the specialized technical agency that is contracted by the commissioning agency to undertake the technical analysis, including modelling, data acquisition and processing and the development of recommendations on the most effective planning options to the commissioning agency. For the SEAs of PDPs in Vietnam, this has to date been the Institute of Energy;
3. **The SEA Review Agency:** the agency that is responsible for reviewing and approving the SEA once it has been submitted by the commissioning agency. For SEAs in Vietnam, this is the Ministry of Natural Resources and the Environment (MoNRE). In Vietnam, as in most countries where there are statutory requirements for an SEA, the approval of the SEA is a requirement for the approval of the whole strategic plan such as the PDP.

It is essential that this division of responsibilities is understood and respected by all parties. In addition, there will be a number of **external stakeholders**, such as other ministries, sub-national government agencies, academic and technical agencies, private sector bodies, non-government organizations and the general public. The commissioning agency must define clearly how and when these external stakeholders will be informed about and consulted on the executing and outputs of the strategic plan and the SEA.

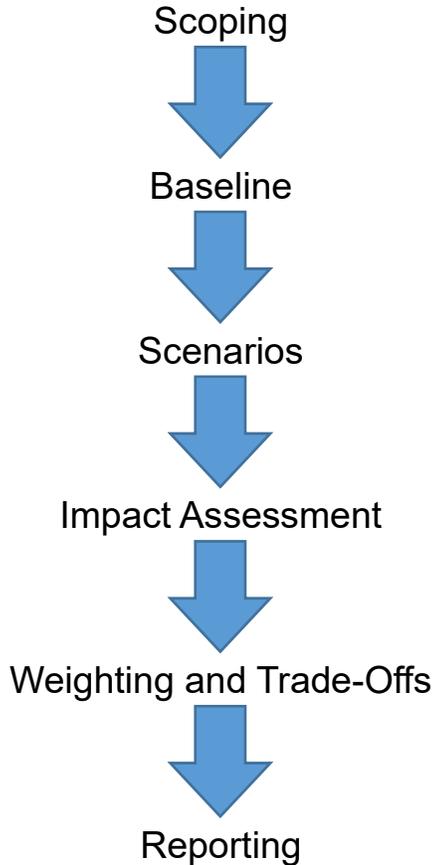
The success of an SEA depends on good preparation. The commissioning agency must have clear and agreed terms of reference (ToR) for the SEA that set out the following:

- The national and sectoral **policies and targets** that must be clearly reflected in the content and conclusions of the SEA. For Vietnam, the 2017 Law on Planning states that this should be shown in specific and quantified measures that show how the plan and the SEA are contributing to defined national development targets.
- The **links between the SEA and the strategic plan** (the PDP). The ToR should define at which stages of the planning process that the SEA contributes to and influences. For a PDP this can include, for example, the analysis of demand forecasts, the definition of plan scenarios and the assessment of costs for different plan options (through the valuation of externalities to be included in the economic analysis).
- The **outputs** to be produced by the SEA. This will include the SEA section of the overall plan and a separate SEA report that has to be submitted to the review agency. It will also include interim outputs that should be submitted during the execution of the SEA.
- The **time and resources** available to the SEA. The depth and scope of analysis in an SEA is completely contingent on the time available and the resources that can be provided for data acquisition and analysis, the use of specialized external expertise and, most importantly, the size and quality of the SEA team in the executing agency. A simple maxim to remember is that you get what you pay for.
- The **consultation mechanism**, including the identification of key stakeholders, that the commissioning agency requires to be included in the execution of the SEA. This should be clearly structured and linked to the key stages in the implementation of the SEA set out in the next section.

#### 4. STAGES IN THE EXECUTION OF AN SEA

There are a number of different specific SEA methodologies but the one selected should reflect the basic principles listed above. The methodology selected must also reflect national regulations and reporting requirements and must be realistic in terms of the time and resources available for completing the SEA in a timely and efficient manner. As has been the case with past SEAs in Vietnam's power sector, the core methodology for SEA of PDP 8 follows six main steps of activities (see Figure 2):

Figure 2: Stages in the SEAs of PDPs in Vietnam



1. **Scoping** including defining the boundaries of the SEA, the first phase consultations and identification of the key strategic/policy issues (including defined targets) that will be the context for the development of the SEA. The consultations should include a defined list of key stakeholders both within and outside of government.

2. **Baseline** preparation and data identification/acquisition, including the definition of the analytical methods that will be used during the SEA and the starting point for key parameters that will be analyzed in the SEA's impact assessment. Where appropriate, the baseline analysis should be spatially disaggregated to the regional and/or provincial level. The baseline should also define the likely trends over time in key variables such as demand for power, economic growth and changing environmental conditions.

3. **Scenarios** and alternatives: the analysis of the power generation mix and other plan components (e.g. transmission system) for the different scenarios in the PDP. The scenarios for the SEA should reflect and be designed to examine the scenarios that will be modelled in the main PDP. The use of scenarios provides an opportunity to examine the implications of different policy and planning options at an early stage of the planning process and before commitments are made to different implementation options. They should reflect and be used to ensure conformity to national policies and development targets.

4. **Impact assessment:** the assessment of the social and environmental impacts of the different scenarios, including where possible the quantification and valuation of these impacts. The impact assessment should be comprehensive and should give a consistent quantitative and economic analysis of the key impact parameters identified in the baseline phase of the SEA. The economic analysis should, as far as is possible given data limitations,

provide an economic valuation of all externalities identified in the impact assessment and reflected in the choice of impact parameters.

5. **Weighting and trade-off** analysis: this will include the quantitative assessment of impact of assigning weightings to different impacts (in particular to reflect policy priorities) in the scenarios and where appropriate sensitivity analysis to analyze the consequences of assigning different values to key variables (e.g. the valuation on CO<sub>2</sub>).
6. **Reporting**, including the identification of preferred scenarios (those that best reflect the key objectives of the PDP and national policies and targets) and, where needed, the assessment of mitigation measures and policy or regulatory measures required for the successful realization of the development options for the power sector in the PDP.

### More on Scenarios

The definition and analysis of scenarios in the SEA is a key step that will determine the ability for the planners to properly understand the full implications of the different options that can be included in the plan.

Developing scenarios is often something new to many people involved in the process so it is useful to briefly explain what scenarios mean and how they are constructed.

Scenarios can be described as stories of the future that are used to inform current decision-making. They are an effective way to plan for the future where uncertainties exist and where the planners want to understand the full implications of **alternative possible futures**. This includes giving insights into the policy impacts of different alternatives that the plan considers.

Scenarios can also be used to provoke and structure debate on the different alternatives that the plan needs to consider. They are a very effective communications tool where different stakeholders can understand how their perspectives are reflected in the alternative options that are included in the planning process.

Good scenarios have the following characteristics. They are:

- **Plausible:** the story each scenario tells is believable and relevant to the issues the plan is considering.
- **Consistent:** the different scenarios should be based on the same logic and include the same key parameters.
- **Engaging and informative:** the story each scenario tells should be interesting and should give insights to the planners that they would otherwise not have.

Key elements used in constructing scenarios are (and see Figure 3):

**Baseline:** the starting point for preparing the plan. The baseline must be the same for all of the scenarios.

**The scenario logic:** a clear definition of what each individual scenario is trying to show.

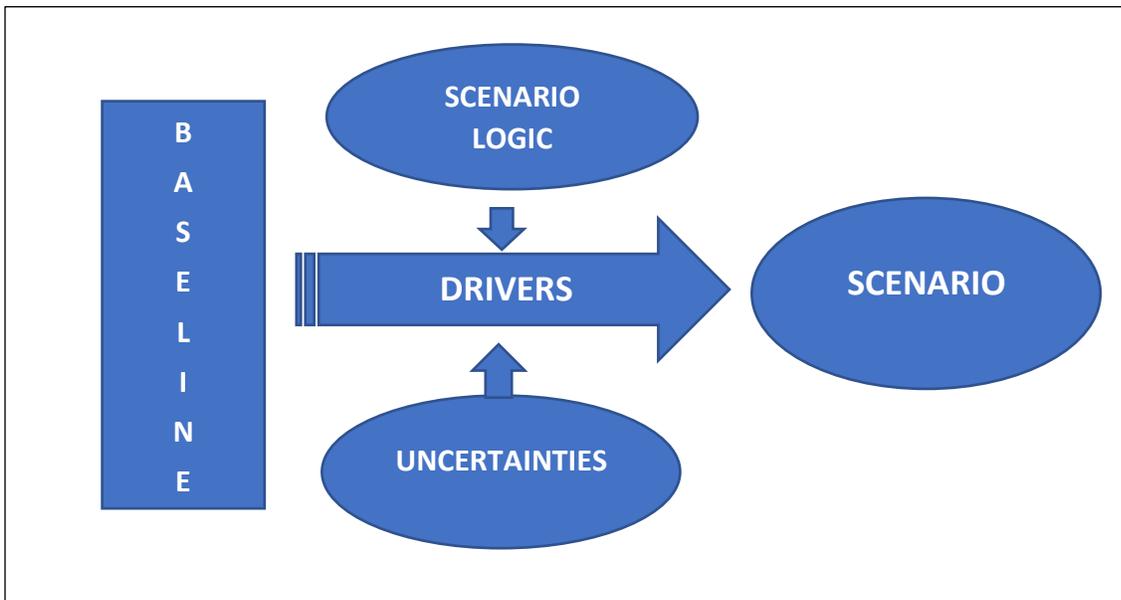
An example from PDP 8 is: RE target under RE development strategy and Resolution 55-NQ/TW: reach 38% in 2020, 32% IN 2030, 40.3% IN 2045, 43% IN 2050, including external costs (this is the scenario recommended in the draft PDP 8 report). The logic of the scenario is to meet national targets for the expansion of renewable energy.

**The scenario drivers:** what are the factors that will determine the speed of change, the cost and the achievability of the pattern of change the scenario is showing (for example, what will be the future cost of solar panels, what will be the externality costs of the scenario?).

**Uncertainties:** long-term plans such as a PDP face many uncertainties (such as the future cost of fuels, the discount rate of capital investments, changes to technology costs and many others). The effects of these uncertainties on the scenario need to be shown. This can include doing a **sensitivity analysis** where the values of key but uncertain parameters are given different values in different scenario runs to see how much this affects the overall result.

**The scenario output:** what changes to the baseline values does the scenario generate and how effectively does it achieve the overall plan objectives.

**Figure 3: Construction of Scenarios**



### **Weighting and Trade-Offs: An Exercise**

The exercise below is an example of a weighting exercise where you have to decide which strategic policy issues are the main ones that the SEA (and the PDP) should be examining. This is valuable for screening the SEA to see how this relates to the key policy issues identified in the ToR. It is also an exercise that can be done with different stakeholders within a consultation workshop, as it provides a structured system to identify the differences in the priorities and interests of different stakeholder groups.

**Table 1: Score the following issues in relation to their importance for the preparation of a Power Development Plan**

**1 = not at all important to 10 = extremely important**

Strategic Issue	1	2	3	4	5	6	7	8	9	10
National Energy Security										
Meeting Future Demand										
Minimizing Investment Costs										
Minimizing Costs to Consumers										
Reducing Greenhouse Gas Emissions										
Reducing risks to human health										
Reducing Impacts on Sensitive Ecosystems										
Ensuring Universal Access to Electricity										
Promoting Energy Efficiency										
Increasing Renewable Energy Use										
Promoting Regional Power Trade										
Stimulating Economic Growth										
Creating Attractive Investment Opportunities										
Reducing supply disruption risks in the power generation system										
Anything Else (name)										

**Table 2: Choosing from the table above, select the FIVE most important issues and rank them in the table below, from 1 = most important to 5 = least important of the 5**

Rank	Strategic Issue	Reason for Selecting this Issue
1		
2		
3		
4		
5		

## Stages in an SEA: Conclusions

The SEA, where fully integrated into the PDP preparation, plays a crucial role in ensuring that the analysis of the full range social and environmental impacts of plan proposals are understood and reflected in the analysis of the different power generation options that the PDP will consider.

In particular, the SEA of PDP 8 has not just identified potential social and environmental impacts that have traditionally been seen as externalities, but has gone further through providing (where this is possible) an economic valuation of these impacts and that have then been integrated into the overall economic appraisal of the PDP.

The aim is to move from a least cost financial analysis to a least cost analysis based on the full economic cost (including externalities) of the different options. The SEAs of past PDPs have been moving in this direction but further work needed to be done in this area.

This is demonstrated through the discussion, in Section 6 below, of the evolution of SEAs in Vietnam's recent PDPs.

### 5. Reviewing an SEA as part of a PDP

The review of the SEA is a formal stage that is the responsibility of the SEA Review Agency (MoNRE in Vietnam) but that must also involve a wide range of stakeholders that have been consulted through the SEA consultation process. Before the formal review process starts, it is also necessary that the SEA Commissioning Agency (EREA/MoIT for the PDP) reviews the SEA as part of their overall review of the draft PDP once it is submitted. There is a distinction that should be made between the review of MoNRE and that of EREA/MoIT.

The MoNRE review is of the separate SEA document that is submitted in accordance with the provisions of the Law on Environmental Protection and Decree No. 18/2015/ND-CP. The Decree specifies the format and content of the separate SEA report and the MoNRE review is based on the provisions of this Decree.

The EREA/MoIT review is qualitatively different in that EREA/MoIT needs to review the SEA as part of the overall PDP and focuses on the SEA chapter in the PDP report. Although it will also examine the formal SEA report but much of this is procedural, the EREA/MoIT review is focused on the substance, the analysis and conclusions, of the SEA. The EREA/MoIT review is to make sure that the SEA submitted to MoNRE meets their obligations as the SEA owner.

With regard to overall good practice in reviewing an SEA, international good practice in evaluation has identified six core characteristics of a project or programme that should be assessed when conducting a review. These core characteristics were first advanced in the OECD/DAC evaluation manual and have been adopted (or adapted) by most international development organizations. For this module, they have been adapted to reflect the characteristics of an SEA as part of a PDP and a Vietnamese context. The six core evaluation characteristics that should form the basis for the final judgment in the review of the SEA are:

- **Implementation:** Were the SEA's activities implemented as originally intended? Were any adaptations to the terms of reference clearly justified?
- **Effectiveness:** Is the SEA achieving the goals and objectives it was intended to accomplish?

- **Relevance:** are the outputs and impacts relevant to the SEA's and the PDP's objectives and to overall national development priorities?
- **Efficiency:** were the SEAs activities and outputs produced with appropriate use of resources such as budget and staff time?
- **Sustainability:** are the findings and recommendations of the SEA sustainable within the context of the development of Vietnam's power sector?
- **Attribution:** Can progress on goals and objectives be shown to be related to the SEA, as opposed to other things that are going on at the same time?

The EREA/MoIT review needs to be based on a clear procedure and review criteria. The following is a standardized example of such a procedure and set of criteria for use in the review by the Commissioning Agency (EREA/MoIT). It is a procedure that they should follow before they formally submit the SEA to MoNRE for their review and approval. The steps to be followed in the EREA/MoIT review of the draft SEA are as follows:

**Step 1** is to check that the SEA meets the requirements of the SEA ToR that were given to the Executing Agency (IE in the case of the PDP). This should be a preliminary check to make sure the scope of the SEA is in accordance with ToR requirements but is not an assessment of the content in any detail. It is intended to check that the SEA is in an appropriate state for the consideration of external agencies.

**Step 2** is to send the SEA out to a consultation group of external stakeholders for their comments and, if possible, agreement on the analysis and the recommendations of the SEA. The stakeholders to whom the SEA is sent should be based on the SEA consultation process that has taken place during the implementation of the SEA. The stakeholders should be given a deadline for comments on the report. It is also customary to hold a stakeholder workshop during this consultation process so that the different stakeholders can share their perspectives with each other as well as with the Commissioning Agency.

**Step 3** is the internal review by the Commissioning Agency (EREA/MoIT) of the draft SEA. This is a formal process where the SEA is checked for quality and scope and any requirements for improvement and amendment of the SEA are sent to the Executing Agency (IE). This internal review should be based on clear criteria such as those set out in Table 3 and Table 4, below. This review should take into account the comments received from external stakeholders.

**Step 4** is a documented response to the draft SEA that is sent by the Commissioning Agency to the Executing Agency (EREA to IE) that spells out in detail their formal response to the draft SEA and gives specific details on any amendments/improvements that should be made to the draft SEA. It should include a section that provides information on the comments received from the consultation with external stakeholders. The documented response should give a specific (and justified) answer on whether the SEA is approved, approved with improvements or not approved.

**Step 5** is the improvements made to the draft SEA by the Executing Agency, IE, in response to the requirements as set out in the formal documented response of the Commissioning Agency, EREA/MoIT. The Executing Agency will then re-submit the SEA to EREA/MoIT for approval.

**Step 6** is the review of the amended SEA report. If the required changes were not major then this can be a limited process that focuses on the areas where changes were needed and can be conducted internally in the Commissioning Agency. If the required changes were major and

require a fundamental reworking of the SEA then the review process should revert to Step 2 and send the amended report for external consultations.

**Step 7:** if and when the Commissioning Agency is satisfied that the SEA report meets its requirements it can send a formal approval to the Executing Agency. It is at this stage, and not before, that the formal SEA report (that is the legal responsibility of the Commissioning Agency) can be sent to the Review Agency (MoNRE) for their review process. The submission to MoNRE should be done in accordance with the requirements of Vietnam's SEA legislation and regulations.

A document that sets out this or a similar review process should be sent by the Commissioning Agency to the Executing Agency (EREA to IE) to make sure that all parties are clear on the review procedures and requirements.

The following tables contain SEA review criteria that can be used to make an assessment of the different characteristics of the SEA. Table 3 includes criteria that are about the SEA procedure and content. Table 4 provides an overall assessment of the SEA based on the six core evaluation characteristics discussed above.

The completion of these two tables will give a specific and detailed basis for the review of the SEA, including the identification of issues that need to be addressed in a re-submission of the SEA should the overall assessment decide this is necessary. The criteria give form and direction to the judgments that EREA/MoIT need to make in the review of the SEA but they do not replace these judgments. The final decision on the review must be made by the responsible officers in EREA/MoIT.

**Table 3: SEA Review Criteria**

	Review Criteria	Decisions on Compliance with Review Criteria			
		Approved	Conditional Approval (specify concerns and improvements required)	Not Approved	Reasons for Rejection and Required Changes
	<b>Overall Assessment of the SEA</b>				
	Does the SEA contain credible <b>predictions</b> of impacts?				
	Is there an <b>evaluation</b> of the implications of these impacts for the effectiveness of the plan?				
	Does the SEA contain <b>mitigation</b> measures where they are needed to ameliorate the impacts?				
	<b>Specific Review Criteria</b>				
1	Meet ToR Requirements				
2	Meet Government Legal Requirements for an SEA				
3	Accordance with Government Policies Specified				
4	Quantified Impacts on Government Targets Provided				
5	Links between the SEA and the PDP specified				
6	Stakeholder Consultations Undertaken				

7	Clear and Appropriate SEA Methodology Used				
8	Scenarios Defined and Reflect Policy Priorities				
9	Balanced Coverage of Alternative Plan Options Included				
10	Key Social and Environmental Impacts (Externalities) Identified for each Plan Option				
11	Key Social and Environmental Impacts Quantified				
12	Key Social and Environmental Impacts Given an Economic Value				
13	Externality Valuations Integrated into Plan Economic Calculations to Give a Full Economic Cost Analysis of the overall PDP				
14	Mitigation Measures for Key Impacts Identified				
15	Limitations of SEA Identified and Explained (e.g. data limitations)				

**Table 4: Overall Review Criteria for the Final Decision on the SEA**

<b>Review Criteria</b>	<b>Score 1-6 (see below)</b>	<b>Comments (including statement on where improvements are needed)</b>
<b>Implementation</b>		
<b>Effectiveness</b>		
<b>Relevance</b>		
<b>Efficiency</b>		
<b>Sustainability</b>		
<b>Attribution</b>		
<b>Overall Assessment</b>		

**Note:** this table should only be prepared after Table 3 has been prepared and discussed internally amongst EREA/MoIT experts

The standard scoring levels for the assessment of the review criteria are:

1. **Highly Satisfactory:** The SEA had no shortcomings in the achievement of its objectives.
2. **Satisfactory:** The SEA had minor shortcomings in the achievement of its objectives.
3. **Moderately Satisfactory:** The SEA had moderate shortcomings in the achievement of its objectives.
4. **Moderately Unsatisfactory:** The SEA had significant shortcomings in the achievement of its objectives
5. **Unsatisfactory:** The SEA t had major shortcomings in the achievement of its objectives.
6. **Highly Unsatisfactory:** The SEA had severe shortcomings in the achievement of its objectives.

Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results may not be higher than the lowest rating on either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

## 6. VIETNAM'S EXPERIENCE ON SEA IN PDP PREPARATION

### 6.1. SEA OF THE HYDROPOWER MASTER PLAN IN THE CONTEXT OF PDP 6<sup>34</sup>

The first power sector SEA undertaken in Vietnam was supported by the Asian Development Bank's (ADB's) Greater Mekong Subregion (GMS) Environmental Operations Centre (EOC) and started in 2006, soon after the first introduction of SEAs in the 2005 LEP. This SEA was confined to the hydropower sector (though alternatives to hydropower, principally coal, were analyzed in the scenarios analysis the full thermal proposals of PDP 6 were not assessed) and took place after PDP 6 had been completed and approved. The intention was not to do the SEA as part of the planning process; rather the SEA was a pilot to introduce SEA (which was a new legal requirement) to the sector and build experience and awareness of the fundamentals of an SEA methodology and impact analysis.

Within the limits of the hydropower schemes proposed in PDP 6, the SEA was detailed and comprehensive. The full range of potential impacts, both negative and positive, from hydropower development were analyzed in as much detail as data availability made possible (there were data constraints at this time and one useful outcome of the SEA was to identify these so that they could begin to be addressed for future SEAs). PDP 6 contained proposals for 21 large-scale hydropower schemes and the SEA analysed the impact of all of these schemes, the details of which were described in the Hydropower Master Plan that had been completed in 2006, with the Plan suggesting that these were the remaining large-scale hydropower schemes that were technically and economically feasible. A key objective of the SEA was to see whether they would remain feasible once social and environmental impacts had been taken into consideration.

The scenario analysis was a core feature of the SEA, providing an analytical tool that could compare social and environmental sustainability of different mixes of power generation for PDP 6. Five scenarios were considered, with a base case that included all the existing schemes in PDP 6, then four further scenarios that progressively reduced the number of hydropower schemes and replaced them with the least-cost alternatives, invariably coal-fired power generation, identified during the modelling undertaken in PDP 6. The impact analysis in each scenario then included the full range of impacts, both those of the hydropower schemes and the coal-fired power generation included in that scenario. As such, the scenarios gave a clear picture of the implications of meeting defined levels of generation capacity requirements through different generation source mixes.

The SEA identified a wide range of potential impacts, both positive and negative, from each of the hydropower development proposals. The significance of these impacts varied greatly from scheme to scheme, reflecting the characteristics of the place in which they would be built, the numbers of people who would be affected and the effects of hydropower schemes on the dynamics of the river basins on which they were to be constructed. In summary, the main types of impact from the hydropower schemes identified in the SEA were:

- **Hydrological impacts** with the dams affecting river flows in the river basins that they would be built. This has both positive and negative impacts, with concerns over sustaining

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<sup>3</sup> Soussan, J. *et al* (2008) **Strategic Environmental Assessment for Sustainable Hydropower Development in Vietnam Summary and Main Report**, Asian Development Bank, Manila.

<sup>4</sup> Soussan, J., Pokhrel, S. & Nguyen Thi Thu Huyen (2012) **Internalizing the Externalities: Strategic Environmental Assessment of Power Development Plans in Viet Nam: Implications for the GMS**, Asian Development Bank, Manila.

minimum river flows and impacts on water availability for agriculture and other uses balanced by potential reduced flood risks and improved dry season river flows.

- **Displaced people**, with thousands of families likely to be displaced or otherwise impacted by dam construction. This would lead to potential impoverishment and substantial social and livelihood impacts. The 21 hydropower schemes would lead to the displacement of 61,571 people, with the number varies from scheme to scheme.
- **Natural resource** impacts, especially on forests and on riverine aquatic ecosystems, were identified as high and potentially negative. This would be caused by changes to river flows, direct forest clearance and the effects of opening up previously remote areas to outside exploitation and settlement.
- **Biodiversity** impacts were assessed to be severe in some cases, with the risk of ecosystems fragmentation significant where a high proportion of sensitive biodiversity areas are located close to dam sites.

The scenario analysis followed the impact assessment, comparing hydropower with the alternative generation sources identified in PDP 6 as the most viable schemes not yet included in the PDP proposals. All were coal-fired power stations. The scenario analysis considered the impacts of these alternatives, taking into account in particular the impacts of air pollution from emissions and the impacts of coal mining and transportation. The main impacts from both hydropower and coal-fired generation were given an economic value.

Overall, the impact assessment in the SEA demonstrated that: (i) the risks of social and environmental impacts from hydropower development are significant; (ii) these risks can, in most cases, be quantified and valued; (iii) some of the impacts, such as reduced flood risks, can be positive, and (iv) effective mitigation measures can reduce or compensate for many of the negative impacts. Mitigation costs could be significant but not at a level where they compromise the financial viability of any of the hydropower schemes. They can be seen as good investments in terms of their overall economic returns to Vietnamese society.

The study demonstrated the potential of SEA as a key part of the strategic planning framework for the power sector in Vietnam, providing a means for the assessment of the full range of potential risks for society and the environment from hydropower development, both within and beyond the immediate vicinity of the dams. It also integrated the identification of mitigation and compensation actions to reduce risks and compensate for negative impacts into the preparation of PDPs.

This study was extremely effective as a pilot, showing that an SEA was not just feasible, but also that it produced results that would greatly strengthen to overall outcomes of the PDP process. It provided a basis for anticipating and addressing potential future problems and for ensuring that the decisions reached in plan preparation could be based on a more complete understanding of the ramifications of the different alternatives considered. The SEA was also instrumental in building capacities for and an appreciation of the benefits from SEAs in future PDPs. One intangible but important outcome was that the initial suspicion or even hostility of traditional power planners to the consideration of social and environmental issues in the PDP were largely overcome, building a more effective basis for the SEA in the preparation of PDP 7 that started soon after the PDP 6 hydropower SEA was completed.

## 6.2. THE SEA OF PDP 7<sup>5</sup>

The preparation of PDP 7 took place in 2011 to cover the period 2011-2030. The SEA for PDP 7 was implemented at the same time as the PDP and used PDP outputs, in particular, the results of the modelling of supply options based on the main PDP scenarios. The scenarios themselves were based on the demand analysis, which used assumed GDP growth figures to project base, low and high demand scenarios for the PDP period up to 2030. The PDP analysis then identified the least cost generation options to meet the predicted levels of demand for each scenario and the SEA then undertook an analysis of the potential impacts of the different generation option mixes for each scenario. It also analyzed the impacts of the expansion of the transmission system in the PDP.

The preparation of the plan's SEA was done simultaneously with the analysis of generation options in the PDP. There was a level of coordination at the different stages of the PDP and the SEA, but at the same time there were limitations in the extent to which the SEA was fully integrated into the PDP process. The preparation of the SEA for PDP 7 represents a significant step, but it was not the finished article. The emphasis in the PDP preparation was still on lowest supply cost for the final generation mix and, although there was some consideration of the cost of externalities these were not integrated into the supply cost calculations in the core PDP scenarios. The SEA considered the social and environmental impacts of the different generation mixes in the scenarios, starting with the base case scenario.

**Thermal power** dominated the proposed expansion of power generation in all of the PDP 7 scenarios, so inevitably was also the main source of potential social and environmental impacts for each scenario. These impact particularly related to atmospheric pollution, with the levels of the emissions of CO<sub>2</sub> and particulate matter increasing more than tenfold during the PDP 7 period up to 2030 whilst those for SO<sub>2</sub> and NO<sub>x</sub> will increase several-fold. The impacts of these atmospheric pollutants would be extremely high and would affect large sections of the population. The SEA made a valuation of these impacts (Table 4), with the cost for the base scenario estimated to cost over \$11 billion per year by 2030 unless concerted actions were taken to reduce the levels of atmospheric pollutant releases from, in particular, coal-fired power generation.

**Table 4: Total Annual Environmental Costs for Each Pollutant in the Original Power Development Plan 7 (\$ million)**

Year	2011	2015	2020	2025	2030
PM*	98.86	134.95	289.57	439.40	710.24
SO <sub>2</sub>	93.77	148.09	311.85	448.18	728.74
NO <sub>x</sub>	234.15	274.48	386.09	494.30	638.86
CO <sub>2</sub>	1,215.50	2,190.50	4,118.70	6,075.90	9,071.90

**Note:** CO<sub>2</sub> = carbon dioxide, NO<sub>x</sub> = nitrogen oxide, SO<sub>2</sub> = sulfur dioxide; PM: Particulate Matter

**Hydropower** was the second largest source of the expansion of power generation in PDP 7, with the potential hydropower schemes included being those that had been identified in PDP 6, but for which there was as yet no commitment to develop them. Given that a comprehensive analysis of

<sup>5</sup> Soussan, J., Pacudan, R., *et al* (2011) **PDP 7 SEA Summary Report**, Asian Development Bank, Manila.

the potential impacts of these schemes had been undertaken in the earlier SEA, this analysis was taken into the PDP 7 SEA, updated where appropriate to reflect any developments in the intervening period.

The social and environmental impacts of the expansion of the **transmission lines** was assessed and concerns were identified in relation to the fragmentation of sensitive ecosystems. The SEA showed that the transmission line expansion would result in the loss of 14,103 ha of forests and the fragmentation of vulnerable ecosystems and endanger the ecological viability of a number of protected areas. The SEA recommended measures to consolidate and re-route transmission lines to reduce these impacts.

The SEA of the original PDP 7 consequently identified a range of potential social and environmental impacts and, through the scenario analysis, also demonstrated the likely effects of two major strategies to reduce the main impacts from air pollution: strengthened energy efficiency and expanded renewable energy. The results of the SEA, and in particular the economic assessment of the costs of atmospheric pollution resulted in an instruction from the government that the existing PDP 7 needed to be substantially revised, with the focus of this revision to be what were considered to be more realistic demand forecasts and a more sustained effort to reduce the social and environmental impacts of the expansion of thermal power in the plan. One of the driving forces behind the requirement for a revision was the increased awareness of a wide range of stakeholders, including the central government, of the effects of increased air pollution from the expansion of coal-fired power generation. This led to a scrutiny on the sector over this issue at a time when air pollution was becoming an issue of general concern in Vietnam.

### 6.3. THE SEA OF REVISED PDP 7<sup>6</sup>

The SEA was influential in the revision of the PDP, with the traditional “high, medium and low” demand scenarios that have characterized earlier PDPs replaced by scenarios in large measure based on the SEA scenarios, to examine the scope for increasing energy efficiency and the use of renewable energy. The outcomes of the RPDP 7 process included higher targets for energy efficiency, the rapid growth of renewable energy sources for power generation, the removal of specific investment proposals that were seen as having unacceptable negative impacts, changes to the routing of proposed transmission lines, changes in the fuel mix (especially from coal to gas) for thermal power generation, increased compensation measures for people affected by the proposals in the plan, and changes to technology choices.

New demand projections that included assumptions about enhanced energy efficiency measures were prepared, resulting in reduced demand levels in the PDP by over 20% by the end of the plan period in 2030 (see Table 5).

**Table 5: Installed Capacity Growth Over Time in the Original and Amended PDP7 (MW)**

Year	2015	2020	2025	2030
Original PDP 7	30,803	52,040	77,084	110,215
Revised PDP 7: Base Case Scenario	28,480	41,605	62,395	88,833
Difference	2,323	10,435	14,689	21,382

<sup>6</sup> Soussan, J. (2016) **Revised PDP 7 SEA Report**, Asian Development Bank, Manila.

The rate of growth of coal-fired power generation in RPDP 7 is still significant, but is much lower than that of the original PDP 7, with this both reflecting lower levels of demand in the PDP and an increase in the proportion of the new investments in power generation that were for renewable energy, especially wind and solar power (see Table 6). The reduction in coal is significant, at more than a quarter of the original planned expansion of coal-fired generation, whilst the levels of expanded renewables in RPDP 7 was close to six times that of the original PDP 7 proposals.

**Table 6: Generation Mix of PDP 7 and RPDP 7**

	Original PDP 7	Revised PDP 7
Generation capacity 2030	137,388	129,508
Coal	77,160	55,252
Natural gas and oil	17,465	19,078
Hydropower and pumped storage	21,125	21,871
Other renewable energy sources	4,829	27,199
Nuclear	10,700	4,600
Imported	6,109	1,508

The result of these changes is a very significant reduction in air pollution from thermal power, which in turn reduced the predicted impacts of power development on climate change (see table 7) and other adverse effects from atmospheric pollution. By the year 2030 the saving amount to over 100 million tons of CO<sub>2</sub>, more than a quarter of the originally projected emission level. The RPDP 7 also identified significant reductions of other atmospheric pollutants, especially SO<sub>2</sub>, NO<sub>x</sub> and particulate matters, with important implications for decreased human and environmental health risks resulting from power generation.

**Table 7: Changes to CO<sub>2</sub> Emissions between the Original and the Amended PDP7 (Unit: CO<sub>2</sub> 10<sup>3</sup> tons per annum)**

Base Case Scenario	2015	2020	2025	2030
Original PDP 7	107,163	201,491	297,237	443,802
Revised PDP 7	73,604	101,249	200,770	334,235

The SEA process in the revision of PDP 7 influenced the preparation of the amended plan, leading to the more effective consideration of social and environmental issues in a number of important areas during plan preparation:

- The analysis in RPDP 7 was based on scenarios that emerged from the consideration of issues such as improved energy efficiency and an increase on renewable energy that were identified in the original PDP 7 SEA;
- The cost and benefit calculations included in RPDP 7, more effectively internalized the valuation of a number of social and environmental impacts, with these values assessed as part of the SEA process;

- RPDP 7, including the SEA, reflected key government policy priorities more clearly, including in key areas such as green growth, clean technology development and environmental protection;
- Specific investment proposals in RPDP 7 reflected actions to mitigate negative social and environmental impacts identified in the SEA (especially the impact of increase coal-fired thermal power generation), including:
  - The integration of increased levels of energy efficiency assumptions in the demand projections;
  - An increased rate of growth of the use of renewable energy sources in power generation up to the year 2030;
  - The removal of specific individual investment proposals that were identified as having high social or environmental impacts;
  - Changes to the routes of proposed transmission lines, especially to avoid the fragmentation of protected areas and the loss of forest resources;
  - Changes in the fuel mix (especially from coal to gas) for thermal power generation in order to reduce air pollution in key areas;
  - Increased compensation measures for people affected by the proposals in the plan;
  - Changes in technology choices and the adoption of clean technology where this is feasible.

The changes between PDP 7 and RPDP 7 were consequently significant in terms of reducing a wide range of potential social and environmental impacts and the SEA was instrumental in providing insights into how government policies and priorities could be reflected in the revised plan recommendations. The preparation of RPDP 7 saw a much higher level of integration of the SEA with the plan preparation, with the iterations of the scenarios and modelling closely coordinated, and the final version of the overall RPDP 7 reflecting the outcomes of the SEA analysis. The starting point for the preparation of the SEA of PDP 8 was consequently one where there had been an accumulation of experience in the preparation of SEAs as part of a PDP but also one where all parties agreed these experiences needed to be built on and the SEA process improved to reflect the changing context of PDP preparation discussed above.