



## Malaysia's rare earth processing plant: Nurturing greening capabilities

### Teaching Note

#### CASE SUMMARY

This learning case will discuss the Lynas Advanced Materials Plant (LAMP) from the context of impact assessment and nurturing greening capabilities. The central issue of the case surrounds the rare earth plant controversy in the city of Kuantan, Pahang: rare earth elements are important for the production of green technologies, yet processing the elements is linked to serious environmental, social, economic, and political issues. Hence, while its usefulness justifies more production outputs from greenfield locations such as in Malaysia, there is much at stake with regards to the future of sustainable development. For a developing nation such as Malaysia an SPC policy becomes paramount, in order to ensure that development and sustainability go hand-in-hand. A value chain analysis, impact-risk assessment and tradeoffs following any national prioritization agenda would need to be conducted in order to ascertain important key steps forward for the current situation faced by the LAMP. This learning case is intended to be used for an eventual social capacity for change, from a business entity reacting to issues, towards a business entity which leads the nation and the industry itself.

#### LEARNING OBJECTIVES

- To conduct value chain analysis and propose greening capabilities.
- To analyse undesirable risks based on impact-risk assessment.
- To scrutinize value tradeoffs and implication for SPC policy.

#### TIPS FOR FACILITATORS

Overall, discussion on the case needs to consider these four contentious issues related to sustainability:

- Supply disruption of magnets which contain rare-earth metals. Solar and wind power products/technology depends on rare-earth magnets and are expected to account for the biggest energy growth markets over the next 20 years
- New initiatives producing magnets which are less dependent on rare earth elements are needed. Taming consumption of raw materials which is negatively affecting the ecosystems and their services is necessary
- Whether the employees and community's health and safety would in fact be compromised in the future due to the hazards accruing from the by-product of material processing
- The politicization of the LAMP issues by the anti-Lynas camp could continue to affect evaluations, decisions, and nature of stakeholder engagement by Lynas, LAMP, government officials, and agencies



In deliberations with participants on the working sessions, various points of discussion an instructor should expect from the participants include both positive and negative impacts relating to:

- Cleaner production methods;
- Compliance with international assessment/regulations: transportation of radioactive waste across national boundaries;
- International and local protests mired in political issues both domestic and international;
- Radioactive and hazardous wastes,
- Leadership of government agencies;
- Internal CSR: toxic reruns from the processing plant and its effects on employees;
- Waste management: storage and disposal;
- Potential negative impacts upon other industries such as tourism and fishing; and
- Health impacts on the communities.

## **FACILITATION OF THE LEARNING PROCESS**

The purpose of this case is to demonstrate a positive leadership change that the private sector from a developing nation could adopt. The impact of the this change could extend beyond the nation's geographical borders and include the global corporate world, especially in regards to the rare earth industry's value chain. There are three main discussion questions (1-3) raised at the end of the text of the case. Each of these questions relate to the three worksheets, respectively. The sample answers below for all the worksheets are for reference only, and are not necessarily exhaustive.

Based on an introductory presentation which builds the context and scope of discussion, approximately 30-45 minutes should be set aside for each worksheet to be completed in small groups. It is within this timeframe that the facilitator could use creative means to trigger quality answers from each group. Alternating into big and small group discussions ensure that participants are on the right track. As much as possible, participants should be encouraged to use the case facts as specific answers on all the worksheets.

Worksheet 1: For a good value chain analysis discussion, begin the discussion by introducing the concept of natural capitalism and use Table 1 as a basis to trigger answers for the 'Issues arising from value chain factors' column.

Worksheet 2: This particular exercise on impact-risk assessment requires participants to think deeply about the potential future risks emanating from the impact of key drivers. Begin by discussing Table 2 on the four types of impact from key drivers and the future key concerns. Then, refer to Table 3 on the five possible future risks emanating from these impacts. As facilitators, you may want to consider making reference to established cases in the past which were seen as critical in relation to the impact/risks they have caused today.



At the end of Worksheet 2, allow participants to answer Discussion Question 4 by reflecting on their answers from Worksheet 1. The purpose of this question is to allow participants to deepen their understanding on what it means to nurture greening capabilities with a foresight perspective and a keen appreciation of the emerging issues in the future. Link Worksheet 1 and 2 and summarise how greening capabilities from Worksheet 1 are connected with future requirements in Worksheet 2.

Worksheet 3: Next, trigger further discussions on the assumption related to prioritization of particular dimension and associated value tradeoffs. The ultimate objective is garnering as much participation as possible on the imperatives which must be included in an SPC policy. Different approaches, including discussing in small groups, relating to real life situations, and debating on key concepts, could be used to meet this objective so that various inputs are garnered.

Finally, at the end of Worksheet 3, in Discussion Question 5, discuss generalized principles for business organization such as LAMP to adopt with regards to its SPC agenda in the future.



**Worksheet 1: Value chain analysis and nurturing greening capabilities**

<b>Value chain factors</b>	<b>issues arising from value chain factors</b>	<b>Key leadership actions to consider</b>	<b>Greening capabilities to nurture</b>
<p><b>Upstream situations:</b></p> <p>Raw materials from suppliers</p> <p>Suppliers and environmental footprints</p>	<p>Environmentally-friendly materials from suppliers</p> <p>Environmentally friendly technology applied by suppliers</p> <p>Suppliers meeting regulatory framework surrounding the business</p>	<p>Sourcing environmentally friendly suppliers</p> <p>Forging a partnership with suppliers willing to continuously improve on greening their services/products: create value innovation together</p> <p>Help suppliers reduce environmental costs and regulatory burden</p>	<p>Green design: connecting production methods at focal point with the supplied raw materials</p> <p>Eco-labeling partnership and certification of suppliers</p> <p>Green purchasing</p>
<p><b>Focal point situations:</b></p> <p>Production methods</p> <p>Environmental management system</p> <p>Industry-related problems</p>	<p>Stages of processing and by-products</p> <p>Meeting regulatory framework surrounding the business</p>	<p>Emphasis on service vs. sales</p> <p>Niche pitches on green products</p> <p>Reduce environmental costs and regulatory burden</p>	<p>Transportation carbon footprint</p> <p>R&amp; D related to clean technology and environmentally friendly materials</p> <p>adopt new CR measurements</p> <p>New business model which emphasizes on less use of natural resources/optimization of resources used</p>



			<p>Transparency: Reporting both good and bad</p> <p>Perform life-cycle assessment/ trace footprints</p> <p>Perform supply chain audits</p> <p>Improve on green building construction</p> <p>Waste reduction actions</p> <p>Recycling action plan</p> <p>Energy efficiency footprint</p>
<p><b>Downstream situations:</b></p> <p>Negative social and environmental impact</p> <p>Customer assurances</p> <p>Stakeholder assurances</p>	<p>Environmental impact: Biodiversity, etc</p> <p>Health impact: Employee well-being</p> <p>Stakeholder assurance</p> <p>Meeting regulatory framework surrounding the business</p>	<p>Ownership in reduction of CO2 emissions along supply chain downstream</p> <p>Vertical integration: owning the total supply chain</p> <p>Build indigenous capability/domestic demand for raw earth oxides/REOs (processed rare earth minerals) local demand from industry clusters</p>	<p>Comprehensive impact assessment which includes community well-being</p> <p>Cradle-to-cradle concept;</p> <p>Call-back programs</p> <p>Eco-design with customers: make their problem your problem</p> <p>Eco-efficiency: reduction of further processing to reduce by-products</p>



		Collaborative efforts with downstream customers to reduce environmental costs and regulatory burden; build partnership incentives	
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**Worksheet 2: Impact-risk assessment**

<b>Future impact from climate change and industrialisation</b>	<b>How LAMP/rare earth industry contributes towards future risks?</b>	<b>How LAMP/rare earth industry is affected by future risks?</b>	<b>How LAMP could mitigate future risks</b>
Water stress	<p><b>Reputational risk:</b></p> <p>Water scarcity/inadequate water table preservation/poor water management from extensive water usage</p> <p>Water pollution from wastes</p> <p>Fishing population affected</p> <p>Health of community affected</p>	<p><b>Economic risk:</b></p> <p>Inadequate water supply;</p> <p>Low quality of REO produced</p> <p>Lost of contract with downstream customers</p>	<p>Improve R&amp;D and technology application which use less water/is more efficient with use of water</p> <p>CSR with regards to water management</p> <p>Value chain leadership: sourcing and collaborating with suppliers on better quality raw materials</p>
Natural resource and raw material scarcity	<p><b>Operational and supply chain risk:</b></p> <p>Sources of rare earth metals diminishing/inadequate</p> <p>Energy as natural resource scarcity</p>	<p><b>Market risk:</b></p> <p>Pressure to optimize use of raw materials</p> <p>Competition within industry for natural resources</p> <p>Rising REO prices</p>	<p>Understanding the concept of shared resources and willingness to collaborate on reducing global rare earth production footprints</p>



		Reduced demand from customers due to price volatility	
Public pressure for environmental stewardship	<p><b>Reputational risk:</b></p> <p>International reputation at stake: stakeholder management and engagement becomes crucial</p>	<p><b>Reputational risk and regulatory risk:</b></p> <p>Constant need for crisis management</p> <p>Unreadiness to comply with future national / international standards</p>	<p>Public discourse</p> <p>Stakeholder active participation in decisions affecting their livelihoods</p> <p>Stakeholder dialogue</p> <p>CSR reporting</p>
National security and safety concerns	<p><b>Regulatory risk:</b></p> <p>Country-level/ Regional/ International disputes from negative impact on society's health and environment</p> <p>Expanding carbon footprint</p>	<p><b>Regulatory risk:</b></p> <p>Climate change and changing weather patterns leading to impoverished natural resources and sustainance of eco-system/human lives</p>	<p>Extended corporate responsibility: working with customers on design for environment and use of REOs in selected products</p>



## **Discussion Question**

4. Revisit the value chain analysis on greening capabilities in Worksheet 1. Based on what needs to be done to mitigate the future risks, which part of the value chain is critical and requires more effort?

Guide for facilitator: Weigh the answers in Worksheet 2 in terms of the severity of the risks. The ultimate objective is to discuss deepening insights for greening capabilities.



**Worksheet 3: STEEP analysis and values tradeoffs**

<b>STEER Dimension:</b>	<b>Assumption underlying the dimension</b>	<b>Value tradeoff/potential losses from prioritization of the dimension</b>	<b>Implications for SPC policy actions to address the imbalances from value tradeoffs</b>
1.Societal well-being	Pursuits in economic goals/capitalist interests which hampers highest level of societal well-being should be contained  Rare industry's existence is not good for societal well-being	Imbalanced growth: Without continuous economic growth, there are limitations for continued societal well-being	Education on living within eco-system and what it means to create a balance for peaceful coexistence of business within society  Ethical leadership of rare earth business is required
2.Technological advancement	Discovery for its own sake; No boundaries in R&D; Destruction/ waste of natural resources is permissible for the sake of new discoveries	Unethical underpinnings are practiced when those in power decide what new frontiers are all about and what societal well-being means; pillaging natural resources;	Innovation subsumed within eco-system perspective  Ethical compass on what is the purpose of innovation for the rare earth business
3.Economic growth	Growth allows for more environment preservation opportunities  Existence of rare earth business assist the development of green products	Consumption needs are encouraged	Revaluing a consumption-oriented society in a developing nation and promotion of a service-based economy as opposed to production-based economy  Rare earth industry should be prioritizing services over and above volume/sales of products
4.Preservation of Environment	Limits on business growth to the point of closure of business hazardous to	Business must lose	Shared values and sharing economy perspective needed amongst the competitors within business industry



	environment Moratorium on new mining of rare earth minerals and rare earth industries		
5. Political stability	National security supercedes all other dimensions Rare earth business mired in political gridlock/ politicisation of issues	Transparency at stake/disclosure of information may be withheld; Misinformed/ uninformed stakeholders Protectionist barriers	Industry ethical leadership is important to complement nation's priorities



**Discussion Question:**

5. Reflect on the answers for Discussion Questions 1-4. In terms of ensuring ethical and balanced outcomes, based on Worksheet 3, what key principles should LAMP be guided by when it charts its future SPC policy?

Guide for facilitator: The overall emphasis is for participants to analyse the common themes arising from the answers in all worksheets. For example, collaboration along the supply chain could be one key principle which could be used to chart the future SPC policy.