Malaysia’s Rare Earth Processing Plant: Nurturing Greening Capabilities

SLIDES PRESENTATION

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.

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Source:
Case 5:
Malaysia’s Rare Earth Processing Plant: Nurturing Greening Capabilities

Context of the case

Greasing capabilities through Natural Capitalism

- Increasing natural resources’ productivity: developing dramatically more efficient production processes that stretch natural resources (energy, minerals, water, forests) 5,10, even 100 times further than they go today. The ultimate objective is to maximize/optimize the usability of resources;
- Imitating biological production models: every output of manufacturing processes is composted into useful natural resources or recycled for further production. The ultimate objective is to preserve ecosystems;
- Changing business model: providing services instead of selling more products. The ultimate objective is to move clients towards getting access to products/services without needing own the products; and
- Reinvesting in natural capital: reinvest in restoring, sustaining, and expanding natural habitat and biological resource base. The ultimate objective is to gain public reputation for environmental responsibility.
Discussion Question 1:

Based on the value chain analysis, what are the enabling green opportunities for LAMP?
### Discussion Question 2:

What are the risk mitigation opportunities arising from an impact-risk assessment?
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<table>
<thead>
<tr>
<th>Impacts from Drivers</th>
<th>Future key concerns</th>
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<tbody>
<tr>
<td>Water stress</td>
<td>• What is the possibility of short water supply due to climate change?</td>
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<td>• Would change in weather patterns affect global/regional/local distribution of</td>
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<td>fresh water?</td>
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<td>Natural resource and raw material</td>
<td>• Would the future show a dire need for conservation of resources?</td>
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<td>scarcity</td>
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<td>Public pressure for environmental</td>
<td>• Would stakeholders represent more of a negative driving force than a positive</td>
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<td>stewardship</td>
<td>force?</td>
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<td>National security and safety concerns</td>
<td>• What kind of protectionist economic barriers would be imposed by countries</td>
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<td>with available natural resources?</td>
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<td></td>
<td>• What happens if countries form new political alliances to protect natural</td>
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<td>resources, which shift global economic strength?</td>
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<td>• How about military action to protect sovereign borders?</td>
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<td>• What is the impact of public unrests?</td>
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<td>• What about the safety of living organisms and habitats due to climate change/natural disasters?</td>
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<table>
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<tr>
<th>Risks</th>
<th>Key challenges for consideration</th>
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<tr>
<td>Economic risk from energy, water and</td>
<td>Price volatility</td>
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<td>other natural resource prices</td>
<td>Meeting long-term demand through raw materials substitution</td>
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<td>Alternative energy sources</td>
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<td>Market risk from poor response to</td>
<td>Environmentally friendly products</td>
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<td>changing consumer preferences</td>
<td>Companies with good corporate responsibility practices</td>
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<td>Regulatory risk from government action</td>
<td>Global agreements</td>
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<td>and legislation</td>
<td>Industry-wide regulatory proposals</td>
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<td>National, state, local level of legislations</td>
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<td>Reputation risk from failure to</td>
<td>Environmental stewardship</td>
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<td>strengthen corporate social</td>
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<td>responsibility</td>
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<td>Operational and supply chain risk</td>
<td>Environmental hazards</td>
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<td>from inefficiencies and environmental</td>
<td>Natural disasters</td>
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<td>change</td>
<td>High operating costs</td>
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<td>Polluted water supply</td>
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Discussion Question 3:

Based on value tradeoffs analysis of the STEEP dimensions (societal well-being, technological advancement, preservation of environment, political stability), what are the implications related to SPC policy?

Mapping Issues—the Societal dimension:
Is social contract missing?

- Wave of green consumerism
- Public pressure for environmental stewardship; whistle blowing by stakeholders
- Critical stakeholders to manage
- Loss of employment in the future due to damage to marine ecosystem and sluggish tourism industry
- On-site safety and labour human rights
- Lack of social impact assessment: need consistent monitoring of health and safety due to possible radiation exposure
- Transparency and disclosure of information

Wave of green consumerism
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**Mapping Issues—the Technological dimension:**
LAMP and its contribution as a Green business

- Alternative application for magnets which does not require rare earth
- Efficient green technology requires rare earth
- New technology will be required to reduce magnet dependency on rare earth
- Alternative and renewable energy sector at stake
- Does LAMP possess advanced recycling technology?
- Need more R&D in rare earth processing technology which is environmentally friendly
- Is LAMP’s processing technology designed for environment

**Mapping Issues—the Economics dimension:**
Economic risk mitigation at the expense of environment?

- China and control of world rare earth supply
- Rare earth and global supply chain crisis: natural resources and raw material scarcity
- Meeting market demand
- Malaysia: high income status society aspiration
- Malaysia: part of rare earth global supply chain
- Malaysia: Largest rare earth extraction plant in the world
- Malaysia: Rare earth indigenous knowledge and industry knowledge
- Employment for skilled workforce in Malaysia
- Malaysia: Rare earth and global supply chain crisis: natural resources and raw material scarcity
Mapping Issues—the Environmental dimension:
Lynas and extended product responsibility

- Possible leakage of radioactive materials from plant building?
- Green house gas emissions from transportation of ore from Australia
- Wastes stored on-site in residue storage facility—for how long?
- Recycling of hazardous wastes NUF and FGD into gypsum and fertilizers—health hazards?
- Extensive water footprint from processing
- Contaminants due to chemical by-products: food security and damage to marine ecosystem
- Permanent waste disposal will not be developed
- Air pollution from polluting gases: effective air dispersion technique?
- Will waste water be discharged into waterways?

Mapping Issues—the Political dimension:
Malaysian government’s response to stakeholders muddled by politics of the opposition?

- Lynas and reputational risk
- Malaysia’s reputational risk in international arena
- Politicisation of environmental issues by Malaysia’s Opposition party
- Operating Licence
- Is LAMP a chemical plant or nuclear plant?
- Regulatory compliance and enforcement of standards by AELB and AEIA
- Past bad reputation of rare earth industry
Four contentious issues

- supply disruption of magnets which has 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 its services is necessary
- whether the employees and community’s health and safety would in actual fact not be compromised in the future due to the hazards accruing from the by-product of material processing
- the politicization of the LAMP issues by anti-Lynas camp could continue to affect evaluations, decisions, and nature of stakeholder engagement by Lynas, LAMP, and government officials, and agencies

Moving towards social capacity for change and policy implication

- Location consideration of any business must consider tradeoffs between impact on climate change and economic growth incentives
- Social impact assessment and environmental impact assessment should be integrated
- Consideration on carbon trading as a control measure
- Business industry association (e.g. rare earth industry association) acts as a network to self-regulate and curb unnecessary CO2 emissions
- Government’s requirement on transnational organisation in practicing sustainability policy
- Knowledge transfer from transnational organisation on best practices in sustainability application should be considered
Key learning points:

1. To understand the Triple-bottom line perspective: trade-offs amongst the three concentric circles
2. Drawing out different worldviews and mental constructs from participants
3. Understanding undesirable and desirable impact on ‘focused’ topic
4. Developing social capacity for change
5. Directed towards societal transformation

“It’s not the strongest of the species that survives, nor the most intelligent; but the one most responsive to changes”

- Charles Darwin -

Thank you...