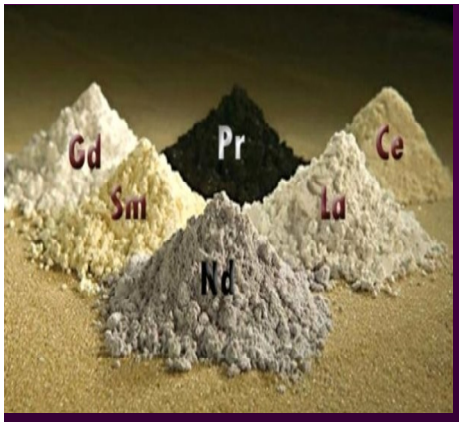
Malaysia's Rare Earth Processing Plant: Nurturing Greening Capabilities

SLIDES PRESENTATION



Source:
http://au.ibtimes.com/articles/318376/20120323/obama-threatens-rare-earth-trade-war-against.htm

Malaysia's Rare Earth Processing Plant:

Nurturing Greening Capabilities

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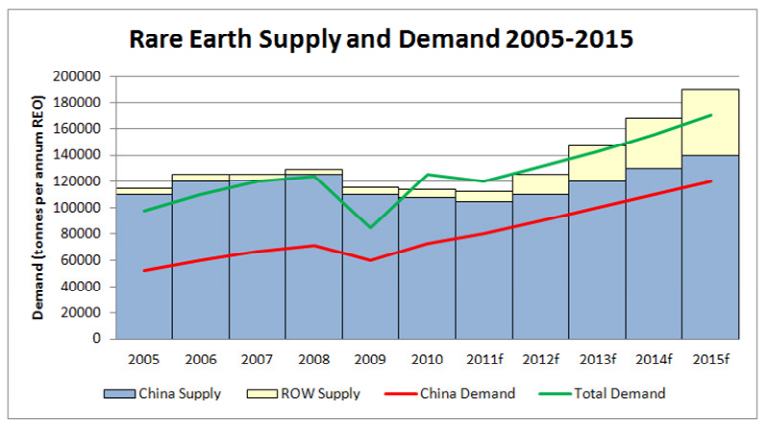
Learning objectives:

- 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.

Context of the case



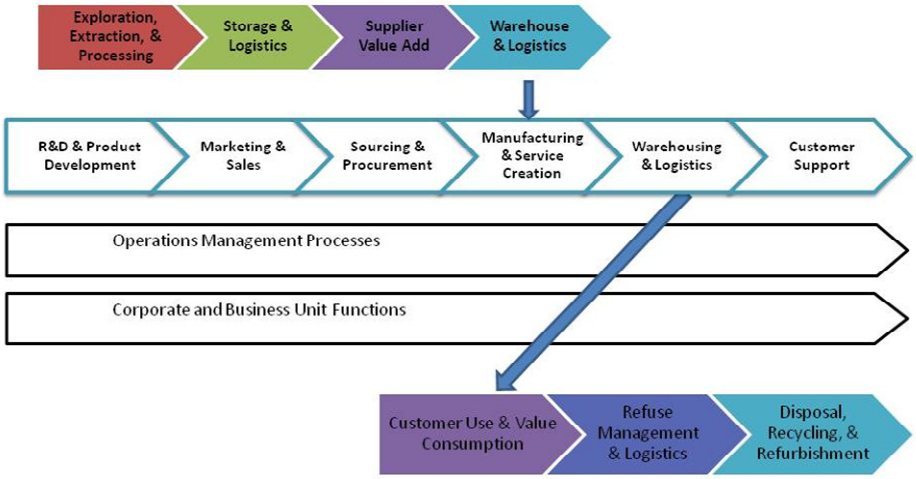
Greening capabilities through Natural Capitalism

- 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 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?

Traditional Supply Chain and Value Chain	Lifecycle Chain



VALUE CHAIN FACTORS	SPC ISSUES RELATED TO VALUE CHAIN FACTORS
Focal point	•How big is our environmental footprint? •What resources are we most dependent on (energy, water, materials), and how much do we use? •What emissions do we release into the air or water? •How do we dispose of waste? •How up-to-date is our environmental management system? •What are our chances of a spill, leak, or release of hazardous materials? •Have others in our industry had problems? •What local, state, federal, or international regulations apply to our business? Are we in full compliance? Are these requirements getting tighter?
Upstream	•What resources are our suppliers most dependent on? Are they abundant or constrained, now and in the near future? •Do our suppliers pollute? Do they meet all applicable laws? Will legal requirements get tighter for them? •What substances go into the products suppliers sell to us? Are they toxic?
Downstream	•How much energy (or water or other resources) does our product require customers to use? •Are there hazardous substances in our products? •What do customers do with our products when they are done with them? What would happen if we were required to take the

Discussion Question 2:

What are the risk mitigation opportunities arising from an impact-risk assessment?

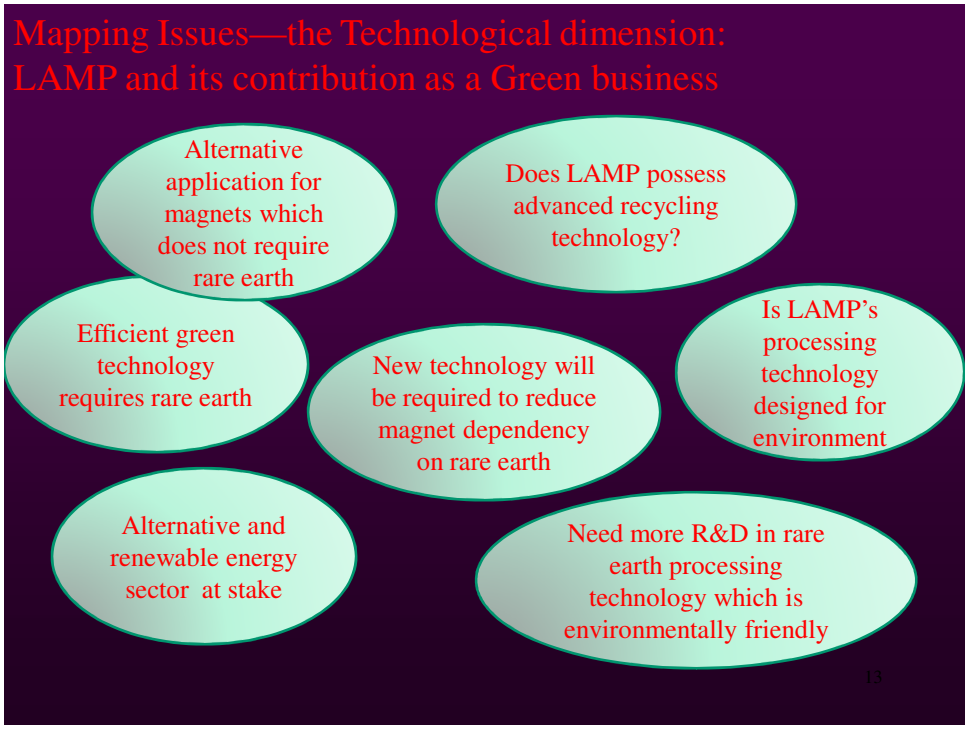
Impacts from Drivers	Future key concerns
Water stress	•What is the possibility of short water supply due to climate change? •Would change in weather patterns affect global/regional/local distribution of fresh water?
Natural resource and raw material scarcity	•Would the future show a dire need for conservation of resources?
Public pressure for environmental stewardship	•Would stakeholders represent more of a negative driving force than a positive force?
National security and safety concerns	•What kind of protectionist economic barriers would be imposed by countries with available natural resources? •What happens if countries form new political alliances to protect natural resources, which shift global economic strength? •How about military action to protect sovereign borders? •What is the impact of public unrests? •What about the safety of living organisms and habitats due to climate change/natural disasters?

Risks	Key challenges for consideration
Economic risk from energy, water and other natural resource prices	Price volatility Meeting long-term demand through raw materials substitution Alternative energy sources
Market risk from poor response to changing consumer preferences	Environmentally friendly products Companies with good corporate responsibility practices
Regulatory risk from government action and legislation	Global agreements Industry-wide regulatory proposals National, state, local level of legislations
Reputation risk from failure to strengthen corporate social responsibility	Environmental stewardship
Operational and supply chain risk from inefficiencies and environmental change	Environmental hazards Natural disasters High operating costs Polluted water supply

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?


Mapping Issues—the Technological dimension:
LAMP and its contribution as a Green business
Alternative application for magnets which does not require rare earth
Does LAMP possess advanced recycling technology?
Efficient green technology requires rare earth
New technology will be required to reduce magnet dependency on rare earth
Is LAMP's processing technology designed for environment
Alternative and renewable energy sector at stake
Need more R&D in rare earth processing technology which is environmentally friendly
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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: Rare earth indigenous knowledge and industry knowledge
Employment for skilled workforce in Malaysia
Malaysia: Largest rare earth extraction plant in the world
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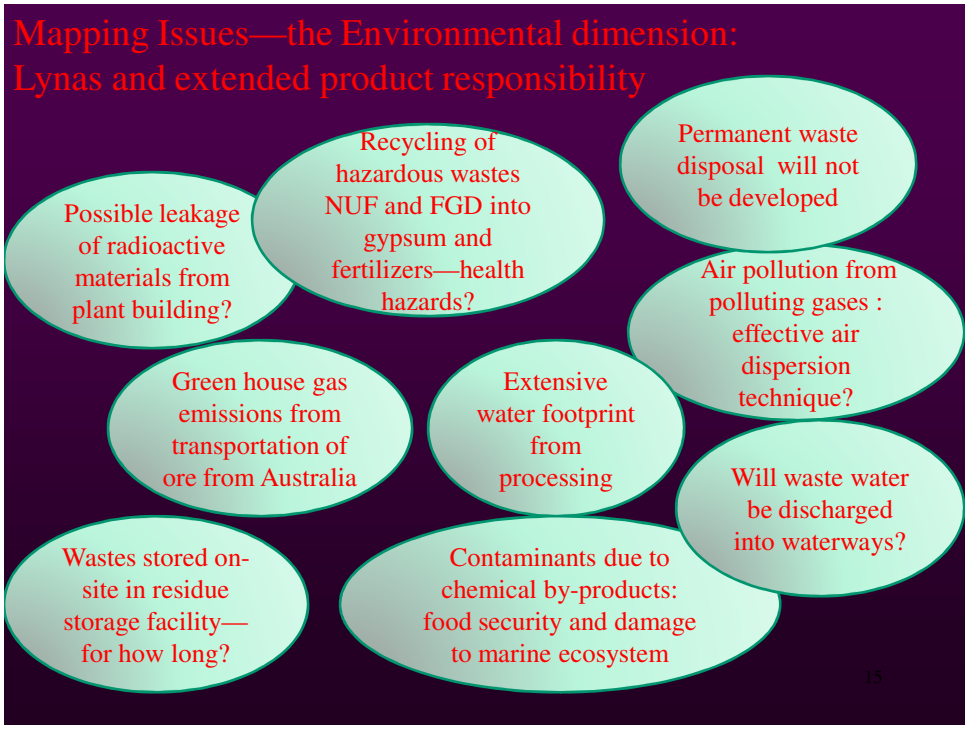
Mapping Issues—the Environmental dimension:
Lynas and extended product responsibility
Recycling of hazardous wastes NUF and FGD into gypsum and fertilizers—health hazards?
Permanent waste disposal will not be developed
Possible leakage of radioactive materials from plant building?
Air pollution from polluting gases : effective air dispersion technique?
Green house gas emissions from transportation of ore from Australia
Extensive water footprint from processing
Will waste water be discharged into waterways?
Wastes stored on-site in residue storage facility—for how long?
Contaminants due to chemical by-products: food security and damage to marine ecosystem
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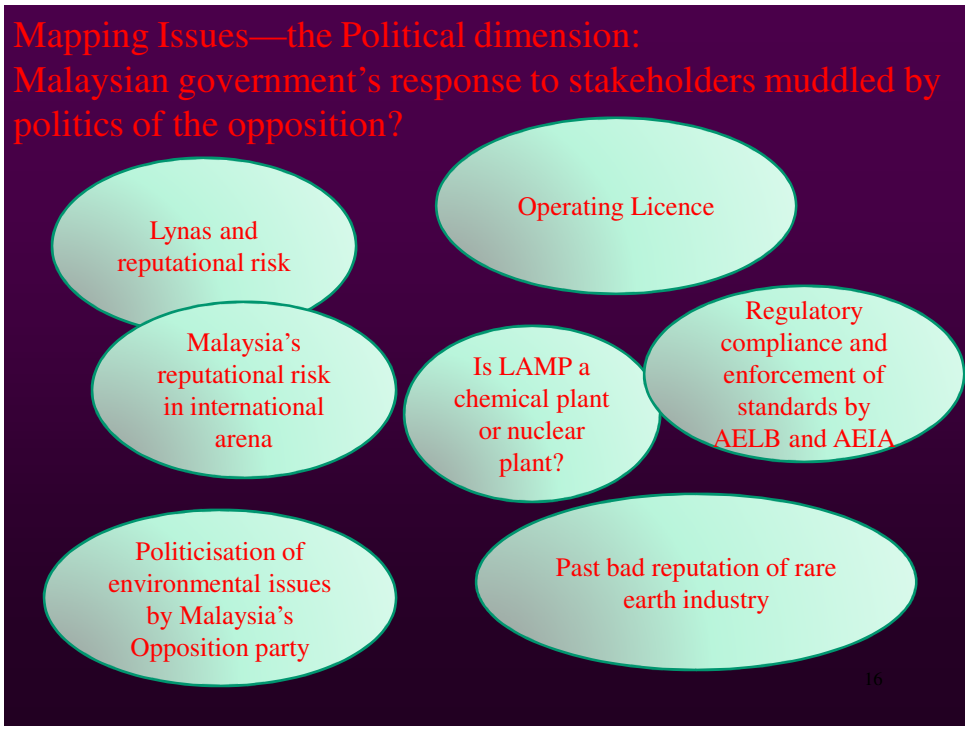
Mapping Issues—the Political dimension:
Malaysian government's response to stakeholders muddled by politics of the opposition?
Lynas and reputational risk
Operating Licence
Malaysia's reputational risk in international arena
Is LAMP a chemical plant or nuclear plant?
Regulatory compliance and enforcement of standards by AELB and AEIA
Politicisation of environmental issues by Malaysia's Opposition party
Past bad reputation of rare earth industry
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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

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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…