Sustainability in the supply chain of Enel Green Power North America (EGPNA)

Enel Green Power

MIT MANAGEMENT | Sustainability Initiative

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PROBLEM

Problem Statement: EGPNA would like to **improve the sustainability of its supply chain**, but does not have an understanding of what components have the greatest impact.

EGPNA has processes for managing sustainability in the construction, commissioning and operation of its facilities, but lacks a framework for its supply chain operations.

Which products have the greatest impact on the company's supply chain from the sustainability perspective?

Project Scope:

- A **framework** for evaluating the sustainability of the components of EGPNA's supply chain.
- A **pilot hotspot analysis**, to identify where to start and what indicators to use.
- Recommendations on how to **develop a repeatable process** that will enable EGPNA to embed sustainability into its supply chain.

BUSINESS CASE

▶Sustainability is increasingly material to investors and energy consumers.

EGPNA is installing sustainable energy solutions

Are EGPNA's suppliers sustainable?

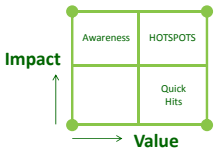
▶EGPNA seeks to embed sustainability in its procurement and supply chain within 3 years.
▶The company's reporting will be enhanced as a result.

METHODOLOGY

1. Identify primary consumption points from Enel's purchasing data
   - Wind Turbines
   - Solar Panels
   - Focus 1 Electrical equipment
   - Focus 2 Transportation
2. Identify material issues from literature
   - SASB + Industry Reports
3. Define scorecard using benchmarks
   - Vestas, SUNPOWER, ABB
   - LIFE-CYCLE ASSESSMENT: cradle to cradle
4. Hotspot Analysis

HOTSPOT = Value of Component X Impact

2 x 2 Matrix



RECOMMENDATIONS

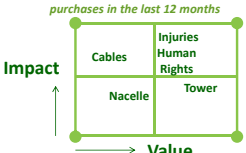
1. Define **criteria to select suppliers**, weighting in the different prioritized impacts.
   - Use the scorecards of this project as checklists.
   - Update the benchmarks once a year.
   - Select suppliers that report on material issues according to SASB's Materiality Map.
2. Request an LCA or at least a detailed **impact analysis** to suppliers following Vestas and Sunpower's examples.
3. Request an analysis of the **local social impact** of these suppliers on their communities as well.
4. Collaborate with Vestas, Sunpower, ABB and other suppliers in measuring and improving human rights and safety in the extended supply chain.
5. Assess the specific impact of **transportation**, by asking about the origin of components to suppliers.
6. Consider using a **price for carbon** to inform internal purchasing decisions.
7. Collaborate in advancing the use of **water footprint**, taking into account types of water and local water scarcity.
8. Lead **stakeholder dialogue** and local community development.

RESULTS

WIND

- **Manufacturing** has the most impact in the life cycle of a wind plant, particularly the **cables**, **tower** and **nacelle**.
  - A long life of operation significantly reduces overall impacts. Environmental impacts decrease by around 17% for an increased lifetime of 4 years (20% of the baseline 20 years).
- **Recycling** is the second most important phase.
  - It is very important to recycle metals to account for end-of-cycle credits of avoided impact.
  - Even better, turbines should be built with recycled metals.
- **Transportation** can range between 1% and 40% of the impact, justifying a case-by-case analysis.
- **Human rights** and **human safety** are a very material issue in wind power and should be studied further.
- In sensitive communities, analyze the potential impacts of land use, deforestation, noise and local impacts on biodiversity, generally included in Environmental Impact Assessments (EIA) in plant design.

Wind was the largest component of EGPNA's purchases in the last 12 months

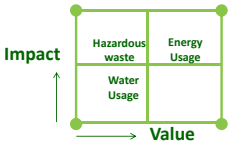


E 30x — Return on energy
E 6.9 — gCO2 / kWh
E 84.5% — Recyclability
S 7 — Injuries / M working h
S 1427 — ecotoxicity potential (mg DCB-e / kWh)

SOLAR

- **Energy Management**
- **Waste and Waste Water Management**
- **Hazardous Materials Management**
- **Lifecycle impacts of products and services**
  - Products that are able to be recycled
  - End of life material recovered
- **Materials sourcing**
  - Tungsten, Tin, Tantalum, and gold sourcing
  - Conflict materials

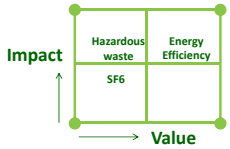
Solar will be the largest component of EGPNA's purchases in the coming years



S 1.2 — Injuries / M working h
E 348 — Energy MWh/MW
E 225 — Tons of CO2 / MW
E 88% — Recyclability

ELECTRICAL EQUIPMENT

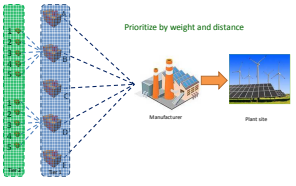
- **Energy Management**
  - Target suppliers with increased % of renewable energy in electricity use.
  - Favor suppliers that have transformers with technologies for load loss reductions.
- **Waste and Hazardous Materials Management**
  - Explore switchgear suppliers that develop insulation fluids other than SF6.
- **Lifecycle impacts of products and services**
  - Target suppliers with comprehensive recycling and waste management policies.
  - Target suppliers that have programs in place for reclamation of GIS switchgears at end of life.
- **Product Safety**
- **Materials sourcing**
- **Business Ethics and Competition**



E 400 — Transf. Energy losses MWh/ MVA
E 0.1% — GIS SF6 Losses
E 90% — Recyclability

TRANSPORTATION

- **CO2 emissions framework**
  - Determine the top components by weight
  - Determine emissions by multiplying number of units, weight, distance and emissions factor for each mode of transportation.



GOVERNANCE

G — LEADERSHIP
- ✓ UN Global Compact
- ✓ Employee Code of Conduct
- ✓ Business Partner Code of Conduct

G — ETHICS
- ✓ World Economic Forum's Partnering Against Corruption Initiative
- ✓ Bribery Risk Assessment

G — REPORTING
- ✓ Carbon Disclosure Project
- ✓ Life Cycle Assessment
- ✓ Supplier audit

NEXT STEPS

1. **Break down into components** each of the categories analyzed (Wind, Solar, Electrical Components).
2. For each component, **create benchmark scorecards**, derived from the scorecards provided in this project.
3. **Assess suppliers** in regard to the key indicators and hotspots identified, using the scorecards.
4. Use the assessment for purchasing decisions, and **collaborate with suppliers** to improve the metrics.

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