ENERGY AND BIODIVERSITY

TECHNICAL DOCUMENTS

LIFE Institute is making available a ***Series of Technical Documents***, one of them is titled ***Energy and Biodiversity***.

ENERGY AND BIODIVERSITY

The energy consumed by a company may come from different energy sources. The use of each one of these sources presents different impacts on both ecosystem processes and biodiversity. In order to assess the impact of the use of one or more energy sources by an organization, the complete cycle of 15 different energy sources was analyzed, from its extraction to end use.

THE STEP BY STEP OF THE ENERGY USE IMPACT MATRIX

- **STRUCTURING** of the matrix
- **IDENTIFYING** energy sources
- **REVIEW** of the environmental impacts by the energy sources
- **INDIVIDUAL ANALYSIS** of each energy source
- **COMPARATIVE MATRIX** of impacts among energy sources

STRUCTURING
THE MATRIX

In order to allow the *quantifying* and *ranking* of the impacts from different energy sources, a comparative matrix of the impacts was structured, adapted from the ***Leopold Matrix***, taking into account the ***generating action*** and ***severity***.

GENERATING ACTION the action in each phase of the energy chain, responsible for the generation of impacts

SEVERITY of the impacts in each generating action
(magnitude and reversibility)

- It assesses the ability of returning to the original environmental conditions after the action is carried out
- It evaluates the degree of de-characterization of the environmental component when it is exposed to the impact

ASSESSEMENT ENVIRONMENTAL ASPECTS

Biota

Water

Air

Soil

PHASES OF THE CHAIN OF THE ENERGETIC

Extraction ❯ Processing ❯ Conversion ❯ Storing ❯ Final use of the energy

IDENTIFICATION
OF ENERGY SOURCES

Identification of 15 energy sources:

1. Bio-fuel (alcohol)
2. Bio-fuel (oils and biodiesel)
3. Biogas
4. Biomass (firewood)
5. Biomass (residual)
6. Coal
7. Seawater
8. Wind
9. Natural gas
10. Geothermic
11. Hydroelectric
12. Non-renewable residues
13. Nuclear
14. Crude oil and oil products
15. Solar

STUDIES
OF THE ENVIRONMENTAL IMPACTS BY THE ENERGY SOURCES

An extensive literature review was carried out to identify the potential impacts by generating actions during the phases of the chain of each energy source.

INDIVIDUAL ANALYSIS
OF EACH ENERGY SOURCE

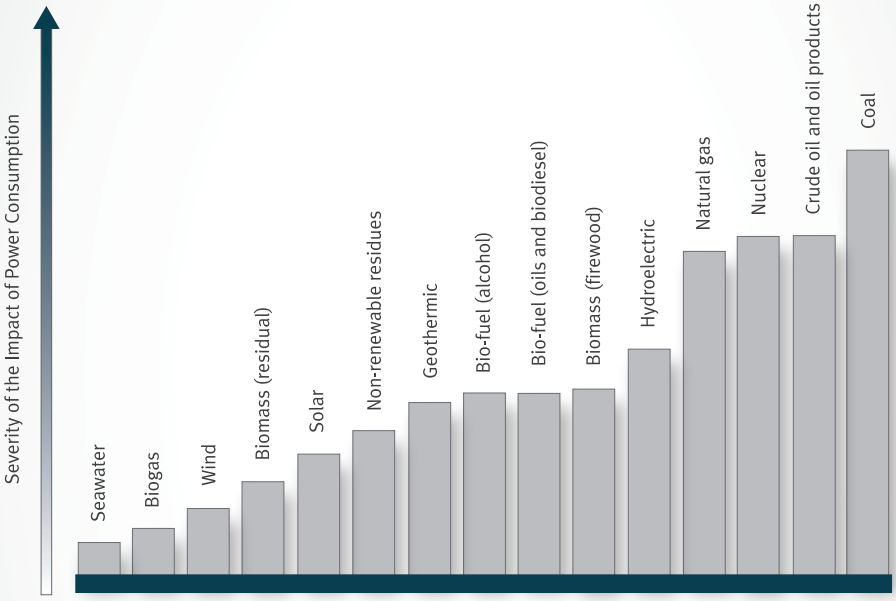
- The matrix developed was used to ***assess the environmental impact*** of each of the 15 identified energy sources;
- An impact value was ***attributed to each energy source*** based on the analysis of all the phases of the power generation process;
- ***The assessment and comparison of impacts*** among energy sources were achieved, taking into account the ***greater or lesser severity*** in the different phases of their production chain;
- **RESULT:** Fifteen matrices for assessment of environmental impacts.

COMPONENT	ENVIRONMENTAL ASPECT	ENVIRONMENTAL IMPACT
WATER	Water use and/or consumption	Change in water availability
	Effluents generation	Change in water quality
AIR	Greenhouse gases emissions	Contribution to increased climate warming
	Atmospheric emissions	Change in air quality
	Noise emissions	Change in noise levels
SOIL	Soil movement	Intensified siltation processes
		Intensified erosion processes
		Generation of induced earthquakes
	Soil occupation	Landscape and land use change
	Generation of waste	Change in soil quality
BIOTA	Occupation of areas	Habitat change and/or decrease
	Effluents and solid waste generation; atmospheric emissions	Structural and/or functional changes in ecosystems

COMPARATIVE MATRIX

OF IMPACTS AMONG ENERGY SOURCES

The fifteen energy matrices generated by the sources were consolidated into a single matrix, allowing that a comparison was made among them and a value was defined for the severity of the impact of power consumption.



You can read the Technical Document Energy and Biodiversity on the website www.institutolife.org or using the QR code

YOU CAN ACCESS THE TECHNICAL DOCUMENT SERIES ON LIFE INSTITUTE WEBSITE

LIFE Certification

Lasting Initiative For Earth

LIFE Certification is an effective tool, with third-party audit, that evaluates the inclusion of biodiversity in a transversal way to the organization's environmental management. LIFE Certification also assesses biodiversity conservation actions that are carried out voluntarily. It is an International Certification system that acknowledges businesses that employ pro-biodiversity strategies thus contributing to global solutions for the maintenance of natural capital.

Certification focused on Biodiversity and Ecosystem Services. Based on it, organizations are able to measure and disclose their results in regards to biodiversity performance.
LIFE Certified organizations differentiate themselves from their competition, thus promoting their pro-diversity reputation.

Photos: Shutterstock

life
Lasting Initiative For Earth

LIFE INSTITUTE

is responsible for the development and management of LIFE Certification

www.***institutolife***.org

Curitiba - Paraná - Brasil
life@institutolife.org
+55 (41) 3253-7884

LIFE Institute