



Universidad Nacional Autónoma de México

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Researcher

Engineering Institute

- Founded in **1551**.
- **349,515** students and **40,578** teachers, researchers and technicians





I. General information

Restructure of the energy policy

Mexico adopted the concept of **energy security** based on the wellbeing of the Mexican society.

Mexico signed the **Paris Agreement**, adopting a commitment of diminishing in 22% the GHG emissions for 2030.

- Opens the possibility to promote its abundant renewable energy potential.
- Fostering the research and technical development, according to the national resources availability and socio-economics characteristics of Mexico
- Create 5 Mexican **Centers for Innovation in Energy (CEMIEs)**: wind, solar, geothermal, oceanic and biomass. Each one of the CEMIEs join until 500 national and international experts and 35 institutions.
- **UNAM is a relevant actor and leader in all the CEMIEs**

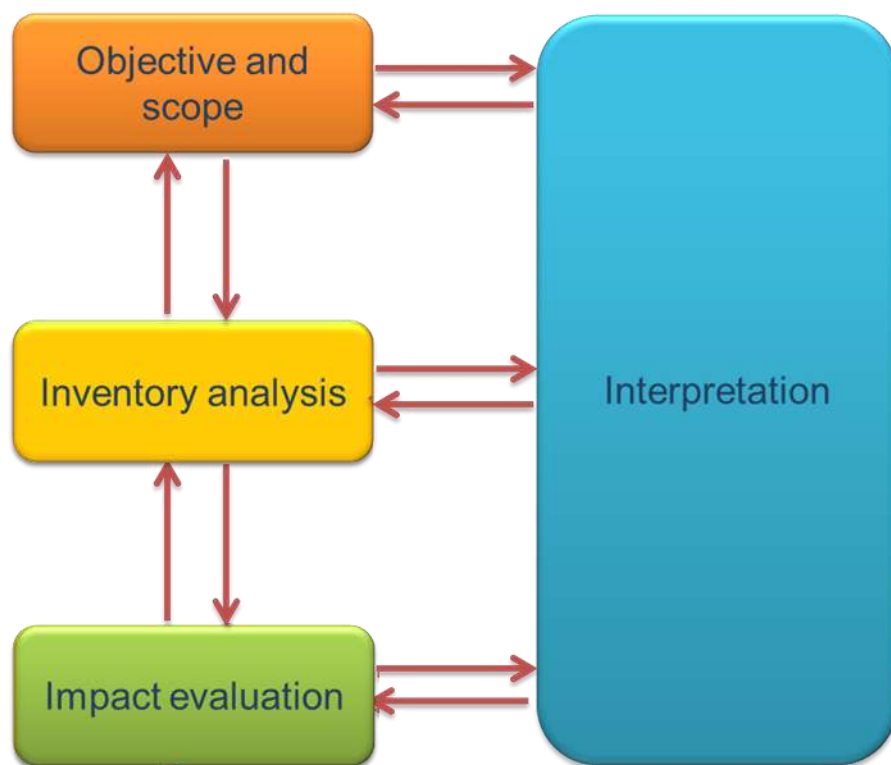
Renewable energy reduces GHG emissions and the fossil fuel consumption.

It generates possible environmental impacts associated with each of the life-cycle stages of energy

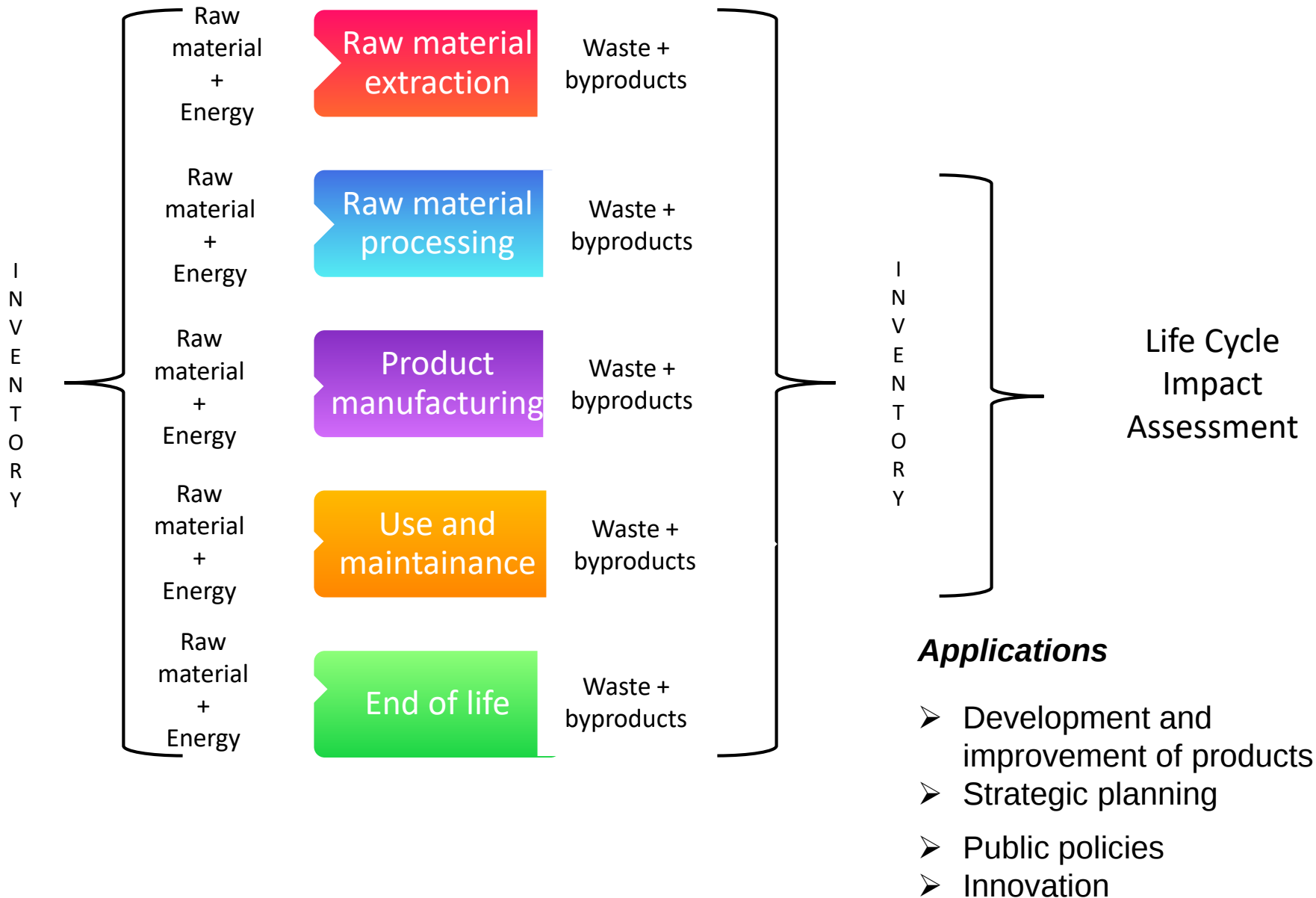
The development of renewable energy technologies requires robust information to allow responsible decision-making in terms of sustainability.

Life Cycle Assessment

LCA structure



The Life Cycle Assessment is a methodological tool that evaluates the potential environmental impacts associated with a product or service, from the extraction of raw materials to its final disposal, taking into account all the means involved (air, water and soil).





Ocean energy

Waves



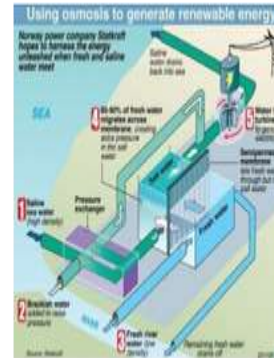
Tidal



Thermal
gradient



Salinity
gradient



Ocean
currents



Ocean wind





SENER
SECRETARÍA DE ENERGÍA



CLÚSTER
BIOCOMBUSTIBLES GASEOSOS

CONACYT
Consejo Nacional de Ciencia y Tecnología

Energy from biogas

Organic waste



Sludge from wastewater
treatment systems



Bagasse of Agave Tequilero



CEMIE - Geothermal energy

CEMIE - Solar energy

CEMIE - Wind energy

Biodiesel

Bioturbosine

Inorganic waste as fuel in cement kilns

Undergraduate Degrees

Renewable Energy Engineering
Petroleum Engineering

Master and Doctoral Programs

Earth Sciences
Physical Sciences
Environmental Engineering
Renewable Energy Engineering
Sustainability Sciences

Academic Bodies

Faculty of Sciences
Faculty of Engineering
Faculty of Economics
Social Sciences Research Institute
Engineering Institute
Physics Institute
Renewable Energies Institute



CONGRESO
DE INGENIERÍA, CIENCIA
Y GESTIÓN AMBIENTAL
AMICA



5th International
Conference
of Greening
of Industry
Network

*Environment and Governance:
Innovation 4.0 towards Sustainability*

2019
October 28, 29 and 30
Instituto de Ingeniería, UNAM
Mexico City



Walmart
México y Centroamérica

**UNIVERSITY
OF TWENTE**

**Tecnológico
de Monterrey**

Thank you!

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SDI SECRETARÍA DE
DESARROLLO
INSTITUCIONAL

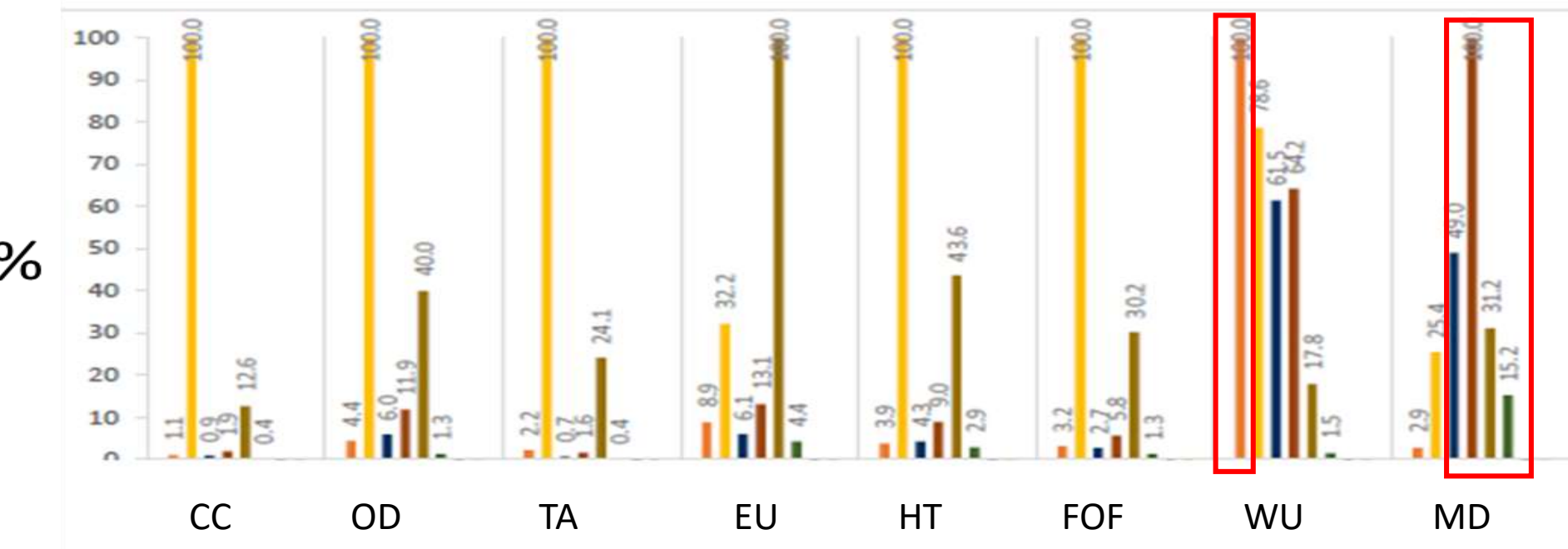
<http://www.sdi.unam.mx>





- It is **national**
- It is **self-governing**
- It is **public**
- It privileges **equity & plurality**
- It provides higher education for **students of low income families**
- It is **laic**

Preliminary results



Biogas from bagasse of Tequila Agave

Conventional (Mexican mix of fuels)

Waves (Buoy with mechanical arm and storage in mini-hydro pumping)

Waves (Buoy in platform and storage in mini-hydro pumping)

Waves (Buoy with mechanical arm and storage in batteries)

Waves (Buoy in platform and storage in batteries)

Waves
(different devices
based on
buoys)