

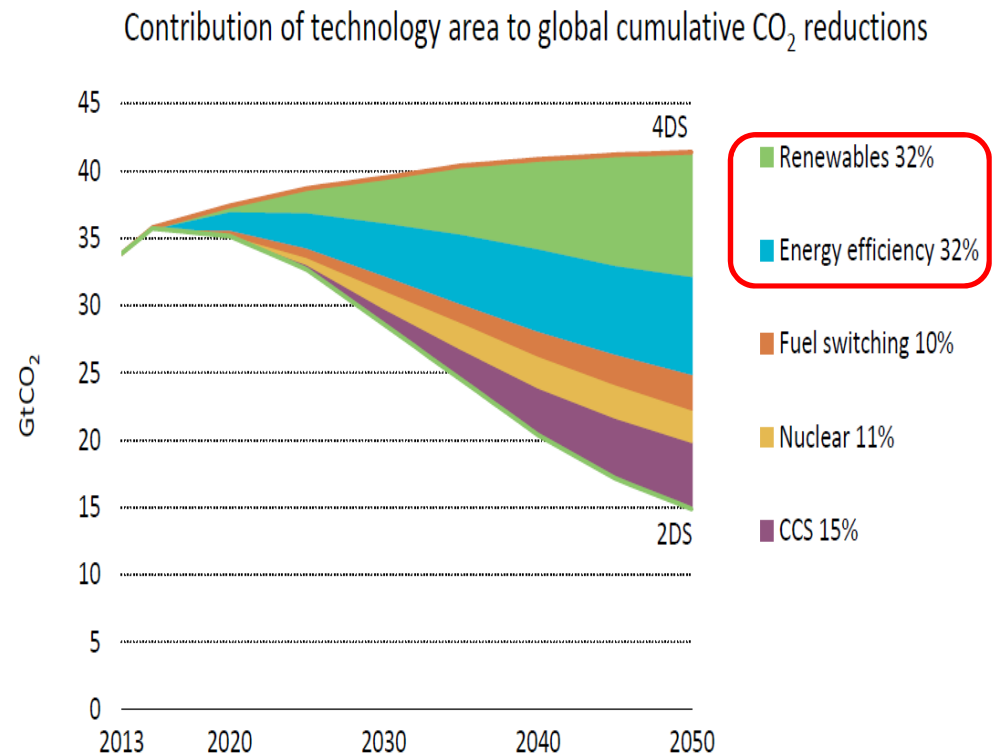
Clean Energy Innovation in Mexico

MEXICAN INNOVATION CENTERS FOR CLEAN ENERGY (CEMIES)

30 / mayo / 2017

DECARBONIZATION OF THE GLOBAL ENERGY SYSTEM

- COMMON CHALLENGES: THE 3 'E'S OF ENERGY SECURITY, ECONOMIC GROWTH AND ENVIRONMENTAL SUSTAINABILITY
- COP21 PARIS AGREEMENT (2015) TO LIMIT GLOBAL TEMPERATURE INCREASE **BELOW 2 °C**
- **MISSION INNOVATION** IS A MULTILATERAL INITIATIVE THAT AIMS TO ACHIEVE GLOBAL **CLEAN ENERGY TECHNOLOGY PERFORMANCE** BREAKTHROUGHS AND COST REDUCTIONS.



Source: IEA/OECD (ETP, 2016)

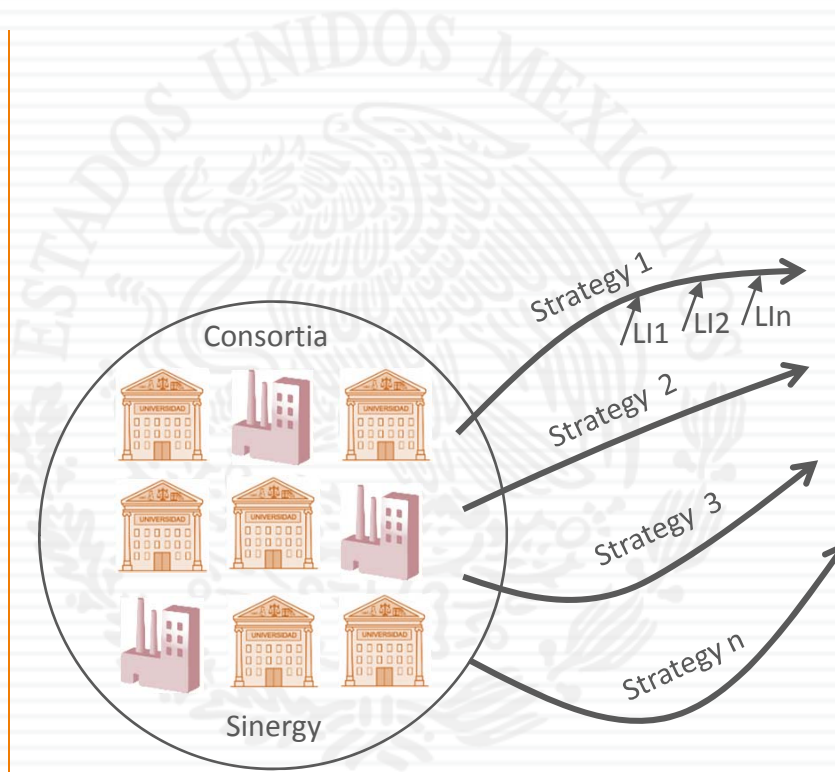
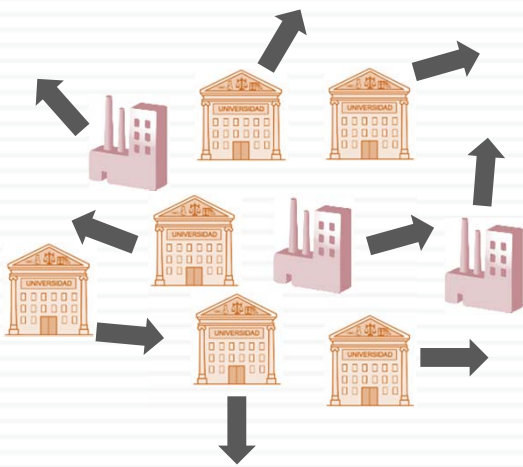
ENERGY INNOVATION SYSTEM



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

PREVIOUS
CONTEXT

CEMIES CREATION



- State of the art
- Technology based products and services



- Specialized human resources
- Specialized infrastructure



MEXICAN INNOVATION CENTRES FOR CLEAN ENERGY (CEMIEs)

IN OPERATION



Solar CEMIE
(IER, 16 entities)

Ocean CEMIE
(1 Consortia > 50
institutions)



Geothermal CEMIE
(CICESE, 6 entities)

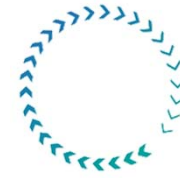
Bioenergy CEMIE
(5 clusters)



Wind CEMIE
(INEEL, 6 entities)

**Current total Investment of
> 170 million USD + New
Smart Grids CEMIE**

CEMIE-GEO



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

- Consortia Led by CONACYT Research Centre (CICESE), in Baja California State.
- There are 22 members between academia, industry and international partners. In its third year of operation.
- Strategic research lines:
 - Evaluation of national geothermal resources
 - Research and technological developments for exploitation
 - Direct uses of geothermal heat



Main contact:

Technical representative: Dr. José Manuel Romo Jones (jromo@cicese.mx)

CEMIE-SOL



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

- Consortia Led by the Institute for Renewable Energy (IER) at UNAM.
- There are 43 members between academia, industry and international partners.
- Strategic research lines:
 - Heat for electricity
 - Heat for processing
 - Solar cells
 - Solar fuels
 - Inventories
 - Laboratories
 - Photovoltaic modules



Main Contact:

Technical representative: Dr. Jesús Antonio del Río Portilla (arp@ier.unam.mx)

CEMIE-EÓLICO



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

- Consortia Led by the National Institute for Electricity and Clean Energy (INEEL), with other 32 members between academia, industry and international partners .
- Strategic research lines:
 - Available wind resource
 - Materials and coatings
 - Aerodynamics
 - Applications of artificial intelligence and mechatronics
 - Power Storage
 - Integration of wind technologies into the grid



Main contact

Technical representative: Dr. José Manuel Franco Nava (jmfranco@iie.org.mx)

CEMIE-BIO



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

- Started operations in 2016 and its led by the Instituto Potosino de Investigación Científica y Tecnológica (IPICYT).
- It is integrated through 5 thematic clusters: Biogas, Bioalcohol, Solid Biofuels, Bio Jetfuel and Biodiesel.



Bioalcoholes

Technical representative: Dr. Arturo del Sagrado Corazón Sánchez Carmona (arturo@gdl.cinvestav.mx)

Biodiesel

Technical representative : Dra. Georgina Coral Sandoval Fabián (gsandoval@ciatej.mx)

Bioturbosina

Technical representative: Dr. David Ríos Jara (david.rios@ipicyt.edu.mx)

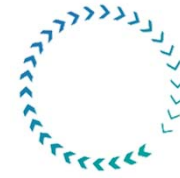
Biosolidos

Technical representative: Dr. Omar Raúl Masera Cerutti (omasera@gmail.com)

Biogas

Technical representative: Dr. Elías Razo Flores (erazo@ipicyt.edu.mx)

CEMIE-OCÉANO



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

- Consortia led by the Engineering Institute (IINGEN) at UNAM, with other 44 members between academia, industry and international partners.
- Started operations in 2016.
- Strategic research lines:
 - Thermal gradient
 - Saline gradient
 - Wave energy
 - Currents and tidal power



Main Contact:

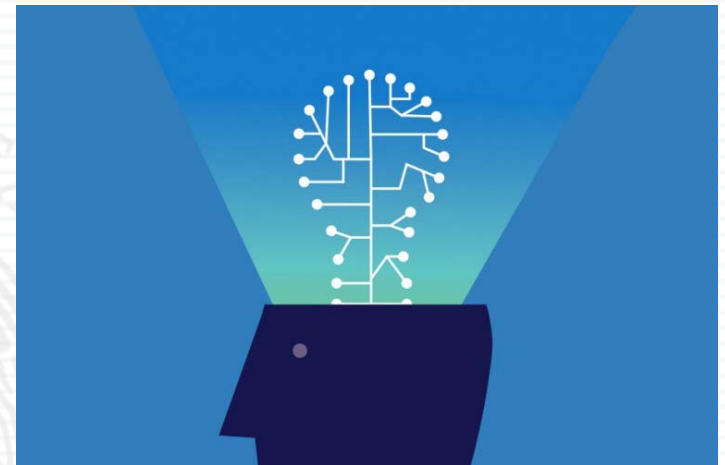
Technical representative: Dr. Rodolfo Silva Casarín (rsilvac@iingen.unam.mx)

CEMIE SMART GRIDS



FONDO
DE SUSTENTABILIDAD
ENERGÉTICA

- Consortia led by Universidad Michocana de San Nicolás de Hidalgo.
- To start in July 2017
- Strategic research lines:
 - Integration of distributed and renewable generation
 - Management and improvement applications in the distribution and transmission network.
 - Advanced measurement infrastructure



Contacto:

Technical representative: Dra. Elisa Espinosa Juárez (eejuarez@umich.mx)

THANK YOU!

esantoyo@energia.gob.mx