Geothermal in Mexico
Population 112 million

384 cities

72% of population living in cities

25 million vehicles (gasoline & diesel)

2010

Population 130 million

489 cities

88% of population living in cities

.3 million vehicles (gasoline & diesel)

2027

Diagnosis
Geothermal Potential - 13.4 GWe (Generation)

Top 6 Countries installed capacity:

<table>
<thead>
<tr>
<th>Country</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>3,450</td>
</tr>
<tr>
<td>Philipp.</td>
<td>1,187</td>
</tr>
<tr>
<td>Indones.</td>
<td>1,340</td>
</tr>
<tr>
<td>New.</td>
<td>1,005</td>
</tr>
<tr>
<td>Italy</td>
<td>916</td>
</tr>
<tr>
<td>Mexico</td>
<td>899</td>
</tr>
</tbody>
</table>

Proved Reserves: 264 MW
Probable Reserves: 5,730 MW
Possible Reserves: 7,422 MW
On December 20th, 2013, Mexico amended the Constitutional provisions related to energy (first time in 60 years).

- Private investment in Generation is allowed.
- CENACE, an independent system operator, implemented a competitive Electricity Market.
- CFE became an energy company with financial and operational autonomy, and freedom to form partnerships.
- CFE was divided in 6 different companies.
- Regulators were strengthened.

The new Geothermal Energy Law provides legal certainty to investors.
### New Electrical Market

- CENACE, Independent operator (Nov)
- Interconnection Criteria (Dec)

### Clean Energy Certificates (CELS)

- Guidelines published (Oct)
- CELs Requirement for 2018 5%
  - Round Zero, granted CFE 13 areas for exploration and 5 areas to exploitation
  - First area was granted to a private company for exploitation
  - Two areas were granted to private companies for exploration

### Geothermal

- Guidelines published (Oct)
- CELs Requirement for 2019 5.8%
  - Six additional areas were granted for exploration

### Wholesale Market

- Guidelines (Feb)
  - National System Development Program (July)
  - Electronic System Trials (Oct)

### 2016

- Wholesale Market Operation (Jan)
Outcomes of the Geothermal Energy Law

Before the Reform:
Only 4 geothermal fields exploited by CFE

After the Reform:
Two new geothermal fields exploited by CFE
21 geothermal areas explored by CFE, DRAGÓN, and ENAL
Process to invest in geothermal in Mexico

1. SENER’s Exploration Permit
   - 3 years, renewable once
   - Up to 150 km²
   - The process is resolved in 45 days

2. CONAGUA’s Drilling Permit
   - This permit is aimed to drill wells, and is given for a certain number of wells
   - 30 years, renewable
   - Up to 150 km²
   - The process is resolved in 30 days

3. SENER’s Exploitation Concession
   - 30 years, renewable
   - The process is resolved in 30 days

4. CONAGUA’s Exploitation of Geothermal Waters Concession
   - 30 years, renewable
   - The process is resolved in 30 days

In May, 2017, these procedures will be available online through the SENER platform.
Phase 1 - Insurance Part I

Drilling up to 2 exploratory wells

> 3MW per well

No → Ok

Subsidy payment

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Phase 1 - Insurance Part II

Drilling up to 2 exploratory wells

> 3MW per well

No → Ok

Subsidy payment

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Phase 2 - Financing

Drilling up to 3 producing wells

> 3MW per well

No → Ok

Subsidy payment

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Phase 3 - Financing

Construction of the geothermal power plant

Ok

Subsidy payment

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Development Bank in charge of operating the mechanism.
June 2, 2016 - GEMex was announced as winner

EU and Mexico contributed to the 20 million € project

The project will last three years

**Los Humeros - SHGS CFE’s exploitation area**
- Application of new technologies for geothermal exploration
- Development of chemical, thermodynamic and production models to solve the erosion and corrosion of deep wells

**Acoculco - EGS CFE’s exploration area**
- Application of technologies to improve production wells
- Increase the communication of the permeable zones in the reservoir
Thank you