



**ESMAP**  
Energy Sector Management Assistance Program



CLIMATE  
POLICY  
INITIATIVE



CLIMATE  
INVESTMENT  
FUNDS

 **UNEP DTU  
PARTNERSHIP**



## Geothermal Resource Risk Mitigation Mechanisms.

### GLOBAL GEOTHERMAL DEVELOPMENT PLAN – ROUNDTABLE 2

OCTOBER 23-24, 2014  
UN CITY COPENHAGEN FN BYEN, MARMORVEJ 51  
DENMARK

# Nafin Program Outcomes.

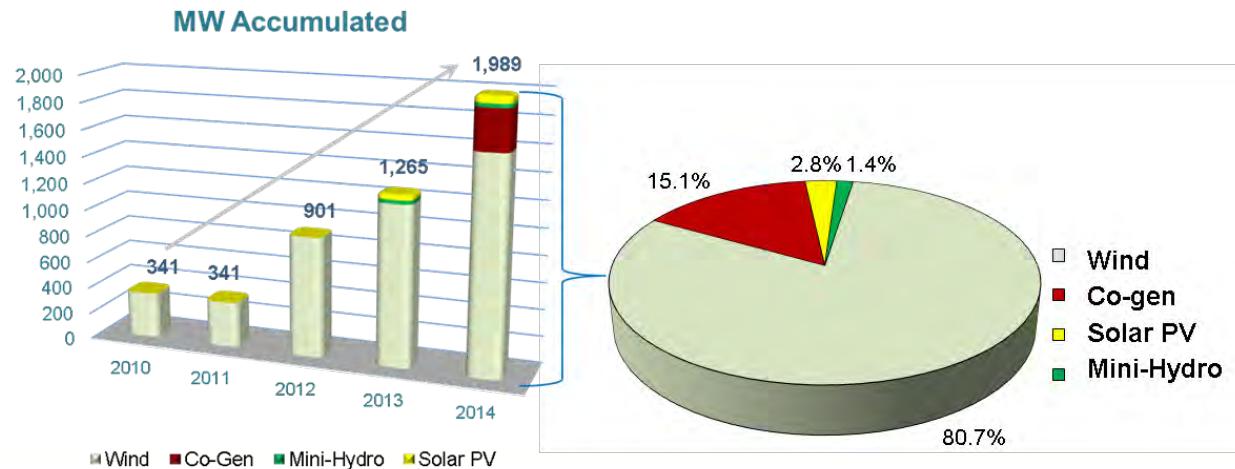
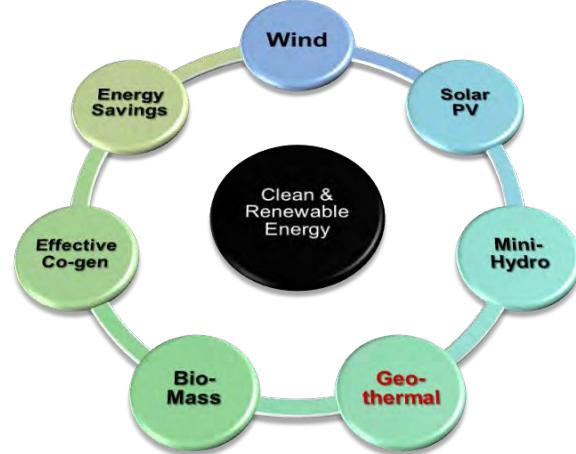


Nafin has set a credit offer for Sustainable Projects

- Focused on **large projects** (more than 30 million dollars)
- Structuring **case by case**
- In Partnership with commercial banks and international agencies (Club Deal, Syndications).

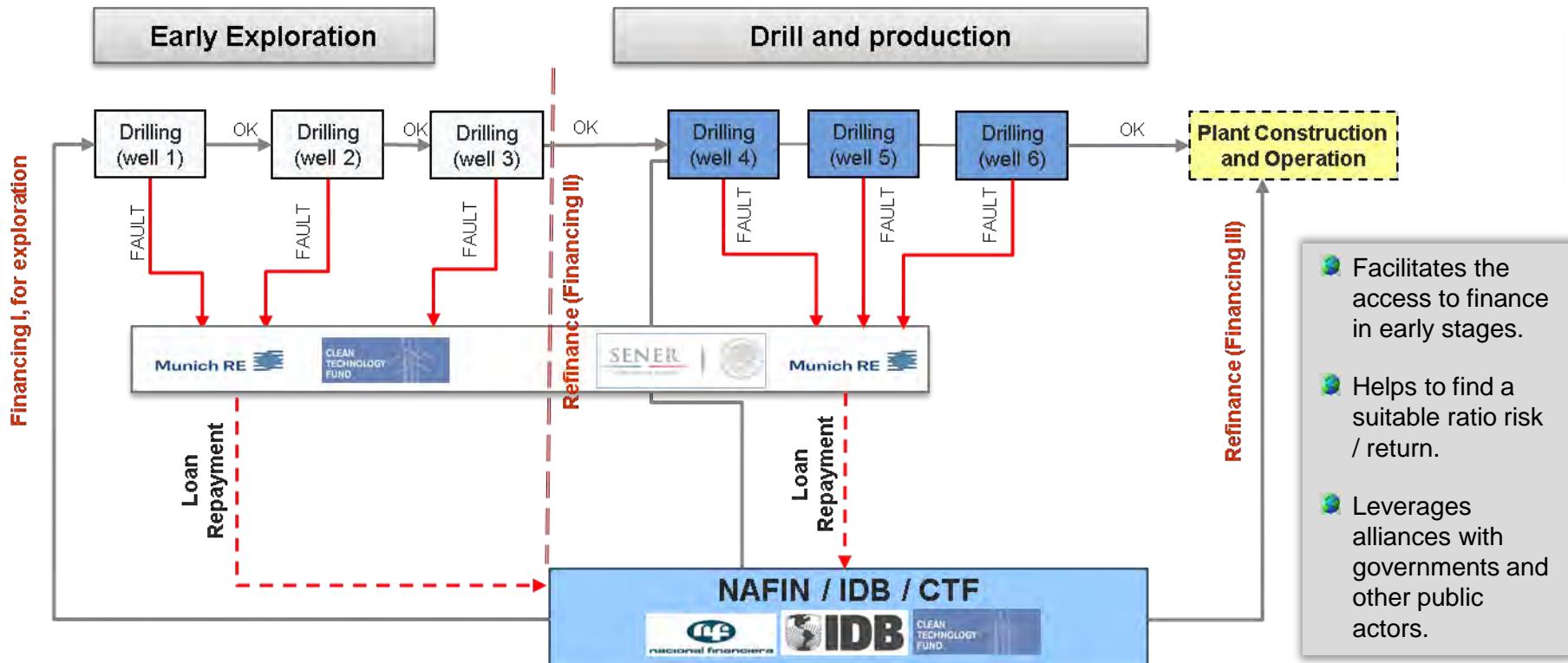
## Nafin's Portfolio Characteristics

- US\$ 5,000 millions investment Total value;
- 2 GW Installed capacity
- 4.5 Millions CO<sub>2</sub> tons emissions avoided
- US\$ 800 millions Nafin's Investment.



# Financing Geothermal Exploration Risk.

- NAFIN, CTF, IDB and SENER are working in the design and implementation of an insured financing instrument for early exploration in Geothermal Projects, where the highest risk in this technology is allocated.
- This will contribute to solve financial barriers for the development of geothermal energy projects in México.



# Main Geothermal energy fields in México.

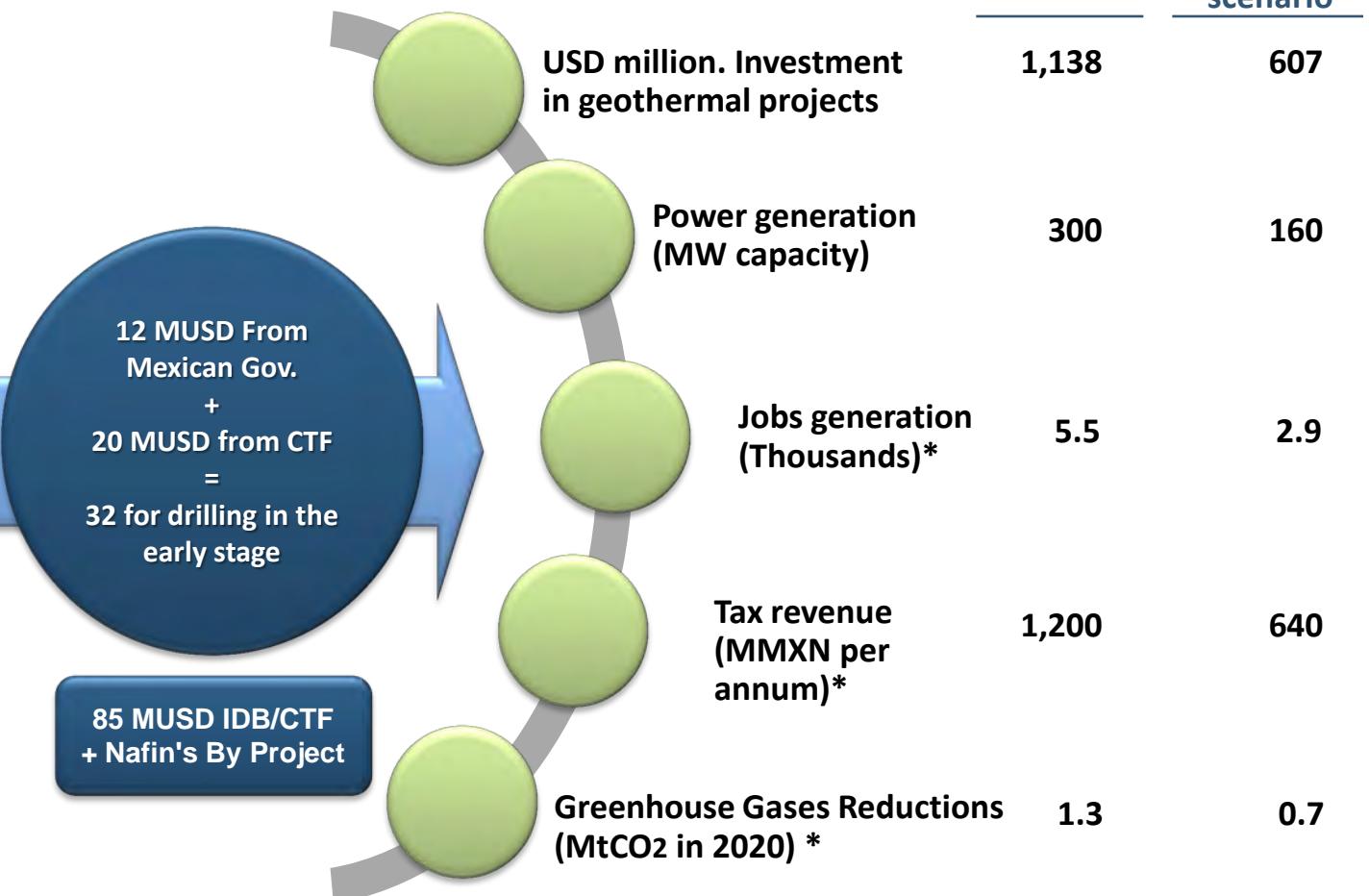
- 🔥 The **Cerro Prieto** geothermal field is one of the largest in the world and to date has installed capacity to produce **620,000 kilowatts** of electricity.
- 🔥 There are plans to increase onsite the production capacity to more than **700,000 kilowatts** in the coming years.
- 🔥 The geothermal field of **Los Azufres** has been being tested through pilot plants producing a total of **25,000 kilowatts**. It has a proven reserve of **135,000 kilowatts** and a probable reserve of **165,000 kilowatts**. It is building now in this site, a plant that will generate more than **50,000 kilowatts** of electricity.<



Other Sites	Expected temperature	Expected production capacity
Pathé (EDOMEX)	215° C	49 MW
Graben de Compostela (NAY)	225° C	110 MW
Las Planillas (JAL)	240° C	83 MW
La Soledad (JAL)	210° C	51 MW
Acoculco (PUE)	280° C	48 MW
Hervores de la Vega (JAL)	220° C	45 MW
Araró (MICH)	215° C	32 MW
Tacaná (CHIS)	250° C	52 MW
Volcán Ceboruco (NAY)	240° C	50 MW
Chiconal (CHIS)	250° C	45 MW
San Antonio el Bravo (CHIH)	215° C	36 MW
		<b>601 MW</b>

# Expected Impact of the Program.

## Simulation results

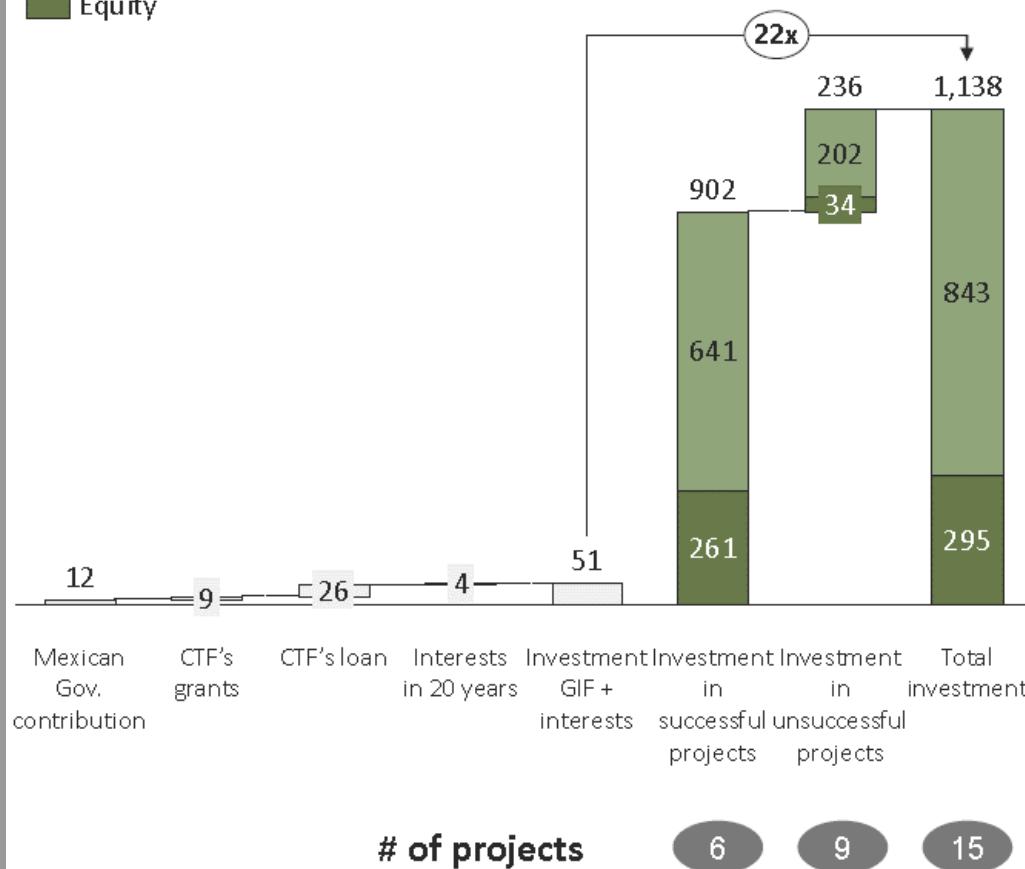


\* Estimates based on data from the document "initiative for the development of renewable energies in Mexico" SENER.

## Related investment with the fund

Millions of USD

- GIFT
- Debt
- Equity



### Simulation results

- Approximately 80% of the investment is related to successful projects
- Direct impact of FIG in successful projects:
  - 300 MW in 6 projects
  - 261 million dollars equity investment
  - 641 million de dollars related to financing geothermal projects
- 236 million dollars in equity and financing in unsuccessful exploration
- 21 million dollars of the FIG to reduced the premium cost
- Capability and additional investment in extension of successful projects is not quantified