



ESMAP
Energy Sector Management Assistance Program



CLIMATE
POLICY
INITIATIVE



CLIMATE
INVESTMENT
FUNDS

UNEP DTU
PARTNERSHIP



NACIONAL FINANCIERA



ANIVERSARIO

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.

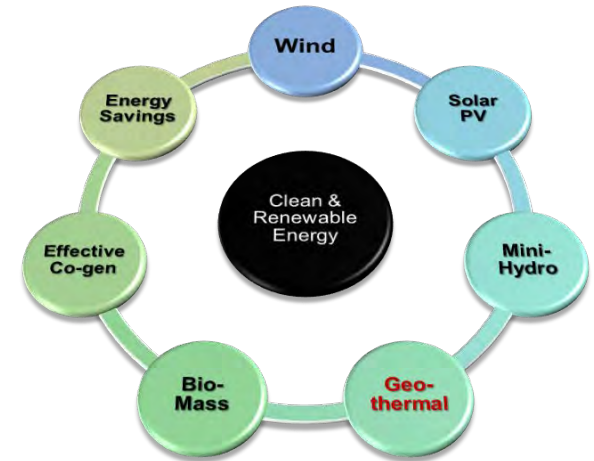


Nafin has set a credit offer for Sustainable Projects

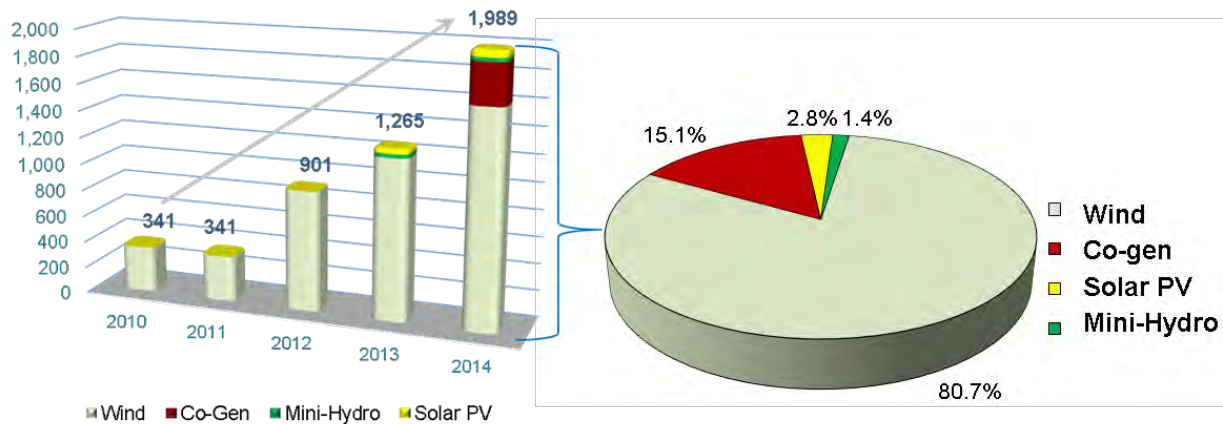
- Focused on **large projects** (more than 30 million dollars)
- Structuring **case by case**
- **In Partnership** with commercial banks and international agencies (Club Deal, Syndications).

Nafin's Portfolio Characteristics

- **US\$ 5,000** millions investment Total value;
- **2 GW** Installed capacity
- **4.5 Millions CO2 tons** emissions avoided
- **US\$ 800** millions Nafin's Investment.

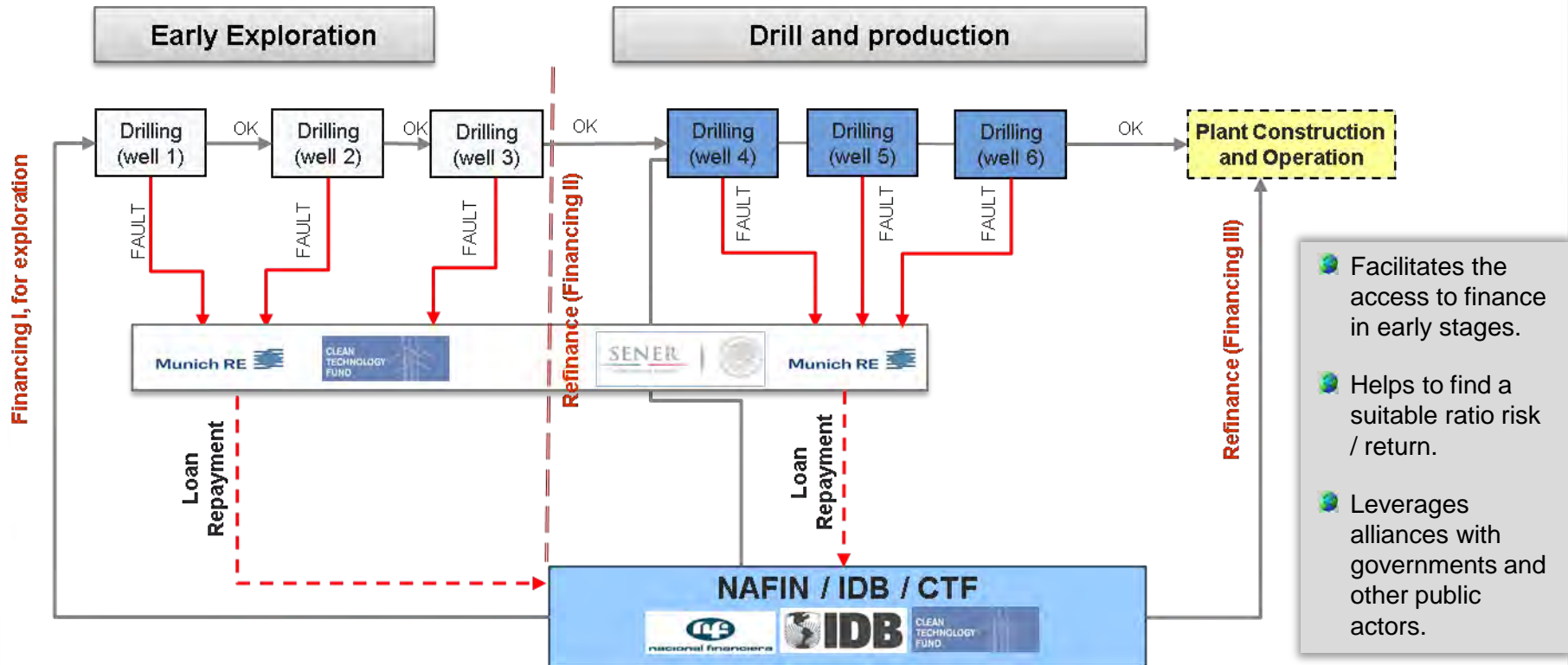
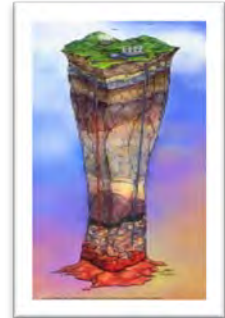


MW Accumulated



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.



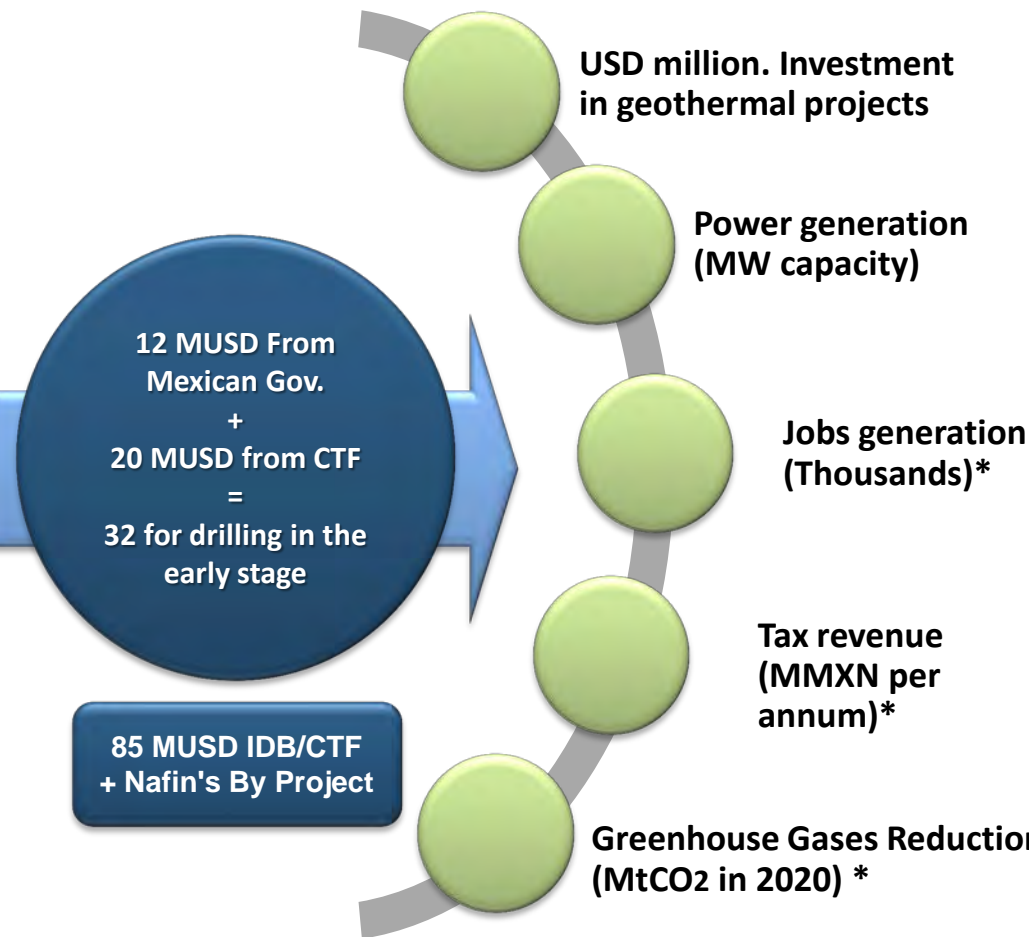
Main Geothermal energy fields in México.

- 🔥 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
Grabena de Compostela (NAY)	225° C	110 MW
Las Planillas (JAL)	240° C	83 MW
La Soledad (JAL)	210° C	51 MW
Acozulco (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
		601 MW

Expected Impact of the Program.



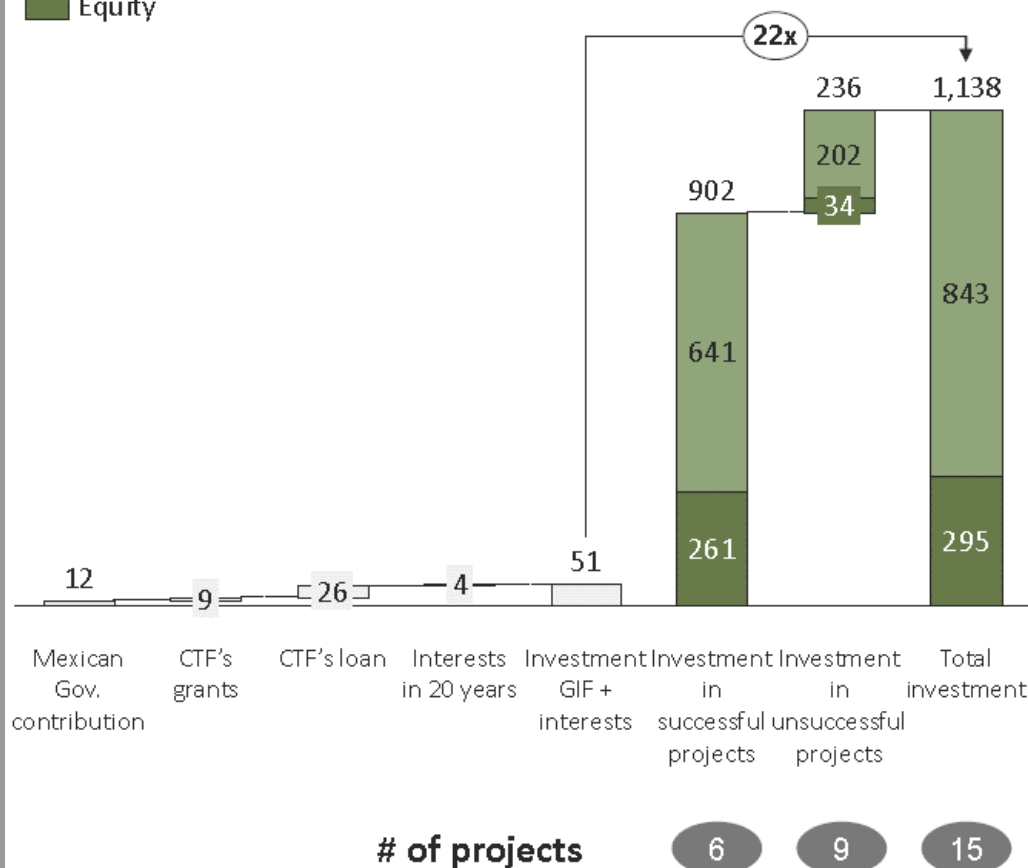
Simulation results

	Base Case	conservative scenario
USD million. Investment in geothermal projects	1,138	607
Power generation (MW capacity)	300	160
Jobs generation (Thousands)*	5.5	2.9
Tax revenue (MMXN per annum)*	1,200	640
Greenhouse Gases Reductions (MtCO2 in 2020)*	1.3	0.7

* 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



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