

The Role of Public Finance in Deploying Geothermal: Lessons from Developing countries

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Project and agenda

Study for the Climate Investment Funds (CIFs).

Focus on the **effective use of public finance** to scale up geothermal development in **developing countries**.



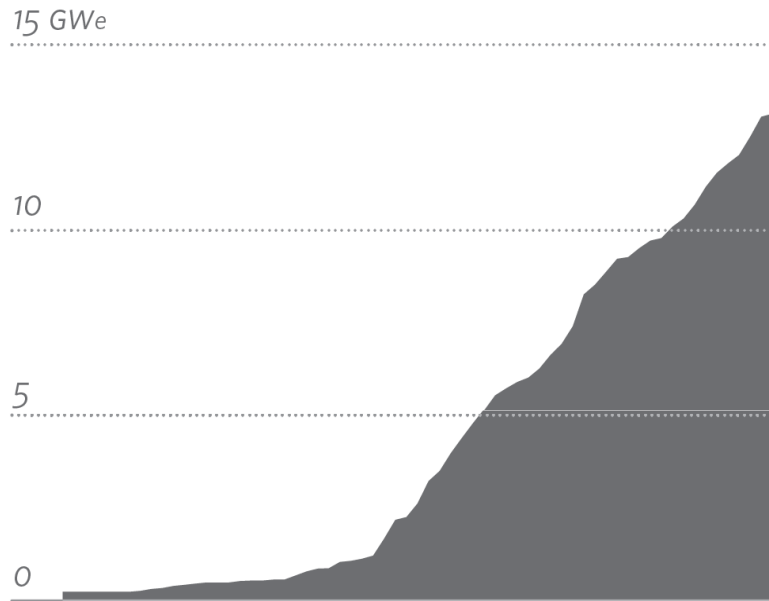
AGENDA

- Background
- Attracting private investment and managing costs
- Lessons for public institutions

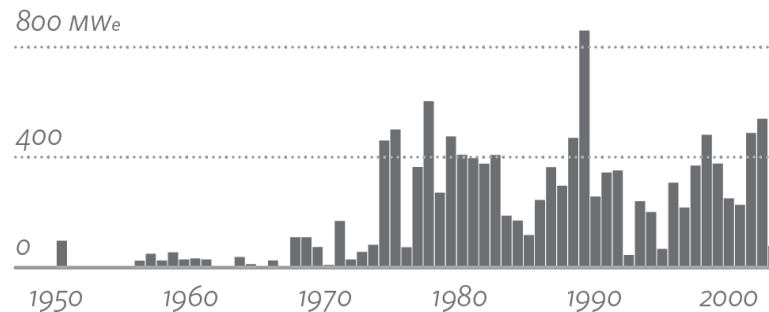
Background

Geothermal is not meeting its potential

CUMULATIVE GEOTHERMAL CAPACITY GROWTH



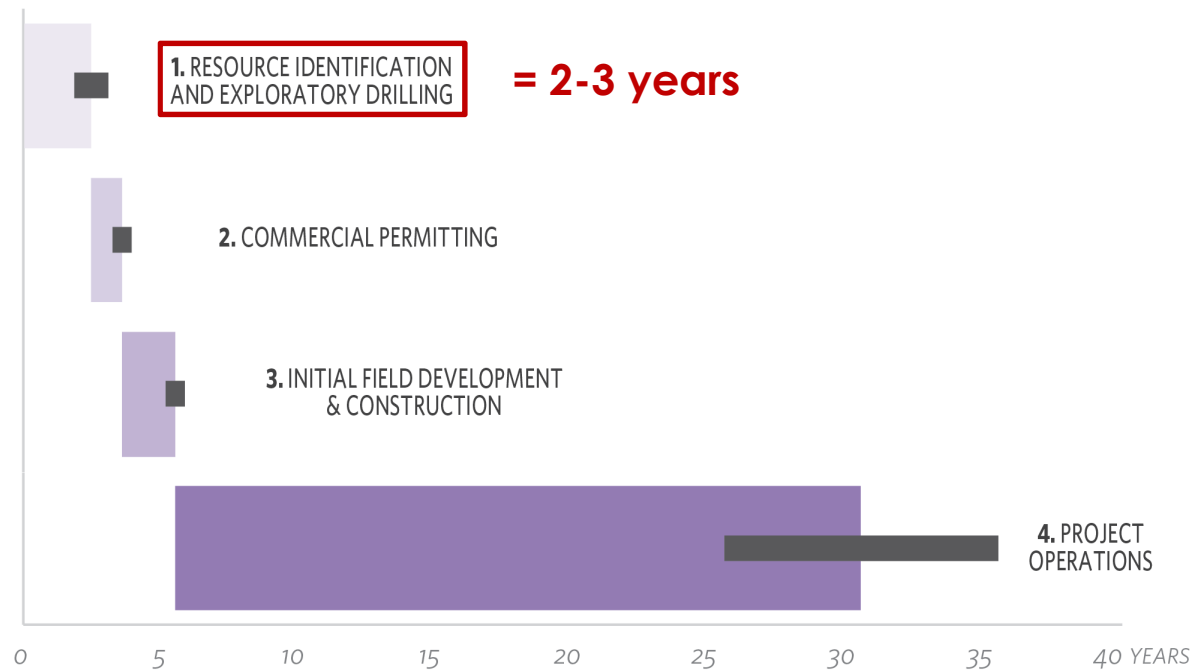
ANNUAL INSTALLED CAPACITY



Rate of geothermal deployment **lower** than **deployment needs** and other **renewables**.

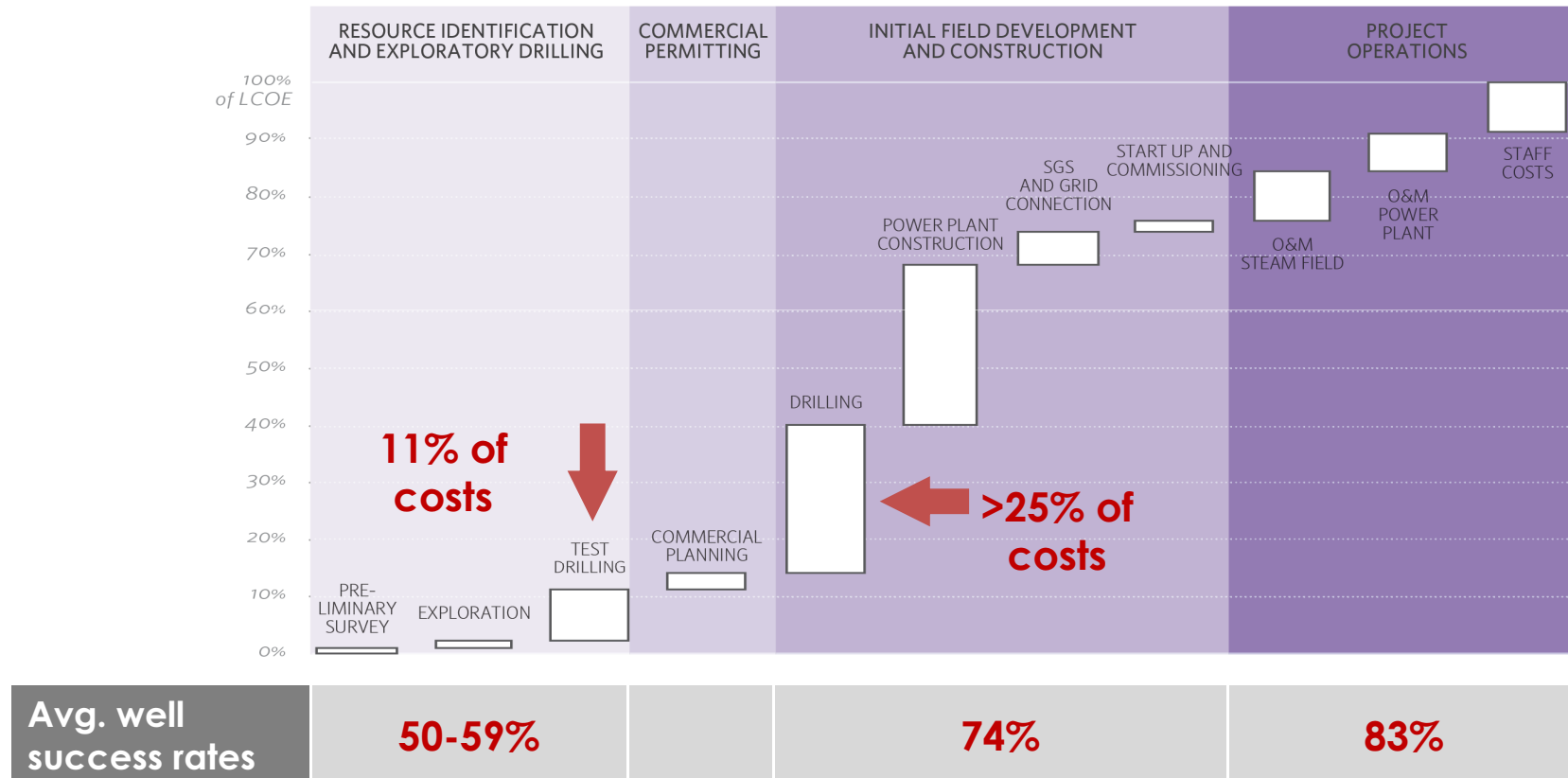
Wind and Solar now stand at **308** and **145 GW** capacity respectively Vs **13.5 GW** of geothermal power.

Development timeline longer than other energy investment alternatives



- Development of a geothermal project requires **5.5 years** on average.
- **2-3 years** of the development time is dedicated to **resource identification** and **exploratory drilling**

Resource risks high during the exploration phase and still relevant in the development phase



Attracting private investment and
managing costs

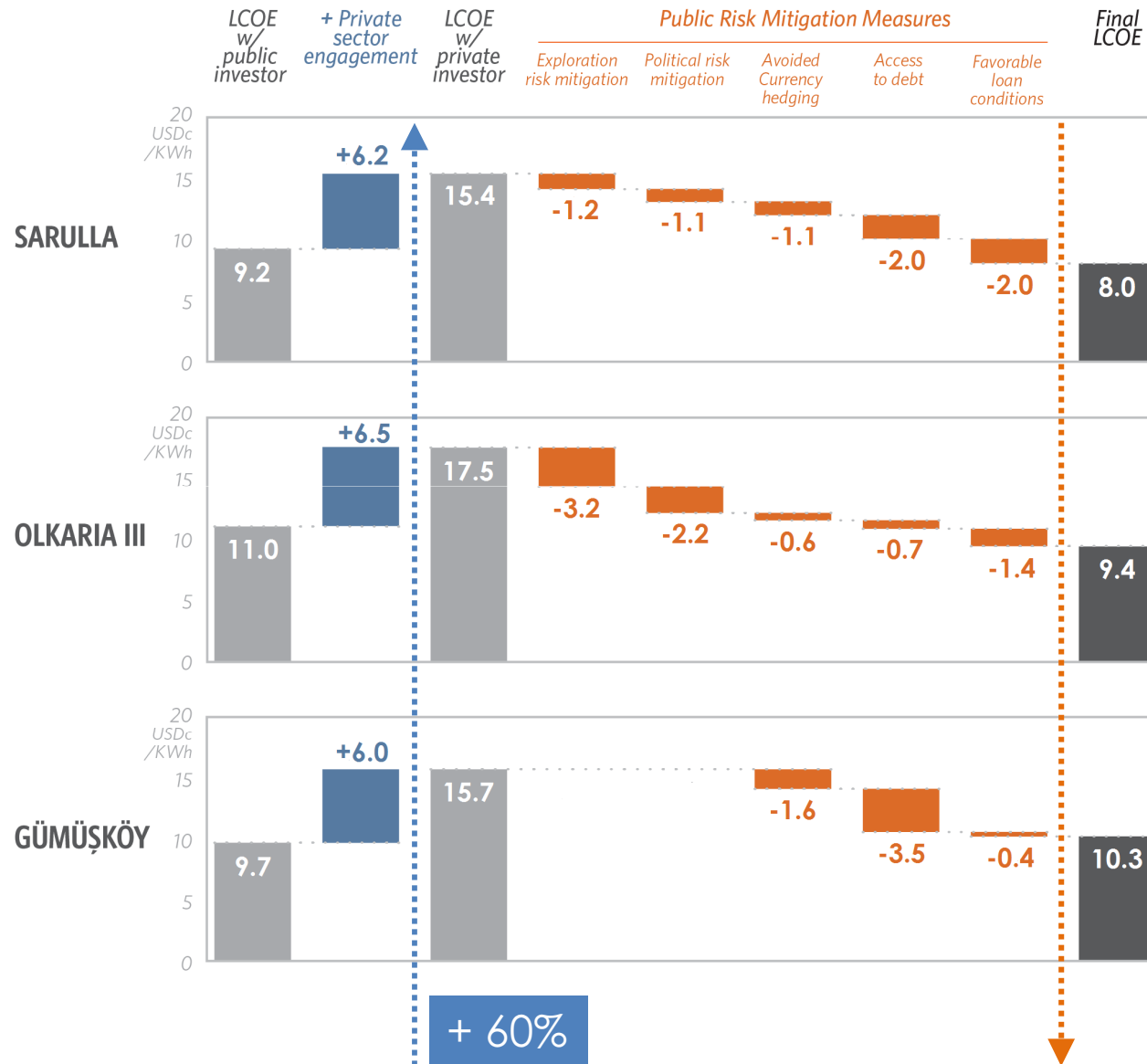
Case studies attracted significant private investment

Gümüşköy, Turkey: *The first time the private sector financed exploration of an unproven geothermal field in the country*

Olkaria III, Kenya: *The first privately-funded and developed geothermal project in Africa*

Sarulla, Indonesia: *The largest single contract geothermal power plant in the world*

Tariff increases needed to incentivize private investment can be offset by public measures



1: Provide stable and sufficient revenues

Supportive regulatory frameworks are a basic condition for growth.

FiT design can help attract private investment provided:

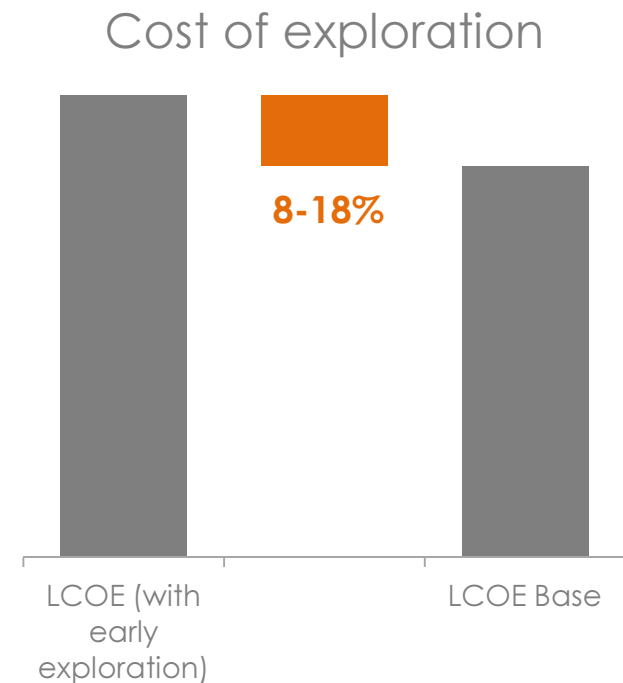
- It is aligned with the **project's lifetime** or **loan conditions** available in the local debt market.
- It shifts **revenue risks** considered most critical by the private sector to the public sector.

2: Provide exploration phase support that is appropriate to the country context

Public exploration and tendering of proven fields can be critical for attracting private investment.

Private exploration should be incentivized if:

- The private sector can manage risks at the **lowest cost**
- **Survey data** can be provided to support the exploration phase
- **Tariffs can be increased** to reflect the developer's exploration costs



3: Provide longer-term, lower-cost debt to bring down the cost of capital

Favorable loan conditions can be critical to ensure projects' **financial viability**

Access to debt is critical to free **equity resources** for further development

| | AFTER TAX EQUITY IRR | WITHOUT FAVOURABLE LOAN TERMS |
|-------------------|----------------------|-------------------------------|
| SARULLA INDONESIA | 14-16%* | 10-12% |
| OLKARIA III KENYA | 16% | 12% |
| GÜMÜSKÖY TURKEY | 16% | 15% |

4: Use risk mitigation tools and capacity building to unlock debt

Government guarantees for contractual **off-take obligations** seem to be crucial in contexts with significant off-taker risk.

DFIs' **political risk mitigation** tools can unlock additional financing and further lower the cost of capital.

DFIs can increase the **technical capacity** of private lenders and enable additional finance.

Lessons for public institutions

Lessons for public institutions

- Set **ambitious deployment** targets to send a strong signal to private developers
- **Feed-in tariffs** need to reduce private sector risks while minimizing costs to the public sector
- Facilitate centralized **data-sharing** on geothermal resources between public agencies and private developers
- Continue to rebalance support towards **earlier riskier stages** of project development
- Facilitate access to **risk guarantees** where guarantees from host-country governments are not available.

Thank you!

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