

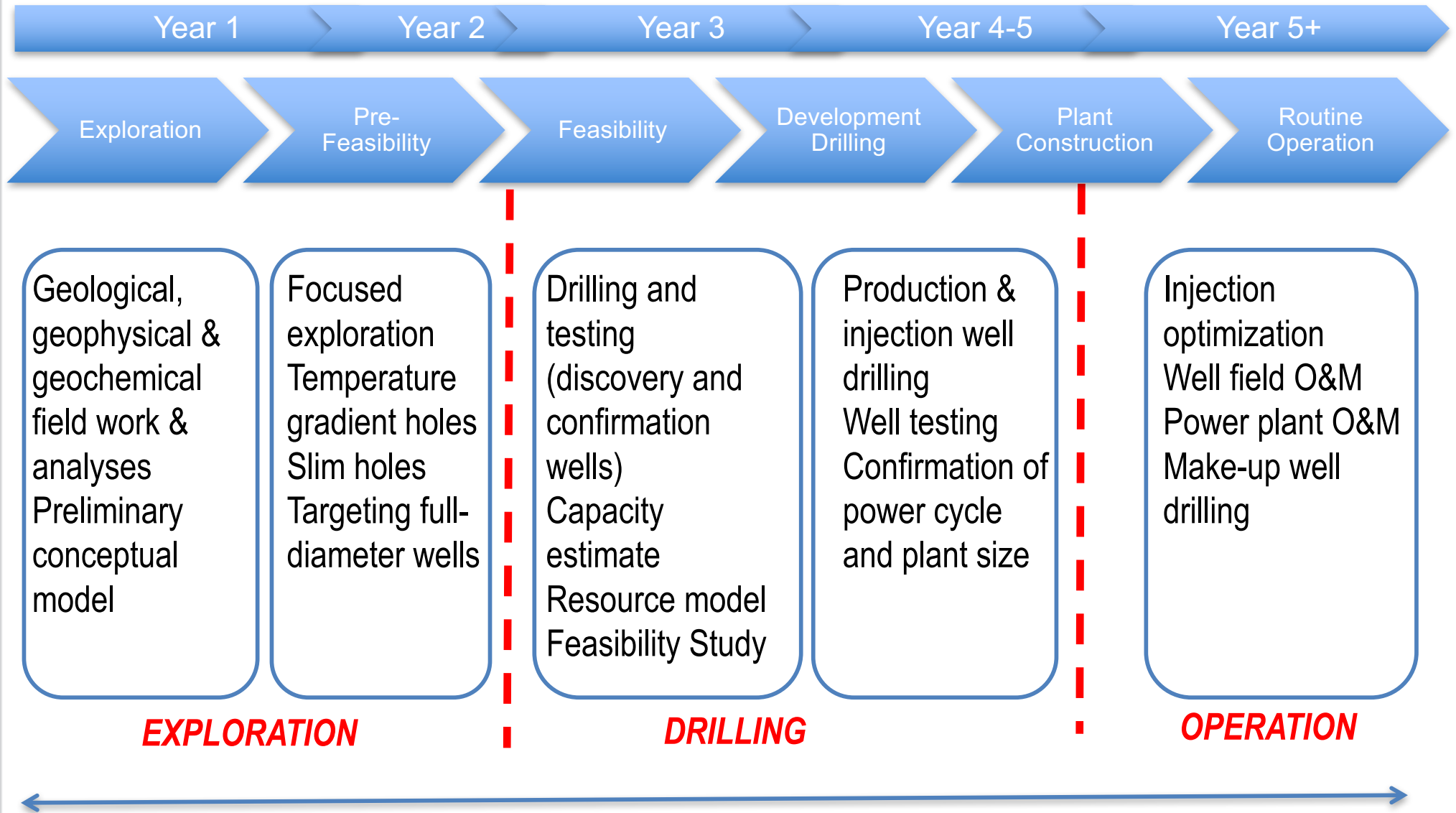
SPECIALISED INSURANCE & RISK FINANCE PRODUCTS FOR CARBON MARKETS,
CLIMATE RISKS, RENEWABLE ENERGY AND EMISSION REDUCTION PROJECTS

Geothermal Resource Insurance

IRENA – Nairobi

January 2018

Geothermal Life



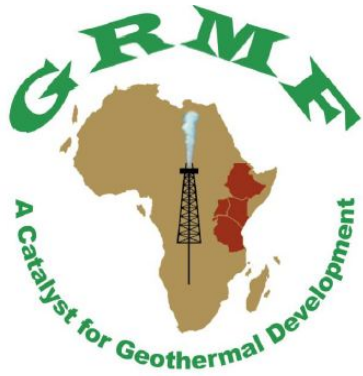
Geothermal Risks

- Resource uncertainties
 - Size and temperature
 - Where to drill, and why
 - Drilling success rate
 - Average well productivity
- Regulations
- Infrastructure / access
- Environmental and social issues
- Power price
- Creditworthiness of off-taker
- Cost of capital (equity / debt)



Time

Geothermal Risk Mitigation Schemes



KFW



Mexico GFRMP
Chile MiRiG
Caribbean



Nordic Development Fund

IRENA ADFD
Supporting Energy Transition



European Bank
for Reconstruction and Development

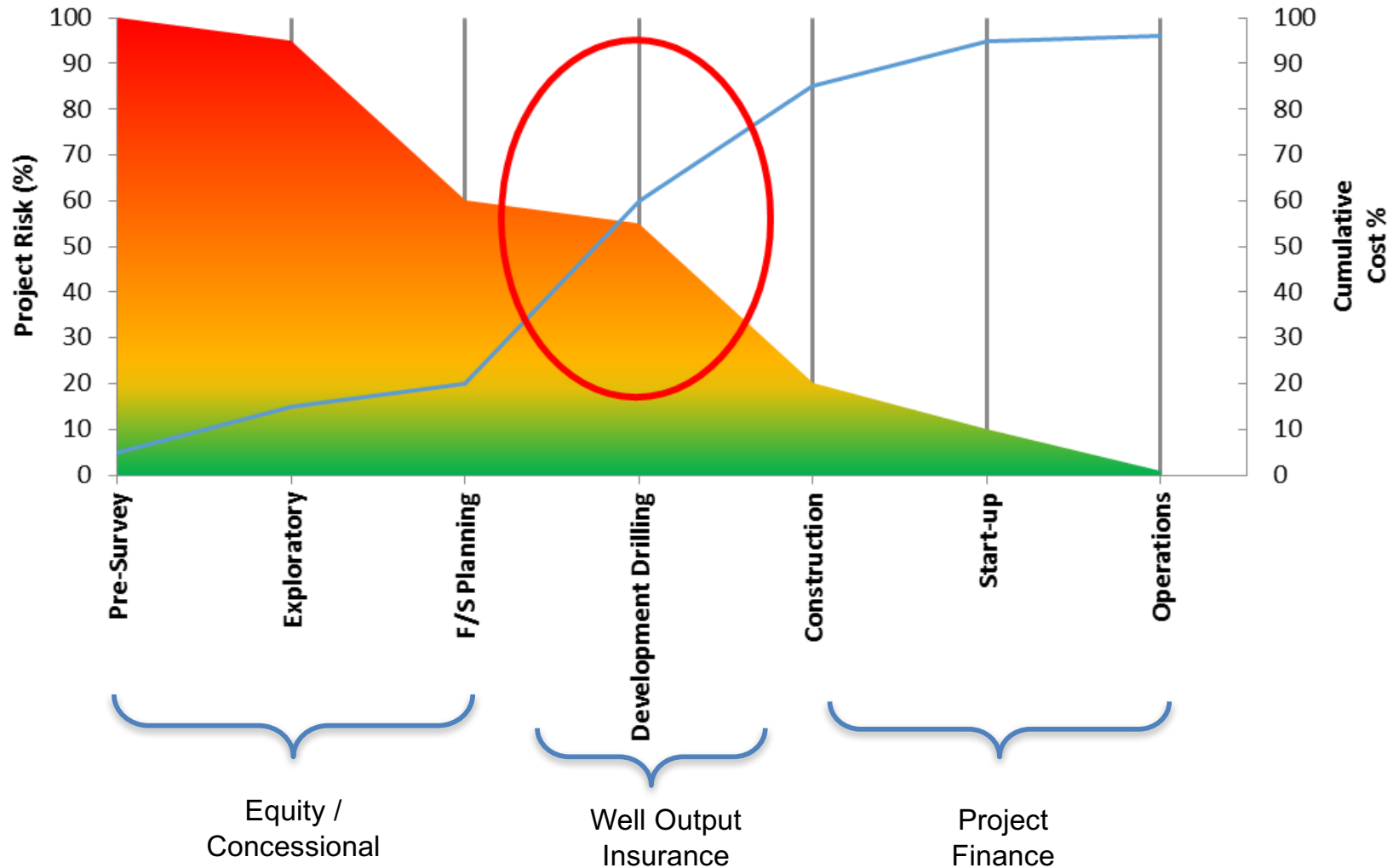
PLUTO



WORLD BANK GROUP

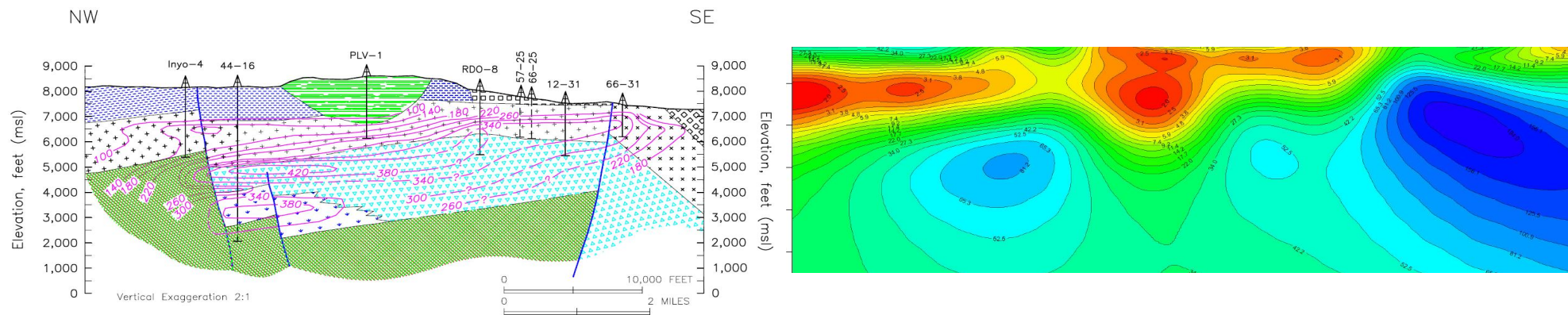
Project Risk and Costs during Geothermal Development

Project Risk and Cost during Geothermal Development



Geothermal Risk and Reward

- Risk profile is unattractive to equity investors (i.e. potential for large capital impairment, albeit low probability)
- Low probability / high severity risk more appropriate to insurance market
- Parhelion insurance structure puts a 'floor' on the downside for investors and so makes it easier for developers to raise equity



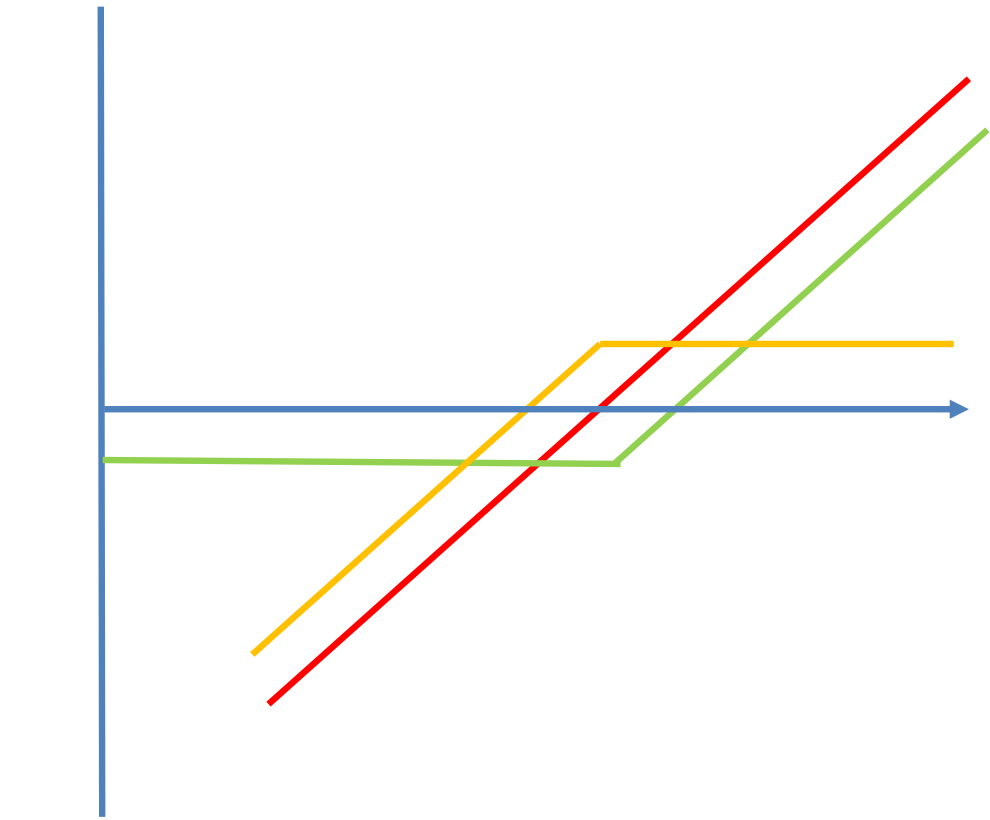
Risk Profiles

Profit

Loss

Project
Success

- = Uninsured Risk Profile
- = Insurer Risk Profile
- = Insured Risk Profile











- Complements existing Technical Assistance facilities
- Includes support for infrastructure development
- Leverages experience in other risk mitigation instrument
 - Builds on KfW's GRMF and GDF LAC
 - IDB Mexico contingent recovery scheme
- Allows continued support for drilling after GRMF
- Covers exploratory and confirmation drilling
- Simplifies and streamlines application process
- Has a milestone-based disbursement scheme



- Provides support throughout the project life cycle
- Addresses risks that are acknowledged by stakeholders
- Provides support to all types of developers
 - Public sector, private sector, PPPs
- Focuses initially on Ethiopia and Kenya, but will expand
- Uses different support mechanisms in 3 funding pillars
 - Direct Finance
 - Risk Mitigation Finance
 - Innovation implementation



GeoFuture - Summary Table

Activity Addressed	Pillar 1 - Direct Finance			Pillar 2 - Risk Mitigation		
	Coverage	Type	Sectors	Coverage	Type	Sectors
Surface Studies		40% CL	Any		N/A	N/A
Infrastructure		40% CL	Any		N/A	N/A
Exploratory Drilling		40% CL	Any		60% CL	Pri & PPP
Appraisal Drilling		N/A	N/A		60% CL	Pri & PPP

Intervention Type Key

NRG Non-Recoverable Grant
 CL Convertible Loan
 N/A Not Applicable

Sector Key

Any Any sector (public, private or PPP) eligible
 Pri Private Sector Eligible
 PPP Public Private Partnership Eligible

Next Steps

- Much useful risk mitigation work done but gaps remain
 - for issues that commonly arise during various development stage
 - for issues that are specific to conditions in East Africa
- Next Steps:
 - Accredited Entity
 - Government 'No Objection'

