

Project Development

Lessons learnt & take away.



RG is a developer of geothermal power projects

- Signed Power commercial agreements for the world's two largest geothermal projects in Ethiopia, in addition to late stage projects ready for execution in Mexico and St. Vincent
- Experienced team with experts in power development, engineering, geoscience, operations and financing
- Proven track record as lead developer and contributor of some of the world's largest geothermal projects
- Elite development partners such as Emera, Meridiam, the African Renewable Energy Fund and Power Africa
- Benefits of geothermal as an increasingly compelling source of power generation: clean, cost competitive, long-term, reliable baseload power

10
years

We develop, structure, build and operate geothermal projects in attractive markets, providing exceptional risk-adjusted returns to our investment partners

- 2008 – RG formed and headquartered in Reykjavik, Iceland
- 2010 – Masdar City drilling of 2 wells completed.
- 2010 – RG Ltd. formed
- 2011 – RG awarded license in Ethiopia, Development starts
- 2011 – Emera partnership formed for St. Vincent
- 2012 – Mexxus partnership formed in Mexico
- 2013 – RG/Emera enter St. Vincen
- 2013 – Mexico approves Ceboruco IPP
- 2013 – 1,000 MW HoT PPA signed in Ethiopia
- 2014 – Corbetti SHA with AREF and IDC
- 2015 – Civil works begins in Corbetti
- 2015 – St. Vincent EPC tender issued
- 2015 – Civil works begins in Mexico
- 2015 – ENGIE partnership formed
- 2015 – Corbetti PPA signed
- 2016 – New geothermal law in Ethiopia
- 2016 – Civil works begin in St. Vincent
- 2017 – Tulu Moya SHA with Meridiam
- 2017 – RG/ENGIE awarded 3 exploration permits in Mexico
- 2017 – Tulu Moya and Corbetti PPA's & IA's signed



Lessons Learnt & Take Away

1. Reykjavik Geothermal Team

Team involved in development of geothermal in 20+ countries

- Leading professionals in business development, finance, science, operations and asset management
- Complete team with globally experienced staff.

Board of Directors

Michael Philipp
Chairman

Carl H. Hahn
Vice Chairman

Mikael Andren
Board Member

Gunnar Gunnarsson
COO

Gudmundur Thoroddsson
CEO

Trent Philipp
Board Member

Magnus Asbjornsson
Board Member

Commercial Team

Gunnar Gunnarsson
COO

Magnus Asbjornsson
Executive Director

Trent Philipp
Executive Director

Thorleifur Finnsson
Head of Development

Jon Örn Jonsson
Development

Chris McCormick
Development

Vilhjalmur Skulason
Legal

Olof Palsdottir
Corporate

Margret Thorsdottir
Corporate

Technical Team

Gestur Gislason
Sr. Geologist

Hjalmar Eysteinnsson
Sr. Geophysicist

Loftur Gissurason
Head of QHSE

Snorri Gudbrandsson
Geochemist

Sigurbjorn Jonsson
Geophysicist

Tomas Gudmarsson
Engineering

Tadesse Mamo
Geologist

Aklilu Hailu Tekka
Geophysicist

Emma Baz
Engineering

1. Reykjavik Geothermal Team

Gudmundur Thoroddsson

- CEO, RG
- 30+ Years of experience energy & utilities
- CEO, Reykjavik Energy (RE) & Reykjavik Energy Invest (REI)
- Chairman, Icelandic Drilling Co. & Board Member, Enex China



Michael Philipp

- Chairman, RG
- 25+ years of experience in finance
- Chairman and CEO, Credit Suisse Europe, Middle East, Africa; Chairman and CEO, Asset Mgmt. of Deutsche Bank
- Board Member, World Wildlife Fund



Dr. Carl Hahn

- Vice Chairman
- 50+ years of experience in automotive and industrial sectors
- Former CEO and Chairman of Volkswagen AG and Continental AG.
- Board member of Audi, Seat and Skoda and senior advisor of General Capital Group.

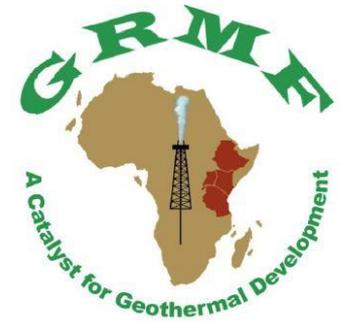


"If you want to go fast, go alone. If
you want to go far, go together."

- African Proverb -

2. Partners

Governmental



2. Partners

Top tier partners with focus on strategic, commercial and technical aspects

Commercial



Technical



“Ever tried. Ever failed. No matter. Try Again.
Fail again. Fail better.”

- Samuel Beckett -

3. Government Support

Success



what people think
it looks like

3. Government Support

Success



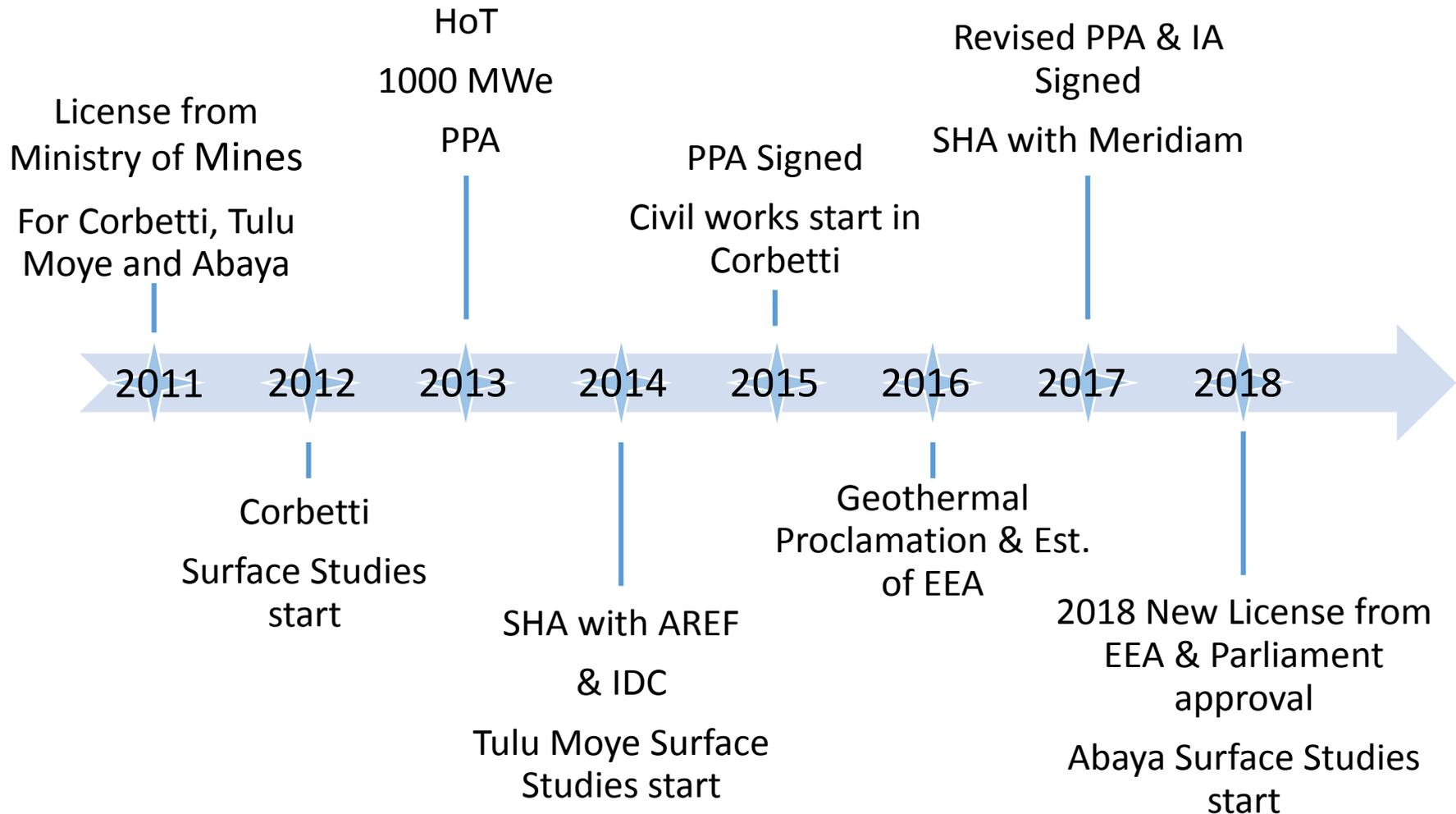
what people think
it looks like

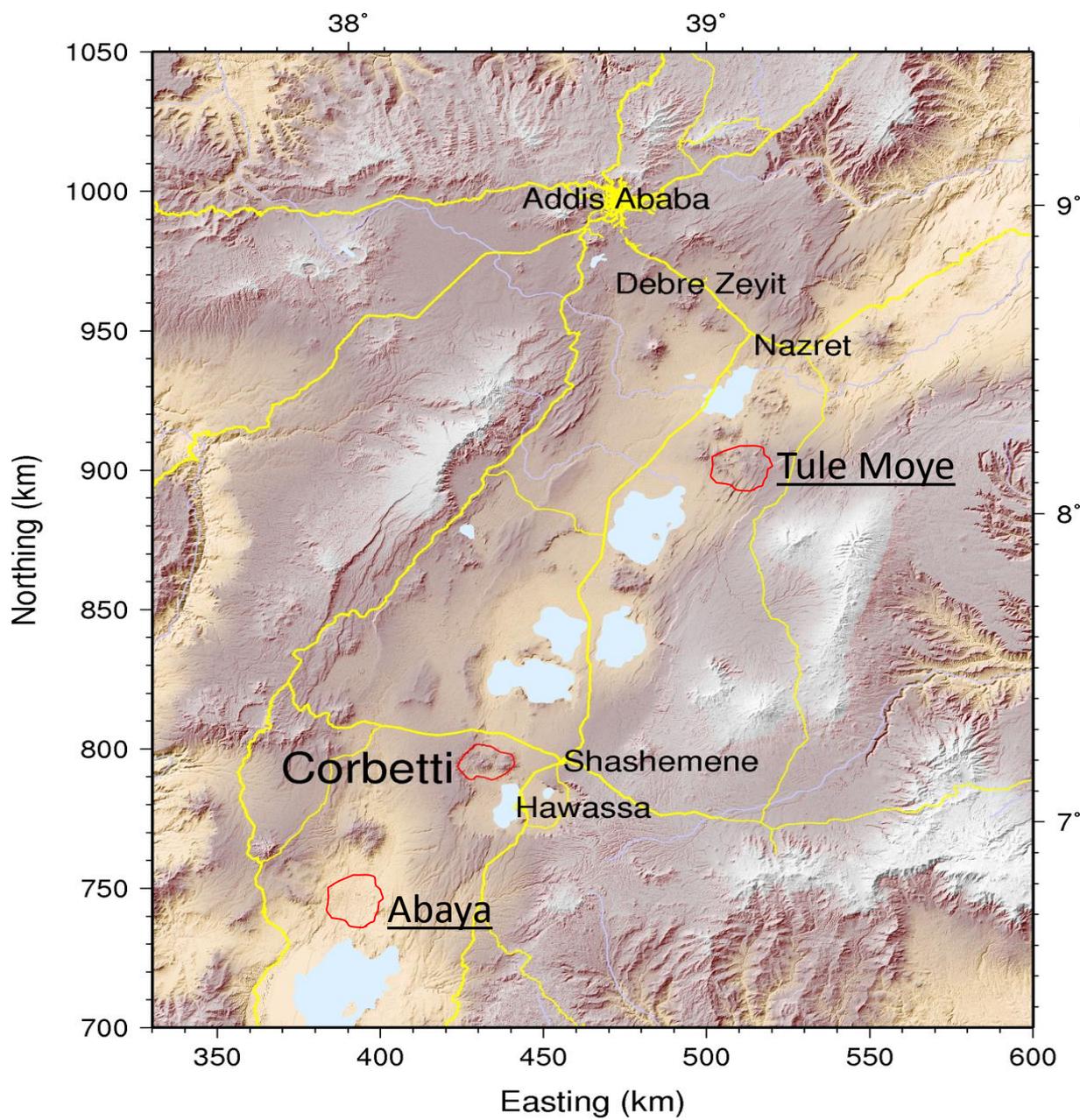
Success



what it really
looks like

3. Government Support





“The biggest risk is not taking any risk... In a world that changing really quickly, the only strategy that is guaranteed to fail is not taking risks. “

Mark Zuckerberg

“Geothermal plants are very individual in terms of the quality of their resources and management needs, and therefore specific lessons cannot be easily inferred. Nonetheless, adherence to best international practices for survey and management and thorough data analysis from the project site are the best risk mitigation tools available to developers.”

IRENA - Renewable Power Generation Costs in 2017

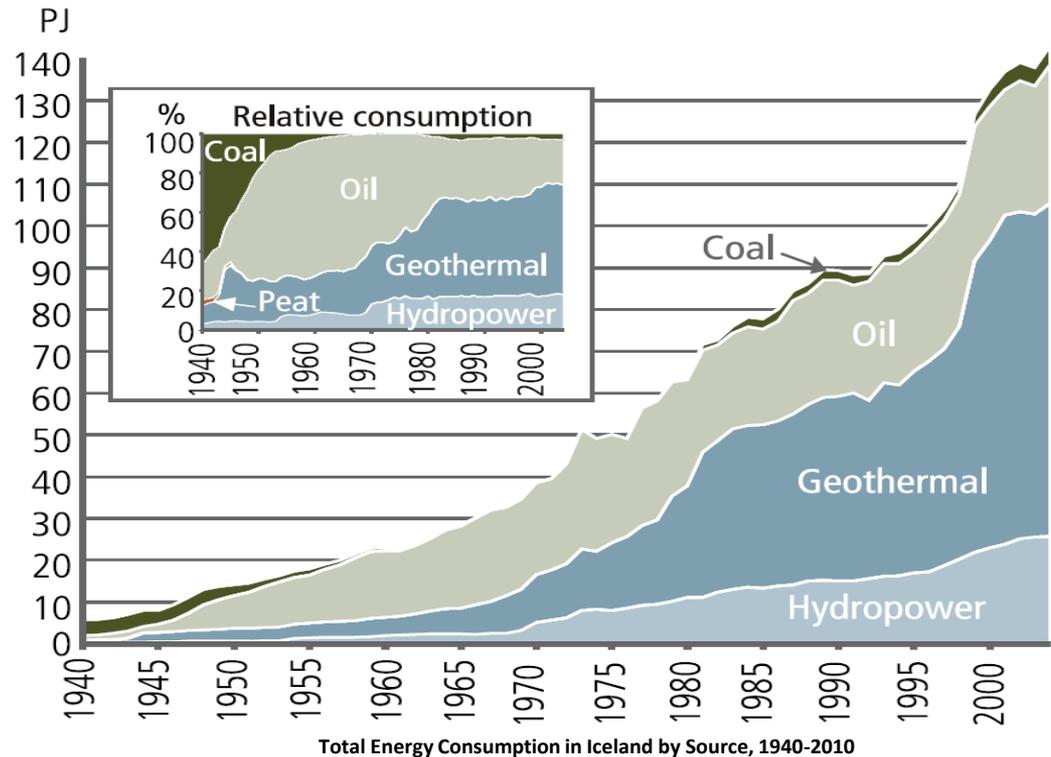
“ This has allowed new markets to benefit from previous, hard-won business acumen in the field of renewable project development. In conjunction with local partners, in many cases to help navigate the local regulatory and business landscape; these project developers are enabling even new markets to achieve very competitive pricing, where the regulatory and policy framework is conducive to renewables.”

IRENA - Renewable Power Generation Costs in 2017

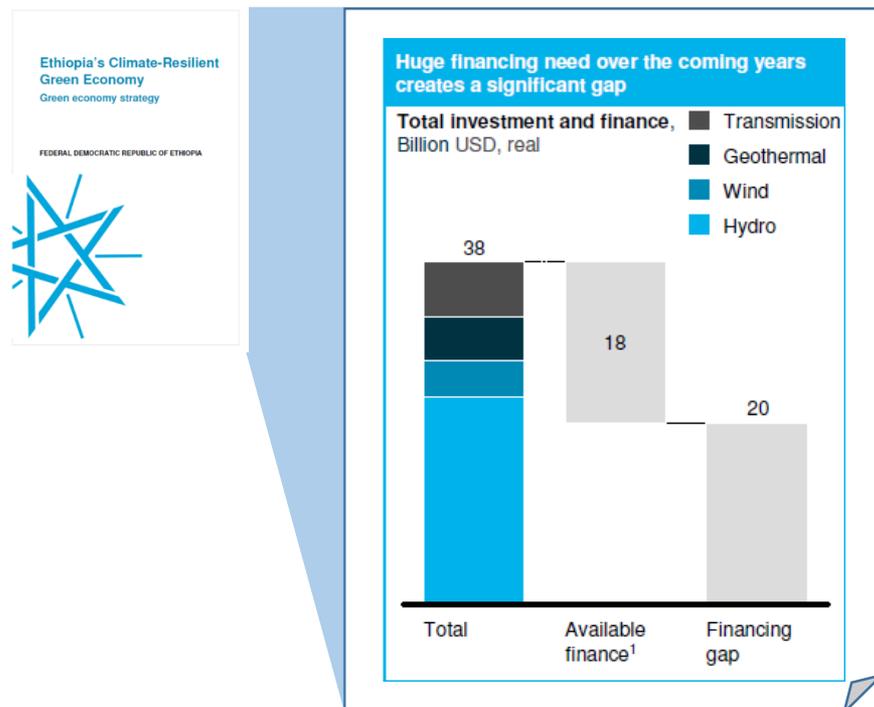
Geothermal Can Transform an Economy

“In my youth, over 80% of Iceland’s energy needs came from fossil fuel in the form of imported coal and oil. We were a poor nation, primarily of farmers and fishermen, and Iceland was classified by the UNDP as a developing country right down to the 1970s. Now, despite the effects of the financial crisis, we are among the most prosperous nations in the world, largely due to the transformation which made our electricity production and space heating 100% based on clean energy.”

- Mr. Ólafur Ragnar Grímsson, former President of Iceland



Government Understanding the need of the IPP/PPP to reduce the financing gap.

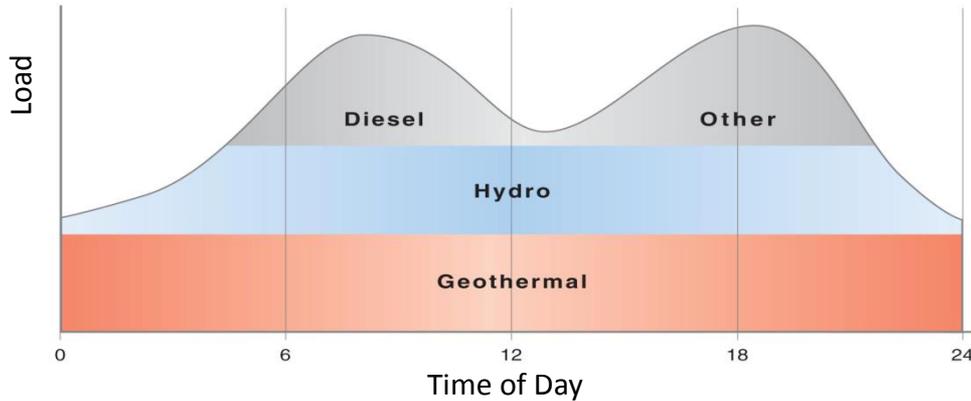


- The Ethiopian Government's Climate Resilient Green Economy strategy from 2011 (CRGE, developed with McKinsey) showed⁽²⁾:
 - Investment needs in the power sector of USD 38 Bn over the next 20 years
 - However, only USD 18 Bn can be financed with existing financing sources
 - USD 20 Bn needs to be financed with foreign investment, tariff increases and cost reductions
- Attracting external financing for power sector investment was one of the CRGE's four main initiatives

1. Assuming constant domestic tariffs; projections assume that financing from existing debt and equity sources remains roughly constant
2. Ethiopia's Climate-Resilient Green Economy; Green economy strategy, Federal Democratic Republic of Ethiopia, 2011

Understanding High efficiency of Geothermal and need of Base Load

Sample Load Curve ⁽¹⁾

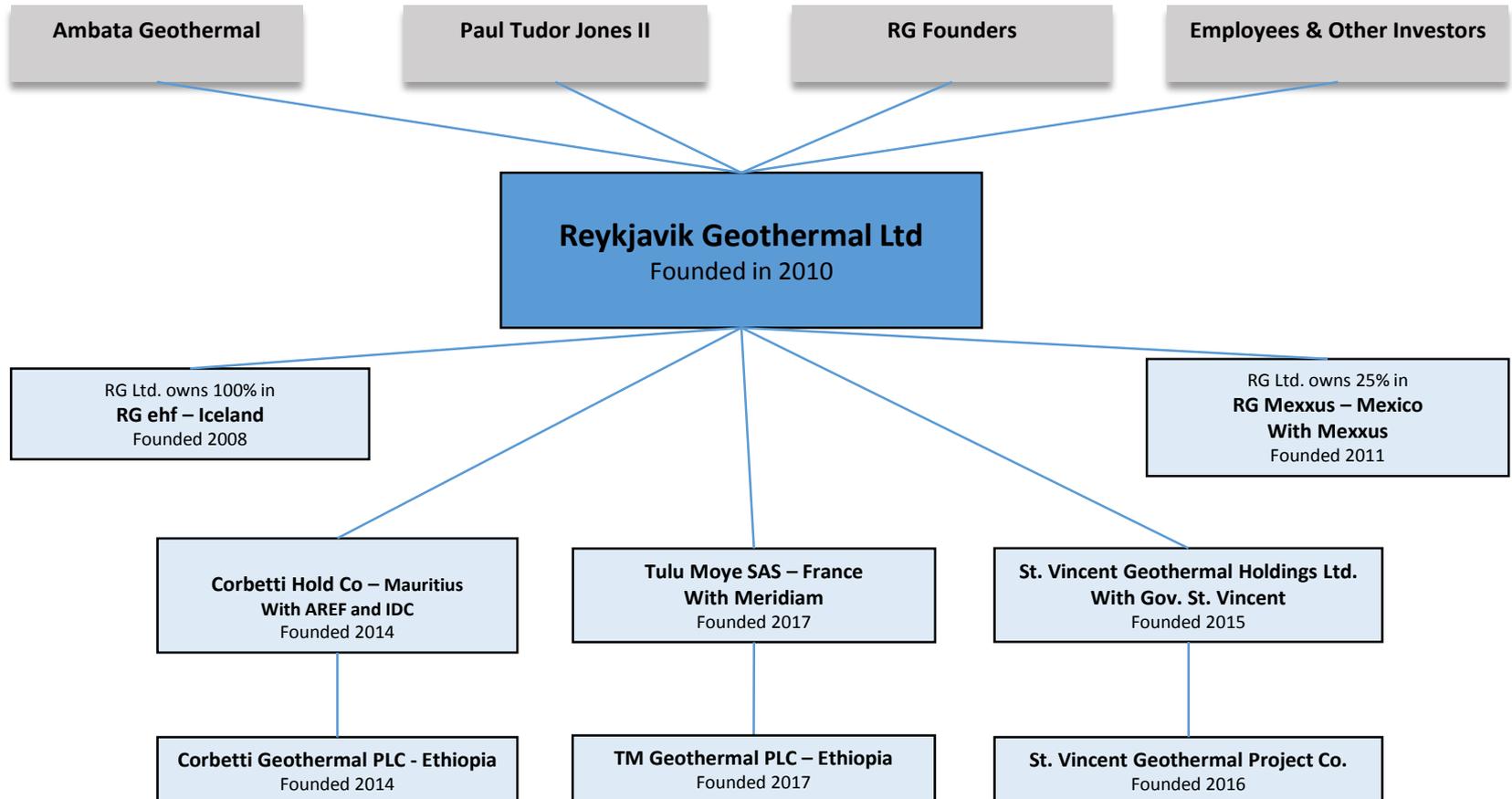


Geothermal Power's high capacity factor allows it to provide reliable large scale "base load" power supply, making it an excellent complement to other renewable energy sources such as hydro, wind and solar energy.

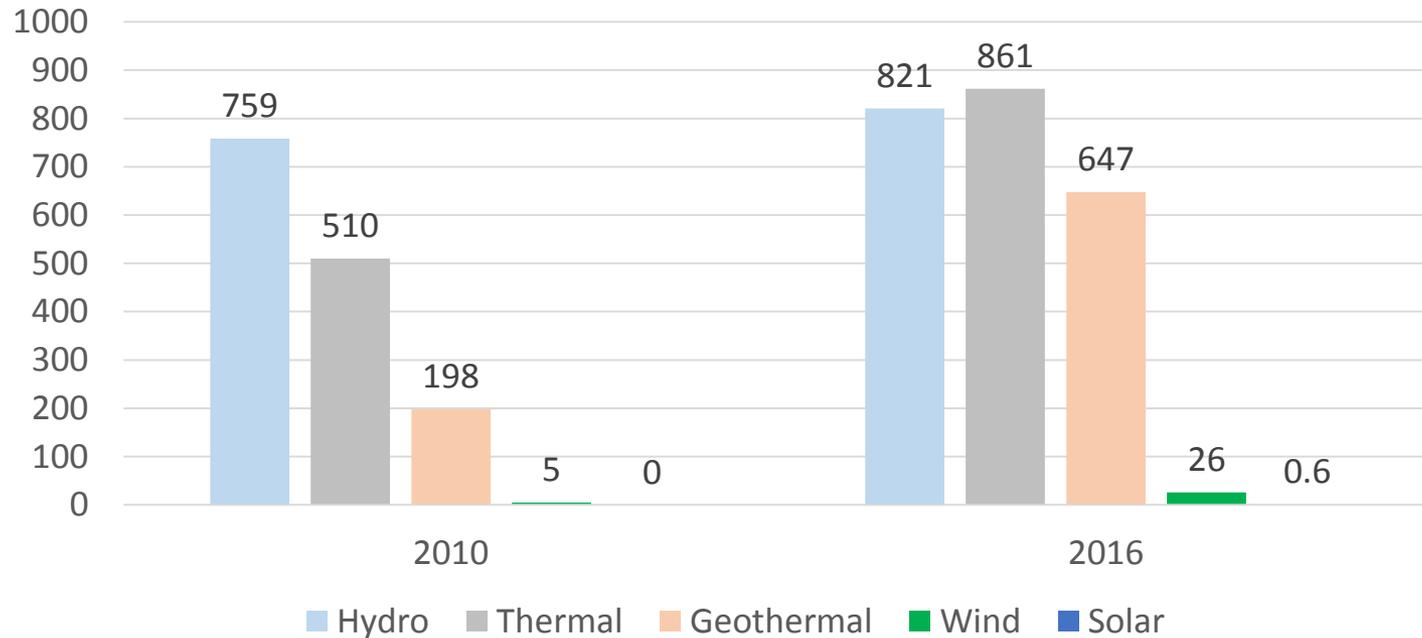
Iceland's combination of hydro and geothermal power generation has resulted in a world-class combination of grid stability and low cost green sustainable energy. This can be the case for Ethiopia and the East Africa region.



4. Risk Mitigation



Kenya's Installed Capacity in MW 2010 vs. 2016



Source: KPLC 2016 Annual Report

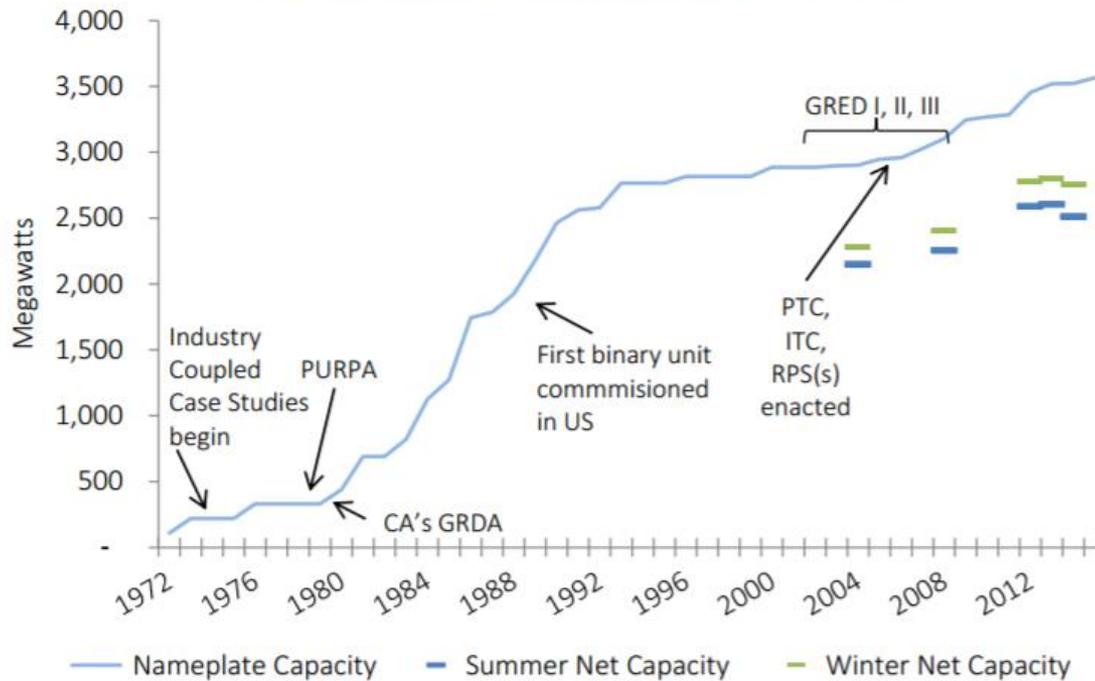
KPLC insists electricity bills won't jump on biting drought

Mar. 21, 2017, 12:30 am | By WEITERE MWITA @mwitamartin



5. Role of Support Programs

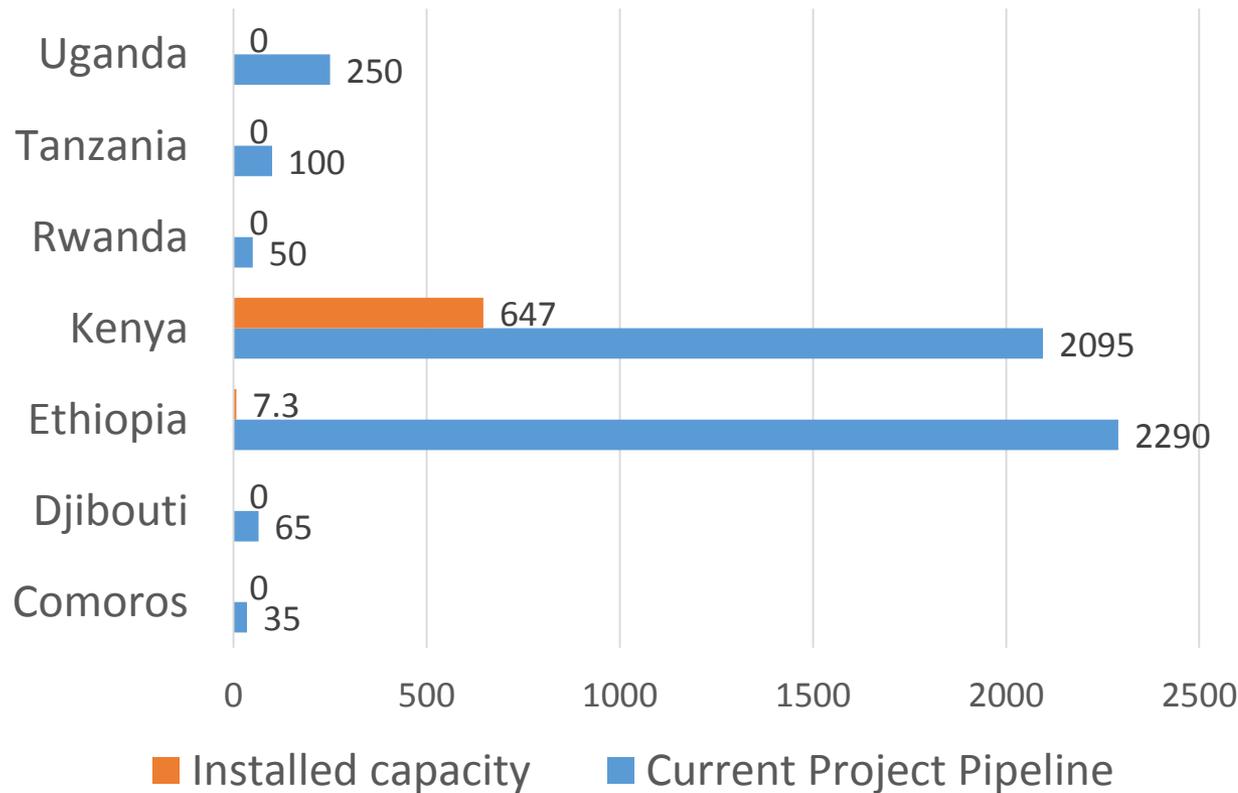
Figure 5: U.S. Industry Geothermal Nameplate & Net Capacity



Note: PCA (Planned Capacity Additions), pilot plants and utility scale geothermal plants built in the first half of the 20th century and then decommissioned are not included in the above time series. Terms: Public Utility Regulatory Policy Act (PURPA), Geothermal Resource Exploration & Definition Program (GRED), Renewable Portfolio Standard (RPS), California's Geothermal Grant and Loan Program (CA's GRDA), Production Tax Credit (PTC), Investment Tax Credit (ITC). Source: GEA & EIA²⁶

5. Role of Support Programs

Installed Geothermal & Project Pipeline

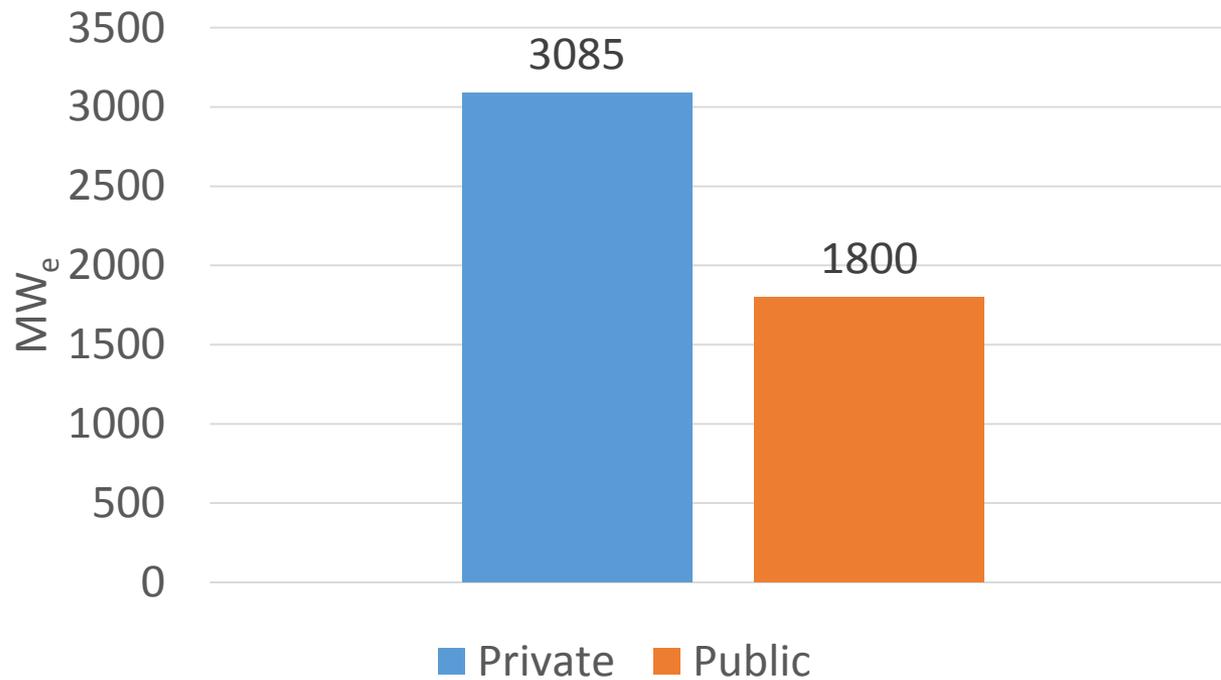


Note: The figure above compares current installed geothermal capacity to “announced developing capacity.” “Announced developing capacity” is the estimated power plant capacity reported for specific sites by a private company, government agency or contractor associated with the site.

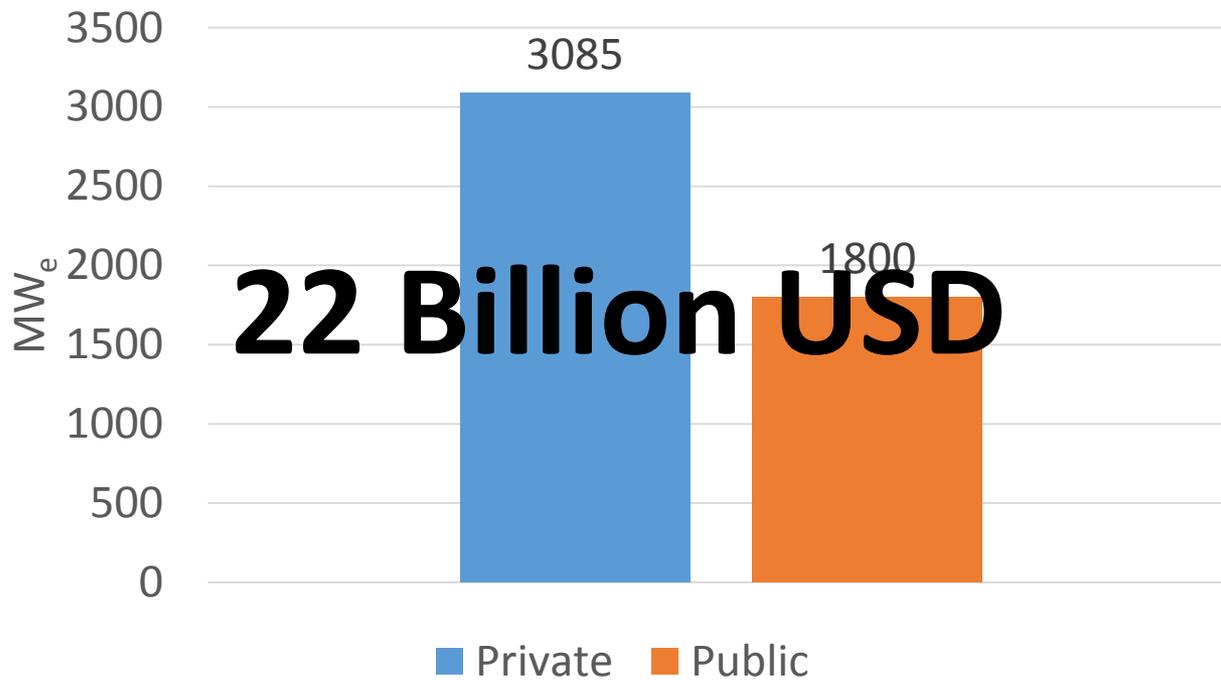
Source: Authors research

5. Role of Support Programs

The Rise of Geothermal is mostly private



Projected Investment in Geothermal



- Energy/electricity law and regulations
- Lack of established energy market
- Investment law and regulations
- Currency exchange
- Investors/lenders risk avoidance
- Investors/lenders requirements on financial structure
- Lack of local geothermal service industry
- Perceived Risk has reduced
- New Policies are providing IPP/PPPs with a clearer playing ground
- Technology has Advanced
- Financing support increased

For more information or questions please contact:

Jón Örn Jónsson
Country Manager Ethiopia
jon@rg.is

