To succeed geothermal development in Indonesia, there is no option but to give it for the Indonesia State of Enterprises.
INDONESIA GEOTHERMAL RESOURCES

Total geothermal resources : 285
Geothermal resources : 29 GW

Installed = 1,226 MWe
Total GWA = 35 (4,100 MWe) w/ Total 19 IUP

Status of April 2012
## Indonesia Geothermal Resources

<table>
<thead>
<tr>
<th>RESOURCES (MW)</th>
<th>%</th>
<th>RESERVES (MW)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spekulatif (Speculative)</td>
<td>8.231</td>
<td>45.17%</td>
<td>54.83%</td>
</tr>
<tr>
<td>Hipotesis (Hypothetical)</td>
<td>4.964</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13.195</strong></td>
<td></td>
<td><strong>29.215</strong></td>
</tr>
<tr>
<td>Terduga (Possible)</td>
<td>12.909</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mungkin (Probable)</td>
<td>823</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terbukti (Proven)</td>
<td>2.288</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sumber: Badan Geologi Kementerian ESDM
Status: December 2011
## Indonesia Potential Resource & Energy Production

### New Renewable Energy Resources

<table>
<thead>
<tr>
<th>NO</th>
<th>New Renewable Energy</th>
<th>Resources</th>
<th>Installed Capacity - MW</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HYDRO</td>
<td>75,670 MW</td>
<td>5,705.29 MW</td>
<td>7.54</td>
</tr>
<tr>
<td>2</td>
<td>GEOTHERMAL</td>
<td>29,038 MW</td>
<td>1,226 MW</td>
<td>4.22</td>
</tr>
<tr>
<td>3</td>
<td>PLTMH</td>
<td>769.69 MW</td>
<td>217.89 MW</td>
<td>28.31</td>
</tr>
<tr>
<td>4</td>
<td>Biomass</td>
<td>49,810 MW</td>
<td>1,618.40 MW</td>
<td>3.25</td>
</tr>
<tr>
<td>5</td>
<td>PV PLTS</td>
<td>4.80 kWh/m²/day</td>
<td>13.5 MW</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>WIND</td>
<td>3 – 6 m/s</td>
<td>1.87 MW</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Uranium</td>
<td>3,000 MW (e.q. 24,112 ton for 11 years*)</td>
<td>30 MW</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* Only in Kalimantan Barat

### Fossil Resources

<table>
<thead>
<tr>
<th>No</th>
<th>Fossil</th>
<th>Resources</th>
<th>Proven</th>
<th>Ratio (%)</th>
<th>Production</th>
<th>Ratio (Year)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OIL (milliard barrel)</td>
<td>56.6</td>
<td>7.99 **</td>
<td>14</td>
<td>0.346</td>
<td>23</td>
</tr>
<tr>
<td>2</td>
<td>Gas (TSCF)</td>
<td>334.5</td>
<td>159.64</td>
<td>51</td>
<td>2.9</td>
<td>55</td>
</tr>
<tr>
<td>3</td>
<td>COAL (milliard ton)</td>
<td>104.8</td>
<td>20.98</td>
<td>18</td>
<td>0.254</td>
<td>83</td>
</tr>
<tr>
<td>4</td>
<td>Coal Bed Methane/CM (TSCF)</td>
<td>453</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*) NO RESERVES DISCOVERED

**) INCLUDES CEPU BLOCK
BLUE PRINT GEOTHERMAL DEVELOPMENT: 2004 – 2020
BLUE PRINT ENERGY DEVELOPMENT: 2005 - 2025

2006
852 MW
(Production)

2008
2000 MW

2012
3442 MW

2014
5171 MW

2016

2020
7788 MW

2025
12,000 MW

1148 MW
Existing WKP

1442 MW
Existing WKP

1158 MW
Existing WKP + New WKP

2617 MW
New WKP

4544 MW
New WKP

4,600 MW *

6,000 MW *

9,500 MW *

PERMEN ESDM
No. 15/2010

5171 MW
Plus Crash Program
Scenario Phase II

*) Road Map 2007

INDONESIA TO GET

1,000 MW =
42,250 BOEPD from
GEOTHERMAL
ENERGY &
42,250 6.1 MM
TON CER’S/YEAR
INDONESIA GEOTHERMAL GWA STATUS

- There are 54 Geothermal Working Areas:
  - 19 GWA Existing (Pre UU No. 27 Year 2003);
  - 35 GWA New (Post UU No. 27 Year 2003).

- 19 GWA Existing:
  - 7 GWA in Operation 8 PLTP;
  - 12 GWA in Exploration Stage.

- 35 GWA - New:
  - Published 19 Working Permits (3 with PPA & 16 in negotiation process);
  - 16 GWA tender process & preparation process / re-tender.
- 7 PLTP
- Production 1,226 MW
## GEOTHERMAL DEVELOPMENT PLAN & REALIZATION
### YEAR 2010 – 2015

<table>
<thead>
<tr>
<th>NO.</th>
<th>GEOTHERMAL DEVELOPMENT</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Capacity Adding Up (MW)</td>
<td>0</td>
<td>37(^*)</td>
<td>115</td>
<td>3</td>
<td>375</td>
<td>1.797</td>
</tr>
<tr>
<td>2.</td>
<td>Installed Capacity PLTP (MW)</td>
<td>1.189(^*)</td>
<td>1.226(^*)</td>
<td>1.341</td>
<td>1.344</td>
<td>1.719</td>
<td>3.516</td>
</tr>
<tr>
<td>3.</td>
<td>Investment Assumption (MM US$)</td>
<td></td>
<td></td>
<td>402.5</td>
<td>10.5</td>
<td>1.312.5</td>
<td>6.289.5</td>
</tr>
</tbody>
</table>

**Catatan:**

*) Realization - Assumption CF (Capacity Factor) PLTP = 90%; Geothermal Investment Assumption: US$ 3.5 juta/MW
GEOTHERMAL VS. PPA PROJECT

Geothermal Project

Sign JOC / ESC

Resource Development

Construction Starts:
- Roads
- Land Purchase
- Drill Wells

“2-3 Yrs”

Resource Feasibility Study Approved

EPC Bids Financing Plans

Finalizing Costs:
- Confirm Resource
- Financing Plans

~ 1 Yrs

Submit Notice of Intention To Develop

Project Construction

Complete Construction:
- Close Financing On Final Phase - PGF

~ 2 Yrs

Commercial Operations

Coal/Gas Power Project

Sign PPA

EPC Bids Financing Plans

Conditions Precedent

Close Financing

Project Construction

Construction Starts

~ 1 Yrs

Commercial Operations

“2 Yrs”
Note:
- Based on PP 59/2007 (Geothermal Business Activity)
- Early Survey can be done by Menteri, Gubernur, and/or Bupati/Walikota;
- Menteri, Gubernur, and/or Bupati/ Walikota conduct the tender;
- Menteri, Gubernur, and/or Bupati/ Walikota provide Geothermal Business Permit.
GEOTHERMAL DEVELOPMENT STAGE

**Indicative Cost**

- ≤$1 M
  - Identification & Bidding
  - Period 3 – 6 mths
    - Locate and Assess Prospect
  - Lease & Permit Issues
    - Land acquisition
    - Land use laws
    - Water rights & availability
    - Environmental review
  - Prepare Bid and Business Model
    - Economic modeling
    - Resource concept modeling
    - Project concept modeling
    - Market analysis
    - Grid availability

- ≤$40 M
  - Exploration
    - Period 1 – 2 years
      - Regional Exploration
        - Geophysical
        - Geophysical
      - Prospect Exploration
        - Temperature core hole drilling
      - Resource measurement
      - Preliminary modeling
      - Permits
        - Environment permits
        - Exploration permits
      - Geothermal Resource Permit
    - Preliminary Drilling
      - Road & pad construction
      - Rig procurement
      - Target identification
      - Exploration drilling
      - Delineation drilling
    - Re-evaluate Business Model
      - Site, scale & technology
      - Resource update
      - Generation update
      - Feasibility Study

- ≤$400M
  - Development
    - Period 3 – 4 years
      - Production Drilling
        - Construction of Roads & Pads
        - Design characteristics
        - Geological structure
        - Drilling targets
        - Engineering requirements
        - Procurement of materials
        - Obtain suitable rig & crew
        - Equity Funding
        - Well testing
        - Reservoir management
        - Permits
          - Drilling permit
          - Power Purchase Agreement
          - Environmental Permit
          - Water permits
          - Building permits
        - Re-evaluate Business Model
          - Site, scale & technology
          - Resource update
          - Generation update
          - Feasibility Study
  - Construction
    - EPC Contract

**Profit!**

- Period 30 – 40 years
  - Operate Facilities
    - Employ & train staff
    - Spare parts
    - Routine maintenance
  - Manage Resource
    - Resource modelling
    - Makeup wells
    - Well Workover
    - Reservoir modeling
  - Ongoing Development Phases
    - Repeat Exploration & Development Phases

**Probability of Success (%)**

- Desktop
- Reconnaissance
- Geophysics
- Exploration Drilling & Evaluation
- Feasibility Study
- Initial Production Drilling
- Financial Close
- Production Drilling
- Injection Drilling
- Power Plant Construction

**Status**

- Indicative Cost
- Identification & Bidding
- Exploration
- Development
- Operation
## NEW LAW VERSUS OLD PD’S

<table>
<thead>
<tr>
<th>NO</th>
<th>TERMS</th>
<th>PRESIDENTIAL DECREE (No. 45/91; No. 49/91; No. 23/92)</th>
<th>LAW NO 27/2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Player - Upstream - Downstream</td>
<td>Pertamina PLN</td>
<td>Geothermal Mining Permit Enterprise Permit for Electricity</td>
</tr>
<tr>
<td>2</td>
<td>Business Entity - Upstream - Downstream</td>
<td>Pertamina - JOC Other Legal Entity Contract with PLN - ESC</td>
<td>Project Management: under permit Holder</td>
</tr>
<tr>
<td>3</td>
<td>Licensing - Upstream - Downstream</td>
<td>Mining Right to Pertamina Contract with PLN</td>
<td>Mining Right to Legal Entities (IUP) Contract with PLN</td>
</tr>
<tr>
<td>4</td>
<td>Fiscal</td>
<td>Lex Specialist (34% of Net Operating Income (NOI))</td>
<td>Obligation to pay for Taxes &amp; royalty</td>
</tr>
<tr>
<td>5</td>
<td>Project Execution</td>
<td>Integrated from exploration to generation of electricity</td>
<td>Survey and exploration by Gov, Exploitation by Business Entity</td>
</tr>
<tr>
<td>6</td>
<td>Supervision and Inspection</td>
<td>Central Government</td>
<td>Central and Local Government</td>
</tr>
</tbody>
</table>
GOI:

- The Government is requested to conduct exploration, from the preliminary survey to drilling;
- Entrepreneurs might conduct activities up to exploration stage.
- No.27/2003: exploration activities are divided into 2 stages:
  - Preliminary Survey (Survey Pendahuluan)
  - Exploration Drilling (bermakna pengeboran)
Geothermal Development faces obstacles *resource risk*. Information regarding subsurface conditions including reserves in Indonesia assessed is still minimal & squeeze the business risk.

Geothermal development faced the problem of large investments in upstream side.

High exploration costs with no guarantee of success (up to US$5 million per well).

Small scale developers have limited fund to do exploration; investors will NOT invest or participate in concessions of unknown potential.
Magneto Meter Jenis : Proton Magnetometer G-856AX

Magneto Telluric MTU Meter
<table>
<thead>
<tr>
<th>JENIS ALAT</th>
<th>DAYA</th>
<th>KAPASITAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONGYEAR 38</td>
<td>56 HP / 2200 rpm</td>
<td>NQ = 575</td>
</tr>
<tr>
<td>Buatan, 1987</td>
<td>Air cooled</td>
<td>HQ = 375</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HW = 325</td>
</tr>
<tr>
<td>LONGYEAR 34</td>
<td>41 HP / 2200 rpm</td>
<td>NQ = 335</td>
</tr>
<tr>
<td>Buatan, 1984</td>
<td>Air cooled</td>
<td>HQ = 210</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HW = 180</td>
</tr>
<tr>
<td>LONGYEAR 24</td>
<td>11 HP / 2200 rpm</td>
<td>BQ = 70</td>
</tr>
<tr>
<td>Buatan Jepang, 1984</td>
<td>Water cooled</td>
<td>NQ = 50</td>
</tr>
<tr>
<td>LY HC – 28</td>
<td>45 HP / 3600 rpm</td>
<td>BQ = 185</td>
</tr>
<tr>
<td>Buatan, 1985</td>
<td>Air cooled</td>
<td>NQ = 120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BW = 75</td>
</tr>
<tr>
<td>KOKEN RK – 3A</td>
<td>38 HP / 2200 rpm</td>
<td>NQ = 440</td>
</tr>
<tr>
<td>Buatan Jepang, 1984</td>
<td>Water Cooled</td>
<td>HQ = 325</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HW = 210</td>
</tr>
<tr>
<td>KOKEN OE8 BL</td>
<td>15 HP / 2400 rpm</td>
<td>NQ = 220</td>
</tr>
<tr>
<td>Buatan Jepang, 1988</td>
<td>Water cooled</td>
<td>HQ = 160</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HW = 80</td>
</tr>
<tr>
<td>KOKEN SD-3A</td>
<td>5 HP / 2600 rpm</td>
<td>AW = 50</td>
</tr>
<tr>
<td>Buatan Jepang, 1998</td>
<td>Water cooled</td>
<td></td>
</tr>
<tr>
<td>ZT – 110</td>
<td>15 HP / 2200 rpm</td>
<td>AW = 100</td>
</tr>
<tr>
<td>Buatan</td>
<td>Water Cooled</td>
<td></td>
</tr>
<tr>
<td>TONE TOP 150</td>
<td>90 HP / 2000 rpm</td>
<td>NQ = 325</td>
</tr>
<tr>
<td>Buatan Jepang, 1986</td>
<td>Water cooled</td>
<td>HQ = 220</td>
</tr>
<tr>
<td>TONE THS – 5M</td>
<td>22 HP / 1800 rpm</td>
<td>BQ = 350</td>
</tr>
<tr>
<td>Buatan Jepang, 1984</td>
<td>Air cooled</td>
<td>NQ = 250</td>
</tr>
<tr>
<td>TONE TXL</td>
<td>78 HP/2200 rpm</td>
<td>NQ = 1200</td>
</tr>
<tr>
<td></td>
<td>water cooled</td>
<td>HQ = 2000</td>
</tr>
<tr>
<td>KOKEN GSR 100 A</td>
<td>138 HP/2600 rpm</td>
<td>NQ = 3000</td>
</tr>
<tr>
<td></td>
<td>Air cooled</td>
<td>HQ = 2000</td>
</tr>
<tr>
<td></td>
<td>3 1/2” = 1500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 1/2” = 1200</td>
<td></td>
</tr>
</tbody>
</table>

**DRILLING EQUIPMENTS & HEAVY DUTY**
HEAVY DUTY

CRANE KATO KAPASITAS 25 TON

BULDOZER KOMATSU D65 E
UTILIZATION OF GEOTHERMAL FUND FACILITY

- Preliminary Survey Data
- Pre-feasibility Study Based On Preliminary Survey Data
- In sufficient Data. Pre-FS Not Bankable
- No Financing For Data
  - Enhancement No Progress to Geothermal Development
  - Reasonable Electricity Bid Price
  - Risk Premium

Electricity Selling Price
The Objective of Geothermal Fund Facility

- To reserve fund to make available verified / certified geothermal exploratory data by internationally reputable institutions so that geothermal projects are financially viable & bankable

Objective of Geothermal Fund Facility (GFF) as stated in Art. 2 of Minister of Finance Regulation No. 3/2012:

- To enhance sufficiency of data from Preliminary Survey to mitigate exploratory risk in the utilization of geothermal energy to produce electricity
- To supply supporting data to prepare for tender documents of Geothermal Work Area (WKP) for the procurement of geothermal project cooperation contract to Business Entities; and/or
- To support exploratory activities in the framework of acceleration of geothermal power project development
The source of Geothermal Fund comes from State Budget and could also be from source of fund in accordance with stipulations of prevailing regulations.

**Size of GFF:**
- 2011 State Budget: Rp 1,126.5 billion
- 2012 State Budget: Rp 876.5 billion
- Total: Rp 2,003 billion

Management of GFF is carried out by the Centre of Government Investment (PIP) as stipulated in Ministry of Finance Regulation on authorization of PIP to carry out the management of Geothermal Fund.
Discussion

Legal Framework and Government Policies

<table>
<thead>
<tr>
<th>What worked in attracting investment from pre Geothermal Law?</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ UU 8/1971 establishing Pertamina. As part of government, Pertamina is credible manager of contractor</td>
</tr>
<tr>
<td>✓ Keppres 22/1981, Keppres 45/1991 allow Pertamina to sell steam and electricity and establishes role as JOC manager</td>
</tr>
<tr>
<td>✓ Keppres 49/1991 defines government share from geothermal resources, which includes all taxes</td>
</tr>
<tr>
<td>✓ Min. Decree 766/KMK.04/1992 implements fiscal terms</td>
</tr>
<tr>
<td>✓ Government assurances of PLN performance to Pertamina and JOC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What is the situation for new investors?</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Geothermal Energy identified as priority for development</td>
</tr>
<tr>
<td>✗ Pertamina as competitor creates conflict with developer’s role as JOC manager.</td>
</tr>
</tbody>
</table>
Discussion

Legal Framework and Government Policies

What are the implications if we use subsidy from PLN?

- In line with Law No. 30/2009 on electricity, it is only be given gradually to customers who are not financially capable; thus, PLN should not receive a subsidy, but payment from the government for deficiency payment by the consumers (people).

- Price difference with the rates set out in Government and the House of Representatives is subsidy from the government to consumers of PLN (people).

- In this way, PLN has positive cash flow, and IPP (Independent Power Producer) is expected to grow and raise fund easily because it will cooperate with a healthy PLN (without subsidies) and bankable also the selling price of PLN to the consumers (people) appropriate economies (tariff determined the government) because of the difference would be government payments over government subsidies to the people (customers).

- Thus, PLN will become healthy and competent to perform investments or business cooperation to meet the growth of the demand. PLN does not receive a subsidy and sells its electricity according to the economic case.
What is effective way to do an exploration stage using GFF?

- A 'cost recovery' is given to developer who does exploration drilling and successfully get 'delivery steam' well (equivalent to minimum 5 MW). This developer initially spends some costs similar works in oil/gas for maximum of three wells or about some cost maximum value. When the developer is success then GOI gives a reimbursement to the developer. But, if the developer who does exploration well is fail, the developer does not get a reimbursement (cost recovery).

- An exploration stage is done by GOI. This is not an usual is common in most country in the world who has geothermal resources. A developer must accept and receive government data, and GOI body such as Pertamina or others is authorized by GOI to do this task. This GOI body can hire expats to do this job professionally. An audit will be done when it is completed.
The only institution to accelerate Indonesia geothermal project and lead and champions into transaction for fast-tracked development is the Government, that has proven implementations of PLTP projects reached today about 1,226 MW.

Geothermal Fund Facility (GFF) as stated in Art. 2 of Minister of Finance Regulation No. 3/2012 must be applicable and used to GOI’s body (BUMN) for exploration drilling instead of developers.

The long term benefit analysis, which is based on the avoided cost for not using high price non-renewable fuel (gas and coal) and imported fuel (oil), with the settled electricity price of geothermal project have to be in the government regulations. The geothermal projects will clearly reflect the cost of developing geothermal and the long term benefit enjoyed by the nation.

To initiate an investment status in electricity, it is important to subsidize state-owned corporations (e.g. Pertamina and PLN) by: - Convert PLN’s job desk – based subsidy into customer based, by changing of PLN subsidy program to people with the way that the government pays deficiency payment people into PLN as payment on behalf of people. Here, in financial book no subsidies to PLN from the government.
PERMASALAHAN PENGUSAHAAN PANAS BUMI
(Dengan Regulasi Saat Ini)

<table>
<thead>
<tr>
<th>Potensi/Instansi</th>
<th>Potensi Panas Bumi</th>
<th>STADIUM PENGUSAHAAN (S-X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kementerian ESDM</td>
<td>Peta Potensi</td>
<td>WKP</td>
</tr>
<tr>
<td>Pemda Prov.</td>
<td>Survei Biaya APBN</td>
<td>Evaluasi Hasil SP</td>
</tr>
<tr>
<td>Pemda Kab./Kota</td>
<td>Survei Biaya APBD</td>
<td>WKP</td>
</tr>
<tr>
<td>Badan Usaha</td>
<td>Survei Biaya APBD</td>
<td>WKP</td>
</tr>
<tr>
<td>PLN</td>
<td>Biaya Pihak Lain</td>
<td></td>
</tr>
</tbody>
</table>

Pemenang Lelang

Pemenang Lelang

Pemenang Lelang

Pemenang Lelang

Pemenang Lelang

Eksplorasi

Produksi/Pemanfaatan

TEROBOSON I

TEROBOSON II
GEOTHERMAL ENERGY PRICING IN INDONESIA

KOB, BEL Bedugul: 70% * Regional Tariff

Small scale electricity price = 80% x HPP (Prov. Sumut 816) Sibayak (2006)) = Rp.652.80/kWh = 0.7 cents US $/kWh

MNL electricity base price = 4.94 cents US $/kWh
## Major of Risk Component

<table>
<thead>
<tr>
<th>INVESTOR</th>
<th>OFF TAKER</th>
<th>GOVERNMENT</th>
<th>LENDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reservoir Capacity</td>
<td>Pricing Energy</td>
<td>Regulation</td>
<td>Pricing Energy</td>
</tr>
<tr>
<td>Drilling Success Ratio</td>
<td>AF Power Plant</td>
<td>Pricing Energy</td>
<td>Capital Cost</td>
</tr>
<tr>
<td>Well Capacity</td>
<td>CF Power Plant</td>
<td>Investment Security</td>
<td>Energy Production</td>
</tr>
<tr>
<td>Well Decline</td>
<td>System Capacity</td>
<td>Force Majeure</td>
<td>off taker Capability</td>
</tr>
<tr>
<td>Steam Quality</td>
<td>Financing</td>
<td>COD</td>
<td>Gov. Guarantee</td>
</tr>
<tr>
<td>AF Power Plant</td>
<td>Quality Supply</td>
<td></td>
<td>Environmental</td>
</tr>
<tr>
<td>CF Power Plant</td>
<td>Force Majeure</td>
<td></td>
<td>Equipment Quality</td>
</tr>
<tr>
<td>Capital Cost</td>
<td>Fluctuation USD Exchange Rate</td>
<td></td>
<td>Force Majeure</td>
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<tr>
<td>Financing</td>
<td>COD</td>
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<tr>
<td>Pricing Energy</td>
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<td>Force Majeure</td>
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<td>COD</td>
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Major Component Impact to Pricing

- Natural Resources
- Pricing
- Electricity
- Geothermal
**PRICING COMPONENT AND ESCALATION**

**Investment:**
- Steamfield, Production well, Injection well
- Power Station
- Environmental
- Engineering, Project Management, Develop cost
- Other Facilities.

**O & M:**
- Resource O & M; Generation O&M
- Make Up Well
- Financing, Return
- Import Duties, VAT, Corporate Tax
- Royalty for local Government & Central Gov.

**Capacity Charge**

**O & M Charge**

**Index/escalation**
**BACKGROUND**

- Indonesia has 40% of the world geothermal energy reserves, equivalent to 29,000 MW of electricity or approx. 12.5 billion barrels of oil reserves.

  
  - 11 geothermal power projects/ energy sales contracts were concluded for total capacity 3,417 MW, involving approx. USD $ 4 Billion investment.
BACKGROUND

• In 2000, PD 76/2000 was enacted – the exploratory risk from developer to GOI & to remove the les specialist tax
• In 2003, Law No. 27/2003 on geothermal energy was enacted – almost no new investment to explore new work areas since issuance of PD 76/2000 & Law No. 27/2003
• Indonesia has more than 285 locations along the country, yet only less than 5% of total potential reserves have been utilized with total installed capacity of geothermal energy 1,226 MW
• This needs over US$ 14,000 million, in order to support the program, GOI has issued some policies and regulations to overcome barriers in geothermal development.