Energy Sector Reform in the Democratic Republic of Congo (DRC). Inga III and Grand Inga Hydro Projects Development

by

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1. D R Congo background
   a) D R Congo energy potential
   b) Electricity and Water Access levels
   c) Challenges and constraints

2. Reform of the Energy Sector
   a) Reform of the institutional framework
   b) Reform of the public utilities SNEL(power) and REGIDESO(water)

3. Inga III and Grand Inga projects development
   a) The Inga hydro site
   b) Inga site development
   c) Inga III hydro project
   d) Grand Inga hydro project

4. Conclusion– opportunities for investors
I. DRC Background

- Geographical position: located between longitudes 5°20’ north and 13°27’ south
- Area: 2,345,441 sq km
- Country Organisation: 11 Provinces
- Hydroelectric potential: 100,000 MW (with 44,000 MW located at Inga)
- Post conflict country
- Population: 72 millions people
- Population growth rate: 3%
- Abundant water resources (on and under ground)
a). D R Congo energy potential

100,000 MW hydropower potential, 44,000 MW at Inga site. 56,000 MW throughout the country. Renewable energies include: solar, biomass, wind, methane gas, geothermal. Installed hydro capacity: 2,498,45 MW (2.5% of the country potential). Abundant water resources.

Superficie : 2,345,441 km²
Population : 72 millions habitants
Taux de croissance population : 3,0%
215 hydro sites identified across the 11 provinces for small scale hydro projects (P≥ 500 kW) aimed at reducing internal energy deficit; this option is more economical than that of supply from Inga.

<table>
<thead>
<tr>
<th>Capacity range in MW</th>
<th>Number of sites</th>
<th>Total capacity in MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 10 MW</td>
<td>62</td>
<td>69 304, 90</td>
</tr>
<tr>
<td>Between 1 and 9 MW</td>
<td>83</td>
<td>246, 88</td>
</tr>
<tr>
<td>Between 0.5 and 1 MW</td>
<td>70</td>
<td>29,12</td>
</tr>
<tr>
<td>Total</td>
<td>215</td>
<td>69 580,90</td>
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</tbody>
</table>
### b). Electrification Rate

<table>
<thead>
<tr>
<th>PROVINCES</th>
<th>POPULATION</th>
<th>Electricity Access in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BANDUNDU</td>
<td>8 135 000</td>
</tr>
<tr>
<td>2</td>
<td>BAS-CONGO</td>
<td>4 684 000</td>
</tr>
<tr>
<td>3</td>
<td>EQUATEUR</td>
<td>7 401 000</td>
</tr>
<tr>
<td>4</td>
<td>KASAI OCCIDENTAL</td>
<td>5 215 000</td>
</tr>
<tr>
<td>5</td>
<td>KASAI ORIENTAL</td>
<td>6 448 000</td>
</tr>
<tr>
<td>6</td>
<td>KATANGA</td>
<td>10 834 000</td>
</tr>
<tr>
<td>7</td>
<td>KINSHASA</td>
<td>8 683 000</td>
</tr>
<tr>
<td>8</td>
<td>MANIEMA</td>
<td>1 970 000</td>
</tr>
<tr>
<td>9</td>
<td>NORD KIVU</td>
<td>5 621 000</td>
</tr>
<tr>
<td>10</td>
<td>ORIENTALE</td>
<td>7 939 000</td>
</tr>
<tr>
<td>11</td>
<td>SUD KIVU</td>
<td>4 874 000</td>
</tr>
<tr>
<td><strong>Average electrification rate</strong></td>
<td><strong>71 804 000</strong></td>
<td></td>
</tr>
</tbody>
</table>
c). Constraints and Challenges

CONSTRAINTS
- Poor electricity (9%) and water access (24%) rate
- Imbalance in energy development among provinces
- No studies available for identified projects
- No funding available for projects development
- Poor funds absorption and mobilization
- Institutional framework unable to attract international investors (The project of Electricity Act that should improve electricity sector environment has been tabled to Parliament, and very soon for Water)

CHALLENGES
- Improve electricity access from 9% to 19% in 2015, 33% in 2020 and 60% in 2025; for water access from 24% to 34% in 2015, 50% in 2020
- Need to mobilise funding for electricity as follows:
  - 6.5 billion USD in 2015 (1.5 billion USD for Water)
  - 12 billion USD in 2020
  - 20 billion USD in 2025.
II. Energy sector reform (Power and Water)

- **Objective**: Improve the sector management and attract private investments by offering an attractive and secure institutional and legal framework.
- **Current legal framework**: liberalized sector lacking updated documentation
- **Current institutional framework**:
  - (1) Ministry of Energy,
  - (2) Public Power utility SNEL managing 95% of the country electricity infrastructure; Public Water utility REGIDESO.
  - Independent Power Producers: 2 private companies: EDC (Electricite du Congo, in generation and distribution) and Hydroforce (in generation and distribution)
  - An independent Transmission Operator: SAF Energy
a) Progress in the legal and institutional framework to date

- **Electricity Act**
- Adopted by the Government and submitted to Parliament for approval before promulgation by the DRC Head of State

- **Electricity Act content:**
- An institutional framework includes the Ministry of Energy, an Independant Regulator, a National Electrification Agency (mostly for rural electrification) and a National Electrification Fund.
Legal and institutional framework (continued)

- Legal documents for business activities:
  - Concession (transmission and distribution)
  - License (generation with capacity > 1000 kW and/or power export),
  - Authorization (by provincial authorities, with capacity between 60 kW and 1000 kW),
  - Declaration (generation capacity ≤ 60 kW)
  - Liberty (electricity network in private concession)
Legal and institutional framework (continued)

- Legal aspect of Infrastructure:
  - Private ownership of generation infrastructure is allowed with transfer of the ownership to the Congo government after the contract period.
b) SNEL Reform to date.

- SNEL has been commercialised
- With capital of 3.1 billion USD. The legal documentation of the new company was published in the December 2010 issue of the Official Gazette.
- Performance contract with independent audit to review performance indicators every 3 months during the company stabilisation phase.
- Unblending along generation, transmission and distribution might follow in the long run.
- Successful PPP experience with private investors, namely mining operators who provide funding for projects and are paid back through a portion of their electricity bills, according to specific agreements.
3). Development of Inga III and Grand Inga projects

a) The Inga site
b). Inga site development scheme

Congo River:
- 42 000 m³/s average flow
- Exceptionally: ~ 95 000 m³/s

Installed capacity:
- Inga I: 351 MW (1972)
- Inga II: 1424 MW (1982)
- Inga III: ~ 3500 à 4 320 MW (project)
- Grand Inga ~ 39 000 MW (project)
C) Inga III hydro project

- **Objectives**: (1) Reduce the country energy deficit (in Kinshasa and in the mining industry in Katanga Province), supply BHP BILLITON aluminum smelter and (2) export excess capacity to Southern African countries.
- Project approved in Kinshasa in June 2009
- Steering Committee in place since September 2010. Project to develop through PPP arrangements
- Invitation to tender for the selection of a developer launched in nov–dec 2010 (for more information please visit www.cate.cd and www.energie.gov.cd)
- Selection process of a developer ongoing.
d) Grand Inga hydro project

- Objective: Reduce the country energy deficit and export of excess of capacity to African Power Pools along the following axis: North, Centre-West, South-West and South-East.
- PPP Project
- Global study of the Inga site development and associated transmission lines recently launched in Kinshasa on March 9, 2011. Study funded by African Development Bank. Grant of 15 millions USD.
- Study to be conducted in 17 months by Consultants EDF (France) and RSW Intl (Canada).
### Planning – Global study of Inga site (EDF–RSW)

<table>
<thead>
<tr>
<th>Activités</th>
<th>Mois</th>
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<tbody>
<tr>
<td>Rapport de premier établissement</td>
<td>1</td>
</tr>
<tr>
<td>Volume I: Etude Offre &amp; Demande</td>
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<tr>
<td>Volume II: Etude de Préfaisabilité</td>
<td>4,5,6,7</td>
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<tr>
<td>Atelier de restitution &amp; orientation stratégique</td>
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<tr>
<td>Volume III: Etude de Faisabilité</td>
<td>8</td>
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<tr>
<td>Volume IV: Etude d'impact Environnemental &amp; Social</td>
<td>17</td>
</tr>
<tr>
<td>Volume V: Structuration &amp; Financement de Projet</td>
<td>11,12,13,14,15,16,17</td>
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<tr>
<td>Volume VI: Communication &amp; Sensibilisation</td>
<td>17</td>
</tr>
<tr>
<td>Volume VII: Synthèse de l'étude</td>
<td>17</td>
</tr>
<tr>
<td>Réunions des bailleurs de fonds</td>
<td>17</td>
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</tbody>
</table>
Interconnections projects from Inga

**LEGEND**

**Interconnection Projects**
- **DRC Egypt**: 5 300 km
- **Alternative route** **RDC - Egypt**
- **DRC - Zambia - RSA**: 3 676 km
- **DRC - Angola - Namibia - RSA**: 2 734 km
- **DRC - Nigeria**: 1 400 km

**Conversion stations**
- **Existing**
- **Project**

RD Congo
4). Conclusion– Opportunities for investors

- Investors around the world are kindly invited to participate to the development of the Congo hydro resources including the Inga site, with the following advantages:

  - Clean, abundant, low cost and environmentally friendly energy
  - An important electricity market in Congo and other African countries with growing electricity needs. A cheaper alternative to very expensive generation options.
  - A legal and institutional framework that will protect your investment.
  - Profit expected as generation cost is very low at Inga (+/− 2 Usd/ kWh)
  - A more and more peaceful environment within growing economic stability.
  - Improved business climate as Congo has joined the OHADA treaty.
Inga = Affordable Answer to Energy Deficit in Africa.
THANK YOU