Opportunity in Vietnam’s Renewable Energy Sector

Tien Nguyen - Infunde Development
Fundamental Conditions create Opportunity for RE Sector

- Available Resources for RE in Vietnam
- Vietnam Power Demand Supply Gap
- Improving Regulatory Environment
Fundamental Conditions create Opportunity for RE Sector

Available Resources for RE in Vietnam

Vietnam Power Demand Supply Gap

Improving Regulatory Environment
Available Resources for RE in Vietnam

Diversified and abundant renewable resources ...

<table>
<thead>
<tr>
<th>Renewable Resource</th>
<th>Potential Capacity</th>
<th>Present Capacity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Hydropower</td>
<td>7,000</td>
<td>2,143 (~30%)</td>
<td></td>
</tr>
<tr>
<td>Solar</td>
<td>130,000</td>
<td>~6 (~0%)</td>
<td></td>
</tr>
<tr>
<td>Wind</td>
<td>27,000</td>
<td>179 (~1%)</td>
<td></td>
</tr>
<tr>
<td>Solid Waste</td>
<td>400</td>
<td>~2 (~1%)</td>
<td></td>
</tr>
<tr>
<td>Biomass</td>
<td>2,000</td>
<td>150 (8%)</td>
<td></td>
</tr>
<tr>
<td>Biogas</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Geothermal</td>
<td>350</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td>Ocean energy</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Unit: MW

Sources: N.D.Cuong, WB, MoIT, IE, EVN
MOIT/GIZ Support Program

but almost unexploited except hydro
Fundamental Conditions create Opportunity for RE Sector

- Available Resources for RE in Vietnam
- Vietnam Power Demand Supply Gap
- Improving Regulatory Environment
Current consumption: 158,000 GWh in 2016
Double digit electricity demand growth in the last decade (i.e. 10% - 15%)
...expected to continue until 2020 after slow down to 7.5% – 8.5% pa in the period of 2021-2030.
Power Demand Supply Gap

- Power import from China, Laos until 2020, 2030
- Is the Plan achievable? Hydro exploited; gas reach limitation; nuclear delayed; coal sources? pollution... ⇝ many delays already despite the recent revision in March 2016
   ⇝ RE is the obvious solution/choice for Vietnam

Sources:
Fundamental Conditions create Opportunity for RE Sector

Available Resources for RE in Vietnam

Vietnam Power Demand Supply Gap

Improving Regulatory Environment
## Improving Regulatory Environment

### Vietnam’s Competitive Power Market Roadmap

<table>
<thead>
<tr>
<th>Level 1</th>
<th>2005-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive Generation Market (VGCM)</strong> - power generators will be allowed to enter the market and sell electricity to Vietnam Electricity (EVN), the only buyer, at competitive prices</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 2</th>
<th>2015-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive Wholesale Market (VWEM)</strong> - power generators and wholesale power distributors will enter the market. Besides EVN, there will be other wholesale buyers</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level 3</th>
<th>2021-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Competitive Retail Market (VREM)</strong> - Vietnam retail electricity market - power generators, wholesale distributors and retail consumers will all enter the market</td>
<td></td>
</tr>
</tbody>
</table>

➡️ Opening the power market; reducing monopoly and increasing competition and transparency

By the end 2016, Vietnam competitive electricity market is still at Level 01, but a trial of VWEM (Level 02) will be launched in 2017-2018 and the market will officially operate in 2019 (Decision No. 8266/QĐ-BCT)
- Many power subsidiaries and projects invested by Vietnam Electricity (EVN) will be privatized, according to a plan for restructuring the group in 2017-2020.
- Noting that after equitization of another major power generator - Vinacomin Power (35%), PV Power (49%) with ~4,200MW will is also planned to IPO this year.

Source: MOIT/GIZ Support Program, May 2017
## Improving Regulatory Environment

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Content</th>
<th>Major RE Target / Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decision No.1855/QD-TTg, dated 27 December 2007</td>
<td>Approving Vietnam Energy Development Strategy until 2020, vision 2050</td>
<td>3% - 2010; 5% - 2020; and 11% - 2050 within total primary energy sources.</td>
</tr>
<tr>
<td>Decision No.1208/QD-TTg, dated 21 July 2011</td>
<td>Approving National Power Development Plan 2010 – 2020, vision 2030 (Power Master Plan 7)</td>
<td>3.5% - 2010; 4.5% - 2020; and 6.0% - 2030 within total power generation mix.</td>
</tr>
</tbody>
</table>

- Determining supportive measures and specifying RE target during each period ➔ creating foundation for implementation in detail later and at provincial level
- Emphasizing power diversify and increasingly important role of RE in the national power and energy system
• Deployment of renewable energy as a priority for the future of the national electricity mix.
• Targets are set at 6.5% of the electricity production by 2020, 6.9% by 2025, and 10.7% by 2030.

Source: Revised National Power Development Plan VII
Improving Regulatory Environment

Tariff Incentives Mechanism

<table>
<thead>
<tr>
<th>RE Sources</th>
<th>Supporting Mechanism</th>
<th>Price (US cents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar PV</td>
<td>FIT</td>
<td>9.35c/kWh</td>
</tr>
<tr>
<td>Wind</td>
<td>FIT</td>
<td>7.8c/kWh</td>
</tr>
<tr>
<td>Small Hydro-power</td>
<td>Avoided cost Tariff (ACT)</td>
<td>~5c/kWh</td>
</tr>
<tr>
<td>Biomass</td>
<td>FIT</td>
<td>7.34 – 7.55c/kWh</td>
</tr>
<tr>
<td>Waste-to-Energy</td>
<td>FIT</td>
<td>7.28 – 10.05c/kWh</td>
</tr>
</tbody>
</table>

- **FIT** issued for both Wind and Solar
- Long term **Standard Power Purchase Agreement** (20yrs PPA)

Sources: MOIT/GIZ Support Program, May 2017
**Fundamental Conditions create Opportunity for RE Sector**

**External Conditions:**
- Better technology: more efficiency equipment or improved material
- Capex reduction
- Climate Change

- Available Resources for RE in Vietnam
- Vietnam Power Demand Supply Gap
- Improving Regulatory Environment
Infunde Development is InfraCo Asia’s exclusive Developer for South East Asia (excluding Myanmar & Co-Development program)

World Class Development Capability
Infunde has signed a developer services agreement with InfraCo Asia for its Southeast Asia developer services program.

Stimulating greater private sector investment in infrastructure development in lower income countries of South and South East Asia.
InfraCo Asia receives funding from the governments of Australia, Switzerland and the United Kingdom.
EXCLUSIVE INFRACO ASIA DEVELOPER

Infunde Development is responsible, on behalf of InfraCo Asia for project origination, pre-financial close, project development, EPC management and financial structuring activities in Southeast Asia.

InfraCo Asia is a company of the Private Infrastructure Development Group a coalition of donors mobilising private sector investment to assist developing countries attain infrastructure vital to boosting their economic growth and combating poverty. InfraCo Asia is currently funded by three PIDG members - Australian Department of Foreign Affairs and Trade (DFAT), the Swiss State Secretariat for Economic Affairs (SECO), and the UK Department for International Development (UKAid).

@InfraCoAsia
InfraCo Asia
www.infracoasia.com

@pidgorg
Private Infrastructure Development Group
www.PIDG.org
WE SEEK PROJECTS THAT

Reduce poverty and provide social benefit

Complement, not compete, with the private sector

Are commercially viable
Aim to stimulate greater private sector investment in infrastructure by providing capital and expertise

Fund early stage, high-risk infrastructure development activities by taking an equity stake in projects

Seek partners committed to the highest project development standards

Seek projects where we add significant value through our technical, commercial, financial and sell-side expertise
Leadership

DEVELOPMENT EXPERTISE

- Successfully signed PPAs with all national utilities in the region, including EVN, EDC, PLN, EGAT, Meralco and PEA
- Experience in all infrastructure sections
- Negotiated more than US$10 billion of completed EPC contracts
- Team experience with International Firms such as Poyry, Worley Parsons, RW Beck, GDF Suez, Coastal Power, Bechtel
- Infunde developers have successfully raised US$ 20 billion of project finance debt

DEVELOPMENT FUNDING

ACCESS TO DEBT

INFUNDE
AREAS OF POTENTIAL INVESTMENTS

Target Sectors

- Telecoms
- Logistics & Transport Infrastructure
- Water & Waste Water
- Urban & Social Infrastructure
- Manufacturing

- Agriculture
- Waste Management
- Power & Energy
- Oil & Gas Distribution
FOCUS COUNTRIES

LAOS

VIETNAM

CAMBODIA

INDONESIA

PHILIPPINES
OUR APPROACH

RISK      COST      PROJECT VALUE

ENTRY POINT

EXIT POINT

Concept | Early-Stage Development | Advanced Development

Financial Close | Construction | COD | Commercial Operation

Bank club formed Financing Term Sheet Signed

Project Definition

Pre-FS Completed

Offtake Agreement Signed

Bankable FS Completed

2 - 10% of project cost

Opportunity Identification

Local Partner Selection
OUR APPROACH

Strong Local Partner(s) – Key to Success

- Early-Stage Development
- Advanced Development
- Financing / Pre-Construction
1. **NDA**
   Agree and sign non-disclosure agreement (NDA).

2. **REVIEW PROJECT INFO / DISCUSS CONCEPT**
   Infunde reviews an existing project or discuss with Local Partner on potential projects.

3. **MOU**
   Agree and sign a memorandum of understanding on partnership.

4. **AGREE THE PLAN**
   Infunde prepares model, budget and schedule for agreement with Local Partner.

5. **PRESENT TO IAD**
   Infunde presents to InfraCo Asia (IAD) for approval to incur third-party costs.

6. **3RD-PARTY STUDIES / DUE DILIGENCE**
   Infunde engages external advisors for DD or studies to better understand the opportunity (if required).

7. **JDA TERM SHEET**
   Agree key commercial terms for Joint Development Agreement (JDA).

8. **JDA**
   Prepare and execute the JDA and other transaction documents with help of counsel.