Stimulating Markets for Variable Renewable Energy through Corporate Purchasing Commitments

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Vietnam Low Emission Energy Program [V-LEEP]
Funded by US Agency for International Development (USAID)
Implemented by Deloitte Consulting
Agenda

• Introduction to the USAID Vietnam Low Emissions Energy Program
• Why enable Corporate Procurement of Renewable Energy in Vietnam?
• Building consensus and determining demand for DPPAs in Vietnam
• DPPA model selection
• DPPA pilot program development
• Take-aways from the DPPA development process in Vietnam

**Public Policies and Programs**

- Energy Security Studies for Politburo
- Power Development Plan - 8 with MOIT
- Renewable Energy Development Action Plan
- Direct Power Purchase Agreement (DPPA)
- Renewable Energy Portfolio Standards
- Minimum Energy Performance Standards for Key Industry Sectors

**Private Sector Engagement**

- Deploy Utility Scale Grid-Connected RE
  - DPPA
  - Project Development
- Increase Energy Efficiency
  - Buildings
  - Cement
  - Iron/Steel
  - Textiles
  - Sugar
Why DPPA for Vietnam?

178 global companies endorse RE100 across worldwide operations. 38 member companies have operations in Vietnam

**Widespread support** for an alternative Renewable Energy procurement mechanism.

In Vietnam, DPPA is supported by:
- REBA VN
- CEIA
- VBF
- AmCham
- EuroCham
Global DPPA market trends

1. US corporations purchased a record **4.2GW of clean energy** in 2018, just under 60% of the global total
2. Behind-the-meter solar dominated DPPAs in China, with **10GW of rooftop PV installed** in 2018
3. Corporations in India have purchased **4.1GW of clean energy**
4. Contracted DPPA purchases of the largest multinational corporations exceeds total RE production in many countries

Top-10 Corporations Entering into DPPAs

<table>
<thead>
<tr>
<th>Corporation</th>
<th>MW</th>
<th>Solar</th>
<th>Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facebook</td>
<td>437</td>
<td>680</td>
<td>820</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>820</td>
<td>667</td>
<td></td>
</tr>
<tr>
<td>Norsk Hydro</td>
<td>667</td>
<td>524</td>
<td></td>
</tr>
<tr>
<td>Alcoa Corp</td>
<td>524</td>
<td>473</td>
<td></td>
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<tr>
<td>Microsoft</td>
<td>473</td>
<td>300</td>
<td>108</td>
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<tr>
<td>Walmart</td>
<td>108</td>
<td>300</td>
<td>160</td>
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<tr>
<td>T-Mobile</td>
<td>160</td>
<td>130</td>
<td></td>
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<tr>
<td>MGM Resorts</td>
<td>130</td>
<td>102</td>
<td></td>
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<tr>
<td>Google</td>
<td>102</td>
<td>86</td>
<td></td>
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<tr>
<td>Nike</td>
<td>86</td>
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**Notes:**
- MW: Megawatts
- Solar: Solar energy capacity
- Wind: Wind energy capacity

**Source:** Data from various reports and company announcements.
Global DPPA market trends

10-year DPPA Growth Trend by Region

Top-10 Non-US Countries Originating DPPAs
Benefits of DPPA for Vietnamese stakeholders

**Power Consumers**
- Meet sustainability commitments
- Hedge against energy price increases
- Lower upfront capital requirements
- Ensure long-term price certainty

**Power Sellers**
- Access additional credit-worthy offtakers
- Lock in long-term offtake arrangements
- Improve project bankability
- Reduce operational risk (via associated DPPA policies)

**Government of Vietnam**
- Attract foreign direct investment
- Enable direct RE procurement by large energy consumers
- Support Vietnam’s RE development targets
- Reduce fiscal liability of long-term RE purchase agreements
- Demonstrate RE policy leadership
Contracts that define the direct purchase of power by a designated consumer. Two types:

- Private Wire DPPA
- Sleeved DPPA

**Financial PPAs**
Financial contracts that allow the Generator and Consumer to derive value from the direct sale of power to the Vietnam power market:

- Synthetic DPPA
<table>
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<th>Criteria for selecting a DPPA model</th>
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</table>
| **Economic and Financial Impacts** | • Economic and cost impact  
• Balance sheet and electricity bill impact  
• Tax incidence |
| **Market Considerations**         | • Attractiveness to investors and consumers  
• Alignment with existing and future power market structures |
| **Operational Considerations**    | • Ease of implementation  
• Additional work requirements for power sector agencies |
| **Legal and Regulatory Considerations** | • Changes in existing laws  
• Requirements for new or modified regulations |
V-LEEP and ERAV tailor-made a synthetic DPPA model to fit Vietnam’s Electricity Law and Wholesale Electricity Market.
Step 1: Negotiate DPPA Price Support ("strike price")

The **DPPA Price** (amount paid to the GENCO) is the difference between the **Fixed Strike Price** and the Hourly Spot Price.

The **DPPA Price** is paid to the GENCO.

The **Spot Price** is paid to the PC.

The **Fixed Strike Price** = $0.080/ kWh*

The **Spot Price Cap** = $0.056/ kWh

The **Hourly Spot Price**

The **DPPA Price**

*Estimated strike price based on average FIT for ground-mounted solar power projects for FY 2020*
Step 2: Estimate off-setting electricity savings from the Market Based Tariff (vs. Retail Tariff*) (USD/kWh)

Through the DPPA, the Consumer obtains access to a **Market-Based Tariff (MBT)**, which is generally lower than the Retail Tariff and does not fluctuate based on time-of-use periods.

![Graph showing hourly electricity price variations](image)

*Note: Average Retail Price is for customers between 22 to 110 kV; Data Source: EVN.com, accessed March 25, 2019

**MBT = Hourly Spot Price + DPPA Charge ($0.0131/kWh)**

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The DPPA Charge allows EVN to recover transmission, distribution, and system operations costs.
DPPA Project Business Case Development Step-Wise Process

1. Data Collection
2. Deloitte Financial Flows Model
   Impacts on GVN Power Sector
   “Gut Check” to Buyer & Seller Financial Model
3. Sensitivity Analysis
   VWEM/DPPA Functionality
4. Risk Identification & Allocation
5. Rough Term Sheet
6. DPPA Policy "Must Haves"
   Prep for the Pilot Program
### Term sheet and agreement “Must Haves”

<table>
<thead>
<tr>
<th>Category</th>
<th>Must Haves</th>
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<tbody>
<tr>
<td><strong>Operational</strong></td>
<td>• Priority Dispatch&lt;br&gt;• Must allow capacity scale sufficient to match buyer needs&lt;br&gt;• Model for interconnection, licensing and participation in WEM must be clear&lt;br&gt;• Timely settlement from VWEM for power delivered</td>
</tr>
<tr>
<td><strong>Data Tracking</strong></td>
<td>• Transparent and Credible metering of power delivers&lt;br&gt;• Clear ownership of Attributes</td>
</tr>
<tr>
<td><strong>Transactional</strong></td>
<td>• Freedom to dictate commercial terms such as price, arbitration, termination, assignment&lt;br&gt;• CfD commercially negotiated&lt;br&gt;• Guidance on options at expiration of CfD for purchase and/or sale of power into and out of VWEM&lt;br&gt;• Ability to transfer contract to new counterpart&lt;br&gt;• Ability to contract with multiple buyers</td>
</tr>
<tr>
<td><strong>Protection</strong></td>
<td>• Market Failure Protection and/or remedy&lt;br&gt;• Curtailment protection and/or remedy&lt;br&gt;• Non-disclosure protection&lt;br&gt;• Protection from changes in law/taxes</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>• International leading practices for all agreements&lt;br&gt;• Stability in price and tenure of DPPA Charge&lt;br&gt;• Future price transparency&lt;br&gt;• ERAV/EVN to indicate where projects should be sited subject to land access</td>
</tr>
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## Agreements and Transactions (under development)

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Parties</th>
<th>New agreements</th>
<th>Modifications to existing agreements</th>
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</table>
| CfD Agreement | RE GENCO & Participating Consumer | • CfD term sheet reviewed by ERAV  
• Ability to transfer contract to new counterparty  
• Strike price and delivered amount of power  
• Participating Consumer access to metered power delivery data |  |
| Wholesale Market Participation & Purchase Agreement | RE GENCO & NLDC | • Priority dispatch  
• Provision of settlement data to GENCO  
• Power delivery and payment terms  
• Tenure  
• Default terms  
• Title to environmental attributes  
• Terms and remedy on curtailment | • Adjust tenure to match CfD, with option to renew |
| Participating Consumer Special Contract | Participating Consumer & PC | • Allow access to spot market  
• Set the DPPA charge and revenue allocation | • Retail invoice based on spot market prices  
• Hourly metered data required |
| Interconnection Agreement | EVN & RE GENCO |  |  |
| Metered Data Services Agreement | VN/NLDC, PC & RE GENCO |  | • Provides access to RE GENCO metered power delivery data through PC and NLDC’s internet portal - for both RE GENCO and Participating Consumer |
Q&A