Feedstock Procurement with Tech-savvy Suppliers

Mobile Cloud Computing in the Bioenergy Sector
Topics to Cover

- About Verdanté
- Biomass challenges
- Looking at Standards
- Technology overview
- A brand new “First mile” solution
We make biomass reliable.

- IT Solutions for Biomass
  - Enterprise Solutions
  - Mobile applications
- Consulting
  - Pile Management
  - Quality and Standards
  - Process Optimization
  - Commercial Appraisals
  - Sustainability Reporting

**Bioenergy Pro™**
First mobile application designed for the industry

**Bioenergy ProEX ™**
Patent-pending biomass transaction system
Key Problems in Biomass Supply Chains

- Natural product
- Diversity of producers and workers
- Moisture management – the energy business should be in MWhs, not tons!
- Accurate information from the field/forest is lagged at best
- Lab data can take days or weeks to be available to an entire team
Pain Points

- Biomass is dispersed widely, highly variable, bulky, expensive to transport, and degrades over time, but it is carbon-neutral and renewable.
- Energy projects without feedstock contracts are not financeable
- Lack of transparency results in load refusal, downtime, and failure
- Commodity status for bioenergy feedstocks is elusive due to lack of standardized data
Real-time Supply Chain Data Enables...

1) New business models
   - Vertical Integration
   - Outsourcing

2) Networking with small producers

3) Easy, near real time data sharing

4) Improved specification

5) Easy, clear audit trail
Remote Storage

Just in time inventory.
ENERGÍA
Sampling Feedstock

Understanding standards.
From forest to gate to lab
Can we push standards back into the forest?
**Analytical Report**

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VERDANTE BIOENERGY SERVICES  
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<table>
<thead>
<tr>
<th>Parameter</th>
<th>As-Received</th>
<th>Dry Basis</th>
<th>Analytical Method</th>
<th>ISO 17025</th>
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<tbody>
<tr>
<td>Total Moisture (%)</td>
<td>37.38</td>
<td>1.88</td>
<td>ASTM E871</td>
<td>Q</td>
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<tr>
<td>Ash (%)</td>
<td>1.18</td>
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<td>ASTM D1102</td>
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<tr>
<td>GCV (BTU/lb)</td>
<td>5277</td>
<td>8427</td>
<td>ASTM E711</td>
<td>Q</td>
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TP ID Number: DBL150160-1  
Product Recognized As: Wood Chips/Pine Needles  
Sample Designation: 10-SMS-511  
Sample Weight (lbs): 2.22  
Sample Received: 5/20/2015  
Report Date: 5/27/2015  
Purchase Order:
What is an ERP Solution?

Enterprise Resource Planning (ERP) is business management software used to collect, store, manage and interpret business activity data.

WHAT IT DOES

- Tracks business resources
  - Raw materials
  - Human resources
  - Production capacity
  - Vendors/Partners

- Tracks business commitments
  - Contracts
  - Purchase orders
  - Invoices and Payroll

We make biomass reliable.
We make biomass reliable.
Engage Stakeholders

**Biomass Producer**
- Production Reports
- Harvester
- Field Storage

**Contractors**
- Processing
- Transport
- Laboratory

**Conversion Facility**
- Operations
- Laboratory
- Financial

**External Auditors**
- Regulatory
- Sustainability
- Subsidy

We make biomass reliable.
We make biomass reliable.
Mobile and Desktop Views

- Geo-location Record
- Order Execution
- Tracking
- Photo, video, PDF, and text documentation
- Easy reporting

We make biomass reliable.
We make biomass reliable.

Functions of the System

- Purchasing and Scheduling
- Supplier reviews
- Chain of Custody
- Billing/Payments
- Pricing toolbox
Pricing Toolbox

- Biomass indices
  - 3rd Party reports
  - Internal analysis
- Biomass Cost Analyzer
  - Moisture, ash, BTU
  - Out of spec material discounting
  - Price Bollinger bands
  - Regionally relevant
- Transportation Analyzer
- Sampling SOPs
- Biomass discount model
How it works….

- Buyer signs up
- Suppliers get onboard
- Bid/Ask Transactions
- Buyer Manages Suppliers

Voluntary Discount
Easy Cash Flow
Market Intelligence

We make biomass reliable.
Real World Scenario - Pilot
Wood to Industrial Process Energy

- 250,000 tons per year
- $22 per ton
- Average MC
  - 48% owb received
  - 42% owb utilized
- 6% loss of moisture → $266,000
- 2% spoilage → $110,000

- ROI in less than 3 months!
- Bringing ~$1 million into view on the balance sheet

We make biomass reliable.
We make biomass reliable.

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“We value our customers and their time. Our firm is built upon mutual respect and solid business ethics. I look forward to discussing how Verdanté can make biomass more reliable for your company.”