THE ECONOMICS OF PRODUCTION EXPANSION

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Who We Are

National Client Base: agribusinesses, grain elevators, ag producers, renewable fuels.

Financial and Technical Advisory Services: financial reporting, tax planning, benchmarking and forecast modeling.

Strategic Planning: board of directors training, succession and estate planning, growth strategies, and financing plans.

Dependable Expertise: building relationships with our clients since 1987.

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Who We Are

- C&A Biofuels Benchmarking data consistently represents about a third of all US production gallons.
- 2015: collected data on 4.25 billion prod. gallons.
- Representative sample of the industry: all regions, sizes and organization types; allows us to peer group to identify trends.
Overview

• Production Expansion Trends
• How Production Volume Can Impact Costs
• Funding an Expansion
• Executing a Feasibility Study
Production Expansion Trends

Three kinds of expansion underway:

• Yield enhancements (more ethanol, same feedstock)
  • Improved milling capacity; attention to corn quality; changes in production chemistry and tech
• Organizational growth
  • Buying plants and consolidating organization
  • Building new facilities
• Capacity growth (more feedstock, more ethanol)
  • Added fermenters
Production Expansion Trends

Denatured Ethanol Yield (gallons/bushel @ 15% moisture)

Q1 11 Q2 11 Q3 11 Q4 11 Q1 12 Q2 12 Q3 12 Q4 12 Q1 13 Q2 13 Q3 13 Q4 13 Q1 14 Q2 14 Q3 14 Q4 14 Q1 15 Q2 15 Q3 15 Q4 15 Q1 16

Average
Leaders
Laggards

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Production Expansion Trends

From 2014-2015:
- 5% average production increase.
- Larger plants: 8% increase
- Smaller plants: 3% increase
# Production Expansion Trends

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Production</strong></td>
<td>66,836,252</td>
<td>67,773,734</td>
<td>75,208,753</td>
<td>79,356,260</td>
<td>85,765,199</td>
</tr>
<tr>
<td><strong>Average Capacity</strong></td>
<td>59,467,900</td>
<td>60,400,000</td>
<td>72,707,320</td>
<td>68,823,210</td>
<td>76,840,910</td>
</tr>
<tr>
<td><strong>Percent of Nameplated Capacity Produced</strong></td>
<td>112%</td>
<td>112%</td>
<td>104%</td>
<td>107%</td>
<td>111%</td>
</tr>
</tbody>
</table>
Production Expansion Trends

Single-Plant Comparison:
Change in Production Gallons 2014-2015

<table>
<thead>
<tr>
<th>Percentage Change</th>
<th>Percentage of Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10% to -5%</td>
<td>7%</td>
</tr>
<tr>
<td>-5% to 0%</td>
<td>34%</td>
</tr>
<tr>
<td>0% to 5%</td>
<td>29%</td>
</tr>
<tr>
<td>5% to 10%</td>
<td>27%</td>
</tr>
<tr>
<td>10%+</td>
<td>2%</td>
</tr>
</tbody>
</table>

Change in gallons produced from 2014 to 2015; only includes plants reporting all eight calendar quarters.
Small=under 60MMGY  Large=over 60MMGY
Financial Factors: Costs

100MMGY+ Average Costs

- Variable Costs: $1.43 (92%)
- Fixed Costs: $0.1175 (8%)

US Average Costs

- Variable Costs: $1.44 (92%)
- Fixed Costs: $0.1210 (8%)

Q1 2016, costs per production gallon
Financial Factors: Costs

Q1 2016, costs per production gallon
Financial Factors: Fixed Costs

100MMGY+ Fixed Costs: $.1182/Gal

- Production Labor: 30%
- Repair and Maintenance: 35%
- Plant Supplies: 3%
- Real Estate and Other Tax: 3%
- Insurance: 2%
- Administrative Expense and Labor: 27%

<60MMGY Fixed Costs: $.1382/Gal

- Production Labor: 36%
- Repair and Maintenance: 23%
- Plant Supplies: 6%
- Real Estate and Other Tax: 4%
- Insurance: 3%
- Administrative Expense and Labor: 28%
Financial Factors: Variable Costs

100MMGY+ Variable Costs: $1.46/Gal

- Feedstock Net: 85.91%
- Natural Gas: 4.41%
- Electricity All Sources: 3.15%
- Chemicals and Ingredients: 4.78%
- Water: 0.26%
- Denaturant: 1.49%

<60MMGY Variable Costs: $1.50/Gal

- Feedstock Net: 84%
- Natural Gas: 5.29%
- Electricity All Sources: 2.77%
- Chemicals and Ingredients: 4.91%
- Water: 0.32%
- Denaturant: 1.56%

(Q1 2016, excludes change in inventory)
## Financial Factors

<table>
<thead>
<tr>
<th></th>
<th>Q1 2016 Average Denatured Yield</th>
<th>Yield Difference Gallons/Bushel</th>
<th>Potential Production Change</th>
<th>Potential Revenue Change**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>US Average</strong></td>
<td><strong>2.84</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
<td><strong>-</strong></td>
</tr>
<tr>
<td><strong>~65MMGY at Leader Average</strong></td>
<td><strong>2.95</strong></td>
<td><strong>+.11</strong></td>
<td><strong>+2,530,000 gal</strong></td>
<td><strong>$3,213,100</strong></td>
</tr>
<tr>
<td><strong>~85MMGY at Leader Average</strong></td>
<td><strong>2.95</strong></td>
<td><strong>+.11</strong></td>
<td><strong>+3,300,000 gal</strong></td>
<td><strong>$4,191,000</strong></td>
</tr>
<tr>
<td><strong>Difference (65MMGY vs 85MMGY)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$977,900</strong></td>
</tr>
</tbody>
</table>

65MMGY: Processing approx. 23 million bushels per year (e.g. average production capacity of approx. 65 MM gallons per year). 
85MMGY: Processing approx. 30 million bushels per year (e.g. average production capacity of approx. 85 MM gallons per year). 
**Average ethanol sales of $1.27 (derived from Q1 2016 average $/sales gallon).
Funding Sources & Options

Grants and Subsidies
- Federal government grants and programs
- State and local grants
- Foundations and corporate grants

Non-Grant Funding
- Loans
- Bonds
- Equity
Grants: Overview

• Process of applying for grants
• Potential Sources of grants
• Example of USDA
Grants: Overview

- Process
- Collaborative effort
- Marathon, not a sprint
When Approaching a Grant Opportunity

- Be Informed
- Verify Eligibility
- Identify Service Providers
- Form Partnerships
When Approaching a Grant Opportunity
Grants: Pre-Application Registrations

- DUNS Number
- SAM
- Fed Connect

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Grants: Approach

- Gantt chart
- Punchlist of needed items
- Deadlines for team members responsible
- Monitor progress weekly
USDA-REAP Grants

REAP (Rural Energy for America) Program

- Funding:
  - $50 million annually
- Eligibility:
  - Rural Small Businesses and Ag Producers
- Grants for:
  - Renewable Energy Systems (RES)
  - Energy Efficiency Improvements (EEI)
REAP Details

• Limits:
  • $500,000 for RES or 25% of total project costs
  • $250,000 for EEI or 25% of total project costs
• Deadlines:
  • Ongoing – October 31 and April 30
• Important Considerations:
  • Commercial technology ONLY
  • Can score your own project initially
REAP Requirements

• **RES:**
  - Feasibility Study (Projects > $200,000)

• **EEI:**
  - Energy Assessment (Projects < $200,000)
  - Energy Audit (Projects > $200,000)

Value Added Producer Grant

- Funding: ~ $30 Million / yr
- Definition:
  - Change in physical state
  - Physical segregation
  - Produced in a manner that enhances the value of the end-product
  - Locally produced and marketed food products
  - Farm- or ranch-based renewable energy
VAPG

- Deadline: Typically in July
- Eligibility:
  - Ag Producers or majority farmer-owned businesses
  - Must produce or own more than 50% of the commodity
- Limits:
  - Planning – up to $75,000
  - Working Capital – up to $250,000
Repowering Assistance Program

- Convert heat and/or power from fossil fuel to renewable biomass power.
- Deadline: October 24th, 2016
- Only facilities in operation prior to June 18, 2008 are eligible.
- Limits: 50 percent of total eligible costs under the program up to $1 million
- Must demonstrate the ability to cover the other 50 percent of project costs
- A company with multiple biorefineries can only apply for funding for one biorefinery
Biorefinery, Renewable Chemical and Biobased Product Manufacturing Assistance Program

- Formerly the “Biorefinery Assistance Program”
- Loan guarantees of up to $250 million
- Development of renewable chemicals and biobased product manufacturing facilities
- 2 cycles:
  1. Due October 3, 2016.
  2. Due April 3, 2017
Biomass Research and Development Initiative

- Research, development, and demonstration expenditures
- $500,000 min to $2 Million max, up to 3 yr projects
- USDA and DOE recommend forming partnerships
- At least 20% match required
- Focus areas:
  - Feedstocks development
  - Biofuels and biobased products development
  - Biofuels development analysis
BCAP

Biomass Crop Assistance Program

- **Funding:** $25 Million annually
- **Eligibility:**
  - Ag Producers or majority farmer-owned businesses
- **Payments for:**
  - 50% of the establishment costs for a new, perennial energy crop
  - Annual maintenance payments – up to crop maturity (harvest)
  - Planning – up to $75,000
  - Retrieval payments (matching payments) for harvesting and transporting to the plant
Leveraging Grants

• State programs and grants
• Tax credits/incentives
Initiate and Execute Feasibility Study

Step 1: Know Your Audience and Know Your Goal
• Explore and target funding sources first to ensure you understand all their requirements for documentation and assessment.
• Identify your proposed project in as much detail as possible: budget, time frame, technical specifications, expected outcomes, risks, etc.

Step 2: Pick a partner/consulting firm.
• Set a timeline, budget and expectations for the study.
Feasibility Study

Roadmap for Project

- Site evaluations and recommendation
- Feedstock analysis
- Finished product market analysis
- Construction and startup costs
- Operating costs
- Financial analysis and sensitivity studies
- Competitive analysis
Factors in Feasibility

USDA Requirements:

- Description of the Project
- Market Feasibility
- Technical Feasibility
- Financial/Economic Feasibility
- Organizational/Managerial Feasibility
- Recommendations
Business Plan

• Management
• Market Analysis
• Marketing Plans for Products
• Feedstock Supply Plan
• Risk Management Plan
• Financial Plan – allow for adequate working capital!
• Projected Financial Performance
Conclusions

• Production expansion is a **calculated risk** given the uncertainty about increased demand, but it’s a risk most plants are taking.

• Careful **feasibility assessment** helps you set shareholder expectations and optimizes your chances for grants and favorable financing. Grants can help defray expenses in performing feasibility studies.

• **Have a plan** in place for how the profit from additional gallons can be reinvested to capitalize on new technology and keep your plant a low-cost producer, not just a high-volume producer.
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Questions?
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