Flow of coproducts through US market channels
Opportunities for price reporting services

Tim Worledge, Kansas City
May 13, 2015
• Why am I here?
• Overview of US DDGS markets
  – Market structure
  – Market participants
• Platts perspective
• In search of transparency
Platts is... 

...a leading global provider of commodities information and a foremost provider of benchmark price assessments, covering such key markets as:

- Oil
- Natural Gas
- Electric Power
- Petrochemicals
- Metals
- Coal
- Agriculture
- Shipping
Platts is also...

... a division of McGraw Hill Financial, a leader in credit ratings, benchmarks and analytics for the global capital and commodity markets.

McGraw Hill Financial’s other well-known brands include:
More Than a Century of Growth

Platts was founded by journalist Warren Platt who started a monthly news magazine, National Petroleum News.

Platts was acquired by The McGraw Hill Companies.


Platts expanded into petrochemical markets with the launch of Platts European PetrochemicalScan.

Platts acquired Metals Week and launched Metals Alert, a real-time service.

Platts acquired FT Energy, becoming the primary provider of U.S. gas and power daily benchmarks.

Platts acquired Metals Week and launched Metals Alert, a real-time service.

Platts acquired Metals Week and launched Metals Alert, a real-time service.

Platts acquired Kingsman, gaining a leadership position in sugar and a foothold in agriculture.

Platts acquired Kingsman, gaining a leadership position in sugar and a foothold in agriculture.

Platts acquired Metals Week and launched Metals Alert, a real-time service.

Platts acquired Metals Week and launched Metals Alert, a real-time service.

Platts acquired Eclipse Energy Group, a London-based provider of data and analysis on the European gas, power and LNG markets in mid July.

Bentek Energy, Steel Business Briefing and its pricing unit, The Steel Index, were acquired, establishing Platts’ leadership in natural gas market fundamentals and metals, respectively.
More than 1,000 employees work in offices located in top business cities and commodities trading centers on five continents.
DDGS
The Dry Milling Process

Planting & Harvesting

Wet Milling (10% usage)
- Shelling & Cleaning
- 1 Bushel (56 lbs.)
  - Grinding & Germ Separation
  - Starch-Gluten Separation
- Corn
- Wet Feed
- Gluten Meal
- Corn Starch
- Syrup Refining
- Drying
- Starch
- Syrup
- Fermentation
- Absolute Ethanol
- Denaturation
- Denatured ethanol
- Corn Oil
- 1.5 lbs.
- Wet Feed
- 22.4 lbs.
- Gluten Meal
- 2.6 lbs.
- Corn Starch
- 31.5 lbs.

Dry Milling (90% usage)
- Liquefaction & Cooking
- Corn Meal
- Grinding
- Mix Slurry
- Fermentation & Distillation
- Enzymes
- Centrifuge
- Stillage
- Thin Stillage
- Evaporator
- CDS Syrup
- CO2
- Dryer
- DDGS
- WDGS
- 17.5 lbs.
- Soda
- Carbonation

Distribution & End Product

Milling & Processing

The Dry Milling Process

Source: Compiled Sources from Ethanol Producers & Sapient Resources
### Distiller Grains Types

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>CDS</th>
<th>WDG</th>
<th>MDG</th>
<th>DDG</th>
<th>DDGS (DDG+CDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry matter, %</td>
<td>30-50%</td>
<td>25-35%</td>
<td>50%</td>
<td>88-90%</td>
<td>88-90%</td>
</tr>
<tr>
<td>Moisture level, %</td>
<td>50-70%</td>
<td>65-75%</td>
<td>50%</td>
<td>10-12%</td>
<td>10-12%</td>
</tr>
<tr>
<td>Crude Protein, %</td>
<td>20-30%</td>
<td>30-35%</td>
<td>30-35%</td>
<td>25-35%</td>
<td>25-35%</td>
</tr>
<tr>
<td>Fat, %</td>
<td>9-15%</td>
<td>8-12%</td>
<td>8-12%</td>
<td>8-10%</td>
<td>8-10%</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>Less than 1 week</td>
<td>Less than 1 week</td>
<td>Less than 3 weeks</td>
<td>3+ Months</td>
<td>3+ Months</td>
</tr>
<tr>
<td>Cost to Transport</td>
<td>$$$</td>
<td>$$$</td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

Sources: USDA, US Grains Council, PRX
In 2012, 8MM tons of DDGS worth $369 MM (23% of production) was shipped by rail. 77% was shipped by truck and barges.

Source: Compiled Sources from Ethanol Producers & Sapient Resources
Prospects for growth

United States DDGS Supply

Historic CAGR = 14%
Forecast CAGR = 0.9%

US DDGS Animal Usage by Species

Source: RFA, EIA, USDA
Midwest the cradle of production

Production & Consumption of DDGS by US Region (2013)

*Units in thousands mt

Source: PRX & U.S. Department of Transportation
USDA DDGS Prices for Selected Regions

- **2007:** US DDGS exports break above 2 mil mt, first time since inception (20 years)
- **2007:** USDA launches regional DDGS price assessments FOB plant
- **Apr 2010:** CME launches first Chicago physical delivery DDGS contract
- **Nov 2011:** Mexico overtakes China as top US importer for DDGS
- **2012:** China regains lead as top US importer for DDGS with 2.2 mil mt imported
- **2013:** Prices in feed market rise to meet high demand
- **2013:** Dry mill corn processing reaches over 90% of ethanol production
- **Jun 2013:** Global DDGS exports reach 11.3 mil mt, with the US exporting 9.7 mil mt
- **Jun 2014:** China bans new DDGS imports from the US

*USDA prices are based on FOB plant offers*

Source: USDA Prices & Industry News
Platts US Midwest Ethanol Production Margin Index

Source: USDA, Platts

11/22/13
146.27 cents/gal
Impact on margins

Iowa Weekly DDGS vs Iowa Corn Price

DDGS
Premium to
Corn

DDGS
Discount to
Corn

Impact on margins
### DDGS Supply Drivers
- Ethanol production
- Changes to blending requirements as per the Renewable Fuel Standard for ethanol in transportation fuels
- Ethanol margins
- Availability of corn for use in ethanol production
- Use of wet vs. dry milling methods for ethanol production
- Prices and demand of other ethanol co-products

### DDGS Supply Risks
- Transportation bottlenecks (availability of railcars, trucks, barges, vessels)
- Competition from other feed stocks used to make ethanol
- Perishability

### DDGS Demand Drivers
- Demand for DDGS as a viable ingredient in animal feed
- Level of adoption from buying community
- Demand from international buyers prompts exports vs. local demand
- Rations of DDGS in feed
- Availability and price of feed substitutes
- Ease of Transportability to buyer location
- Government policies
- Price discovery process

### DDGS Demand Risks
- Regionally lower demand for beef swine and poultry
- Changing tastes and preferences for feed ingredients
- Import restrictions from international buyers (e.g. Chinese import ban)

*Source: Industry Interviews*
Market Structure
LEGEND:

- CIF Assessment (Export)
- FOB Assessment
- Paper Contract
- CME Delivery Point

Assessment Provider

- USDA
- US Grains Council/WPI
- DTN

Notes:
* Assessments are on a delivered or FOB basis
** All assessments are based on offer indications only
*** Terms of delivery, payment, and quality varies from one supplier to another

Other sources of price
## U.S. Production (2013 VOLUMES = 35 MMT)

<table>
<thead>
<tr>
<th>Trade Categories &amp; Transaction Flow</th>
<th>DIRECT TRADE (Producer --&gt; End User)</th>
<th>TRADE THROUGH TRADING AND MARKETING COMPANY (Producer --&gt; Trader/Marketer --&gt; Buyer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Types</td>
<td>SPOT</td>
<td>TERM</td>
</tr>
<tr>
<td>Tenor</td>
<td>Shipment within 15-30 days from the transaction date</td>
<td>Multiple shipments for up to 6 months</td>
</tr>
<tr>
<td>Delivery Location</td>
<td>FOB Ethanol Plant, CIF Buyer’s Location, CIF Export Location</td>
<td></td>
</tr>
<tr>
<td>Typical Transaction Size</td>
<td>25 Truck loads (500 mt); 10 Rail Car (1,000 mt); Barge (1,500 mt); Vessel: 40 or 80 ft containers (500 mt – 1,000 mt)</td>
<td>Variable</td>
</tr>
<tr>
<td>Pricing</td>
<td>Fixed price (non-indexed)</td>
<td>Fixed price (non-indexed)</td>
</tr>
<tr>
<td>Price Discovery Mechanisms</td>
<td>Formula Driven based on:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) Plant’s Corn Crush Spread, fixed costs and transportation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Protein and fat content</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Competing values of other feeds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4) Forward and cash pricing for corn and ethanol (e.g. USDA, CME)</td>
<td></td>
</tr>
<tr>
<td>Peer to Peer or Brokered</td>
<td>Both</td>
<td></td>
</tr>
<tr>
<td>Transportation options</td>
<td>Truck, Rail, Barge to Buyer’s Location. Oceangoing bulk or container vessel for overseas shipments</td>
<td></td>
</tr>
</tbody>
</table>

Source: Sapient Interviews
- Volatility and substitutability create a need for risk management
- A study has shown that participants use composite cross hedging strategy using corn and soybean meal futures contracts.

- On April 26, 2010, the CME introduced a DDG contract designed to be substitute to alternative price-hedging instruments.
- It failed to gain traction and has become inactive shortly after its introduction.

Some reasons we researched include:
- Unsuitable delivery locations (i.e. rail junctions) for transport from seller to buyer.
- Less demand and awareness from the buyer community on risk management.
- High liquidity of cross-hedge futures contracts.

Source: Sapient Interviews
Corn and soybean meal futures are by far the most popular sources of information used to determine DDG prices. A large proportion of participants set DDG prices using their own internal formulas or rely on cash and forward pricing. Many respondents use existing risk management products but over 1/3 do not hedge DDG at all. A large majority of respondents have indicated that DDG’s importance to profitability has increased.

Surveying the market

Source: Stroade Survey (2010)
Market Participants
<table>
<thead>
<tr>
<th>Client segment</th>
<th>Estimated Count</th>
<th>Customer Examples                                                                                                                                                                                                cek</th>
<th>Logo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol Producer</td>
<td>~200 plants</td>
<td>Operate ethanol plants as their core business or part of a broader mix of petroleum and renewables production and refining assets. They may also aggregate, market and distribute ethanol for third party ethanol producers. They may also be vertically integrated and own the transportation infrastructure and downstream production and processing of DDGs.</td>
<td>ADM, POET</td>
</tr>
<tr>
<td>Marketers and Trading Companies</td>
<td>~25</td>
<td>Entities that have marketing agreements with ethanol producers to market production both domestically and internationally. Provide a variety of services includes transportation and logistics by truck, rail, barge, and vessel. May own or operate ethanol plants and own transportation infrastructure. Aggregate demand and enhance liquidity.</td>
<td>LouisDreyfus, CHS, Cargill</td>
</tr>
<tr>
<td>Buyers Categories</td>
<td>~87,000</td>
<td>A feedlot is a type of animal feeding operation (AFO) which is used in factory farming for finishing livestock, notably beef cattle, but also swine, horses, sheep, turkeys, chickens or ducks, prior to slaughter. Large beef feedlots are called concentrated animal feeding operations (CAFOs) in the U.S. and intensive livestock operations (ILOs) or confined feeding operations (CFOs) in Canada. Feed manufacturers use raw materials such as DDGS, cereals, cereal by-products, proteins co-products from human food manufacture, minerals, vitamins and feed additives.</td>
<td>Land O'Lakes, CPF, Five Rivers</td>
</tr>
<tr>
<td></td>
<td>~5,250</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>~965,000 (cattle only) 5 major importing countries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brokers</td>
<td>~20</td>
<td>Match buyer and seller of DDGS. Do not take title. Some also provide risk management services and consulting services. Execute futures and options orders for listed markets on behalf of clients. Aggregate demand and enhance liquidity.</td>
<td>McDonald, Atlas</td>
</tr>
<tr>
<td>Government Agencies</td>
<td>&lt;5</td>
<td>is a permanent or semi-permanent organization in the machinery of government that is responsible for the oversight and administration of specific functions</td>
<td>USDA</td>
</tr>
<tr>
<td>Industry Groups</td>
<td>&lt;5</td>
<td>is an organization founded and funded by businesses that operate in a specific industry. Participates in public relations activities such as advertising, education, political donations, lobbying and publishing, but its main focus is collaboration between companies.</td>
<td>AFIA, U.S. Grains Council</td>
</tr>
</tbody>
</table>

Source: Industry profiles
Top 10 US Ethanol Producers form 53% of total US ethanol capacity, Platts has established relationships with several Top 10 US Ethanol Producers by Total Capacity (2013)

- Top 5 US Ethanol account for 43% of total US ethanol capacity
- US Ethanol Plants run at or near full capacity

Source: Bloomberg
Market Data
The distribution network

Net Import/Exports by State & Export Centers (2013)

- Net Production (Export)
- Net Consumption (Import)

*Units in thousands mt

US Transportation Routes by Volume (2007)

- Water channel
- Rail
- Road way

Source: PRX & US Department of Transportation
Nearly 200 operating plants churned out an estimated 13.3 billion gallons of ethanol in 2013, up slightly from 2012 and rivaling 2010 for the second-highest annual output of all time.

Most of the production is concentrated in the corn belt – namely Iowa, Nebraska, Illinois, Indiana, Minnesota and South Dakota.

A Renewable Fuel Standard (RFS) requirement for 13.8 billion gallons, attractive blending economics, a record corn crop and lower corn prices, and robust export demand all played important roles in painting the ethanol demand and production picture in 2013.
Global exports of DDGS have rapidly grown after breaking 2 mil metric tonnes exported in 2007.

The US has historically been the world leader in DDGS exports and accounted for over 85% of global market exports in 2013.

- The top 5 major exporters take over 95% of global DDGS export market share.

US DDGS exports have substantially risen following the expansion of domestic ethanol production in 2007.

- The top 5 US export partners accounted for about 73% of US DDGS exports in 2013.
- Chinese imports of US DDGS accounted for 46% of shipments.
- Mexico has also been a major trade partner for DDGS and had been the largest importer for certain past years.
Buyer Profiles – Feed Mills and Feedlots

Feed Mill Profile

Feed mills/manufacturers are important players in the buyers market that will blend feedstuffs into specific formulated rations. They will also store and sell straight DDGS to end-users and profit the difference from FOB plant prices.

- 65.75% of DDGS produced in 2011 went into US feed mill production
- The top 10 global feed mills represent 14% of global feed production
- The top feed producers are heavily concentrated in Asia and in the US

Feedlots Profile

Large feedlots are important end-users in the buyer’s market that will buy DDGS in bulk volumes.

Cattle and swine feedlots that use feed over free-range pasture methods are going to be the biggest end-users as the vast majority of DDGS is consumed by these species.

- The top 10 US feedlots by capacity represent about 3% of the total market share
- The largest feedlots are heavily concentrated in the Midwest
- DDGS can also be transported to large Canadian feedlots (yellow) concentrated on the Northwestern US border

Raw Materials Used in US Feed (2011)

- Corn 63%
- Soybean Meal (Domestic Use) 16%
- DDGS 16%
- Other 5%

North America Feedlots by Capacity and Cattle Density (2007)

Source: International Feed Industry Federation, WATTAgNet & AFIA
## Commitment to Transparency & Integrity

### Vision
To be the leading provider of benchmarks and analytics in the global commodity markets

### Mission
Promote sustainable growth by bringing transparency and independent insights to the global commodity markets

### Core Values

**Fairness:** The highest standards of fairness and impartiality with our customers, partners and colleagues

**Integrity:** The highest standards of integrity and honesty in all of our dealings

**Transparency:** Transparency in our products and services and bringing transparency to the capital and commodity markets
Unparalleled Expertise in Price Discovery

What is a price assessment?
Platts uses “price assessment” to refer to the market value it publishes for specific commodities or baskets of commodities.

How does Platts develop its price assessments?
Through the collection and analysis of trading data obtained from participants in the physical spot markets.

How many price assessments does Platts publish?
Platts publishes thousands of daily prices to support the physical commodity market flows and the world’s supply chains.

How does Platts determine the value of its price assessments?
At the end of the physical market trading day, Platts editors analyze the market data collected (i.e. bids, offers and trades) with respect to Platts’ methodology guidelines, then publish price assessments quoted as a low-high range or a single value.
Why Price Assessments Are Needed

• Unlike equities and future contracts, physical commodities are not homogenous, i.e.:
  – There are hundreds of different grades and attributes for each commodity
  – There are no standard parameters for quality, delivery, timing, location and lot size

• Platts establishes standards that give market participants a common understanding of a commodity’s attributes and allow them to make comparisons

• By standardizing and providing an assessed value for a particular commodity, Platts’ price assessments provide reference point for buyers and sellers.
Mechanics of a new assessment

**Proposal – DDGS Chicago**

<table>
<thead>
<tr>
<th>Rail</th>
</tr>
</thead>
</table>

**Quality:** Price assessments reflect export quality DDGS with a protein content in the range of 25% to 35%, standardized to 27.3% minimum, color 2, fat minimum 8%, moisture level in the range of 10% to 12%, standardized to 11.5%.

**Quantity:** Railcar assessments reflect cars of 100 metric tons

**Location:** Chicago, Channahan

**Timing:** Delivery next week shipment

---

**Proposal – DDGS New Orleans**

<table>
<thead>
<tr>
<th>River</th>
</tr>
</thead>
</table>

**Quality:** Price assessments reflect export quality DDGS with a protein content in the range of 25% to 35%, standardized to 27.3% minimum, color 2, fat minimum 8%, moisture level in the range of 10% to 12%, standardized to 11.5%.

**Quantity:** Barge assessments reflect sizes of 1,360 mt (1,500 short tons) plus or minus 10%. Other sizes may be considered but normalized to reflect that standard.

**Location:** New Orleans

**Timing:** Delivery next month shipment
Thank you for your attention

• Contact details:
• tim.worledge@platts.com
• +44 207 176 6023
• IM: tim_platts