Governors’ Biofuels Coalition

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Abengoa is an international company that applies innovative technology solutions to sustainable development in the energy and environment sectors.

**Sectors**

- **Energy** 76%
  - Electrical Transmission
  - Concentrated solar power (CSP)
  - Biofuels
  

- **Environment** 24%
  - Desalination
  - Industrial waste recycling

**Geographic distribution**

- Spain: 26%
- Brazil: 19%
- Rest of Latin America: 16%
- Rest of Europe: 16%
- USA: 15%
- Asia & Oceania: 4%
- Africa: 4%

Note: % of sales in 2010

**Additional Information**

- 20 MW CSP Torre (España)
- 100,000 m³/day Desalination plant (India)

+ 23,000 people
ABENGOA

...becoming the only global ethanol company

Biofuel capacity = 1,440 ML
Feed capacity = 980 KTY

York, NE 208 ML since 2001
Colwich, KS 95 ML since 2001
Portales, NM 114 ML since 2001
Ravenna, NE 341 ML since 2007
Evansville, IN 341 ML since 2011
Granite City, IL 341 ML since 2011

Biofuel capacity = 1,500 ML
Feed capacity = 885 KTY

Cartagena, Sp 150 ML since 1999
La Coruña, Sp 195 ML since 2001
Salamanca, Sp 200 ML since 2006

Biofuel capacity = 235 ML
Feed capacity = 980 KTY

Sao Luís, SP 91 ML since 2007
Sao Joao, SP 144 ML since 2007

Global production 2011
Ethanol (ML): 2,950
Sugar (KTPY): 570
Feed (KTPY): 1,865
Electricity (MW): 259
Biodiesel (ML): 225

2G Assets
Commercial biomass plant Hugoton (KS, US)
95 ML since 2013

Biomass demonstration plant in BCyL (Salamanca, Spain)
5ML since 2009

Biomass pilot plant in York (NE, US)
0.1 ML since 2007
### Hugoton project highlights

- **Capacity:** 25 MG PY ethanol from biomass
- **Electricity capacity:** 21-MW electr. power. Neutral to grid
- **Location:** Hugoton, Kansas
- **Site:** 400-acre parcel
- **Feedstock:** Corn stover, switch grass
- **Estimated start-up:** 2013
- **Biomass:** ~380,000 dt per year contracted fix price for 10y
- **Objective:** enzymatic hydrolysis conversion of biomass to ethanol to operate at 2.00 $/gal cost in 2014
- **Finance:** DOE awards validating our technologies

### Positive Economic Impacts

- $17 million in local feedstock purchases
- 300 direct construction jobs for 2 years
- 65 permanent local jobs at the facility
- $5 million annual payroll

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1st commercial-scale biomass to ethanol plant construction started
Hugoton plant biomass feedstock needs

- 380,000 “dry” tons of biomass per year
- Less than 20% of available biomass available within 50 mile radius

Biomass feedstock:

- Percent, irrigated wheat straw, 7%
- Percent, milo stubble, 7%
- Percent, switchgrass / CRP, 4%
- Percent, irrigated corn stover, 81%

Irrigated Wheat Straw  Milo Stubble  Switchgrass  Irrigated Corn Stover  CRP Grassland
Current work in progress – Distillation and Dehydration
Biomass Bales and Fermentation Tanks
May 2012
Completed Fermentation and Cooling Towers
January Construction
Hugoton today
3. Milestones update

- Cogeneration scheduled mechanical completion - Aug 2013
- Enzymatic hydrolysis mechanical completion - Dec 2013

Workforce Statistics
- Average # of workers on site for February 2013 – 254
- Planned peak: ~550 in May 2013
Key policy driver critical to success

- Demand is still driven by one key piece of federal legislation that establishes a market for biofuels, and helps to offset the significant incentives and tax advantages still awarded to petroleum based fuels

- The 2007 Renewable Fuel Standard (RFS-2) provides for the use of 36 billions gallons of renewable fuels annually by 2022 (minimum of 16bgy of cellulosic ethanol and 5 bgy of other Advanced Biofuels).

- RFS has been a success, increasing alternative fuel supplies in the US from 2.5% to 10% of the transportation fuel market, saving consumers between $0.84 and $1.07 at the pump, and has spurred the development of multiple advanced biofuel projects across the country

Here now, expanding rapidly

- Multiple 2G projects developing in 22 states
- 200 million gallons annually projected by 2015, but policies are under attack
- Unintended consequences of modification:
  - Significantly increased fuel prices for consumers (from pricing, volume and octane benefits)
  - Undermine investor confidence and derail the progress currently being made in advanced fuels
  - Stifle potential for nationwide economic development and the national security benefit from this new industry

Sources: DOE (History and Cellulosic Ethanol Forecast), Informa Economics (Conventional Ethanol Forecast), Energy Independence and Security Act of 2007
Sugar to move beyond biofuels into petrochemical complex;

Sugar: the molecule of the future

We are creating technology on bioproducts:
- Biochemical route
- Catalytic route

PMMA
739 BGY
Polyesters/Xylene/Styrene
27 BGY
Poly-Propylenes
32 BGY

3%-5% share of Power generation by 2050
10%-20% share of Primary Energy by 2050

Next stage of industry growth
RFS is working, and is critical to our energy security:
- First generation technologies have:
  - Provided an alternative to the petroleum monopoly, increasing the availability of US produced fuels at lower costs to consumers
  - Increased our national security by helping to reduce the volumes of imported petroleum from 60% to 42% of our transportation fuel requirements (we still spend $1 billion every day to import petroleum)
  - Provided tremendous economic benefits to rural America – (created and supported 400,000 US jobs, and saved consumers $50 billion in fuel costs during 2011)
  - Helped clean the air across the nation, reducing vehicle emissions

Advanced biofuel technologies are now being implemented:
- Commercial scale production facilities are being constructed today
- Creating a 50 state solution to further reduce our dependence on oil imports
- Will bring even more broad based economic development through multiple potential feedstocks
- Development would be slowed, benefits reduced, and unintended negative consequences to consumers would result through inconsistent support of this critical energy policy