

# *Farm Bill Title IX Programs and Advanced Biorefinery Project Finance*

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**DOE Bioenergy Demonstration and  
Deployment Strategy Workshop  
Argonne National Laboratory  
March 12, 2014**

**Tony Crooks  
USDA Rural Development**



# *Food, Conservation, and Energy Act '08*

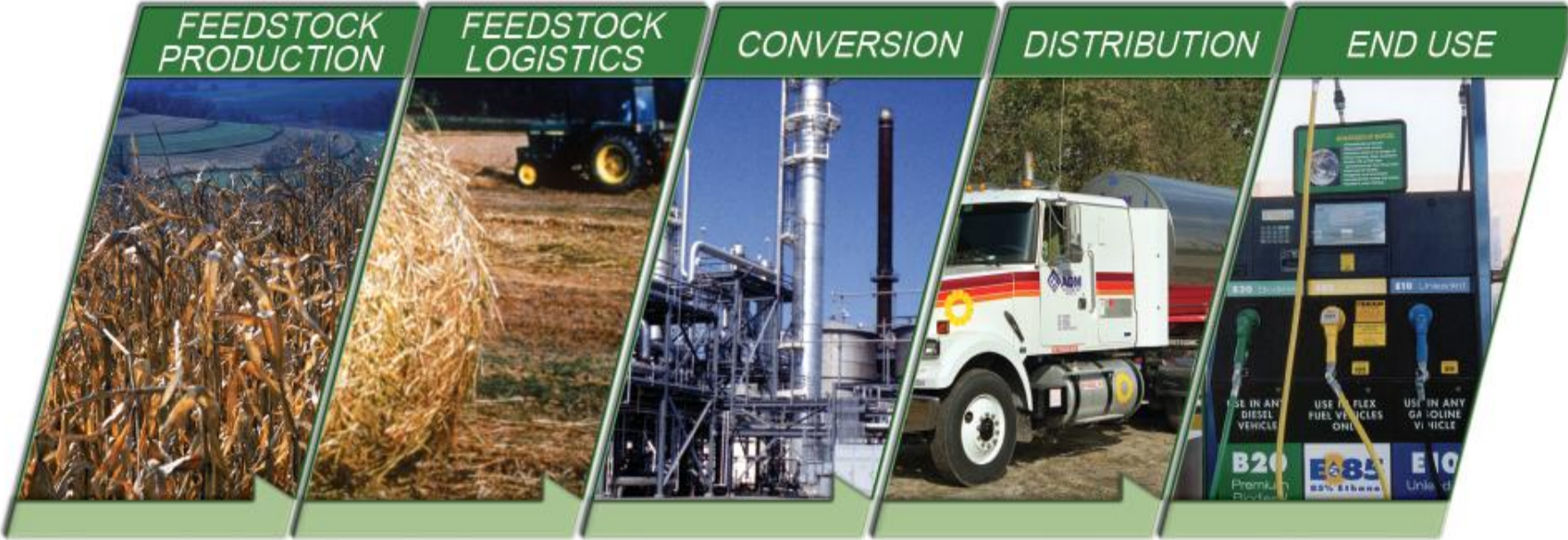
Energy Title Programs with Mandatory Funding

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## **\$1.1 billion to leverage renewable energy industry investments in new technologies and feedstocks**

- **Biomass Crop Assistance Program (BCAP) – \$70 M**
- **Biomass Research and Development Initiative -- \$118 M**
- **Biorefinery Assistance -- \$75 M ('09), \$245 M ('10)**
- **Bioenergy Program for Advanced Biofuels -- \$300 M**
- **Rural Energy for America Program (REAP) -- \$255 M**
- **Biobased Markets Program -- \$9 M**
- **Biodiesel Fuel Education Program -- \$5 M**
- **Biofuels Infrastructure Study -- \$1 M**
- **Repowering Assistance -- \$35 M**

# Sustainable Biofuels Supply Chain





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- Increasing economic opportunity in rural America
- Improving the quality of life of all rural Americans



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# *2008 Farm Bill – Title IX*

Renewable energy programs administered by  
USDA Rural Development

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- **Biorefinery Assistance Program**
- **Repowering Assistance Program**
- **Advanced Biofuels Payment Program**
- **Rural Energy for America Program (REAP)**



# *Biorefinery Assistance Program*

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*FIRST OF ITS KIND*



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## *Section 9003 - Biorefinery Assistance Program*

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- Provides loan guarantees of up to \$250 million for the construction and retrofitting of commercial scale biorefineries that produce advanced biofuels
- **Mandatory Funding (available until expended):**
  - FY 2009 - \$75 Million
  - FY 2010 - \$245 Million



# *Section 9003 Biorefinery Assistance Program*

## Summary of 32 applications received, 2009 to 2012

Number	Technology	Feedstock	Advanced Biofuel
3	Anaerobic digestion	Animal manure, Municipal solid and food wastes	Biogas/Electricity (2008 FB definition)
5	Thermo-chemical (F-T and similar processes)	Woody Biomass, Municipal solid waste	Green diesel, Green gasoline, Aviation Fuel, F-T waxes
6	Biochemical (Enzymatic and steam hydrolysis)	Woody Biomass, Energy grasses, Crop residues	Cellulosic ethanol
3	Thermo-chemical/ Bio-chemical hybrids	Woody Biomass, Municipal solid waste	Cellulosic ethanol
3	Lipid Hydro-cracking (UOP process)	Algae oil, non-food oilseeds (Camelina, high stearic canola), yellow grease, waste food oil	Hydro-treated Jet (HRJ), Hydro-treated Diesel HRD), Naphtha
5	Traditional (methyl ester) biodiesel	Soy oil, yellow grease, waste food oils, reclaimed corn oil (ethanol distillers syrup)	Biodiesel
7	Others	Various	Anhydrous ammonia

# *Section 9003 - Biorefinery Assistance Program*

## Investments in “First of its kind” commercial production

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- **Loan Note Guarantees issued:**
  - Range Fuels Inc., Georgia, \$80 million
  - Sapphire Energy, Inc., New Mexico, \$54.5 million
  - INEOS New Planet BioEnergy, Florida, \$75 million
  - Fremont Community Digester, Michigan, \$12.8 million
- **Conditional Commitments awarded:**
  - Enerkem Corporation, Mississippi, \$80 million
  - Coskata, Inc., Alabama, \$87.5 million
  - Zeachem, Oregon, \$232.5 million
  - Fiberight, Iowa, \$25 million
  - Fulcrum Sierra Biofuels, Nevada, \$105 million
  - Chemtex, North Carolina, \$99 million



# *FY 2014 Biorefinery Assistance Applications*

NOFA closed January 30, 2014.

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- 8 applications received;
- \$510 million in loan guarantee authority requested;
- 4 States – Texas, Louisiana, Georgia, North Carolina;
- 5 Technologies:
  - 2 Green gasoline, diesel, and advanced aviation from woody biomass;
  - Cellulosic ethanol from algae;
  - 2 Anaerobic digesters using swine manure as principle feedstock;
  - Solid fuel pellets from woody biomass;
  - 2 Biodiesel from waste greases and oils.

# *Agriculture Act of 2014*

## Title IX Appropriations, Fiscal Years 2014-18

<b>Program Name</b>	<b>Mandatory Funding (\$M)</b>	<b>Availability</b>
<b>Biobased Markets Program</b>	<b>\$3</b>	<b>Annually</b>
<b>Biorefinery Assistance Program*</b>	<b>\$200</b>	<b>Until expended</b>
<b>Repowering Assistance Program</b>	<b>\$12</b>	<b>Until expended</b>
<b>Bioenergy Program for Advanced Biofuels</b>	<b>\$15</b>	<b>Annually</b>
<b>Rural Energy for America Program</b>	<b>\$50</b>	<b>Annually</b>
<b>Biomass Research and Development Initiative</b>	<b>\$3</b>	<b>Annually</b>
<b>Biomass Crop Assistance Program</b>	<b>\$20</b>	<b>Annually</b>



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**\*Biorefinery, Renewable Chemical, and Biobased Product  
Manufacturing Program**

# *RD Energy Partnerships*

USDA						DOE		EPA	
FSA	NIFA	FS	NRCS	OCE - OCS	ARS National Labs	EERE Biomass Program	National Labs	RFS2	AgSTAR

# *Wealth creation*

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Multiplier effect --

USDA leveraged investments create a multitude of secondary and tertiary employment opportunities and business startups in rural areas and serve as an incubator to new green technologies.

# *Thank you!*

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**Tony Crooks**

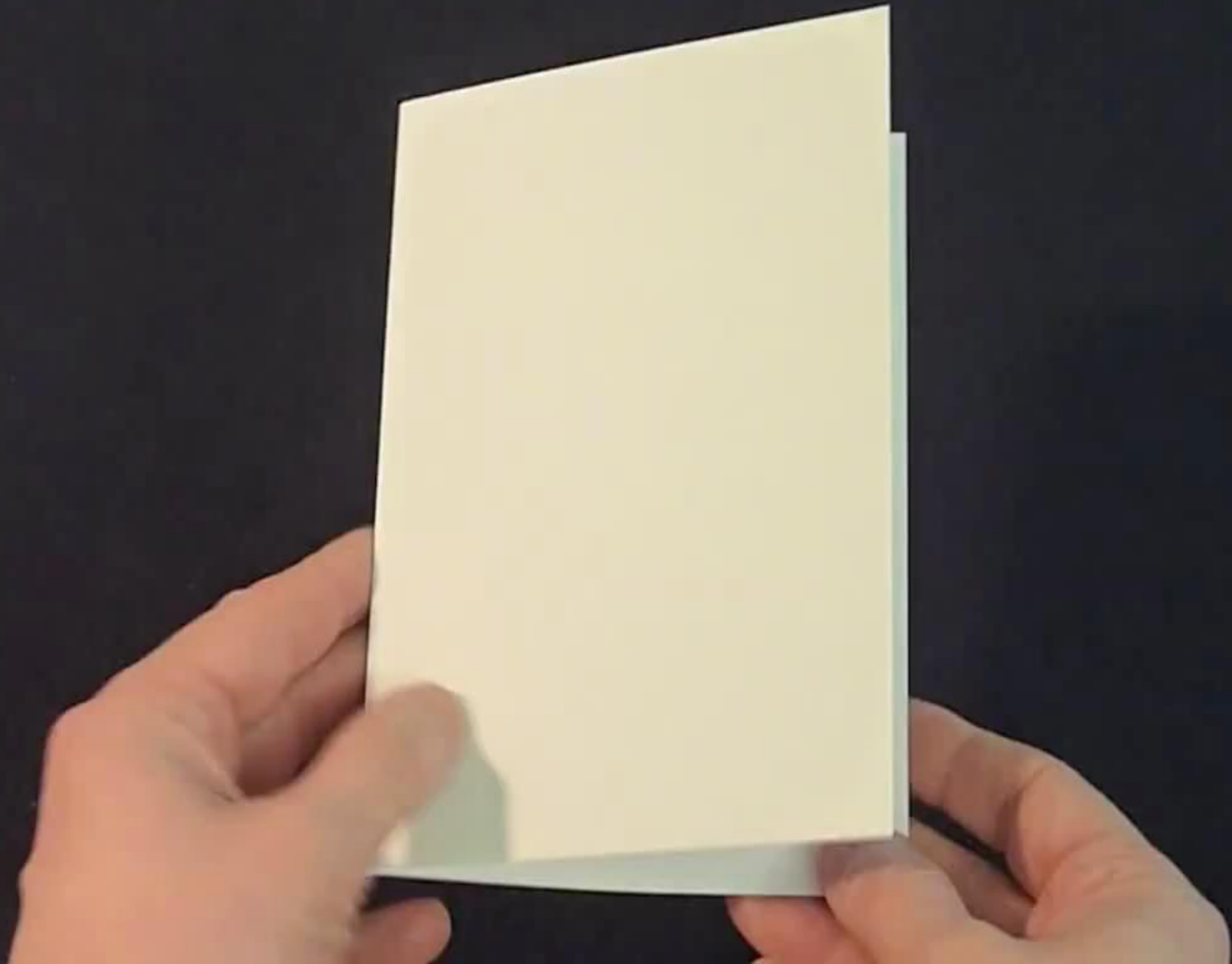
USDA, Rural Development

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# *Range Fuels, Soperton, Georgia*

First of the “First of its kind” commercial scale plants

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- First USDA Loan Guarantee Awarded, \$80M; DOE grant \$76M

- Produce cellulosic ethanol from wood chips

- Expected to produce 20 million gallons of cellulosic ethanol per year.

- Expected to create 63 jobs.



# Sapphire Energy, Columbus, New Mexico

First 3<sup>rd</sup> generation biorefinery

- \$54.5 million loan guarantee; \$50 million DOE grant

- 1 MMtpy Advance Bio Refinery  
**PAID IN FULL**

- Fixes approximately 56 metric tons of CO<sub>2</sub> per day  
**3/31/2013**

- 2014 Completion?



# *Fremont Community Digester, Fremont, Michigan*

- \$12,825,000 Guaranteed Loan
- Complete Mix Anaerobic Digester
- 2.86 Megawatts electricity; 300 tons/day industrial food waste
- Partnership with leading Western Michigan businesses
- Fall 2012 completion/operation



# *INEOS New Planet Energy, Vero Beach, Florida*

## First Commercial Scale Cellulosic Ethanol Producer

- \$75 million loan guarantee; DOE grant \$50 million; \$2.5 million State of Florida grant
- MSW and citrus pulp to 8 million gallons per year of cellulosic ethanol and 6 MW of electricity
- Mechanical completion 4/12; Commissioning complete 9/12
- **On schedule to produce 2 MG in 2014!**





# *ZeaChem Boardman Biorefinery, LLC, Boardman, Oregon*

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- \$232,500,000 Guaranteed Loan
- 25MMG cellulosic ethanol facility
- Expected operational in 2014
- Feedstock – 70% Woody Biomass (hybrid poplar) 30% agriculture residue (wheat straw, corn stover)
- 250,000 gal. demonstration facility completed
- Strong Federal support:
  - US DOE \$25M IBR grant
  - USDA NIFA AFRI \$12 million for demo
  - USDA BCAP award to assist with feedstock establishment



# *Fiberight, LLC, Blairstown, Iowa*

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- \$25 million loan guarantee to retrofit existing facility; \$2.5 million from Iowa Power Fund
- Converts MSW and pulp & paper waste to 3.6 MGY cellulosic ethanol
- Highly efficient, low resource, low CAPEX facility
- Small environmental footprint; reduces GHG emissions by 80 percent



# *Fulcrum Sierra Biofuels, McCarran, Nevada*

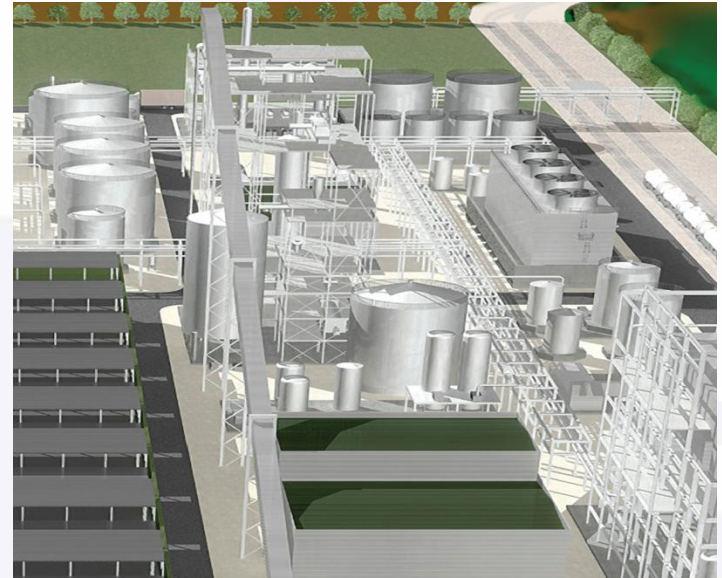
- \$105 million loan guarantee
- 10.5 MGY MSW and agricultural residues to cellulosic ethanol facility
- Relieve pressure on existing and future landfills
- Stimulates economic growth and creates 53 permanent FT jobs in Northern Nevada





# *Chemtex, Clinton, North Carolina*

- \$99 million loan guarantee
- 20 MGY energy grasses to cellulosic ethanol facility
- \$3.9 million USDA, Biomass Crop Assistance Program grant,
- Partnership with the Biofuels Center of North Carolina to grow energy grasses
- Provides economic opportunity and enhanced land stewardship to area swine producers



# *Imperium Renewables, LLC, Grays Harbor, Washington*

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# *Biofuels Interagency Working Group*

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On May 5, 2009, President Obama signed a directive to establish a working group to be chaired by the *Secretaries of Energy and Agriculture, and the Administrator of the EPA*.

The group will work with the National Biomass Research and Development Board on:

- Creating a *biofuel market development program* to boost next-generation biofuels, increase use of flex-fuel vehicles, and assist retail market development
- Coordinating infrastructure policies

# *Growing America's Fuel*

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On February 2, 2010, President Obama expressed his support for the existing biofuels industry and his desire to accelerate the commercial and sustainable establishment of the advanced biofuels industry.

- Established Lead Agency responsibilities for each supply chain segment including:
  - Full-scale and Widespread Deployment of Commercial Facilities USDA Rural Development, and Forest Service, and Department of Energy.
    - Provide financing for innovative first time commercial technologies
    - And the development of first-of-a-kind, scaled-up commercial and multiple-commercial deployed 2nd and 3rd generation conversion facilities
    - The continuation of 1st generation facilities

# *Blueprint for a Secure Energy Future*

March 30, 2011

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- **Develop and Secure America's Energy Supplies**
  - Lead the World Towards Safer, Cleaner, and More Secure Energy Supplies
    - REAP – Wind, solar, geothermal, anaerobic digesters, biomass, hydroelectric and ocean technologies
- **Provide Consumers with Choices to Reduce Costs and Save Energy**
  - Reduce Consumer Costs at the Pump
    - 2011 REAP – 66 Flexible fuel pump projects (over 250 dispensers)
    - Advanced Biofuel Payments to encourage production
- **Innovate Our Way to a Clean Energy Future**
  - Harness America's Clean Energy Potential
    - 4 “First of its kind” advanced biorefinery technologies in the next two years



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# *Section 9003 - Changes from 2010*

Notice of Interim Rule Making published February 14, 2011

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1. Revised the maximum percent guarantee provisions, including adding provisions to **allow for a 90 percent guarantee** for loan amounts of \$125 million or less under certain conditions.
2. Added refinancing as an eligible project purpose under certain conditions.
3. Removed the citizenship and rural requirement for applicant eligibility
4. Revised the **minimum retention requirement to 7.5 percent** of total loan amount.
5. Rate difference between guaranteed and unguaranteed portion of loan can not exceed 500 basis points.



# *Section 9003 - Challenges and Opportunities*

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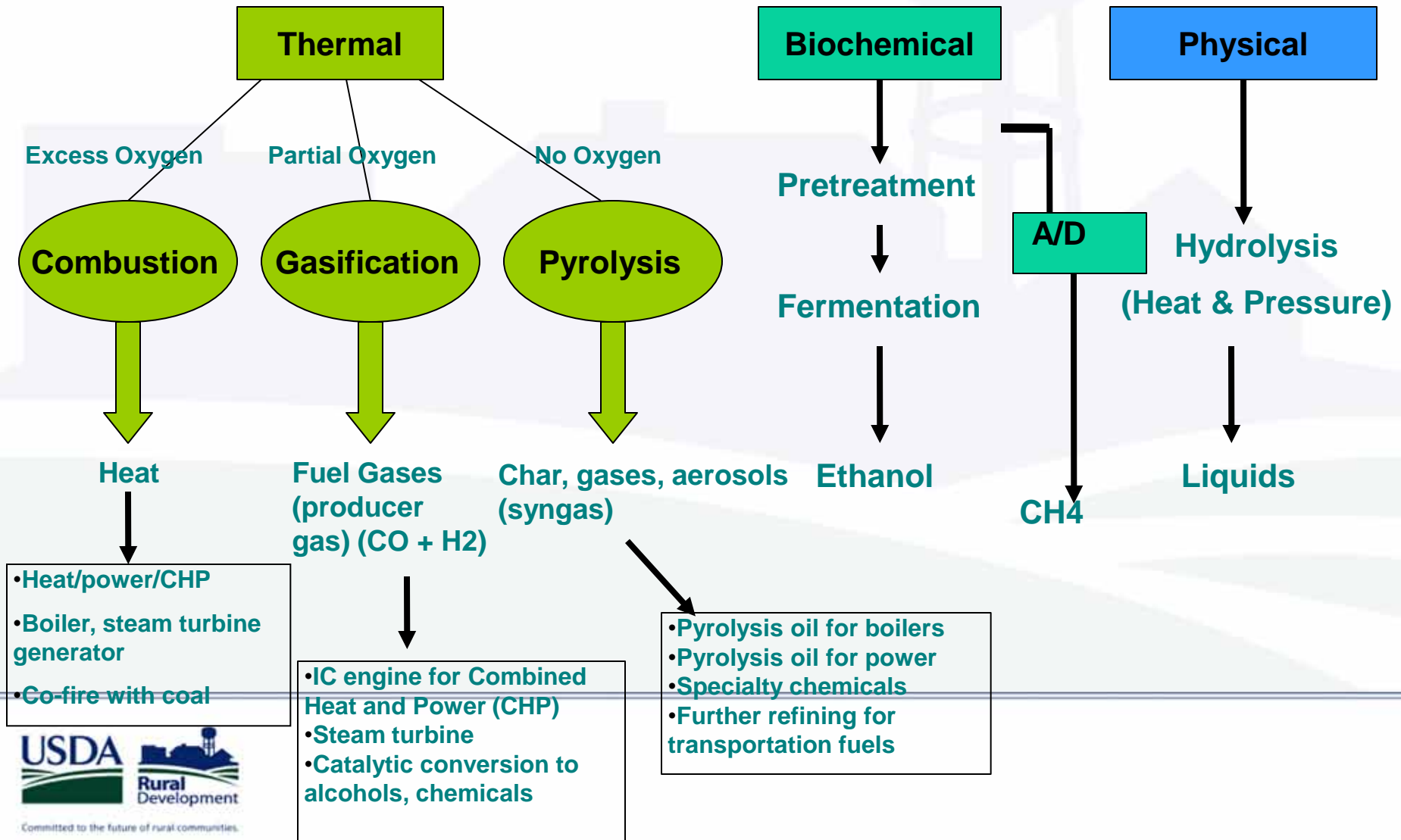
## **Challenges:**

- Lender Participation
- Interest Rates – Guaranteed versus unguaranteed
- Minimum Retention – Closer to B&I

## **Opportunities:**

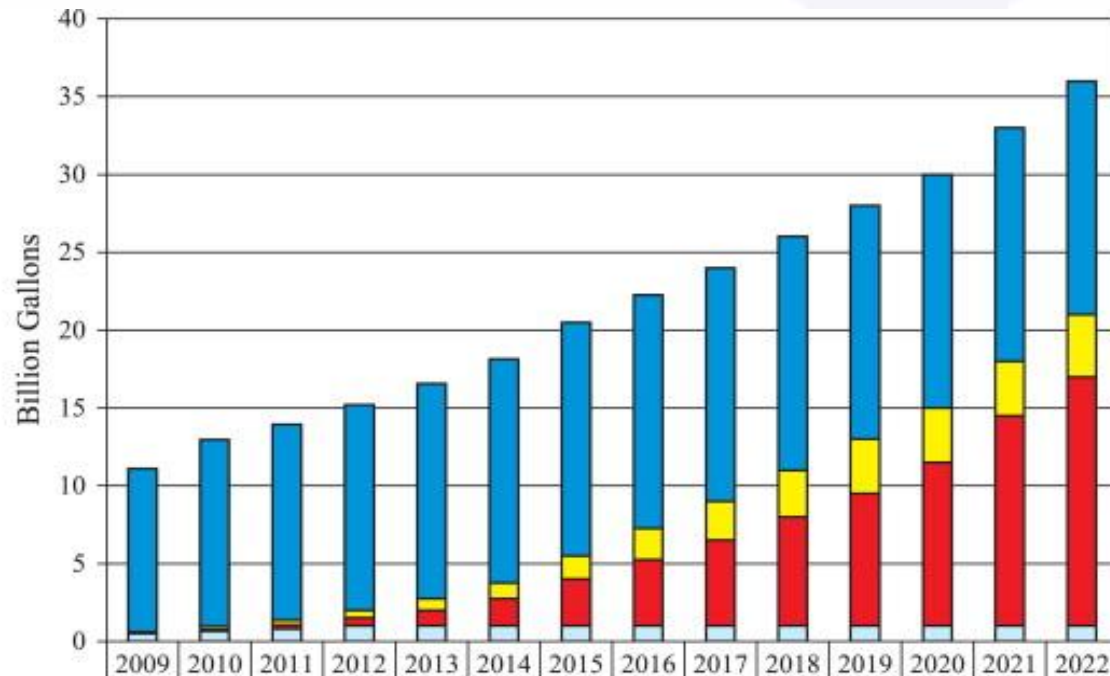
- Help from the State Offices
  - Locally based
  - Assist throughout the process

# Biomass energy pathways





# Renewable Fuel Standard II



■ Conventional Biofuels	10.5	12	12.6	13.2	13.8	14.4	15	15	15	15	15	15	15	15
■ Non-Cellulosic Advanced	0.1	0.2	0.3	0.5	0.75	1	1.5	2	2.5	3	3.5	3.5	3.5	4
■ Cellulosic Advanced		0.1	0.25	0.5	1	1.75	3	4.25	5.5	7	8.5	10.5	13.5	16
■ Biomass-based Biodiesel	0.5	0.65	0.8	1	1	1	1	1	1	1	1	1	1	1

Source: US Environmental Protection Agency (EPA), February 2010