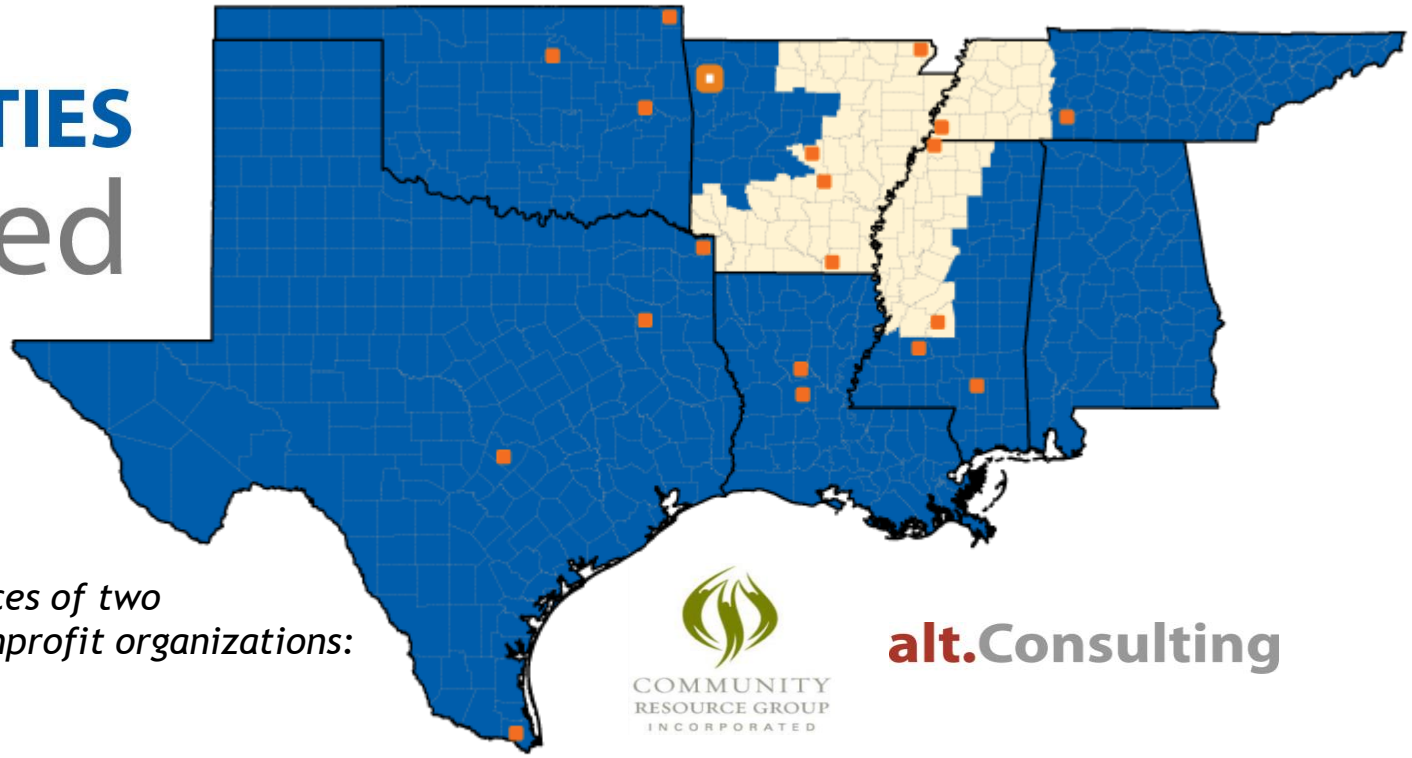
Sustainable energy, one town at a time.

DELTA BIOENERGY

An economic development strategy of

COMMUNITIES
Unlimited



Combined services of two experienced nonprofit organizations:

COMMUNITY RESOURCE GROUP INCORPORATED

alt.Consulting

- 16 years technical assistance and capital to rural entrepreneurs
- Tailored strategies for community wealth creation and livable infrastructure

Arkansas Delta: Landscape of Contrasts

- Rich with entrepreneurial spirit and fertile farmland
- 870,000 acres of land fallow during winter season
- Excellent network of two-year colleges
- Culture: living off the land – farming, hunting, fishing

- Poverty rate > 22%
- Extractive agricultural economy based on commodity crops
- Many minority farmers and small-scale farmers struggle to stay on land
- Two-year college training programs can't place graduates due to lack of jobs
- Communities struggle with population loss and deteriorating infrastructure

DELTABIOENERGY
powered by Communities Unlimited

Where did it all begin?

- In 2010, **Local Tipping Factors** to try something different:
  - Census: Dramatic population loss continued in Delta
  - Few livable wage jobs
  - Few competitive business opportunities

= Need for new economic driver!

- Exposed to **WealthWorks** framework by Yellow Wood Associates and Ford Foundation
- **Vision:** Become a fuel hub for country, connection to regional markets, fuel price stabilization

Identifying Sectors and Demand

- Arkansas Green Energy Network formed in March 2011
- Explored solar, energy efficiency and biofuel

- Biofuel: Building blocks and momentum
- Quantified Demand:
- **Regional** Demand
  - Valero: Needs biofuel to meet Renewable Fuel Standards
- **Local** Demand
  - City of DeWitt: Seeking price stability

Intermediary of the Value Chain

- Secured funding 2011 to build value chain
- Facilitating meetings of larger collaborative and specific working groups

COMMUNITIES Unlimited

- Providing communication for value chain
- Coordinating partners to fill gaps, provide expertise
- Raising awareness and visibility
- Providing accountability and pacing to stay on target
- Providing feasibility studies, financial models, technical assistance for value chain
- Helping value chain secure funding

Arkansas Green Energy Network

80 plus partners, 20 active partners

ASU

PCCUA

MSCC

Farmers

Restaurants

Entrepreneurs

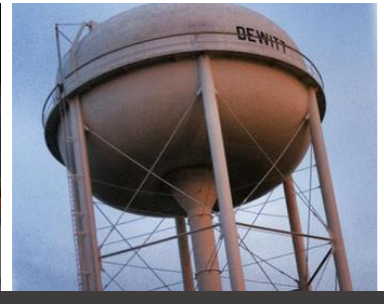
City of DeWitt

Consultants

Funding

Advancement

Coordination



SEAEDD
Southeast Arkansas Economic Development District

Delta Regional Authority

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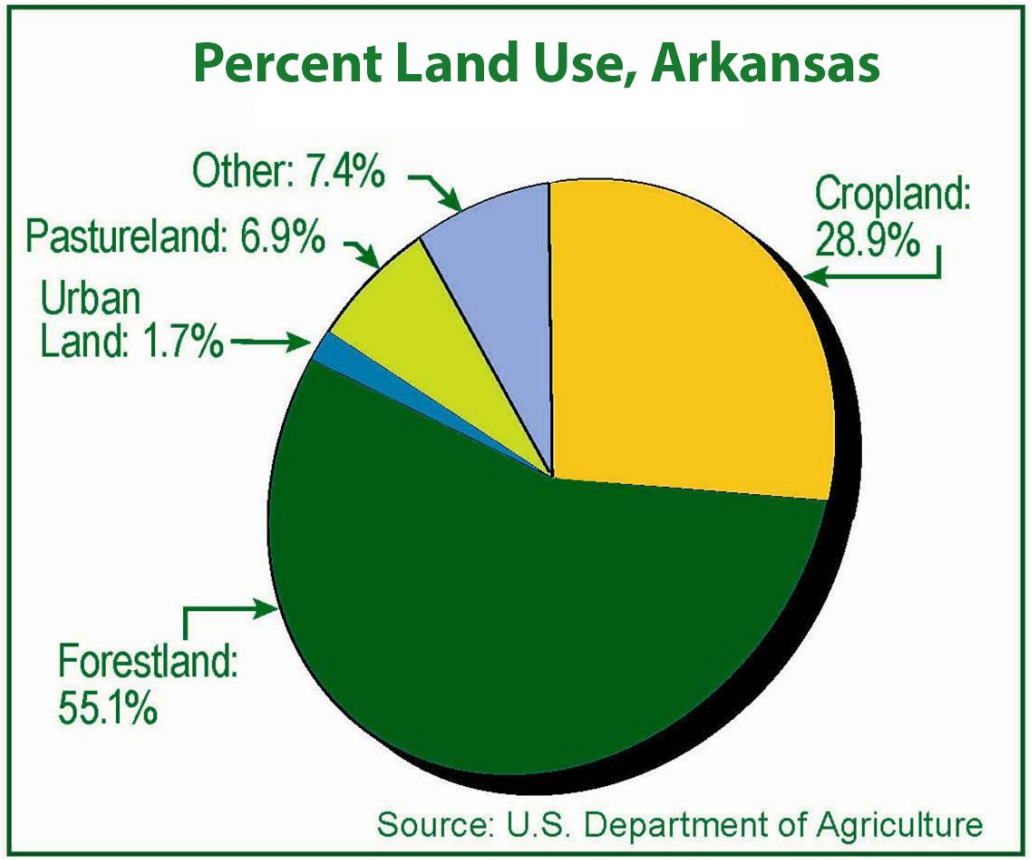
. . . Unlimited

arkansas
advanced
energy
foundation

Arkansas Biofuel Economy

arkansas advanced energy foundation

"Commercial development and deployment of biopower, bioproducts, biofuels and other alternative fuels is a "natural" strategy for Arkansas to strengthen rural communities through job creation and new wealth."



Camelina

- Researching Camelina varieties on ASU and PCCUA test plots since 2011 as energy crop; field testing in 2013
- Winter oilseed crop for Delta: Plant in October, harvest early May
- Crushed into oil and Omega 3-rich meal for feed
- Rotational crop for soybeans, summer vegetables

Small scale biodiesel processing

- 2011: Technology developed at Mid-South Community College as a teaching tool
- 200,000 gallon annual capacity
- Compact, fully automated, waterless, multiple feed stocks
- Generates ASTM standard fuel that can be blended with petroleum diesel or used alone (B100) in any diesel engine

- Low capital investment for refinery installation
- ASU also developed small-scale processing for university ag department – starter strategy

Leaders
Farmers
Entrepreneurs
Investors

City of DeWitt: Anchor demand

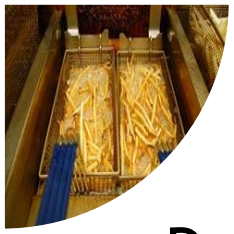
- Landfill closed, creating sudden mileage increase to haul waste
- No room in city budget for fuel price increases; need for stable pricing
- City vehicles utilize **10,000 gallons** per year
- One of longest school bus routes in the state; utilizes **30,000 gallons** per year
- Farmers in Arkansas County utilize upwards of **6 million gallons** per year for crop production
- March 2012: First meeting with the Arkansas Green Energy Network
- Commitment to purchase fuel produced

Local consumption key to profitability during ramp up, regional demand key to reaching scale

Valero:
Needs biofuel to meet Renewable Fuel Standards

Farmers:
#1 user of diesel in local economies of the Delta region

Constructing the “value chain”



Waste Vegetable Oil Recycling

- DeWitt launched successful recycling program in 2012
- WVO another **opportunity to turn waste into revenue** for city
- Cost savings for city water, sewage systems
- Sources of WVO

Jail	Hospital	Campgrounds	Convenience Stores
Lodges	Schools	Restaurants	Fried Fish Caterers

- Southeast Arkansas Economic Development District making DeWitt hub of **10-county waste vegetable oil recycling district** to scale strategy
- Purchased truck and equipment with General Improvement Funds

Gaps	How addressed	Partner/Resources
Supplemental feedstock for biodiesel production	Adding WVO Recycling to local city recycling program	City purchased collection equipment with GIF funds, contracting with restaurants for collection
Funding for micro-refinery, collection equipment	City Council approved purchase, lease to entrepreneur	Southeast Arkansas Economic Development District grants, Delta Regional Authority grant
Technology/research commercialization	Consultants hired for analysis, design for optimum systems	MSCC, ASU, Consultants, value chain construction funds
New crop, managing crop loss	Field testing with farmers, feasibility analysis, agronomic services, guaranteed market	Communities Unlimited provided feasibility study, hired ag consultant, purchased seed with funding
Oilseed processing	Consultants provided system design, entrepreneur and partners determine starter strategy	Processing equipment purchased by Communities Unlimited and leased to entrepreneur, partners providing other services
Regulatory and fuel testing costs	Entrepreneur covering costs with petroleum fuel sales, partners design feasible testing process	Entrepreneur, PCCUA coordinating resources

Economic Opportunities

Catalyst of economic activity

Investments

- Fallow land in winter
- Abandoned facilities
- Relationships

Leveraging Investment

Source	Purpose	Amount
USDA National Institute of Food and Agriculture	Camelina Research	$276,877
Economic Development Administration	Online Entrepreneurship Training	$102,590
Arkansas General Improvement Fund	WVO Collection Equipment, micro-refinery	$125,000
Delta Regional Authority	Micro-Refinery	$50,000
Private Investment	Tanks and Lines for Refinery	$50,000
Arkansas Advanced Energy Association	Launch Event	$8000
Farmers	Camelina production	Fuel, seed, weed control

Inclusivity, relationships

- ✓ Chamber of Commerce
- ✓ Home - based food entrepreneurs
- ✓ Local government
- ✓ City employees
- ✓ Community college
  - -RET grads
  - -Online entrepreneur program
  - -Staff, facilities personnel
- ✓ Small scale and large scale farmers
- ✓ Residents – Recycling
- ✓ Students
- ✓ Restaurants
- ✓ Bankers
- ✓ Local truck drivers
- ✓ Hospital
- ✓ Nursing Homes

Building Multiple Forms of Capital

Intellectual	Mindset shift from exporting outputs to creating more local opportunities; introduction of a new crop
Individual	Online agri-entrepreneurship training through 2-year colleges
Social	Creating deep collaboration between city government, entrepreneurs, non-profits, colleges, policy makers
Built	Turning environmental hazard into viable business
Political	Four state legislators actively supporting AGEN through GIF funds
Natural	Regional waste vegetable oil recycling, clean fuel used by farmers and city
Financial	Securing private investment for local entrepreneurs, creating new opportunities for other entrepreneurs
Cultural	Lifting up agricultural and entrepreneurial culture as agents for local change

Local ownership and control

AGEN Ownership Models

1. Local **entrepreneurs** own businesses. Use own capital or secure local investors

2. Local **municipality** owns equipment and leases it to entrepreneurs to operate. Creates source of revenue for city.

3. Local **farm co-op** owns equipment. Co-op members grow crop, co-op processes biofuel and sells it back to members.

15
local businesses

3
rural communities

= 2100 gal WVO recycled = 1500 gal Biodiesel = 2 New jobs

Renovated facility = 40 new jobs
$$ to tax base

8
Farms Growing

100
Acres of Camelina

100 acres will generate between 4,000 - 5,500 gallons of biodiesel

Economic Impact

Camelina Seed Processing

Waste Vegetable Oil Collection = 3 new small businesses **per community**

Biodiesel Refinery

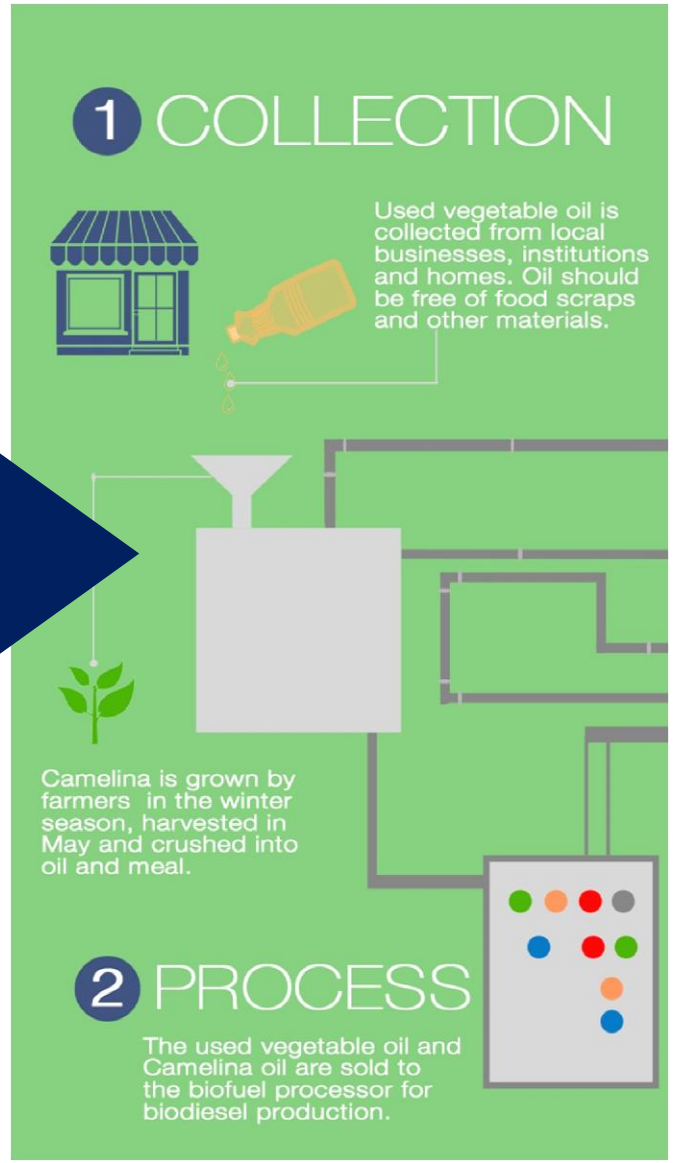
- 4 to 6 new jobs **per community**
- **$900,000 to $3 million** in new economic activity **per community** depending on size of refinery purchased
- **Generate sales taxes** for fuel consumed locally
- Replication in at least **25 communities** across Arkansas Delta
- Farmers are expected to generate **additional profits** from this winter crop.

Without the value chain…

Intellectual	Lack of local processing and no incentive for commercializing technology
Individual	No focused entrepreneur development training, limited opportunity for community college graduates to find jobs
Social	Lack of connection to larger effort for the community and to resources outside of the community
Built	Abandoned facilities not utilized, continue to depress the local economy and community appearance
Political	Lack of support for small scale rural community development
Natural	Continued dependence on fossil fuels
Financial	Small scale farmers and entrepreneurs struggle for access to capital
Cultural	Lack of vision to create prosperity from the assets available

Challenges going forward…

Building Camelina processing with limited crop production

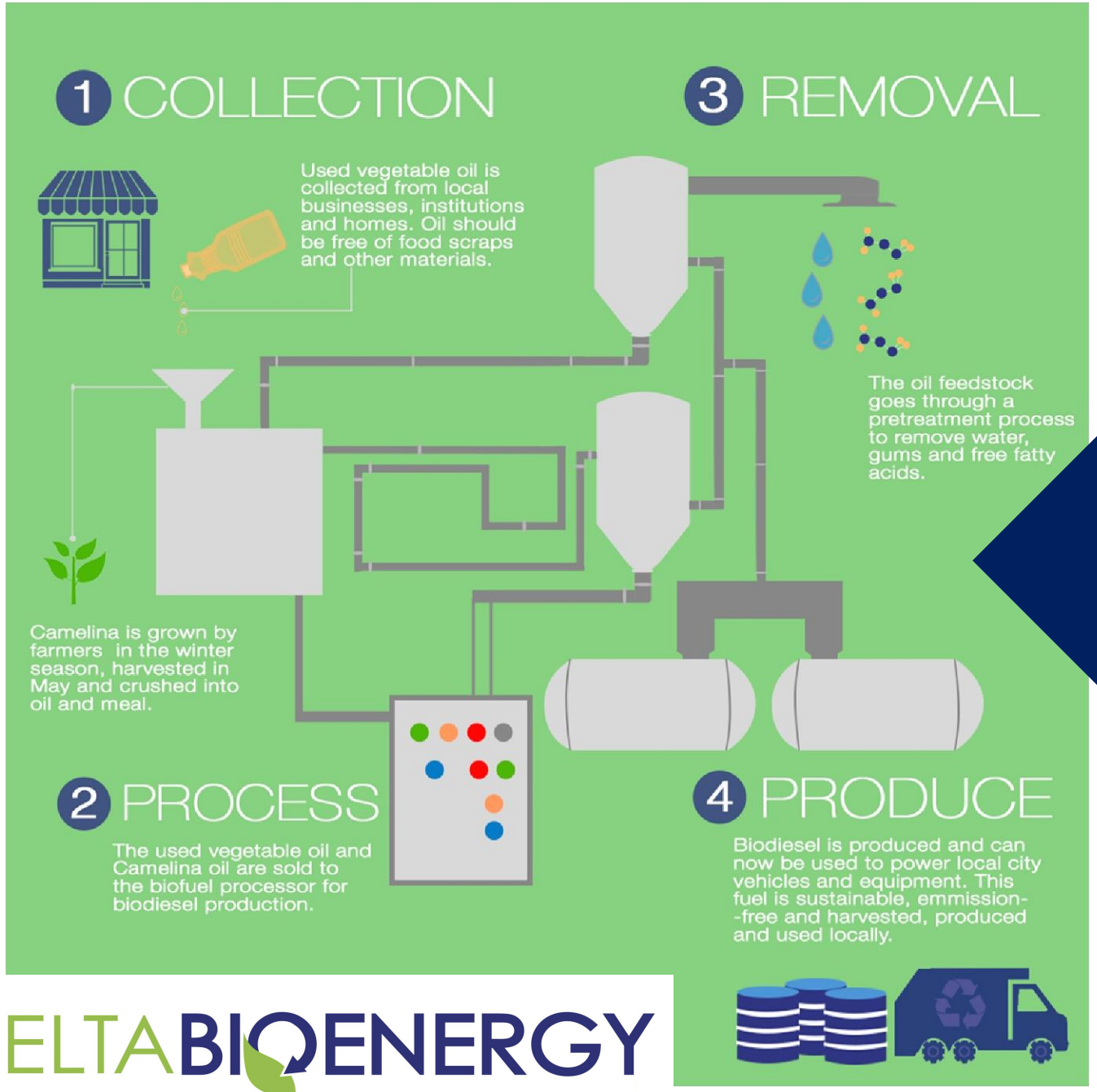


Grant funds available for crush equipment capital

Starter system design available to build capacity for lower investment

Focus on:

- smaller scale cropping systems
- intentional structure for commercial varietal development



Scale for local value chain profitability

Replication for regional impact

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Important to remember…

- ✓ Develop adequate **communication channels** among partners/stakeholders for healthy relationships and foundation for growth, accountability, connection of supply and demand partners, scale potential and pace of development
- ✓ **Partner involvement in measurement**, metrics for proof of concept, continued buy-in, and building ownership and control
- ✓ As coordinator, **avoid doing the work for stakeholders**. It's important for partners to see and experience the value chain development. Utilize expertise of partners for problem solving.

For More Information

DELTABIOENERGY

www.deltabioenergy.org

Tami Hornbeck

tami.hornbeck@communitiesu.org

COMMUNITIES Unlimited

www.communitiesu.org

Story videos available:

https://www.youtube.com/watch?v=38QA73o-Wp8

www.wealthworks.org