Sustainable energy, one town at a time.
An economic development strategy of

**COMMUNITIES Unlimited**

*Combined services of two experienced nonprofit organizations:*

- 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
- Poverty rate > 22%
- 870,000 acres of land fallow during winter season
- Extractive agricultural economy based on commodity crops
- Excellent network of two-year colleges
- Many minority farmers and small-scale farmers struggle to stay on land
- Culture: living off the land - farming, hunting, fishing
- Two-year college training programs can’t place graduates due to lack of jobs
- Communities struggle with population loss and deteriorating infrastructure
- 870,000 acres of land fallow during winter season
- Excellent network of two-year colleges
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

- 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
Arkansas Biofuel Economy

“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
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”

Local farmers and community to local refinery to...

Local Demand

Regional Demand

meet local demand and regional customers.

AGEN

Camelina Oil

Camelina

Micro-Refinery

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

Investments

- Fallow land in winter
- Abandoned facilities
- Relationships
## Leveraging Investment

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

<table>
<thead>
<tr>
<th>Intellectual</th>
<th>Mindset shift from exporting outputs to creating more local opportunities; introduction of a new crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Online agri-entrepreneurship training through 2-year colleges</td>
</tr>
<tr>
<td>Social</td>
<td>Creating deep collaboration between city government, entrepreneurs, non-profits, colleges, policy makers</td>
</tr>
<tr>
<td>Built</td>
<td>Turning environmental hazard into viable business</td>
</tr>
<tr>
<td>Political</td>
<td>Four state legislators actively supporting AGEN through GIF funds</td>
</tr>
<tr>
<td>Natural</td>
<td>Regional waste vegetable oil recycling, clean fuel used by farmers and city</td>
</tr>
<tr>
<td>Financial</td>
<td>Securing private investment for local entrepreneurs, creating new opportunities for other entrepreneurs</td>
</tr>
<tr>
<td>Cultural</td>
<td>Lifting up agricultural and entrepreneurial culture as agents for local change</td>
</tr>
</tbody>
</table>
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.
Renovated facility = 40 new jobs
$$ to tax base

15 local businesses = 2100 gal WVO recycled = 1500 gal Biodiesel = 2 New jobs

3 rural communities

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...

<table>
<thead>
<tr>
<th>Category</th>
<th>Lack of local processing and no incentive for commercializing technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intellectual</td>
<td>No focused entrepreneur development training, limited opportunity for community college graduates to find jobs</td>
</tr>
<tr>
<td>Social</td>
<td>Lack of connection to larger effort for the community and to resources outside of the community</td>
</tr>
<tr>
<td>Built</td>
<td>Abandoned facilities not utilized, continue to depress the local economy and community appearance</td>
</tr>
<tr>
<td>Political</td>
<td>Lack of support for small scale rural community development</td>
</tr>
<tr>
<td>Natural</td>
<td>Continued dependence on fossil fuels</td>
</tr>
<tr>
<td>Financial</td>
<td>Small scale farmers and entrepreneurs struggle for access to capital</td>
</tr>
<tr>
<td>Cultural</td>
<td>Lack of vision to create prosperity from the assets available</td>
</tr>
</tbody>
</table>
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
1. COLLECTION
Used vegetable oil is collected from local businesses, institutions and homes. Oil should be free of food scraps and other materials.

2. PROCESS
Camelina is grown by farmers in the winter season, harvested in May and crushed into oil and meal.

3. REMOVAL
The oil feedstock goes through a pretreatment process to remove water, gums and free fatty acids.

4. PRODUCE
Biodiesel is produced and can now be used to power local city vehicles and equipment. This fuel is sustainable, emission-free and harvested, produced and used locally.

Scale for local value chain profitability
Replication for regional impact
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

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

www.wealthworks.org