Economic Development from Landfill Gas: Carbon Credits Facilitate Job Creation

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CommunityTIES Project

Community-based projects leveraging landfill gas as a resource for local economic development

- Based on EnergyXchange model
- Led by Stan Steury
- Grant funded by GoldenLEAF Foundation, NC State Energy Office, and Z. Smith Reynolds Foundation
Facilitating Local Economic Development from Landfill Gas

- Establish Local Taskforce & Leadership
- Provide Information and Industry Contacts
- Assist Project Identification, Funding & Development
A new perspective on the role of the collection system in project development

For 30 years, the collection system has literally been a ‘sunk’ cost

A major barrier to project development
- High investment risk for unknown resource quantity
- Uncertainty deters potential end user commitment
- Collection system cost often makes uses unprofitable, especially in small landfills
- Availability of up-front funding ~ $1 million

What happens when collecting landfill gas adds value independent of the end use?
Create Economic Opportunity

Before

Risk

After

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Use: highly reliable, income generating use priority

Limited Benefits

Support Economy industry expansion, education, entrepreneurship

Reduce Risk fuel price & volatility, electric reliability/security, GHG limits, environmental non-compliance

MEET LOCAL NEEDS

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Carbon Credits and the Micro-Economy

1 ton CH4 = 21 tons CO2e
Source: IPCC TAR

Greenhouse gas emissions are an asset PROVIDING FREE ENERGY.

Give a man a fish…
Teach a man to fish…

CO2e income = quicker profitability and increase return
CO2e can be a store of value, or a speculative investment to hedge against future regulations or anticipated CO2e price increases
CO2e credits *could be* an economic development incentive
NC Landfill Example

Example County Landfill for North Carolina
Closed since 1997
Waste-in-Place ~1,000,000 metric tons
LandGEM using ‘Inventory Conventional’ (k, L)

Volume & Levelized Cost per $mill Invested

<table>
<thead>
<tr>
<th>Year</th>
<th>LFG Levelized Cost</th>
<th>Elec Levelized Cost</th>
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<tbody>
<tr>
<td>10-year</td>
<td>$4.95/MMBtu</td>
<td>$2.5</td>
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<tr>
<td>20-year</td>
<td>$3.53/MMBtu</td>
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<tr>
<td>30-year</td>
<td>$3.36/MMBtu</td>
<td>$0.8</td>
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Levelized Costs, $/MMBtu

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Gas Use Scenarios

With carbon less electricity is needed for economic feasibility

Project Implications of High Carbon Prices

1) Fundamental shift in project economics ▼ B/E End-Use Price
2) Value redistribution from end-use to collection point
3) Carbon value can be realized in more ways than money, i.e. new jobs, industry recruitment, community project support

If carbon prices are high enough, all the gas is ‘free’
What to do with ‘Free’ LFG

**Robeson County:**
- Recruited new ethanol facility, 15+ FTE

**Rockingham County:**
- Exploring eco-industrial park

**Columbus, Edgecombe:**
- Value-added sweet potato processing, biotech education

**Bertie County:**
- Community agriculture collaborative

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Approaching the Carbon Market Today

Consider future regulatory uncertainties

Guiding principles
- Awareness of potential opportunity cost
- Ensure clear ownership of CO2e assets
- Plan for change until a global market is established
- Consider options appropriate to local situation

Define priorities for LFG goals
- County government income
- Compliance risk reductions
- Economic development
- Environmental quality
What is known today about carbon markets?
- Regulation is coming – uncertainty reigns
- A full spectrum of markets exist today, with great variety
- Opportunity cost of acting/not acting is double-edged
- Regulation tends to increase the price of carbon reductions

How are opportunities best evaluated?
- Define LFG project goals: jobs, income, compliance, etc.
- Consider tradeoff between value and complexity
- County-specific context: debt availability, operational capability, willingness to absorb risk