Getting Projects Done:
An Industry Perspective

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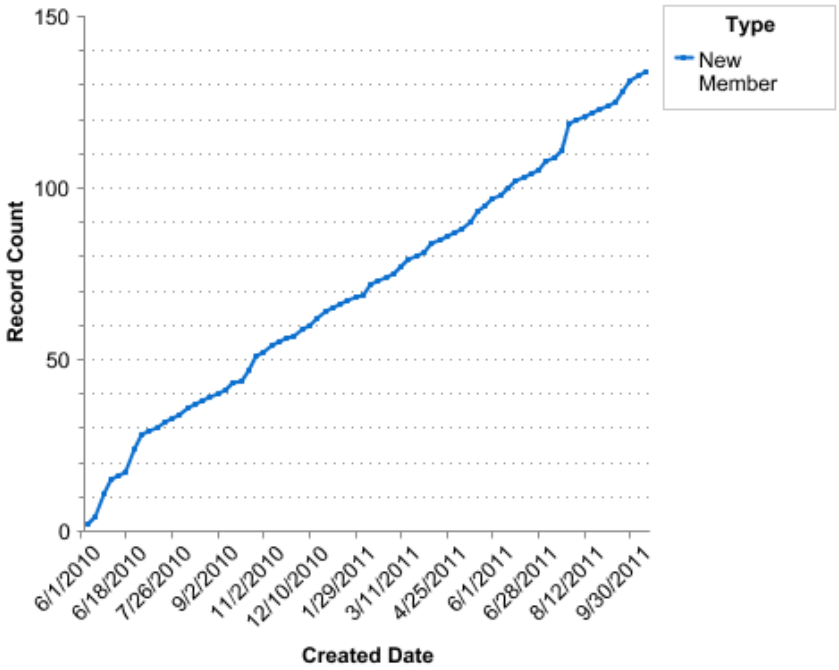
May 14, 2012

American Biogas Council: The Voice of the US Biogas Industry

- The **only** U.S. organization representing the biogas and anaerobic digestion industry
- **147 Organizations** from the U.S., Germany, Italy, Canada, Sweden, Belgium and the UK
- **All** industry sectors represented:
  - Landowners
  - Fuel refiners
  - Manufacturers
  - Project developers
  - Biogas users
  - Plant owners
  - Financiers
  - EPC firms
  - Wastewater
  - Utilities



Growth in ABC Membership

American biogas Council

Dedicated to Maximizing the Production and Use of Biogas from Organic Waste

About Harvest

Harvest Power is ushering in a new era of organic waste management by harvesting the renewable energy and soil-building potential in organic waste at its state-of-the-art organics recycling facilities.

Corporate Profile

- **Business**: Founded in 2008 as builder, owner and operator of organics processing facilities
  - ✓ 3 AD facilities in active development – 100,000 tpy capacity to be commissioned in 2012
  - ✓ Operate one of largest compost sites in North America (250,000 MT/year) in Richmond BC
  - ✓ Major compost marketer through Harvest GardenPro
  - ✓ Expanding technology portfolio supported by industry-leading science and technology advisors
- **Capacity:** Handle 2 million tons of organics per year across 15 sites; Sell 29 million bags of soil and mulch and 400,000 cubic yards in bulk
- **Team**: 350 employees; 200+ years experience on management team
- **Revenue**: $130 million annualized revenue
- **Investors**: Include Kleiner Perkins, Generation Investment Management, Waste Management, True North Venture Partners
- **Capital:** More than $275 million in equity, debt, & grants raised to date

Case Study:
Richmond, BC Energy Garden

Key Statistics

Start-Up: Autumn 2012

Capacity: 30,000 tons /yr. organics (mixed food & yard waste)

Energy Output: 2 MW combined heat-and-power

Product Output: 21,000 MT /yr. high quality compost

Public Outreach: Visitor Center to host educational tours and promote Zero Waste

German Success Story

Germany's biogas industry has grown rapidly since its inception and projections demonstrate significant growth over the next decade.

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	2011	Projection for 2020
Digesters Installed	6,800	25,000
Electricity Produced	17 TWh	76 TWh
Direct Jobs	44,500	200,000
Annual Revenue	€5.9 billion	€26.2 billion

Source: German Biogas Association and Electrigaz

The United States: Powering Up With Biogas

Applying Germany's model of biogas infrastructure to US resources would result in significant benefits.

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	2011	Projection for 2011	Projection for 2020
Digesters Installed	173*	90,000	325,000
Electricity Produced	0.5 TWh	223 TWh	991 TWh
Direct Jobs	-	590,000	2,100,000
Annual Revenue	$60 M	$26 B	$114 B

*** Farm digesters only.** ***Source:*** **AgStar**

Getting Projects Built: Key Requirements

Before proceeding with construction, project owners/developers and investors/lenders must satisfy themselves on 5 critical requirements.

The Right Site

Feedstock Access

Energy Offtake

Residuals Offtake

The Right Technology to Fit All the Above

Project owners/developers must take the lead, but the public sector can and must help

Key Requirements: The Right Site

What the Project Needs	Potential Barriers	Public Sector Levers
• Proximity to feedstock • Proximity to energy offtake • Distance from sensitive receptors • Supportive community • Speed and certainty of permitting	• High land costs • NIMBY (not in my backyard) • FUD (fear, uncertainty & doubt) • Unclear permitting pathways • Lengthy permitting	• Public education and outreach • Regulator education (federal to state; state to local) • Model permitting processes • Best practices sharing

Key Requirements: Feedstock

What the Project Needs	Potential Barriers	Public Sector Levers
• Reasonably secure access to the right mix of substrates • At high enough price for project economics … • But low enough price to beat alternative disposal options • Clean feedstock	• Few long-term contracts available from credit-worthy private counter-parties • Low cost alternatives at landfills • Lack of appropriate collection infrastructure • Required behavioral change around source separation	• Voluntary diversion goals • Mandatory diversion • Public education and outreach

Key Requirements: Energy Offtake

What the Project Needs	Potential Barriers	Public Sector Levers

• Proximity to available offtakers
• Secure, long-term pricing
• Speed & cost certainty of interconnect
• Speed and efficiency of contracting
	• Reluctant utility partners
	• Regulatory hodge-podge
	  ○ RECs
	  ○ RPS
	  ○ RINs
	• Uncertainty on pipeline injection specifications
		• Direct pricing
		• Incentive pricing
		• Carbon pricing
		• Standard form contracting
		• Standard interconnect procedures
		• Clarification and standardization of pipeline injection specs

Key Requirements: Residuals Offtake

What the Project Needs	Potential Barriers	Public Sector Levers
• Known destination for all liquid and solid residuals • Markets for residuals – so they are revenue generating, not costs	• Uncertain markets – lack of awareness of benefits of organic amendments • FUD – around use of residuals from WWTPs	• Public education and outreach • Regulator education (federal to state; state to local) • Research digestate management and benefits • Ongoing research, monitoring and public outreach around Part 503 • "Nutrient trading" regimes

Key Requirements: The Right Technology

What the Project Needs	Potential Barriers	Public Sector Levers
• Right fit – technology appropriate to local feedstocks and market conditions • Lower per-unit capex • Faster construction • Reliable operation • Very effective front and/or back end de-contamination	• Lack of domestic industry • Excess customization / lack of standardization • Immature or unproven technologies	• Research and demonstration grants • Use performance-based regulations; avoid picking technology winners and losers

Conclusion

- Still at early stages of industry development
- Trends unclear
- Ongoing dialogue needed among
  - Federal, state, and local levels of government
  - Private industry
  - Not-for-profit sector
  - Waste generators
  - General public

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