

Summary of Potential Energy Related and Supportive Programs and Projects

Category	Description	Key Contact Information	Comments
Advanced Biofuels and Biomass products (Federal & National Lab)	<p>Technology Demonstration and Deployment The Bioenergy Technologies Office's (BETO) demonstration and deployment activities focus on integrated biorefinery (IBR) applications and biofuel distribution infrastructure and end use. IBR activities address problems encountered in the so-called "Valley of Death" between pilot-scale and commercial-scale deployment.</p> <p>National Bioenergy Center (NBC) Headquartered at NREL, this center unifies DOE's efforts to advance technology for producing renewable transportation fuels from biomass. NBC's mission is to foster capability to catalyze the replacement of petroleum with transportation fuels from biomass by delivering innovative, cost-effective biofuels solutions.</p> <p>Energy Systems Integration (ESI) Headquartered at NREL, this program focuses on a unique system-of-systems concept to energy systems integration. This approach considers the relationships among electricity, thermal, and fuel systems and data and information networks to ensure optimal integration and interoperability across the entire energy system spectrum.</p>	<p>DOE-Energy Efficiency & Renewable Energy (EERE) and National Renewable Energy Laboratory (NREL)</p> <p>Dr. Jonathan Male Director Bioenergy Technology Office (BETO) 202-586-5188 jonathan.male@ee.doe.gov</p> <p>James J. (Jim) Spaeth Program Manager-Demonstration and Deployment Bioenergy Technology Office 720-356-1784 jim.spaeth@go.doe.gov</p> <p>Richard (Rich) Bolin NBC's Partnerships and Business Development 303-384-7716 richard.bolin@nrel.gov</p> <p>Dr. Martha Symko-Davies Director of Partnerships for Energy Systems Integration (ESI) 303-384-6528 Martha.Symko.Davies@nrel.gov</p>	<p>BETO Mission: Develop and transform our renewable biomass resources into commercially viable, high-performance biofuels, bioproducts, and biopower through targeted research, development, demonstration, and deployment.</p> <p>BETO works closely with USDA, the Environmental Protection Agency, the Department of Defense, the Department of Transportation's Federal Aviation Administration, and other departments and agencies to accelerate deployment and commercialization of biomass technologies.</p> <p>NREL is DOE-EERE's principal national lab and it helps administer many of EERE's programs.</p>

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Advanced Biofuels and Biomass products (Federal)	<p>The Biorefinery Assistance Program provides loan guarantees for the development, construction, and retrofitting of commercial-scale biorefineries. Read more</p> <p>The Repowering Assistance Program provides payments to eligible biorefineries to replace fossil fuels used to produce heat or power to operate the biorefineries with renewable biomass. Read more</p> <p>The Advanced Biofuel Payment Program provides payments to producers to support and expand production of advanced biofuels refined from sources other than corn kernel starch. Read more</p> <p>The Rural Energy for America Program provides assistance to agricultural producers and rural small businesses to complete a variety of projects, including renewable energy systems, energy efficiency improvements, renewable energy development, energy audits, and feasibility studies. Read more</p> <p>The Biomass Crop Assistance Program (BCAP) provides financial assistance to owners and operators of agricultural and non-industrial private forest land who wish to establish, produce, and deliver biomass feedstocks. BCAP provides two categories of assistance:</p> <ul style="list-style-type: none"> • Matching payments may be available for the delivery of eligible material to qualified biomass conversion facilities by eligible 	<p>U.S. Department of Agriculture (USDA)</p> <p>Randy Monhemius USDA Rural Development Federal Building, Room 507 200 North High Street Columbus, OH 43215-2418 (614) 255-2424 Randy.Monhemius@oh.usda.gov</p> <p>Website: http://www.rurdev.usda.gov/oh</p>	<p>USDA can assist in many different areas dealing with forest and agriculture. They can work with County Extension Offices to help educate farmers on biomass production and help establish co-ops to harvest and transport biomass products to processing facilities.</p>

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	<p>material owners. Qualified biomass conversion facilities produce heat, power, biobased products, or advanced biofuels from biomass feedstocks.</p> <ul style="list-style-type: none"> Establishment and annual payments may be available to certain producers who enter into contracts with the Commodity Credit Corporation (CCC) to produce eligible biomass crops on contract acres within BCAP project areas. Learn More <p>Feedstock Flexibility Program for Bioenergy Producers, encourages the domestic production of biofuels from surplus sugar. Learn More</p> <p>Rural Development Loan Assistance, forges partnerships with rural communities, funding projects that bring housing, community facilities, business guarantees, utilities and other services to rural America. USDA provides technical assistance and financial backing for rural businesses and cooperatives to create quality jobs in rural areas. Rural Development promotes the President's National Energy Policy and ultimately the nation's energy security by engaging the entrepreneurial spirit of rural America in the development of renewable energy and energy efficiency improvements. Rural Development works with low-income individuals, State, local and Indian tribal governments, as well as private and nonprofit organizations and user-owned cooperatives.</p>		

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Advanced Biofuels and Biomass products (Federal)	Farm-to-Fleet , a joint USDA and Navy venture to make biofuel blends part of regular, operational fuel purchase and use by the military. The program allows for the acquisition of biofuel blends into regular Department of Defense (DOD) domestic solicitations for jet engine and marine diesel fuels.	USDA and Navy	The Navy seeks to purchase JP-5 and F-76 advanced drop-in biofuels blended from 10 to 50 percent with conventional fuels. Funds from USDA's Commodity Credit Corporation (CCC) are available for Farm-to-Fleet projects.
Advanced Biofuels and Biomass products (Federal & National Lab)	BioEnergy Science Center (BESC) is a multi-institutional (18 partner), multidisciplinary research (biological, chemical, physical and computational sciences, mathematics and engineering) organization focused on the fundamental understanding and elimination of biomass recalcitrance. BESC's approach to improve accessibility to the sugars within biomass involves 1) designing plant cell walls for rapid deconstruction and 2) developing multitalented microbes for converting plant biomass into biofuels in a single step (consolidated bioprocessing).	ORNL/BESC Dr. Paul Gilna Director 865-576-0567 gilnap@ornl.gov Website: bioenergycenter.org Dr. Renae Speck Director of Technology Transfer and Partnership 865-576-4680 speckrr@ornl.gov	BESC is one of three Bioenergy Research Centers established by DOE's Office of Science in 2007 to accelerate research toward the development of cost-effective advanced biofuels.
Advanced Biofuels and Biomass products (Industry Group)	Industry group promoting the use of biofuels	Advanced Biofuels Association (ABFA) Michael McAdams President 202-469-5140 Website: www.advancedbiofuelsassociation.com	ABFA represents over 40 member companies who produce advanced and cellulosic biofuels, as well as renewable feedstocks.

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Advanced Biofuels and Biomass products (Industry Group)	Educational programs for a wide range of interests in the renewable energy community, focusing on technology, finance, policy and market development. ACORE has three primary areas of focus: National Defense & Security, Power Generation and Infrastructure, and Transportation.	American Council on Renewable Energy (ACORE) Michael R. Brower President & CEO 202-393-0001 (ACORE Office) Website: www.acore.org	ACORE, a 501(c)(3) non-profit membership organization, is dedicated to building a secure and prosperous America with clean, renewable energy. ACORE convenes thought leadership forums, regional roundtables, and creates energy industry partnerships to communicate the economic, security and environmental benefits of renewable energy, including biofuels and biomass products.
Advanced Biofuels and Biomass products (Industry Group)	Industry group focuses alternative jet fuels for aviation	Commercial Alternative Aviation Fuel Initiative (CAAFI) Steve Csonka Executive Director 513-800-7980 Csonka.CAAFI.ED@gmail.com Website: www.caafi.org	CAAFI is a coalition that focuses the efforts of commercial aviation to engage the emerging alternative fuels industry. It enables its diverse participants - representing all the leading stakeholders in the field of aviation - to build relationships, share and collect data, identify resources, and direct research, development and deployment of alternative jet fuels
Advanced Biofuels and Biomass	Private sector biofuels producer that uses patented microbes and processes to produce renewable chemical and fuels.	Aemetis, INC 20400 Stevens Creek Boulevard Suite 700 Cupertino, CA 95014	Aemetis, Inc. is an industrial biotechnology company producing renewable chemicals and fuels using patented

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products (Industry)		<p>Eric McAfee CEO</p> <p>Andy Foster President of Aemetis Advanced Fuels 408-213-0940 (Aemetis Office)</p> <p>Website: www.aemetis.com</p>	<p>microbes and processes. The Z-Microbe is a patented organism that converts a variety of renewable feedstocks such as sugar, starch and cellulose directly into renewable chemicals and fuels. The Z-Microbe technology utilizes consolidated bio processing (CBP) technology to convert multiple feedstocks into chemicals and fuels in one, low-cost process. Aemetis is a company owned by venture capitalists.</p>
Advanced Biofuels and Biomass products (Industry)	Actively support regional programs and projects that are focused on providing alternative and biofuels to the aviation industry.	<p>Boeing</p> <p>Timothy J. Vinopal Boeing Defense, Space & Security Director - EH&S Engineering 206-406-2277 timothy.j.vinopal@boeing.com</p> <p>Stephen Emmert stephen.k.emmert@boeing.com</p>	Boeing will support, with personnel and funding, regional aviation fuel initiatives that are started and lead by others.
Advanced Biofuels and Biomass products	Private sector biofuels producer	<p>Cool Planet Energy Systems</p> <p>Howard Janzen President & CEO</p> <p>Vital Aelion</p>	Cool Planet strategic investors include BP, Google Ventures, Energy Technology Ventures (GE, ConocoPhillips, NRG Energy), and the Constellation division of Exelon. Cool Planet

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(Industry)		VP of Strategic Planning, Assistant to the CEO 303-221-2029 (Cool Planet Office)	started construction on its first commercial facility in Alexandria, LA in February 2014.
Advanced Biofuels and Biomass products (Industry)	Private sector focused on the logistics biomass feedstock logistics and improving biomass supply chain efficiencies.	FDC Enterprises, INC (FDCE) based in Springfield, OH Fred Circle President & CEO 866-270-4833 (FDC Office) fred@fdcenterprises.com Tom Schwartz Vice President of Marketing 217-725-7550 tom@fdcenterprises.com	FDCE, , has been awarded 2 US Department of Energy (DOE) grants to develop industrial scale methods for efficiently collecting, harvesting, storing and transporting feedstock to be used for biofuels and bioproducts. They are currently involved in 4 major dedicated energy crop projects and 6 direct-fire biofeedstock projects across the nation.
Advanced Biofuels, Biomass products, Waste-to-Energy (Industry)	Private sector biofuels producer	Frontline BioEnergy Jerod Smeenk Director of Project Engineering jsmeek@frontlinebioenergy.com Dr. T. J. Paskach Director of Technology 515 292-1200 (Frontline Office) Website: www.frontlinebioenergy.com	Frontline BioEnergy develops innovative gasification solutions for renewable energy, renewable fuels, and renewable products. In 2013, the U.S. Department of Energy (DOE) announced it would invest \$4.2 million through its Integrated Biorefinery Program in Frontline's TarFreeGas [®] gasification technology and SGC Energia US's Fischer-Tropsch technology to produce drop-in biofuels for military use. Beginning in 2014, this project

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			will be constructed and operated in Texas in partnership with SGC Energia US.
Advanced Biofuels and Biomass products (Industry)	Private sector biofuels producer that utilizes woody biomass as feedstock to produce drop-in fuels.	KIOR Fred Cannon President & CEO John Kasbaum Senior Vice President of Commercial 281-694-8700 (KiOR Office) Website: www.kior.com	KIOR had technical challenges and severe financial losses in 2103. KiOR is a next-generation renewable fuels company that has developed a proprietary technology platform to convert biomass into renewable crude oil that is processed into gasoline, diesel and fuel oil blendstocks. The company built the first commercial scale cellulosic fuel facility in Columbus, MS, which started production in 2012.
Advanced Biofuels and Biomass products (Industry)	Private sector biofuels technology developer responsible for developing and implementing some of the most useful, original technologies in the world. UOP, through its joint venture Envergent Technologies, provides technology that converts biomass into a liquid biofuels.	UOP LLC, (A Honeywell Company) headquartered in Des Plaines, Illinois Jim Rekoske Vice President and General Manager of UOP's Renewable Energy and Chemicals 847-375-7187 James.Rekoske@uop.com	UOP is a leading international supplier and licensor of technologies for the petroleum refining, gas processing, petrochemical production and biomass industry.
Advanced Biofuels and Biomass	Private sector biofuels producer, who uses patented catalytic chemistry, to convert soluble biomass-derived sugars into products molecularly identical to those made with petroleum, including gasoline,	Virent Energy Systems Lee Edwards President	Virent has key strategic relationships in place with Royal Dutch Shell, Cargill and Honda to add vital resources

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products (Industry)	diesel, jet fuel, and chemicals used for plastics and fibers	608-663-0228 (Virent Office) Website: www.virent.com	and expertise required to accelerate commercialization of its technology.
Coal Conversion (Federal & National Lab)	<p><u>ADVANCED ENERGY SYSTEMS PROGRAM</u> NETL's Advanced Energy Systems Office conceives, analyzes, and develops energy technologies that can minimize the environmental impact of fossil fuel use and optimize the use of our domestic energy resources and infrastructure. Below are links to focus areas: <u>Gasification Systems Advanced Combustion Coal & Coal/Biomass to Liquids Solid Oxide Fuel Cells Turbines</u></p> <p>Air Force Coal-derived Jet Fuel, DOE is funding (~20M) projects that will lead to a jet fuel with lifecycle greenhouse gas emissions less than or equal to conventional petroleum-based jet fuel production, while remaining cost-competitive.</p> <p>Award recipients will share in the costs of the project, providing at least 20 percent of the funds. Areas of interest for the jet fuel projects are —</p> <ul style="list-style-type: none"> • Hybrid coal-to-liquids processes for jet fuel production. • Process intensification for coal conversion for jet fuel production. • Innovative non-traditional coal conversion processes for jet fuel production. 	<p>DOE-Fossil Energy and National Energy Technology Laboratory (NETL)</p> <p>Sean Plasynski Director: Strategic Center for Coal 412-386-4867 Sean.Plasynski@netl.doe.gov</p> <p>Heather Quedenfeld Division Director: Advanced Energy Systems Division 412-386-5781 heather.quedenfeld@netl.doe.gov</p> <p>Michael Knaggs Director: Office of Major Demonstration 304-285-4926 mnagg@netl.doe.gov</p>	<p>NETL is DOE-FE's principal national lab and has offices and research facilities in Pittsburgh, PA and Morgantown, WV</p> <p>Need to follow-up with entities receiving funding to see if there is a possibility of having pilots or demonstrations in the region. Also, need to investigate if regional universities are involved as R&D partners.</p>

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	<ul style="list-style-type: none"> Commercialization analysis for construction of a site specific coal-to-liquids facility 		
Coal Conversion (Industry)	Anaerobic bioconversion of coal to useful products: natural (methane) gas, liquid fuels, humic/fulvic acid fertilizer, and chemicals	<p>Arctech and Humaxx</p> <p>Dr. Daman Walia 571-338-5005</p> <p>Websites: www.arctech.com www.humaxx.com</p>	ARCTECH and Humaxx are spin-off company from the Atlantic Research Corporation's Environmental Science and Technology division.
Economic Development	<p>A government formed regional economic development agency that represents a partnership of federal, state, and local government. ARC funds projects that address the four goals identified in the Commission's strategic plan:</p> <ol style="list-style-type: none"> Increase job opportunities and per capita income in Appalachia to reach parity with the nation. Strengthen the capacity of the people of Appalachia to compete in the global economy. Develop and improve Appalachia's infrastructure to make the Region economically competitive. Build the Appalachian Development Highway System to reduce Appalachia's isolation. 	<p>The Appalachian Regional Commission (ARC) 1666 Connecticut Avenue, NW Suite 700 Washington, DC 20009-1068</p> <p>Charles S. Howard Interim Executive Director, General Counsel 202.884.7700 choward@arc.gov</p> <p>Karen Fabiano Program Manager Governor's Office of Appalachia 77 South High Street, 24th Floor P.O. Box 1001 Columbus, OH 43216-1001 614.644.9228 karen.fabiano@development.ohio.gov v</p>	<p>ARC has Local Development Districts throughout the Appalachia. The one for Portsmouth area is:</p> <p>Ohio Valley Regional Development Commission 73 Progress Drive Waverly, Ohio 45690-1196 740-947-2853 Executive Director: John Hemmings email@ovrdc.org Web Site: http://www.ovrdc.org <i>Counties: Adams, Brown, Clermont, Gallia, Highland, Jackson, Lawrence, Pike, Ross, Scioto, Vinton, (Fayette)</i></p>

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Fertilizer Production (Industry)	Private sector involved in producing nitrogen based fertilizer from natural gas.	Ohio Valley Resources, Inc (OVR) 153 Highway 7 S Powhatan Point, OH, 43942 (740) 795-5220 Doug Wilson President & CEO	OVR has entered into a Memorandum of Understanding (MOU) with Tierra Del Fuego Power & Chemical Company Ltd (TEQSA) for the development of the proposed nitrogen fertilizer plant in Spencer County, Indiana, north of Rockport. The focus of the MOU is to provide equity financing for the project construction while retaining the US-based management and operations team assembled by OVR. The high-tech facility is expected to produce ammonia and urea ammonium nitrate (UAN) solution for fertilizer. Some of the ammonia production will serve the local utility markets for NOx control (known as selective catalytic reduction units or SCRs), which reduces emissions in coal-fired power plants and industrial facilities. In addition, the plant will produce diesel exhaust fluid (DEF), a urea solution used to reduce emissions in diesel engines.

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			~ 1,200 workers will be needed to construct the plant during a three-year period. Upon completion in 2017, the facility will employ approximately 80 full-time workers.
Nuclear (Industry)	Commercial Nuclear Power Plant for producing electrical power.	Duke Energy Lawrence Denney Nuclear Development Strategy Manager 704-382-1895 (O) 704-654-7491(M) Lawrence.Denney@duke-energy.com	In 2009 and 2010, as part of the Southern Ohio Clean Energy Alliance, Duke investigated locating a commercial nuclear power plant at PORTS. The other alliance members were AREVA, USEC Inc., UniStar Nuclear Energy and the Southern Ohio Diversification Initiative (SODI).
Nuclear (Industry Group)	Next Generation Nuclear Plant (NGNP), development and commercialize a Generation IV, intrinsically safe nuclear high temperature gas-cooled reactor (HTGR) technology that can be used for cogeneration of process heat and electricity, displacing other fossil fuels and the greenhouse gases	NGNP Industry Alliance Mark Haynes 202-617-1687 haynes@concordiapower.us Website: www.ngnpalliance.org	NGNP Industry Alliance has held collaboration meetings with the European Nuclear Cogeneration Industrial Initiative (NC2I) to discuss collaboration opportunities for the development and commercialize HTGR technology
Ohio Government	State agency responsible of agricultural activities in Ohio	Ohio Department of Agriculture David Daniels Director 614-466-3506	Interface with for energy crop production.

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Ohio Government	State agency responsible of the natural resources in Ohio	<p>Ohio Department of Natural Resources</p> <p>Robert L. Boyles Chief, Division of Forestry 2045 Morse Road, Building H-1 Columbus, OH 43229-6693 614-265-6694</p> <p>Southern District (Division of Forestry) Nate Jester Administrator 345 Allen Avenue Chillicothe, OH 45601 740-774-1596</p>	Division of Forestry's mission is to promote and apply management for the sustainable use and protection of Ohio's private and public forest lands, which about 200,000 acres is State Forest.
Ohio Government	<p>State agency responsible for:</p> <p>Advanced energy and efficiency program, whose mission is to grow the economy of the state by connecting companies and communities to financial and technical resources increase efficiency and deploy advanced energy technologies.</p> <p>Alternative Fuel Transportation Program, whose mission is to improve air quality through financial assistance to businesses, nonprofit organizations, school districts, or local governments for the purchase and installation of alternative fuel refueling, blending, or distribution facilities and terminals.</p> <p>Ohio Coal Research and Development Program,</p>	<p>Ohio Development Services Agency (ODSA)</p> <p>David Goodman Director 614-466-3379</p> <p>Office of Energy and the Ohio Coal Development Office 77 South High Street, 26th Floor P.O. Box 1001 Columbus, Ohio 43216-1001 614-466-6797</p> <p>Governor's Office of Appalachia Jason Wilson</p>	ODSA offers a broad range of services and administers a variety of programs that support economic development.

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	<p>which is administered by the Ohio Coal Development Office (OCDO) and provides funding for (i) research and development at educational and scientific institutions, and for (ii) demonstration projects. The program seeks projects that result in the maximum conversion or use of Ohio coal as a fuel or chemical feedstock in a cost-effective and environmentally acceptable manner.</p> <p>Qualified Energy Project Tax Exemption, which promotes the deployment of alternative energy sources in Ohio by exempting the public utility tangible personal property tax and the real property tax for "energy facilities" in favor of an affordable, fixed annual payment in lieu of taxes for the life of the facility. Owners of large "energy facilities" must repair roadways damaged in the construction of the facility, train and equip emergency personnel, develop relationships with members of the university system of Ohio to promote education in alternative energy, and remain in compliance with all applicable federal, state, and local regulations.</p> <p>The Clean Ohio Fund, which restores, protects, and connects Ohio's important natural and urban places by preserving green space and farmland, improving outdoor recreation, and cleaning up brownfields to encourage redevelopment and revitalize communities.</p> <p>Site Selection and Certification, which helps</p>	<p>Director 614-644-9228 Office of Technology Investments Norm Chagnon Ph.D. Deputy Chief 614-466-3887</p>	

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	<p>businesses, choose the right location for their facility. ODSA works with JobsOhio to provide tools and resources for businesses, site selectors and communities looking to provide development-ready sites. Ohio has a database of available sites for businesses, as well as a program designed to certify and market a community's job-ready sites. ODSA can help communities ensure that sites are viable for their intended end use, and if not, can advise what investments need to be made in order to attract a high-quality end user.</p> <p>Appalachia Programs, which is administered by Governor's Office of Appalachia, who serves as an advocate for Ohio's 32 Appalachian counties. The Office partners with organizations, agencies, and individuals to foster positive economic growth and improve the quality of life for all citizens living in the region. The Governor's Office of Appalachia works with Ohio's four Local Development Districts and with the Appalachian Regional Commission in Washington, D.C., to promote the region's assets and to support local, regional, state, and federal initiatives.</p> <p>Ohio Third Frontier, which Frontier provides funding to Ohio technology-based companies, universities, nonprofit research institutions, and other organizations to create new technology-based products, companies, industries, and jobs. This program is administered by Office of Technology</p>		

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	Investments.		
Oil & Gas (Industry)	<p>Private sector producer and refiner of oil and is exploring biofuel co-processing</p> <p>On Feb. 3, 2014 MPC announced that it signed an agreement to purchase a facility in Cincinnati, Ohio from Felda Iffco Sdn Bhd, Malaysia. The plant currently produces several products including biodiesel and glycerin. The capacity of the plant is 4,100 barrels per day.</p>	<p>Marathon Petroleum Corporation (MPC) 419-422-2121 (Findlay HQ)</p> <p>Website: www.marathonpetroleum.com</p> <p>Gary R. Heminger President and Chief Executive Officer</p> <p>Richard D. Bedell Senior Vice President, Refining</p>	<p>MPC is the nation's fourth-largest refiner, with a crude oil refining capacity of approximately 1.7 million barrels per calendar day in its seven-refinery system. MPC owns, leases or has ownership interests in approximately 8,300 miles of pipeline. Through subsidiaries, MPC owns the general partner of MPLX LP, a midstream master limited partnership. MPC's fully integrated system provides operational flexibility to move crude oil, feedstocks and petroleum-related products efficiently through the company's distribution network in the Midwest, Southeast and Gulf Coast regions.</p>
Oil & Gas (Industry)	Private sector oil and gas producer working the Utica and Marcellus shales.	<p>Chesapeake Energy Robert Lawler CEO 6100 North Western Avenue Oklahoma City, OK 73118 405-848-8000</p>	Chesapeake has grown to become the second-largest producer of natural gas, 11th largest producer of oil and natural gas liquids, and the most active driller of onshore wells in the country
Waste-to-Energy	Private sector company based in Ohio that utilizes anaerobic digestion technologies to convert organic	Quasar Energy Group	Partnered with Clean Fuels Ohio, OSU's Ohio Agricultural

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(Industry)	solid waste from agricultural farmers, industrial food companies, municipal treatment plants and ethanol producers to produce biogas that becomes reusable energy while remaining liquid and resulting solids can be used for fertilizer and organic soil amendments.	Melvin R. Kurtz President Independence Tower 5755 Granger Road, Suite 320 Cleveland, Ohio 44131 216-986-9999	Research and Development Center (OARDC) ENTER and OSU's Ohio Bioproducts Innovation Center (OBIC)