

the Energy to Lead



Enhancing America's Clean Energy Supply with Coal and Biomass

Secure, affordable, and clean energy is emerging as an increasingly important factor influencing economic growth, environmental quality, and overall societal value. Concurrently, the energy industry faces sustained pressure from a supply, deliverability, price, and environmental perspective. Technology will play a pivotal role in meeting both the societal demands for affordable clean energy and the needs of industry for cost-effective, practical solutions. Coal and biomass resources offer tremendous potential as major components of a clean and secure domestic energy portfolio.

The extensive domestic coal resource requires economically-viable solutions to control and minimize the full cycle environmental impact. The U.S. biomass resource, while more limited in size, also offers a secure, clean energy option if logistics, processing, and energy conversion can become increasingly efficient. GTI provides practical technological solutions to further coal and biomass resources as part of the growing clean energy market.

KEY ISSUES

An enhanced domestic supply portfolio addresses several major issues the U.S. currently faces:

- > **Energy Security.** Instability in global producing regions (such as the Middle East), declining production from domestic oil reserves, competing product demands and markets, and increasing global energy use all contribute to increased supply risk for U.S. consumers.
- > **Economic Development.** Increased use of domestic energy resources stimulates economic growth in rural production areas and drives a sustainable industrial base with affordable and clean energy inputs.
- > **Environmental Drivers.** Growing environmental awareness, an enhanced sense of stewardship, and the development and implementation of clean solutions have become increasingly important for government officials and the general public. Next-generation power and liquid fuels production includes increased consideration of carbon management approaches as well as efficiency.

GTI SOLUTIONS

GTI is at the forefront of research initiatives, offering technologies and capabilities for expanding the availability of cost-competitive energy supplies.





GTI acts as a product enabler, helping technologies reach the marketplace at every stage from lab testing through commercial demonstration. Leverage GTI's facilities and expertise to reach your solution faster.

For More Information

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We are working on practical solutions that include:

- > **Gasification Technologies for Coals and Biomass.** Gasification is based on a thermo-chemical process which converts solid fuel to a synthesis gas. For more than 50 years, GTI has been a leader in developing and implementing gasification technologies and systems for coal, biomass, and other solid fuel feedstocks. Advanced pyrolysis approaches being worked on at GTI also promise viable routes to liquid transportation fuels from renewable materials. GTI has extensive facilities and capabilities for thorough evaluation and testing, including the Henry R. Linden Flex-Fuel Test Facility (FFTF) and the Advanced Gasification Test Facility which house pilot-scale gasification and gas processing systems for integrated process development.
- > **Liquid Fuels from Syngas.** As an enhanced fuel generation process, GTI has expertise and experience in the conversion of synthesis gas to liquids, such as the Fischer-Tropsch process.
- > **Substitute Natural Gas.** GTI has worked on catalytic gasification, hydrogasification, and partial oxidation gasification processes to produce substitute natural gas (SNG) that can meet the pipeline specifications for distribution in natural gas infrastructure. Renewable SNG from biomass is of high current interest.
- > **Syngas Processing Systems.** In addition to core gasification technology, GTI provides technical and economic process expertise and solutions for comprehensive fuels processing, including a variety of syngas cleanup options, and syngas utilization applications.
- > **Integrated Energy Systems.** With expertise and experience in related areas such as combustion, heat transfer, catalysis, membrane separations, and fuel cells, GTI can assist in developing approaches and packaged products for integrated systems and solutions.

CAPABILITIES AND EXPERIENCE

GTI works with government and industry both individually or in collaboration with others to reduce the time and cost of getting new technology to market. We partner with natural gas and electric utilities, major industrial firms, equipment manufacturers, private investors, entrepreneurial start-up companies and government agencies in our programs to develop new and innovative solutions and evaluate technologies.

GTI—BRINGING SOLUTIONS TO MARKET

GTI takes on tough energy challenges, turning raw technology into practical solutions that create exceptional value for our customers in the global marketplace. GTI strives to enhance the effectiveness and implementation of these solutions through the integration of several principles and characteristics:

- > **Market-focused.** GTI programs are based on the direct needs of customers and constituents in the market—identifying and addressing both business and technical needs.
- > **Commercialization partner involvement.** Early partnering and deployment strategy development identifies and mitigates potential implementation issues.
- > **Beyond research to practical application.** GTI solutions build from proven science and fundamental research to deliver well-grounded and workable approaches.
- > **Integrated technology solutions.** GTI provides perspective and capabilities that encompass the full range of the fuel cycle from supply, through delivery, to utilization.