

# Carbon Management Information Center

**Duration:** Ongoing Collaborative

**Fee:** \$ 25,000 per Year per Investor

Natural gas provides the least-cost option for major reductions in carbon emissions compared to electric and oil equipment on a full fuel-cycle (“source-to-site”) basis. This fact is generally not recognized by policymakers, regulators, customers, and environmental groups. In particular, large increases in U.S. carbon emissions are being driven in the residential and commercial sectors by electricity usage.

It is important to document and defend the significant benefits of direct natural gas use in a carbon-sensitive environment, enabling cost-effective carbon reduction pathways to emerge and to leverage this into new policies that provide appropriate incentives and recognition of this reality for consumers.

CMIC is intended to serve as a clearinghouse for relevant carbon management information and to develop, where necessary, credible information products and functional tools to meet the needs of members and their customers.

## ISSUE

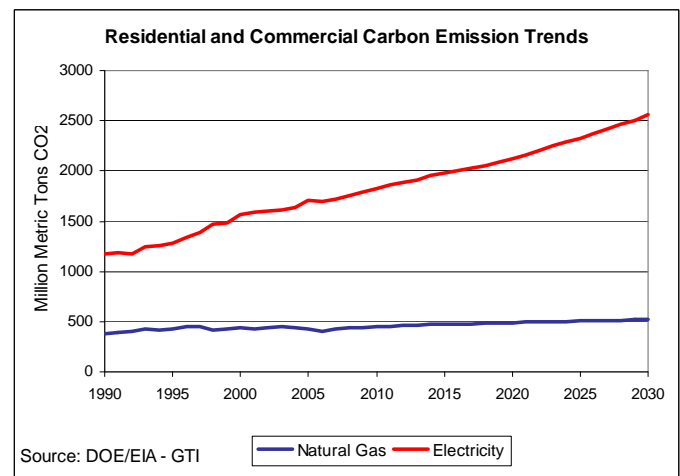
Leading organizations such as the Intergovernmental Panel on Climate Change (IPCC) and McKinsey see the potential for cost-effective carbon reductions in the residential and commercial sectors, but do not talk of natural gas as part of the solution. Natural gas carbon reduction benefits are also not recognized in the perspective presented by policymakers, regulators, and environmental organizations.

A central factor is persistent use of site calculations (rather than total source-to-site energy and carbon emissions) when looking at energy efficiency and carbon reduction opportunities and programs. The result of this

**Approximately 30% of the projected baseline emissions in the residential and commercial sectors – the highest rate amongst all sectors studied by the IPCC – could be reduced by 2030 with a net economic benefit...**

IPCC Press Release (May, 4 2007)

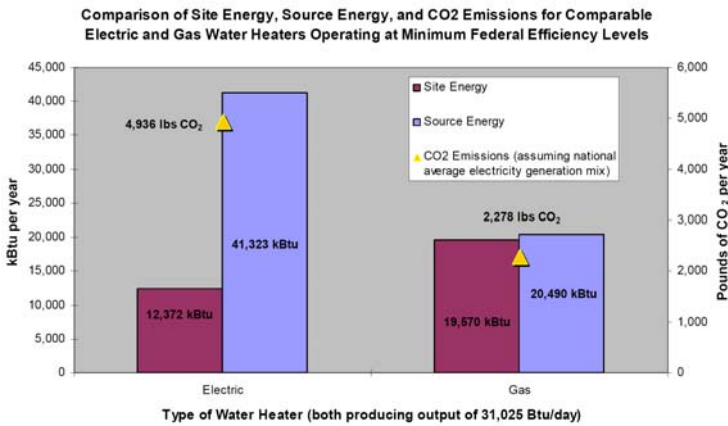
approach is insufficient capturing of the total societal benefits of direct natural gas use. EPA Energy Star appliances compare like equipment (e.g., electric-electric) at the point of use. Green building certifications such as Leadership in Energy and Environmental Design (LEED) use site calculations without regard to source carbon emissions, discouraging natural gas use in many cases.



The public perception is that natural gas is part of the carbon problem, not part of the solution. Funding is being directed to high-cost renewable energy options or modestly more efficient electric appliances (which have very high source-to-site emissions) without recognizing natural gas options.

Natural gas appliances can have significant source-to-site carbon emission benefits over many electric and oil appliances – with carbon emissions cut 55 percent or more on a full

- Encourage development of efficient gas and hybrid products that greatly reduce greenhouse gas emissions
- Identify opportunities to capture financial value through carbon emission reduction and energy efficiency programs
- Provide clear, concise, and technically-defensible information to policymakers, regulatory authorities, public interest groups and others on the beneficial role of natural gas in reducing the nation’s energy consumption and carbon emissions.



fuel-cycle basis (according to the EPA).

Source: EPA

Compared to electric equipment, significant total energy savings can be achieved by avoiding the inefficiencies of power generation and distribution. The expanded direct use of natural gas appliances may also be coupled with potential life-cycle cost savings to users.

Shifting several point-of-use electric and oil technologies to natural gas can provide: (1) a significant reduction in carbon emissions, (2) lower total energy use, and (3) lower life-cycle costs to consumers.

Importantly, natural gas appliances have the potential for being a leading least-cost option for major reductions in carbon emissions – yet the case is not sufficiently substantiated, communicated and accepted.

## BENEFITS

The Carbon Management Information Center (CMIC) is an ongoing collaborative program currently funded by 13 gas industry members that is intended to serve the gas industry and its customers by developing resources and analytical tools that:

- Clearly and fairly evaluate opportunities for efficient natural gas systems to improve total energy efficiency, reduce greenhouse gas emissions, and lower energy costs for consumers

CMIC is helping members support acceptable public policy, legislation, and regulations by providing credible technical data in response to current and future energy efficiency and CO<sub>2</sub> regulatory initiatives. This data will help members inform policy makers, public utility commissions, trade allies, and customers about the significant environmental, energy efficiency, and cost savings of efficient natural gas systems.

Substantial financial resources are anticipated in the future through market transformation, energy efficiency, and carbon reduction programs as well as through capture of economic value in carbon credits in cap and trade programs. Information tools, cost-effectiveness calculators, case studies, technical data for improved regulations, codes and standards, and other products developed or channeled through CMIC will help the gas industry and its customers benefit from an expanded portion of this resource pool.

## SCOPE

During the first year of the consortium program, GTI developed an online information resource (Task 1), conducted analyses for residential and commercial markets (Task 2), and provided technical input to voluntary standards and regulatory initiatives developed and promulgated by other stakeholders (Task 3). During 2009, GTI plans to shift emphasis from Task 1 information clearinghouse and infrastructure activities to Task 2 analytic efforts and Task 3 stakeholder interactions.

GTI is using a combination of in-house resources, subcontractors, and publicly

available information developed by other organizations to meet program objectives. Carbon management information and tools for CMIC members will include reports, case studies, examples of how to capture carbon credits, software, and related information products that highlight the role of natural gas in carbon management and provide cost-effectiveness calculations to demonstrate the least-cost and carbon-reduction benefits of direct natural gas use.

Technology and market assessments will include macro-analysis of carbon impact of end-use technology scenarios, and micro-analysis of specific technologies for targeted sites, regions, and markets. Technical input will include development of key information for use in consensus standards and code change proposals, and participation in targeted certification and standards development and technical committees.

CMIC products can drill down to state and local geographical regions to provide appropriate comparisons of direct natural gas use compared to electricity, oil, hybrids, and renewables on a regionally-specific basis.

As a clearinghouse, CMIC will continue to gather relevant studies, reports, practices, and codes and standards development being undertaken that would impact direct natural gas use. At the direction of members, CMIC monitor or contribute to external studies that may impact the natural gas industry.

## **APPROACH**

**Task 1: Online Information Resource** - GTI staff and subcontractors will continue to collect and publish information relevant to the direct use of natural gas, either hard copy or PDF file, primarily through keyword searches of library databases and websites. Additional information will be provided by other GTI staff, consortium members, and outside stakeholders based on informal discussions and requests. An Excel spreadsheet developed by GTI will be periodically updated to categorize each publication by topic, group type, date, author, and organization. A periodic CMIC Update newsletter also will be provided that identifies and summarizes

specific publications and initiatives judged to be of potential interest to the members.

A website at [www.gastechnology.org/cmhc](http://www.gastechnology.org/cmhc) with public and private domains was created to share the clearinghouse information and analysis results with members and other stakeholders as appropriate. The website provides access to analytical tools, case studies, reports, presentation materials, and links to other helpful resources.

A key element of this ongoing task is strong coordination with other stakeholders that have been active in this area to ensure that information developed under this collaborative does not duplicate work conducted by other organizations, but builds on that knowledge base to improve the quality and quantity of information in this complex and challenging topic. GTI will continue to work with members and other stakeholder groups to ensure that ongoing local, regional, and national initiatives are acknowledged and effectively incorporated into the clearinghouse information.

### **Task 2: Technology and Market**

**Assessments** – GTI will conduct detailed technology and market assessments using a combination of in-house resources and consultants depending on the need. The primary approach to conducting these analyses will be a combination of detailed modeling and spreadsheet calculations.

This effort will focus on case studies and other approaches that will provide a clear, concise, and technically- and economically-defensible comparison of the role of direct natural gas use in reducing energy use and carbon emissions relative to electricity and fuel oil.

GTI has developed a number of sophisticated software products aimed at optimizing applications of natural gas in buildings. One of these engineering tools, Building Energy Analyzer™ (BEA), allows evaluation of monthly and annual energy loads, costs, and pollutant emissions associated with integrated operation of on-site power generation, cooling, heating, thermal storage and desiccant dehumidification systems.

During 2008, GTI staff used the EPA eGrid database, other published sources, BEA

modeling, and detailed engineering calculations to develop the analytical infrastructure and related web-based tools for Task 2 analyses and Task 3 input. The key tool developed under this program in 2008 was a building energy consumption, source energy consumption, and CO<sub>2</sub> emissions calculator available on a dedicated website at [www.cmictools.com](http://www.cmictools.com). The calculator provides estimates of annual site and source energy consumption and CO<sub>2</sub> emissions (as well as SO<sub>2</sub>, NO<sub>x</sub>, and Hg) for baseline and alternative appliances and buildings based on user-selected and pre-defined inputs. Most pre-defined inputs can be modified by the user. The tool design allows average and marginal analyses for national, NERC region, NERC sub-region, state, city, and zip code level buildings, appliances, and fuel mixes. This tool will be updated in 2009 to include methane emissions, commercial building energy consumption and natural gas vehicle estimating capabilities.

Spreadsheet analyses also will be used to evaluate market factors and roll up micro-analyses conducted with detailed models into macro-level results. These analyses will be used as the technical basis of key information and implications that will be described in analytical reports.

Analyses and reports will be tailored to meet the members' needs for technical backup of marketing information and for refuting biased or inaccurate claims by other groups. They will also be used as inputs to codes, standards, regulations, and certifications promulgated by organizations such as the U.S. Green Building Council (USGBC), the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), the Department of Energy (DOE), EPA, International Code Council (ICC), and numerous state agencies.

**Task 3: Technical Input to Voluntary and Regulatory Initiatives** – GTI will provide technical input that can be used by industry advocates to influence codes, standards, regulations, and certifications. GTI staff and expert consultants will supplement and support industry advocates. The key factor for success of this task will be the ability to

build coalitions and to persuade the cognizant committees, councils, and other decision makers to provide equitable treatment of direct natural gas use as a cost-effective carbon management solution based on unbiased technical and societal merits.

Input to standards and certification processes will be most effective through direct participation on research, standards, and technical committees. Current members have indicated the importance of long term involvement in key technical committees. In 2009, GTI is planning to participate in targeted research, standards, and technical committees of USGBC and ASHRAE in conjunction with industry advocates.

GTI staff will also prepare and present Powerpoint slides at targeted public stakeholder meetings throughout the year, including DOE, EPA, and other federal and state agencies to meet member needs.

GTI will continue to coordinate CMIC activities and information products with other GTI carbon management initiatives as well as other gas industry initiatives by LDC's, and regional and national trade associations.

## DELIVERABLES

Deliverables planned for 2009 (subject to available funding) include:

- Updates to a public-access and members-only website containing key information and links to other useful resources
- Updates to the CMIC calculator including methane emissions, commercial buildings, and natural gas vehicle calculations.
- Clearinghouse information on other technical reports, information products, and relevant carbon management activities
- Macro-analysis of carbon impact of end-use technology options and scenarios
- Case studies of specific scenarios in targeted service territories
- White papers, analytical reports, and tabular data for ASHRAE and USGBC standards and technical committees

## CONTACT

Neil Leslie  
Manager, Building Energy Efficiency  
Gas Technology Institute  
847-768-0926  
[neil.leslie@gastechnology.org](mailto:neil.leslie@gastechnology.org)