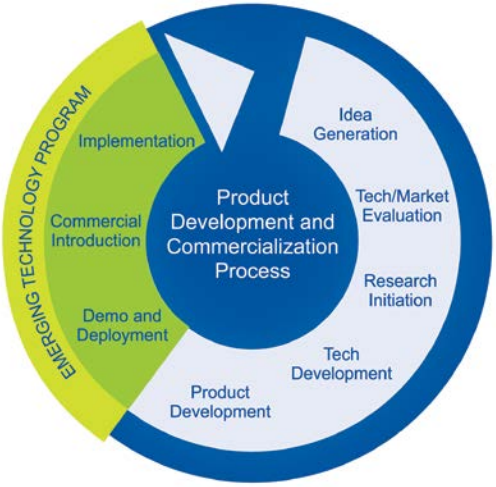
the Energy to Lead

GTI's Emerging Technology Program:

NARUC Energy Efficiency Hour



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GTI Overview

- Not-for-profit RD&D organization with 70 year history
- RD&D largely supported by rate payers and tax payers
- Facilities
  - 18 acre campus near Chicago
  - 200,000 ft^2, 28 specialized labs
  - Other sites in Alabama, D.C, Texas Massachusetts, California
- Staff of 250
  - 170 engineers, scientists covering all fields

Flex-Fuel Test Facility

Offices & Labs

Energy & Environmental Technology Center

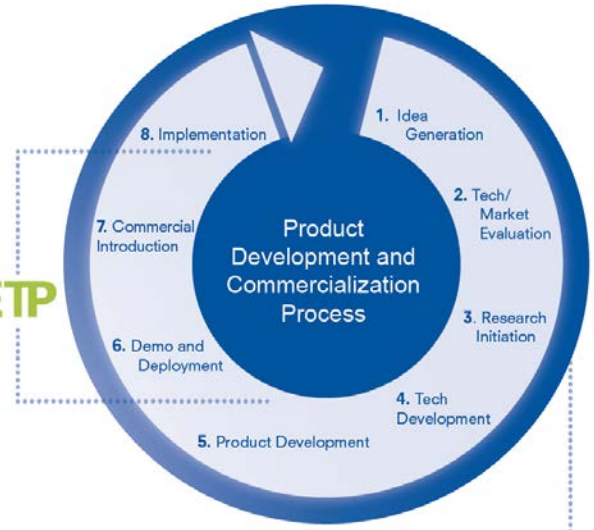
Natural Gas Industry Collaboration

Emerging Technology Program

> Gas Technology Institute led, utility supported, **North American collaborative** targeting **residential, commercial and industrial** solutions

> ETP's principle goal is to **accelerate** the **market acceptance** of emerging gas technologies

AGL Resources
Alagasco AN ENERGEN COMPANY
APGA Research Foundation
ATMOS energy
CenterPoint Energy
CNG
DTE Energy
ENBRIDGE
etic ENERGY TECHNOLOGY & INNOVATION CANADA INNOVATION ET TECHNOLOGIE DE L'ÉNERGIE CANADA
INTERMOUNTAIN GAS COMPANY
National Fuel
Nicor Gas An AGL Resources Company Energy Efficiency Program
NYSEG
PG&E Pacific Gas and Electric Company
QUESTAR Gas
uniongas A Spectra Energy Company
Southern Connecticut Gas Service First! A UIL HOLDINGS COMPANY
Southern California Gas Company A Sempra Energy utility
Yankeegas A Northeast Utilities Company



ETP activities are "beyond development" stage: Field Testing, Demonstration, Pilot Programs, and Deployment – a focused effort to ensure market acceptance of next-generation emerging technologies

2013 Members Listed Above

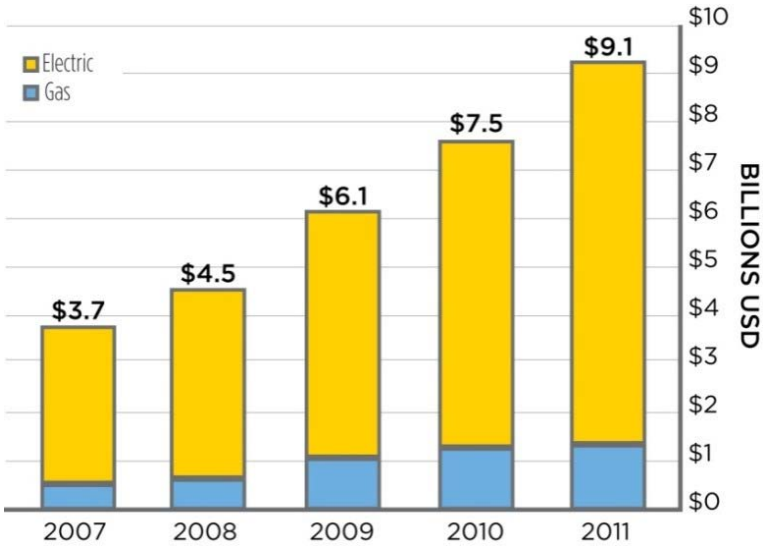
What's Driving ETP?

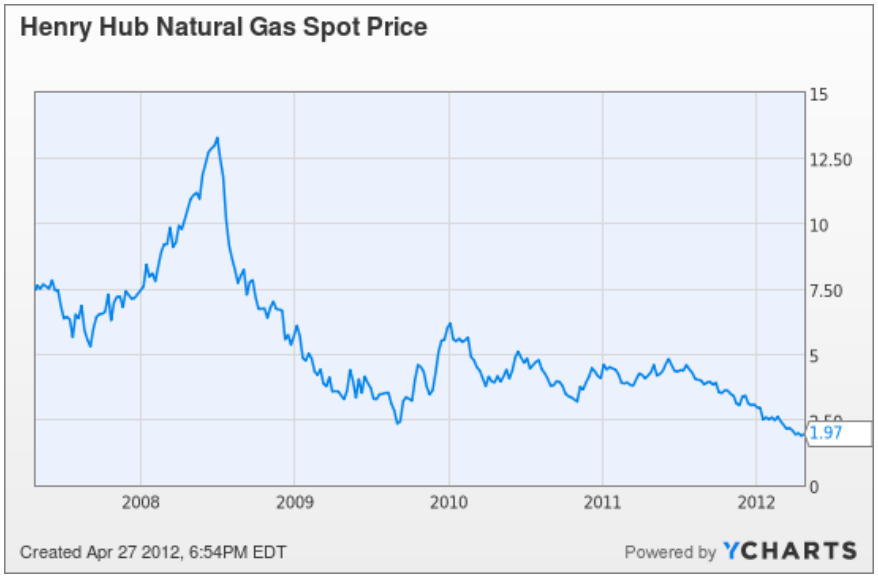
> Significantly growing and maturing gas programs across U.S.

  > Bigger budgets, bigger savings goals

> Low gas prices making efficiency less desirable and cost-effective (e.g. TRC)

US and Canadian Efficiency Program Budgets, 2007–2011





ETP Scope & Direction

ETP Emerging Technology Program

ETP Mission

Accelerate the market acceptance of energy efficient gas technologies

ETP Activities

Identify and demonstrate technologies to **(1) collect and analyze** enabling program and technical **data** while **(2) developing marketplace** through consumer awareness and **infrastructure** improvement.

ETP Results

As gas programs, regulations, and markets mature, low hanging fruit disappears. ETP helps **deliver a pipeline of new technologies** and program solutions enabling utilities to meet tomorrow's energy efficiency goals **with less risk and more certainty**.

Examples: Existing and New ET Program Activities

- California- Roughly 2.5% of total IOU EE and DSM budgets under 2010-2012 Portfolios
- New York- (NYSERDA) Roughly 5% of total program budget
- Pacific Northwest (NEEA)- 10% of total budget 2010-2014
- Illinois- 3% of Gas EE and DSM Program Revenue
- Canadian ETIC

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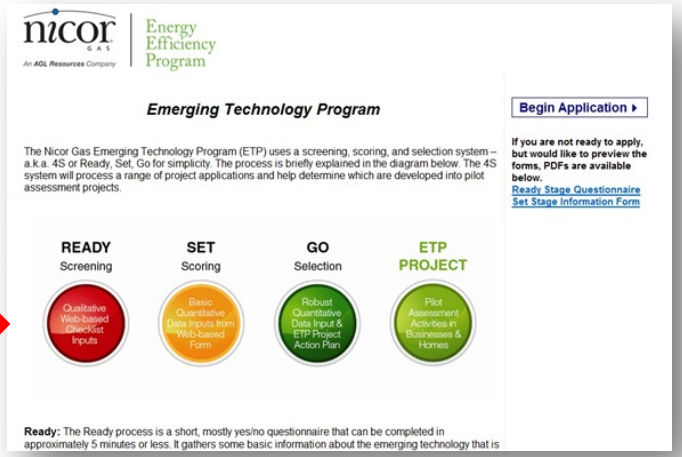
Nicor Gas
Emerging Technology Program

> $50 million/year portfolio, 3% investment in ETP

> GTI selected to implement ETP for Nicor Gas

> Formal, transparent process for project selection



> Goal to identify and demonstrate new technologies for EEP

> **Close collaboration with implementation programs**

Reviewed Tech for 2012

Residential

1. EcoFactor
2. **Combined Space and Water**
3. ASE RetroSave
4. ShowerStart Roadrunner II
5. Opportunities for Residential Natural Gas Feedback
6. Micro-Combined Heat and Power
7. Integrated Design: DHW Systems
8. Radiant Heating and Cooling
9. Mantis Condensing Fireplace
10. Hybrid Gas Solar Domestic Hot Water

Commercial

11. **High Efficiency Rooftop Units**
12. D'MAND Circ for Multi-family Central HW Loops
13. Ozone Laundry
14. Boiler Controls – Greffen M2G
15. IntelliChoice Energy NextAire Mulit-Zone GHP
16. Commercial Food Service Technologies
17. Rheem H2AC Integrated Air and Water RTU
18. High Efficiency Condensing Unit Heater

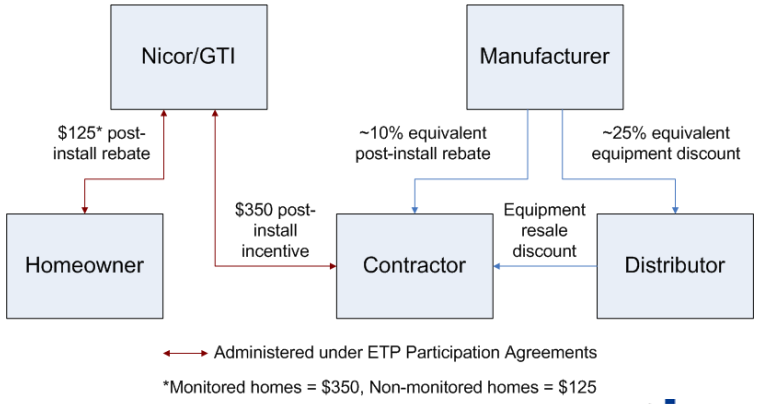
Industrial

19. Ultramizer Boiler Heat Recovery
20. Air Curtains
21. SRU Flue Gas Condenser
22. Automated Steam Trap Monitoring

ACTIVE ETP PROJECTS

ETP National Pilot
Residential HE Combo Systems

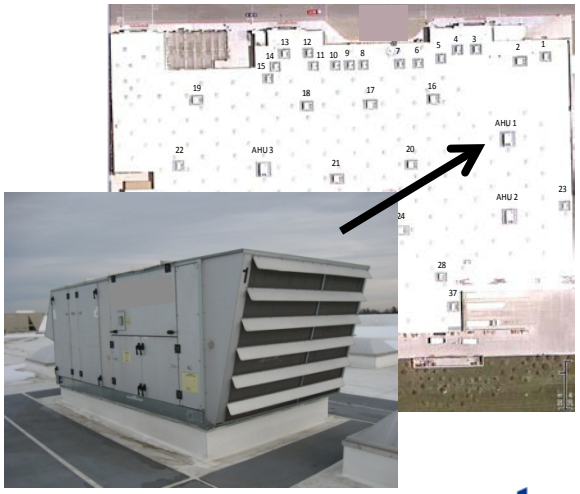
- 94 EF condensing tankless water heater + hydronic air handler (Rheem pictured)
  - Improves utility/customer value proposition for water heating by piggy-backing on larger space heating load
- Multi-unit demonstrations/pilots in IL, NY, and CA
  - At least 20 residencies with data acquisition systems
- Measured field performance, energy savings, cost analysis, and customer reaction
- Contractor technical/sales training, consumer messaging, rebate program pilot



Field Assessments
High Efficiency Gas PACs- RTUs

ETP Emerging Technology Program

- Collaboration with NREL, DOE, **manufacturers**, **national accounts**, and utilities
- Large-scale monitoring shows **diverse runtimes for RTUs** and more therm use than energy models suggested
- **Dedicated outside air systems** (DOAS) **provide** high efficiency **market entry point** application
  - "big box" retail accounts with established DOAS vendors
  - high heating degree day (HDD)/heating load locations
  - 24/7 retail stores
- Retail partner projected $4,400 premium, = 4.1 years ROI @ 90%TE
- Northern climates see more than 3,000 therms/saved per year per unit!



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Comments, Questions

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ETP Emerging Technology Program

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Emerging Technology Program (ETP)

Addressing implementation barriers and associated risks related to market acceptance and adoption of emerging technologies.

Improved energy efficiency is a shared policy goal around the world; it is often the most economic and readily available means of improving energy security and reducing carbon emissions. New technology is essential to further energy efficiency improvements and to move toward a cleaner, more sustainable energy future.

Emerging Technology Program (ETP) —
A newly established collaborative program managed by Gas Technology Institute (GTI) — is focused on accelerating the commercialization and adoption of the latest energy efficient technologies. The program is designed to help companies identify and evaluate the most promising products and integrated solutions and assess their suitability for future use in utility energy efficiency programs.

GTI's industry-leading expertise provides the information and resources required to help advance market acceptance of emerging technologies for near- to mid-term implementation. ETP strives to create market pull by deployment of natural gas solutions at a desired scale, leading to self-sustaining commercial viability and impact.

Effective Industry Collaboration
Collaborative ETP initiatives provide an opportunity for companies to share insights, leverage energy efficiency funds and help increase the transfer of technology between upstream innovations and the marketplace.

ETP also offers access to GTI services and capabilities for energy efficiency program planning, implementation and assessment. GTI and its partners can work with your company to tailor or modify initiatives to address company or regionally specific needs and opportunities. We can also support a regulatory submission for ETP authorization. GTI has a long history of working collaboratively with utility companies, regulatory agencies, local state/federal government, non-government organizations, manufacturers, channel partners, trade allies and other stakeholders to reduce the time and cost of getting new technology to market.

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