


**Controlling Energy Use
to Reduce Operating Costs**

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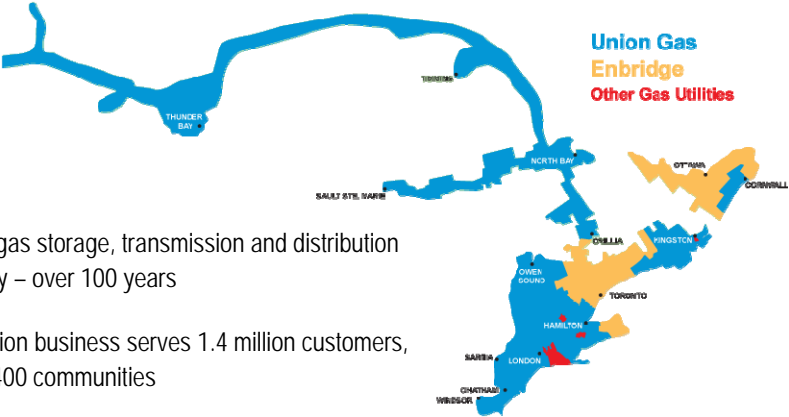


Today's Topics

- Union Gas & Natural Gas Overview
- Reducing Natural Gas Consumption
 - Natural Gas Programs and Incentives
- Reducing Electricity Consumption
 - Electricity Programs and Incentives
- Connecting with Union Gas
- Q&A Session


Union Gas: Your Energy Experts



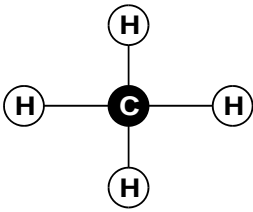


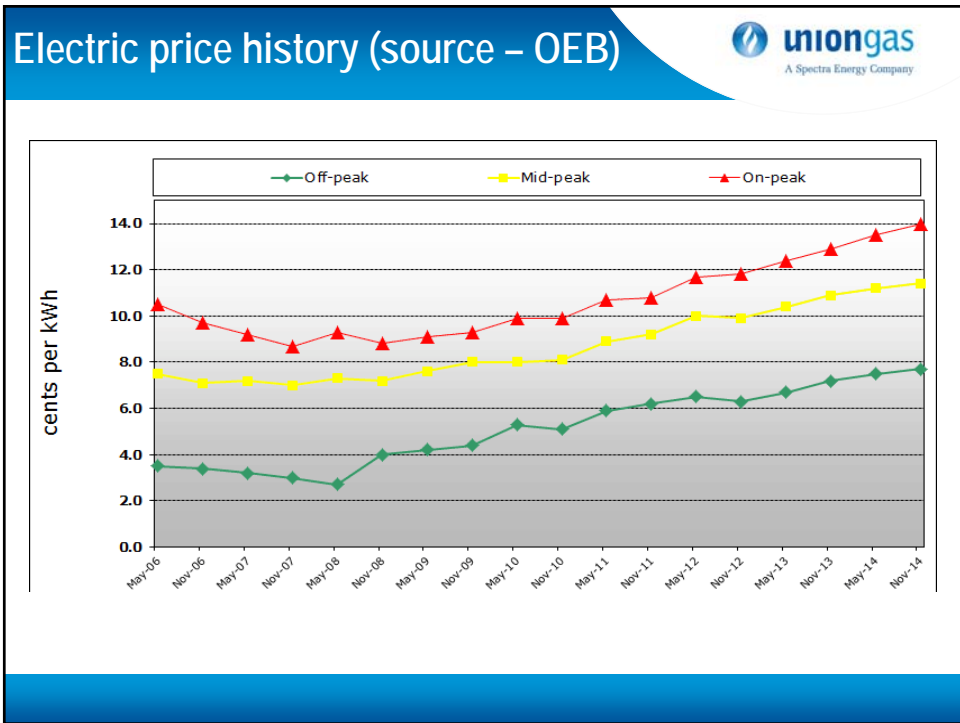
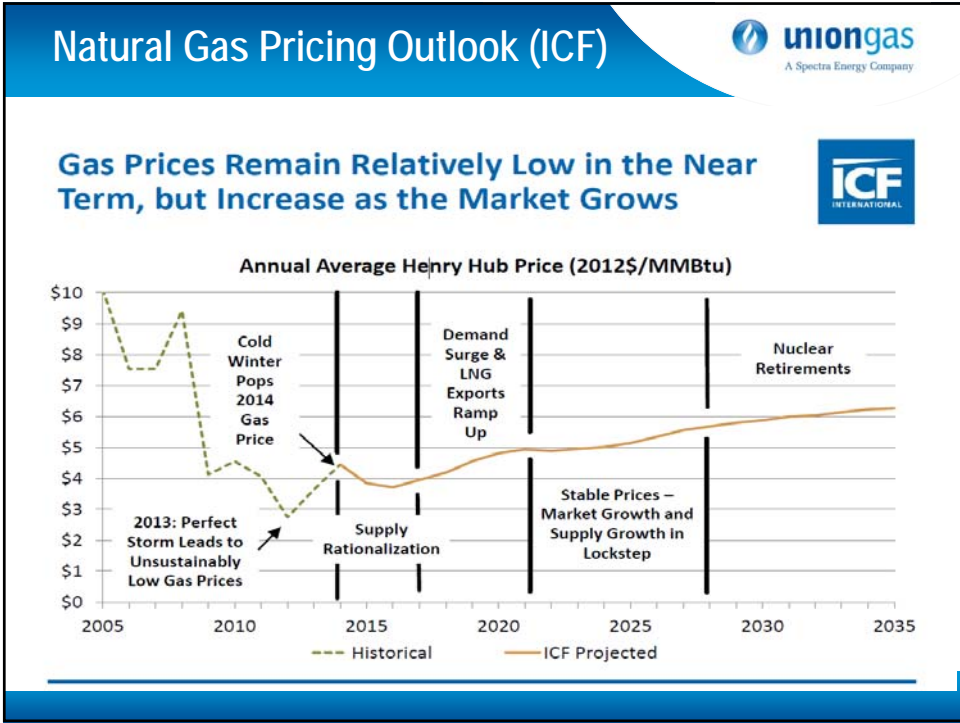
- Natural gas storage, transmission and distribution company – over 100 years
- Distribution business serves 1.4 million customers, in over 400 communities
- One of Canada's Top 100 Employers 2011-to-2015

Benefits of Natural Gas




- ✓ **Cleanest of the fossil fuels**
 - Only one carbon atom to burn
- ✓ **Safest of the fossil fuels**
 - Lighter than air
- ✓ **Abundant supply ensures long term price stability**
 - At least 100 years supply in North America
- ✓ **~1/8th the cost of using electricity (S. Ontario)**
 - Does not include electric system losses






Conserving Energy in Ontario



Energy conservation is a good thing!

- ✓ Preserves the environment
 - Fewer greenhouse gas emissions
- ✓ Protects from rising energy prices
 - Helps keep companies competitive and strong
 - Helps individuals stay warm and comfortable
- ✓ Reduces the need for new infrastructure
 - Keeps the price of energy low
 - Maximizes use of existing pipelines and generating stations

Union Gas' Energy Conservation Focus



- ✓ Union Gas has offered Energy efficiency programs to residential, commercial and industrial customers since 1997
- ✓ Our Account Managers can help:
 - Identify energy efficiency and technical upgrade opportunities
 - Locate applicable incentive programs
 - Fill out applications and ensure customer submissions
- ✓ **Union Gas has generated over 6 billion m3 of savings, the equivalent of 2.1 million cars off the road for a year**

Reducing Natural Gas Consumption



Natural Gas Reductions

- Heating Systems
- Domestic Hot Water
- Make Up Air and Heat Recovery
- Building Envelope Improvements
- Controls and BAS

Natural Gas Reductions - Heating



- Replace old boilers with condensing boilers
 - 15% to 20% savings
 - Can often use lower BTU rated boilers

- Tune up and clean existing boilers
 - Up to 5% savings

- Install a control or Building Automation System to better regulate heating requirements

Customer Success Story: Condensing Boilers for Space Heating



Situation: 25 unit seniors apartment building

- Old boilers requiring multiple repairs – reaching end of life
- Higher than normal gas consumption
- Unreliable performance leads to tenant complaints

Solution: Install condensing boilers for space heating

- 2 x 399 mbh condensing boilers
- Project cost – **\$34,500**
- Annual gas savings – **8,300 m³ = \$2,000**
 - Lifetime savings over 197,000 m³ = \$40,000
- Incentive received from Union Gas - **\$17,250 (50% of costs)**

Natural Gas Reductions - DHW



- Replace old stand alone tanks with condensing water heaters
 - 20% to 30% savings of dhw load
 - Can often use lower BTU rated water heaters
- Lower delivery temperature to apartments
- If using boilers for both heat and DHW, ensure proper controls to prevent wasted heat

Natural Gas Reductions – Make Up Air and Heat Recovery



- Replace old MUA with condensing MUA
 - 15% to 25% savings
- “Right-size” the new MUA based on airflow
- Add Heat Recovery where possible
- Control time of use through VFD and control system

Customer Success Story: VFD on MUA 2014



Situation: 6 small apartment buildings – 15 to 30 apartments

- MUA running full speed 24 hours per day
- MUAs fairly new – no need to change them

Solution: Install VFD on MUA

- Time clock to reduce CFM rate at certain times of day
- Can run at 50% or less for several hours per day
- Cost of VFDs – \$4,000 to \$7,000 – total \$29,000
- Annual gas savings – 45,000 m³ = \$14,000
- Incentive received from Union Gas - \$14,500 (50% of costs)
- Also eligible for electric incentives!

Natural Gas Reductions – Building Envelope Improvements



- Leaking and drafty windows and doors
 - High cost – Replace the windows and doors
 - Low cost – weather-strip and air-seal the perimeters
- Upgrade roof insulation if needed
 - Can often be done when roof is being replaced
 - Small savings unless there is no insulation there
- Building Cladding and Solar Wall
 - If need to replace one or more walls, consider a Solar Wall

Natural Gas Reductions - Controls



- Control systems now available for multifamily buildings with central gas heating
- Relatively new to the Ontario market – 2012 introduction
- These systems limit the amount of heat available to building zones
- Savings between 20% and 40% of the heating load
 - Requires individual building assessment by vendor
- Cost varies with system
 - Wired or wireless, number of units, number of zones, etc

Customer Success Story – Building Controls 2013



Situation: 252 unit apartment building


- Gas heat, hot water and MUA
- Lots of wasted heat – windows open, hot and cold spots, etc
- Annual heating consumption about 180,000 m³

Solution: Install wireless controls with heating zones

- Controls amount of heat available to each apartment
 - Eliminates hot and cold spots in the building
- Project cost - \$70,000
- Annual savings 25% - 45,000 m³ = **\$14,400**
- Incentive received from Union Gas - **\$35,000**



Natural Gas Program Offerings (DSM)



Union Gas' Programs and Incentives

- ✓ **Union Gas' current Ontario Energy Board approved plan for Affordable Housing customers:**
 - 2012 – 2015: OEB approved significant increases in incentives for Affordable Housing Providers
 - Funding a huge issue for non-profit customers
- ✓ **Union Gas has filed a new 2016+ plan with the Ontario Energy Board**

Affordable Housing Single Family Program



✓ Single Family – Target Market

- Union Gas customer
- Home is part of an Affordable Housing complex (private or non-profit)
- Home is built prior to 1975 and requires more insulation
- Home has a natural gas furnace

✓ Single Family – Offering

- Free Home energy assessment
- Free Insulation & air-sealing upgrades
- Free Basic measures
- Health & Safety initiative

Affordable Housing Multi-Family Program



✓ Multi-Family – Target Market

- Union Gas customer
- Building is multi-residential (part 3 under OBC)
- Building is a part of an Affordable Housing complex (private or non-profit)

✓ Multi-Family – Program Offering

- Building assessment – identify energy efficiency/technical upgrades
- Incentives for pre-determined and custom projects – Union Gas will assist in the application

AHCP Multi-Family Incentive Details



- **Pre-determined, equipment incentives***
 - Various technologies with approved savings numbers
 - Pre-set incentive amounts


- **Custom Incentives***
 - Anything not covered in the Pre-determined program
 - New and retrofit projects eligible
 - Incentive is \$0.10 / *lifetime* m3 saved

***Both Pre-determined and Custom limited to 50% of installed costs**

AHCP Pre-determined Incentive Example



- **Condensing boilers (heat)**
 - Based on lifetime gas savings (max 50% installed cost)
 - Example:
 - 299,000 BTU boiler saves about 72,000 m3 over 25 year lifespan, will receive an incentive of \$7,200
 - 1,000,000 BTU boiler saves about 250,000 m3 over 25 year lifespan, will receive an incentive of \$25,000
 - Used for **water heating** is also ok


AHCP Pre-determined Incentives 

- **Condensing Gas Water Heater** - \$1,900
- **HRV** 3000 cfm - \$18,750
- **ERV** 3000 cfm - \$24,400
- **Condensing Make Up Air** with variable frequency drive (VFD) – 3000 cfm - \$12,500

Larger incentives for larger buildings

- Example: 20,000 cfm MUA with VFD and HRV - \$205,000


***All incentives subject to maximum 50% of installed costs

2014 AHCP Custom Examples 

Any project that reduces natural gas consumption and is not part of our Pre-determined program (building specific)

Type of project	# of projects	Avg. incentive
VFD on MUA	9	50% of cost
Insulation	3	\$4,361
Window replacements	5	\$12,000
Controls	3	\$39,200
Solar Wall	1	\$81,800
Hi-eff water heating	3	\$13,900

Applying is Easy!




Program Incentives:


- Contact your UG Account Manager to identify possible incentives
- Simple 1 page application form – on our website or from your Union Gas Account Manager (**we can help with the application!**)
- Submit your application after the project installation, as soon as it's complete

UG Account Manager will assist with your application

For More information:
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Reducing Electricity Consumption



Electricity Reductions



- Replace electric equipment with gas where possible
 - Gas is up to 8 times less expensive than electricity
 - Sometimes also eligible for natural gas incentive
- Controls and BAS
- Variable Frequency Drives (VFDs)
- Combined Heat and Power (CHP)
- OPA programs
 - Lighting
 - Appliances
 - Custom projects
- No incentive for “fuel switching” from OPA or Union Gas

Reducing Electricity - Controls



- Control systems now available for multifamily buildings with electric baseboard heating
- Relatively new to the Ontario market – 2012 introduction
- Savings between 20% and 40% of the heating load
- Cost varies with system
 - Wired or wireless, number of units, number of zones, etc
- Eligible for an OPA incentive

Reducing Electricity – Variable Frequency Drives



- Variable Frequency Drives (VFD) can be installed on new or existing equipment
- Requires some kind of timer mechanism or BAS
- Reduces the run-time of motors – less electricity usage
 - Eligible for an OPA incentive
 - Can be eligible for a Union Gas incentive as well
- Commonly found on forced air equipment
- Electrician can replace your motor at low cost

Reducing Electricity – Combined Heat and Power (CHP)



- Use natural gas (or other fuel) to generate electricity
- NOT an “emergency generator”
- Runs 24 hours per day, 365 days per year
 - ½ day maintenance per year
- Offsets a portion of the electric load
- Hot exhaust from the natural gas generator directed to pre-heat another gas application – DHW, MUA, boiler loop, etc.
- No feedback to the grid – no utility contract required
- Eligible for an OPA incentive based on electricity reduction

Customer Success Story – CHP 2014



Situation: 60 unit apartment building



- Electric heat, gas hot water
- Cost of electricity rising dramatically
- Apartments becoming hard to rent

Solution: Install EC Power Micro CHP unit

- 19kw unit uses natural gas to generate electricity
- Waste heat used to pre-heat domestic hot water
- Project cost - **\$80,000**
- Annual cost savings - **\$12,500**
- Incentive received from OPA - **\$32,000**




Electricity Program Offerings (CDM)

Program for Electricity savings for Commercial customers

- Audit incentives
- Equipment incentives
- Lighting, motors, air conditioning, VFDs, etc
- Custom projects
- **Pre-approval required** – minimum project sizes needed in some programs
- Available through 81 electric utilities in Ontario
- 2011-2014 programs extended to 2015 to bridge transition to new CDM Framework in 2016

www.saveonenergy.ca



Ontario and Other Provinces

- Ontario: Enbridge Gas – GTA, Ottawa, Niagara – rebates similar to UG
 - www.enbridgegas.com
- Quebec: Gaz Metro gas incentives Hydro Quebec electric incentives
 - <http://gazmetro.com> <http://www.hydroquebec.com/business/>
- Manitoba Hydro – gas and electric programs
 - www.hydro.mb
- Fortis BC – gas and electric programs
 - www.fortisbc.com
- Sask Energy – natural gas incentive program
 - www.saskenergy.com
- Heritage N.S. – rebates on conversions in Energy Star
 - www.heritagegas.com
- Alberta – no incentive for saving energy



QA

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