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**Weatherization Best Practices:
20 Years of
Partnering for Performance**

- Subsidiary of NiSource, Largest natural gas utility in Ohio
- Provides natural gas and natural gas transportation services to 1.3 Million customers
- Operates in more than 1,000 communities and in 64 of Ohio's 88 counties
- Columbia transports gas through its pipelines to homes/businesses
- 36% of Columbia's customers purchase their natural gas from a supplier other than COH through the CHOICESM Program
- 23-year relationship with Wx network
- Super Regional Regulated Energy Company
- Natural Gas
 - Transmission
 - Storage
 - Distribution
- Electricity
 - Generation
 - Transmission
 - Distribution

- Common Traits and Trends in Best Practice LI Wx programs (ACEEE)
 - Partnerships and multi-party collaboratives
- Different localized models
 - Community action agencies provide direct customer services where feasible
 - Single/primary providers of services – single point of entry to menu of low income services, customer friendliness and ease of participation
- Common Traits and Trends in Best Practice LI Wx programs (ACEEE)
 - Full menu of energy improvements
- Sophisticated diagnostic and analytical tools
- Whole house/systems approach
- Customer education often integral
 - Program evaluation integral, ongoing
- Cost effectiveness an important objective
- Energy and non energy benefits
 - 2 decades of successful experience
- Achieving significant success

- Some Best Practice factors that influence Program Performance
 - Good Program **Design**
 - Effective **Implementation**, Execution and Delivery
 - Value-focused **Evaluation** and Feedback
- A different look at Best Practice performance factors
 - Strategic Performance Measures
 - Political Management
 - Operational Capacity
 - Value Creation

The Strategic Triangle

- Political Management
 - Do we know, understand, inform and engage our stakeholders as part of our efforts to get the resources and authority we need to create value?
 - Relationships are key.
- Operational Capacity
 - Are we maintaining/building capacity to implement our value and strategies?
- Value Creation
 - Do we create value for the public?
 - How do we measure and communicate it?
 - What is our strategy to create additional public value?

Natural gas is made up mostly of molecules of:

- a. **CO₂**
- b. **C₄**
- c. **CO**
- d. **CH₄**

- Program theory, logic model
- Pre-treatment energy use
 - Climate
 - Housing stock
- External expertise/history (relationships, management)
- Adequate Funding and Support, pricing
- Stand alone & cost share jobs
- Standards/Priorities/Energy Conservation Measures
- Diagnostic inspections, informative work orders
- Evaluation, Data tracking systems
- Other infrastructure

- Program theory and logic model
 - “Weatherization can save low income customers energy and reduce arrearages.”
 - Flow chart or grid of inputs, activities, outputs, outcomes, impact
- Planned work and intended results
- Pre-treatment energy use
 - Climate
- 4400-6600 HDD
 - Housing stock
- A lot of pre energy code “stick-built” homes
 - Gas use
- 1200 ccf/year for average low income household (2004)
- External expertise/history (relationships, management)
 - WAP network
 - Not all CAAs
- Adequate Funding and Support, pricing
 - ~\$5,000,000/year, \$90+M over life
 - Schedule A for ECMs
- Stand alone & cost share jobs
 - 70% cost share with WAP

- Standards/Priorities/Energy Conservation Measures
 - WPS
 - Audit-validated ECM priority list
 - ECMs evaluated post-treatment

- Diagnostic inspection process, informative work orders
 - People driven, with blower doors, combustion analysis, pressure/duct testing, infrared cameras, pre-treatment usage and arrearages
 - Work orders provide information and direction

- Evaluation, Data tracking systems
 - Full data tracking at CBO level, aggregated at COH
 - COH customer data system

- Other infrastructure

What is ?

- Low-income (150%FPG) DSM program
 - Gas space heating and gas baseload usage
 - Target high users and PIPP customers (when possible)
 - Focus on energy management, affordability, comfort, durability, health, safety, efficiency

- History (relationships!)
 - Outgrowth of company experience with Ohio WAP network

- 1984 Energy Audits, Operation HomeCheck
- 1986 Columbia Ohio Weatherization Program (COWP)
- 1987 Pilot Program
- 1994 Regulatory Stipulation
- Energy Conservation Measures (ECMs)
 - Thermal envelope (ceiling, walls, foundation), duct, pipe and water heater insulation
 - Instrumented air sealing, duct and pressure diagnostics
 - Repair or replacement of defective space and water heating equipment
 - Customer education
- Energy Actions
 - Heating and Water heater
 - Laundry
 - Controllable Openings
 - H&S
 - Energy Assistance

Name the substance that is added to natural gas to give it 'that distinctive odor.' Is it:

- a. **Oil of Wintergreen**
- b. **Celebrex**
- c. **Mercaptan**
- d. **MSG**

- Network capacity/expertise
- WAP infrastructure
 - Management, finance, operations
 - Staff and Training
 - Equipment, vehicles, technology
- Inspection, installation standards/policies/procedures
- Customer service, marketing lists
- “Monitoring”
- Funding synergies with WAP
- Adaptive to change

Who runs locally?

- Network capacity/expertise
 - Operated by 4 community-based organizations: COAD, GLS, MORPC, NHST
- One Stop Shop for many services
 - Partner with other low income energy conservation and home repair programs (WAP, EPP, HTF, USDA, RD, etc.)
- Partner with HEAP, PIPP, HeatShare payment assistance services

- Field staff technical training via Ohio Weatherization Training Center
- WAP infrastructure
 - Existing management, finance, operations
 - Trained field staff via OWTC and training requirements
 - Equipment, vehicles, technology
- Inspection, installation standards/policies/procedures
 - WPS
- Building science and performance-based
 - Policies and Procedures Manual
- Marketing
 - CBO responsibility
- They know the customers.
 - Customer list of 40K eligible households
- Arrearage and usage data
 - Telerecruiting, WAP referrals
- “Monitoring”
 - Varies with CBO
- In-house staff
- Initial/final inspection staff, 100% some places
 - COH staff 10%

- Funding/operational synergies with WAP
 - WAP staff and equipment can be used rent-free on cost share jobs
 - Same management and installers
- Open Houses and Showcases
 - Opportunity to build support with stakeholders
- Adaptive to change
 - “Change is good, you go first.”
 - Willingness to try new measures over time
 - Willingness to adopt new technologies
 - Willingness to change processes
- Feedback (all directions)
 - Constant
- Monitoring
 - By CBO
 - By COH
- Metrics, reports
 - Inspections, completions, budget, customer ed
- Process, impact and cost-effectiveness evaluation
 - 13 to date
 - 5 year evaluation in progress
 - Scientific method and healthy level of skepticism

- Value quantification
 - Create win-win for all stakeholders
 - “If you can’t measure it, you can’t manage it.”
- “We should be guided by theory, not by numbers.” – W. Edwards Deming

Which of the Following is NOT a Real Utility-Related Mascot? Is it:

- a. **Wattson**
 - b. **Zappy the Electric Guy**
 - c. **Reggie the Regulator**
 - d. **Cozy Cat**
- It’s the people!
 - Collaboration works, builds relationships.
 - Beyond good design, T/TA, evaluation and a willingness to listen are critical.
 - Pre-treatment usage is the best predictor of post-treatment savings.
 - The low savers are the low users
 - Whole house weatherization saves more energy (25-30%) than doing a few selective measures.

- Attic and wall insulation, blower door guided air sealing, and high efficiency furnace replacements produce the most savings.
 - Attic insulation, 0.15 th/ft² (some attics insulated)
 - Wall insulation, 0.2 th/ft²
 - Air Sealing, 7 th/100CFM50 reduction, ballpark 10% of heating load

- 4127precfm50, 1843 postcfm50
 - Heating Systems, 10-11% of pre-use, 13% of Heating pre-use
 - Attic Insulation, 17%
 - Wall Insulation, 17%
 - Floor Insulation, 3%
 - Heating Systems, 46%
 - Water Heaters, 7%
 - Other, 3% Air leakage, 6%

- Air leakage

- Attic Insulation

- Wall Insulation

- Floor Insulation

- Heating Systems

- Water Heaters

- Other

- Developing automated evaluation process
- 5-year evaluation identifies potential risk
 - Pre-treatment usage is declining
 - Savings still good

Year	# houses	ccfPre	ccfPost	ccfSave	%ccfSave
2004	707	1195	870	325	27.2%
2003	590	1218	867	351	28.8%
2002	580	1250	886	364	29.1%
2001	421	1331	960	371	27.9%
2000	129	1350	983	367	27.2%
		1268.8	913.2	355.6	

- Weatherization helps customers pay down arrearages.
- Combo homes save more energy than stand-alones, but at a greater cost.
- Savings persist over time (no deterioration 1990-2000).
- Cost effectiveness may be marginal if non-energy benefits are not quantified.
- Customer marketing lists are important for some providers.
- Many stakeholders win.

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