



ENERGY EFFICIENCY: ENHANCING HOME PERFORMANCE
PROGRAM TWO
“Home Symptoms and Building Science”

INTRO TEASER (MARK MASON):

Hi, I’m Mark Mason. Do you have high energy bills? Do you have hot or cold spots in your home? Do you have ice damming? Drafty rooms? In this program, we’ll cover building science as well as a number of household problems that not only cost you money, but may damage your home. We’ll visit houses that have some of these problems and talk about how to address them using the latest in building science.

Underwriting

Funding for “Energy Efficiency: Enhancing Home Performance” is provided by: New York State Energy Research And Development Authority, using innovations and technology to solve some of New York State’s most difficult energy and environmental problems in ways that improve the state’s economy.

MARK MASON:

One reason for high energy bills is an increase in the price of electricity or heating fuel. However, high energy bills can also be a result of a problem in your home. That’s where the term “building science” comes in. A house operates as a system and we’ll show you how the cause and effect of common household problems are the result of many things going on in your home. Something in your home is not functioning the way it was meant to – perhaps your windows, insulation, or heating and cooling systems. It is not always easy to pinpoint the problem, but fixing it can make your home more energy efficient and more comfortable. If you have any of the problems identified in this program, the best option is to use a Home Performance Contractor, specially accredited through the Building Performance Institute or BPI to improve the energy performance of your home. We’ll take you on a walk-through of some homes with two BPI Accredited Contractors to help you identify whether or not you might have the same problems.

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Hi, I’m Rick Gerardi. Do you have high energy bills? Are there hot or cold spots in your house? Drafty rooms? Ice damming? In this program, we’ll cover building science as well as a number of household problems that not only cost you money, but may damage your home. We’ll visit houses that have some of these problems and talk about how to address them using the latest in building science.¶
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ELLIS GUILLES: (Cold Air Leaking into House)

Cold air leaking into your house around windows, doors, electric outlets, light fixtures, and gaps due to house settling, can cause rooms to feel cold, drafty, and uncomfortable. As cold air comes through the leaks into the house, warm air is escaping through other leaks to the outdoors. The best way to determine where the air is leaking out of your home, is to contact a Building Performance Institute accredited contractor and they’ll perform a blower door test. Or, simply feeling around your windows, doors, outlets, and ceiling fixtures for drafts may give you a rough idea of where those leaks are.

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JEFF LOOMIS: (Drafty 6: Door, Electrical Outlet, Heating Duct)

What we have here, we have a new door, it's a good example of how the door is very well weather-stripped. We put the artificial smoke is here, and we're getting a very lazy trail with the smoke, however, when we come on the back side of this, you can see the gaps, but when you see the artificial smoke, it's blowing right away from there. We're getting a lot of leakage, and this is very typical of a door or window opening, rough opening. So what we normally recommend is trying to seal these and if you have, the molding is on, what we can do is simply caulk on both sides of the molding to seal that space up. And then also in this application, we're getting some leakage around the base of it, around the sill plate. And you can see the smoke dashing away. Another example that we have here, is on the outlet box, the electrical outlet box or switch boxes of a house, is a very common area for getting air leakage and you can see from the smoke just blowing across here that we're getting a great deal of leakage around these. And these can be done very effectively. We can use foam gaskets behind the covers. In this case you'll want to have to caulk and seal around this, maybe some foam around that. And another big leak area that we seem to have here, you can see how our connection is to the basement through the duct work, and the leakage that we're getting through this is enormous and you can see the smoke trail, there's a lot of cold air leaking up from that basement area.

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JEFF LOOMIS: (Drafty 11 Under Bathroom Sink)

A very typical application is where the plumbing comes up through to the vanity or to the tub, and wherever that piping comes up, often there's a larger hole than the piping, and it makes an ideal area for air to travel and escape and those areas we want to address, try to seal those off and again, cutting down the air stack effect in the house.

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JEFF LOOMIS: (Drafty 12 Pipes for washer)

We've located a leak where the plumbing pipes are, for the washer, and the homeowner has mentioned that they have a problem with pipes freezing in this area. And one of the problems we have is that cold air is actually leaking up through that area, getting to the pipes, and is causing a freezing situation. There's the hassle of freezing and possible pipe splitting and water problems that we can get into a house, so avoid the pipes from freezing, to make the house sealed up and not having that cold air leaking in here as well, that's obviously the ideal scenario, situation that we want.

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JEFF LOOMIS: (Drafty 14 Basement pipe that leads to washer)

This is that pipe area that we were looking at upstairs and this is the section that leads up to the washer, and as you see it goes out over the foundation wall and up through the floor area. But again, part of our problem in this area is the air leakage that we're getting. You can see somewhat from the old cobwebs way up in the sill, where the air's actually leaking through and these are areas that we want to address, to insulate and air seal around this perimeter edge.

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ELLIS GUILLES: (Common household drafts)

Fireplaces, recessed lighting, ceiling fans, and attic doors are a common location for household drafts. In fact, the biggest leaks for escaping air can often be found above your head, in the attic. Poorly installed insulation in the attic and exterior walls can be a cause of cold, drafty rooms. The seams of the insulation should overlap, and there shouldn't be any gaps, rips, or tears or compression in the insulation. In your attic, check for gaps or voids, and if you happen to have

blown cellulose, look for places of excessive settling. Unfortunately, the only way to check your walls in an existing home is with a thermal imaging camera. This will show temperature differences in the wall. Thermal imaging definitely helps, but if a wall is cold to the touch, it's a sign that there is probably missing insulation, or improperly or inadequately installed insulation, or the insulation is dated and has settled, leaving open spaces in the wall which can result in cold air getting into the house.

ELLIS GUILS: (Blower Door 10 Cellar)

Other places that we like to look for air leakage, down in basements, specifically around the windows that might be down here. This one's not too bad, it's not a great window, it's a single pane one. Not a lot of leakage around it fortunately. Rim joists, though, big offenders, fortunately this one's got a little bit of insulation in it, but these tend to have a lot of penetrations, you can see all the piping and wiring going to the exterior of the house that probably weren't caulked or foamed by the builder. Normally we'd want to recommend that you come in here and seal the entire rim joices, as much as you can get, usually big, big areas of air leakage. Real simple building science principle, when we're trying to correct for infiltration in a house, seal low, seal high. What that does is it helps kill the air movement in the house from top to bottom or bottom to top, depending on the time of the year, and that will usually take care of the largest share of air infiltration in the house and then we can look for things in exterior walls and around windows to help tighten the house up even further.

ELLIS GUILS: (Ice Dams)

It's a beautiful sunny day outside today, so we won't see any icicles on this home. However, during the wintertime, if you see icicles on your house or on your neighbor's house, they're caused by ice dams, which are the result of several days of heavy snows and freezing temperatures. Warm air leaking from your house into your attic warms the underside of your roof, causing the snow to melt, and the water will eventually run down to the edge of the roof, where it will refreeze on cold surfaces like gutters. Finding these air leaks can be a tricky thing to do. So you want to contact a Building Performance Institute Accredited Contractor. They'll come in and perform a series of pressure diagnostics to figure out just where the leaks are coming from. In the meantime, you can add insulation to your attic. That will help slow down the heat loss from your house to the roof, and it's important to remember to clean leaves and debris out of your gutters. This will also help prevent ice build up during the wintertime, in your gutters.

JEFF LOOMIS: (Reducing Drafts)

Simple things you can do to reduce drafts in your home include weather stripping, and caulking. You can insulate the attic or other spaces that let in cold air. You can insulate your electrical outlets to reduce drafts. If you have a fireplace, close the damper when not in use.

ELLIS GUILS: (Duct Leakage)

Duct sealing has only recently become part of the building code, so what we see here is pretty typical of homes built in the 70's or 80's or earlier, in that the duct work is not sealed. We can tell that it's not sealed because if it were sealed, we'd see a mastic-like compound, which is much like a mud, over all the various joints and seams of the duct work. The national average is that duct work leaks about 25% when it's not sealed. Properly sealed duct work will make sure

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- Deleted: Have you noticed an abundance of icicles hanging off your roof in the winter? Icicles are the result of ice dams, which usually occur after a heavy snowfall followed by several days of freezing temperatures. Warm air inside your home leaks into the attic and warms the underside of the roof under the snow, causing the snow to melt until it reaches the cold overhang. There, the melted water will refreeze and form an ice dam and icicles.
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that the air gets to the rooms in the house we want it to get to, so that during the air conditioning season, our second floor bedrooms will be comfortable and won't be too warm, and during the heating season, they'll be warm and not too cold. So it's important to have properly sealed duct work. You can also check to make sure that all the major connections in the duct work aren't disconnected, so that everything is good and tight before actually having them sealed. And don't use duct tape to seal them – it's not a good sealant. To make sure that your duct work is sealed properly, contact a Building Performance Institute Accredited Contractor, and they'll make sure your duct work is sealed the way it should be.

Deleted: of the total air that the furnace delivers. Properly sealed duct work means that the hot air from your furnace, or cold air from your central air conditioning system, will go where it needs to go. So those second floor bedrooms that are always too hot in the summer or too cold in the winter will now feel much more comfortable. You can also make sure that a duct has not become disconnected from a register, and that the duct ends fit together snugly. And don't

JEFF LOOMIS: (Ventilation)

However, keep in mind a house needs some ventilation to 'breathe.' If there's no ventilation, moisture from everyday activities such as bathing, cooking, and washing dishes gets trapped in the house. Water leaking in from outside cannot evaporate. High humidity in a house, or a water leak, can lead to mold, mildew, or other biological growth.

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Depending on the severity, conditions can lead to rot, structural damage, premature paint peeling, and even a variety of respiratory problems for its occupants. Water can seep into your house from the outside through a leak in your roof, foundation, or small gaps around windows or doors. If you have water spots on your ceiling or walls, it's a good indication that there's a leak somewhere. A damp basement is commonly caused by moisture migrating through a concrete foundation. During humid months, water can condense on cold concrete walls and floors.

ELLIS GUILLES: (Sump Pump)

Here's a pretty classic example, a sump that's completely full with water, and we've got signs that it's been up over the edges. That tells me that the sump pump's not working, either the pump's gone or defective or the switch that controls it has got a problem. Something we want to make the homeowner aware of, so in case they happen to go south during the winter, don't want them coming back to a flooded basement.

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JEFF LOOMIS: (Crawlspaces)

Homeowners who have crawlspaces should look for pools of water, standing water, or signs that water sometimes gets into the space. Inspect rim joists and wood for discoloration – particularly, for signs of mold, white fuzzy growth, or black, brown, or green discoloration. Check your foundation blocks for staining. Look for obvious openings or gaps between your floor and foundation. And if you see things like nests and animal droppings, that's an indication that animals might be getting in. You can cover your crawlspace with plastic yourself, but that's really only a temporary fix. Eventually, the plastic will trap moisture and increase the risk for mold growth. Crawlspaces should be properly covered and treated by a professional. And a professional can determine if any dangers present, such as radon.

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JEFF LOOMIS: (Condensation on Windows)

Moisture in the air will condense when it touches a cold surface. It is difficult to completely eliminate moisture on existing windows. Old windows, single pane glass with an aluminum frame, or high humidity in the house with inadequate ventilation can lead to problems with condensation, pools of water, or frost on windows. This high level of moisture around windows

and doors can lead to deterioration of the frame, sill, and your doors, and also mold and mildew problems.

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ELLIS GUILDS: (2) Exterior door mold (Bathroom7)

Here's an outside wall with some mold and mildew problems that have obviously begun to start here. You can see the discoloration here on the wood and along into the carpet. This was caused because water from the outside got inside. In talking with the homeowner, we found that the outdoor levels were almost up to where this door came in, so water would tend to pool on the outside, and eventually seep its way into the house. They came in and lowered that, so now that it sits below the entrance to the door, they don't have any more water pooling. So they've eliminated the water portion of the problem. Now what we need to do is replace this section of wood, molding, and down on the carpet and that will eliminate any future mold and mildew growth.

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JEFF LOOMIS: (Leaking Water)

Water can also come from inside your home from leaking water pipes, toilets, showers, or bathtubs. High indoor humidity caused by normal activities such as showering, cooking, using the dryer can also be sources of mold, mildew, and musty odors.

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ELLIS GUILDS: (2) Bathroom Mold)

Discolorations along drywall, sheetrock or molding may be signs that you have a mold or mildew problem beginning to occur in your house. These are specifically found in places like bathrooms where there's a lot of water that may spill over from a bathtub or shower. One of the ways you can help minimize or eliminate it is to make sure your house is properly ventilated, and specifically in the bathrooms. You want a bathroom fan that ventilates to the outdoors to help keep the relative humidity levels down. The other thing you want to do, is to look for ways to make sure the water isn't getting out of the shower or bathtub and on to the floor. That way you won't even begin to grow the mold or mildew, to begin with.

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ELLIS GUILDS: (Install Ventilation Fans)

Install ventilation fans in kitchens and baths to control moisture from hot showers and cooking, and make sure they vent to the outside. If a leak has already occurred, have it fixed fast. If the leak has caused substantial damage, whether it be water or mold, contact a mold and water repair and remediation contractor. Make sure your sump pump in your cellar is working properly. Lining dirt floors in the basement or crawlspaces under your house with a heavy plastic can make sure moisture from the soil underneath your house doesn't get into your house, but it's always a good idea to have a professional properly address the problem. During hot, humid months, run a dehumidifier in the basement.

And make sure that your clothes dryer is properly vented and that it's attached securely and that there're no holes in the duct work. And clean your dryer ducts often.

ELLIS GUILDS: Appliance Ventilation, Gas Leaks

Gas appliances that are improperly installed or vented are another household danger. During normal operation, gas stoves, ovens, hot water heaters, and furnaces release combustion gases, like carbon monoxide, through their ventilation systems. Leaky duct work in your home can

cause these appliances to “backdraft,” which will result in these gases being drawn back into the living space, rather than expelled outdoors where they should be. Gas stoves, dryers, hot water heaters, and furnaces that have been improperly installed or vented can lead to high carbon monoxide levels in the home and increased risk for fire. If you see burn signs on any of these products, it’s a sure sign that it’s not working properly.

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ELLIS GUILLES: furnace with corrosion and hot water heater with pipes that have not been installed correctly

In this house, the hot water heater and the furnace are next to each other and share the same venting system. Usually not a problem, but in this particular home, the pipe system is too long for the particular products that we have here. And in this case, we see on the furnace signs of corrosion. This tells us that there are combustion products coming out of the venting system. This can result in carbon monoxide coming into the house, and this is something we don’t want to have happen, because it can cause a health and safety problem here in the house.

JEFF LOOMIS: Fuel Oil Tank Leak (:42)

In this old farmhouse, and somewhat typical, we have a very old fuel tank. You can see where the fuel line’s come out of it. This is really not a good situation, where the oil has, over time with filter changes and such, they’ve had some saturation. You’re getting the oil fumes in the house, the smell of the raw fuel, and obviously, having this copper line running down to the soil is not an ideal situation either. You could have a leak and never know about it. That’s a situation you’d want to change and remedy. And also footings in the foundation of this particular tank are less than ideal with that brick that’s underneath it. You really, I can’t express enough the importance of having a good foundation, good support legs under your fuel tank. It’s very important.

- Deleted: the duct work has too much horizontal run for the size of the pipes and connections. Here, where the flue pipe connects into the furnace, we’re getting signs of corrosion. This tells me that there are products of combustion coming out of this venting system and dripping down this flue pipe, and ending up on top of this furnace. That means there’s a chance of carbon monoxide getting into the house, and we don’t want that in any home, because it’s a definite health and safety problem. ¶

JEFF LOOMIS:

In the cold winter months, no appliance gets used more than your heating system. However, the older a heating system is, the less efficient it operates. If you have an old furnace, it’s especially important to have your furnace tuned up by a service professional periodically. If you have a furnace 10 years old or older, you could save hundreds of dollars by replacing with an ENERGY STAR® model.

- Deleted: Another concern with gas appliances is gas leaks. If you smell gas in your house, you need to call a professional to take care of it right away. A simple test you can perform yourself is to hold a mirror up by the pipe joints. If it fogs up, you have a gas leak.

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JEFF LOOMIS Furnace 5: Dirt Floor

We have, it’s probably approximately a 35 year old oil-fired furnace. It’s in an older farmhouse, dirt floor, you get a lot of moisture coming up from the dirt floor into the home, and you can see its adverse effects, it can come right up through the concrete blocks to the metal frame of the furnace and it can affect the condition of the furnace and rust and corrode the system. And again we have the oil pipe coming up along the ground, that’s a less than ideal scenario coming into this old burner. And as you can tell, from the age of it, an older system like this, and we got from our readings, really a poor efficiency operating system. Certainly at this point at the very least could use a clean and tune. We can see a number of things that would indicate that it’s had a poor draft, all this rust and scale shows an excess of heat in the front of the furnace, and what’s happening is that heat is not being able to be properly drawn up through the system. There’s a lack of a barometric damper on the flue pipe. The other problem we have here is really a poor distribution system with the duct work and really inadequate return air, somewhat of a common

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problem. We like to have as much return air, or close to it, as we have in supply runs. They're both equally important for that air circulation into the heated space.

JEFF LOOMIS Furnace 6: Duct work

The next thing we're going to look at is the distribution of this system. We'll take a look at the duct work where it connects to the furnace. And up here you can see that this duct work has a fairly poor connection. The old duct tape is dried up and is ready to fall off and is doing nothing at this point to duct seal. These connections are pretty poor, and we can tell how much of a connection there was with leaky duct work to the upstairs with the amount of air we were seeing coming through there. But also looking at this, you can see that the collar connections aren't proper, and ideally we would have a trunk connection delivering the air to the different distribution runs. Those connections all need to be sealed with either a mastic or an approved foil type tape.

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JEFF LOOMIS Furnace 7: Access Point: Crack in Heat Exchanger

We've opened up an access point on to this furnace and what we're trying to do is take a look into this heat exchanger, and actually we found a very major problem on this heat exchanger. And we'll take a little bit closer look at this but we have a major leak between the combustion chamber and the open air circulation point of this system. So it's very unsafe the way that it's operating, and we're going to have to deal with this.

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JEFF LOOMIS: Furnace Tune Up Points

Some sure signs that your furnace needs a tune up, would be a delay in the ignition. When you call for heat and there's a delay in the time that the furnace actually kicks on, or that you noticed some odors when the furnace does kick on, is probably a real good indicator that you need to have your furnace cleaned and tuned by a professional. Something that the homeowner can look at is checking the filter on a regular basis throughout the heating season, and changing it when you find that it is dirty. Check the exterior of your furnace for burn marks, or other signs of overheating, corrosion, or rust. Do you smell some of the furnace gases when it is operating? Do you suspect there might be increased carbon monoxide levels in your home after the furnace turns on? Perhaps you noticed an increased amount of dust in your house. Or, you're using a large amount of heating fuel inconsistent with the size of your house. If you're experiencing any of these problems, at the very least you want to have your furnace cleaned and turned by a professional, which you should have done once a year anyway. And it may be more economical than you realize just to replace the furnace with a new, energy efficient model.

JEFF LOOMIS Furnace Pipe (Upstairs)

This pipe right here is a connection from the oil furnace to the chimney upstairs. Somewhat typical in some older farm houses, but really presents some dangers, such as having this wood box so close to the flue pipe, being a combustible surface, not to mention that ideally it wouldn't be running through the homeowner's living room. And again, that's something we'll address with trying to go with a more energy efficient system. Where the pipe goes up through the ceiling, we have some other connections that are quite close and can create a fire hazard. So we really would like to eliminate this and get rid of that.

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ELLIS GULES: Possible asbestos on furnace pipe

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What we have here, is what we would call an ‘asbestos-like material.’ Now, homes built pre-1970’s, it’s not unusual to find this type of material located on duct work or on piping for hot water and steam systems. Now, we can’t be 100% sure that it’s asbestos, so we would recommend that the homeowner bring in a certified asbestos abatement company to determine, one, is it asbestos, and two, also give them their options for proper abatement.

MARK MASON:

Now that you’ve discovered you have a problem, what do you do to fix it? Most problems will require that you hire a contractor with specialized knowledge. You can log on to getenergysmart.org or call toll-free 1-877-NY-Smart to find a list of Building Performance Institute accredited contractors that have met New York State’s Energy Research and Development Authority’s high standards and qualifications. The Building Performance Institute, or BPI, is a national resource for building science technology that sets standards for assessing and improving the energy performance of your home. A BPI Accredited Home Performance contractor can performance test your home through a Comprehensive Home Assessment. Using the most advanced testing technologies and building science, the contractor will evaluate the entire home, find where you’re losing energy, and help resolve any health or safety problems. The contractor will also explain the financial benefits of installing ENERGY STAR® qualified equipment and point out any improvements the homeowner can do themselves.

JEFF LOOMIS: Soundbyte on choosing a contractor:

The Building Performance Institute works in conjunction with New York State Energy Research and Development Authority, to put together a program to certify and train contractors throughout the state. Really, to say, ‘we want to give consumers a place to go where they can say you know what, we know these people have been trained.’ Because so many people have had bad experiences with contractors, whether they’re remodeling contractors, heating and cooling contractors, insulation and roofing contractors. So they wanted to get together with somebody that could provide some level of training and certification. That’s what the Building Performance Institute does.

ELLIS GUILLES: Soundbyte on choosing a contractor

We find out that a lot of times when people try to correct these things themselves, that they do more harm than good, because you’re trying to take care of a problem without really knowing what’s causing it. And so you may call your local roofer up and say, “I need to add some metal flashing along the edges to help the ice come off.” You’re putting a band-aid on the problem. Call a professional that’s been trained to diagnose this and let them figure out exactly what’s going on, so you can get it fixed and fixed right.

MARK MASON:

A reputable contractor will perform an on-site inspection of the job you want done and provide a detailed bid in a timely manner. Your chosen contractor should be licensed and insured, and have several years of experience as a business in your community.

Make sure you sign an agreement in writing before any work begins. The agreement should: list in detail all the work that is to be performed by that contractor; specify all products to be used by

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Some sure signs that your furnace needs a tune up: is there a delay in the ignition of the furnace from the time you turn it on to the time it kicks in? Is the filter dirty – or haven’t you changed it in a while? Can you smell some of the furnace gases when it’s operating? Check the exterior of your furnace – are there burn marks, or other signs of overheating? Is there corrosion or rust anywhere? Do you suspect there might be increased carbon monoxide levels in your home after the furnace turns on? Have you noticed an increased amount of dust in your house? Are you using a large amount of heating fuel inconsistent with the size of your house? (A lot of questions here. Will Jeff improvise?) Answering ‘yes’ to any of these questions means that your furnace at the very least could use a good tune up, which you should have done once a year anyway. And it may be more economical than you realize just to replace the furnace with a new, energy efficient model. ¶
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quantity, name, model number, and energy rating; provide the manufacturer's warranty, equipment documentation, and contractor warranty information; outline paperwork and permits needed for the project; state the scheduled start and completion date; give the payment schedule; and describe how disputes will be solved. It should also state the contractor's liability insurance and licenses if required.

Consider having a Comprehensive Home Assessment done on your home. Through the Home Performance with ENERGY STAR Program, a participating BPI Accredited Contractor will perform a comprehensive series of tests to diagnose the problems in your home. They'll not only tell you what's wrong, but what must be done to fix it right. And, they're properly trained to do the work.

OUTRO (MARK MASON):

Today we've shown you that the house truly is a system, and just like a car, there are many parts needed for it to operate properly. If you have problems, like the ones we talked about today, we can help. New York's Home Performance with ENERGY STAR Program, using a network of contractors accredited through the Building Performance Institute, can determine where energy is leaking out of your home and show you how to fix it. In our next program, we will go into more detail about how to improve the energy efficiency of your home. Thanks for watching.

Deleted: Rick Gerardi

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Underwriting

Funding for "Energy Efficiency: Enhancing Home Performance" is provided by: New York State Energy Research And Development Authority, using innovations and technology to solve some of New York State's most difficult energy and environmental problems in ways that improve the state's economy.

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Page 3: [1] Deleted	tduflo	6/1/2007 1:52:00 PM
<p>The ice dam can cause damage to the roof, which will result in water leaks to the inside. Frequently, the result will be a water spot on the ceiling under the roof damage. The air leak can be pretty tricky to find, but having a BPI accredited contractor perform pressure diagnostics in the house can help pinpoint it. You can add additional insulation to your attic to reduce the heat escaping from the floors below.</p> <p>Clean leaves and other debris from gutters before the first snow. This will help prevent ice build-up in gutters.</p>		
Page 3: [2] Deleted	tduflo	7/31/2007 11:25:00 AM
<p>Use foam inserts to insulate electrical outlets.</p>		
Page 3: [3] Deleted	tduflo	6/1/2007 2:04:00 PM
<p>Since the ducts aren't sealed in this home, we can be pretty sure that there's a fair amount of duct leakage, and the n</p>		
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BASIC OUTLINE/PREMISE:

“Home Symptoms and Building Science”

This program educates the consumer on household symptoms, problems that can lead to poor home energy efficiency and higher utility and repair bills and the building science behind solving those problems.

Learn how to identify that you have a problem.

Uneven or uncomfortable room temperatures, drafts

Mold, condensation

Ice damming, freezing pipes

Inadequate insulation levels can lead to:

Warm and cool air escaping, causing heating and cooling equipment to work harder than necessary

Ice damming, leading to roof and ceiling leaks

Freezing pipes

Duct leakage can lead to:

Uneven distribution of warm or cool air

Uncomfortable room temperatures

Poor heating and cooling equipment performance

Air leakage through doors, windows, and air conditioning vents can lead to:

Drafts and cold spots

Overworking of heating and cooling equipment

Moisture problems, including condensation, peeling paint, mold, and mildew

Unhealthy air quality due to inadequate air exchange

Improperly vented gas- or oil-fired appliances (such as stoves, dryers, heating systems, and water heaters) can lead to dangerous carbon monoxide buildup (back-drafting).

Ventilation and filtration of air

Find out how to select a contractor and what questions to ask.

See how inadequate insulation, air leakage, and outdated appliances and equipment can cause common household problems.

Learn the dangers of improperly vented gas- or oil-fired appliances (such as stoves, dryers, heating systems, and water heaters).