Senate Energy and Natural Resources Committee
Natural Gas Conference: Proposed Policy Solutions
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Summary

ACEEE research shows that energy efficiency is the most viable near-term strategy for moderating natural gas prices, and is also vital to stabilizing longer-term gas markets. Our proposal is based on a recent ACEEE analysis, which shows that if we can reduce gas demand by as little as 4% over the next five years, we can reduce wholesale natural gas prices more than 20%. These savings would put over $100 billion back into the U.S. economy, at a cost of $30 billion in new investment, of which less than one-quarter would be public funds at a combination of the federal and state levels.

Moreover, this investment would help bring back U.S. manufacturing jobs that have been lost to high gas prices, and would help relieve the crushing burden of natural gas costs experienced by many lower-income households. Importantly, much of the gas savings in our analysis come from electricity efficiency measures, because so much electricity is generated by natural gas, often inefficiently.

The proposed policy solutions, some of which were contained in H.R. 6 and S. 2095 in the 108th Congress, are:

1. **Set end-use efficiency performance targets for electric and gas utilities.**
2. **Create tax incentives for high-efficiency technologies.**
3. **Accelerate federal appliance efficiency standards.**
4. **Support advanced building energy codes.**
5. **Expand support for Combined Heat and Power (CHP).**
6. **Increase funding for energy efficiency research, development, and deployment.**
7. **Conduct a national efficiency and conservation campaign.**

ACEEE offers proposals in three of the Committee's eight areas of focus: (5) diversification and conservation, (6) tax incentives, and (7) investment. The preponderance of our proposals are presented under area (5). More detailed estimates of energy and natural gas savings are provided in our comments under areas (5) and (6).

5. Diversification and Conservation

To what extent and how can demand be reduced through conservation and efficiency measures and through diversification of energy sources used for electric generation, industrial and other applications?

Introduction

Energy efficiency is the best available policy tool for balancing U.S. natural gas markets in the near term, and should thus be a cornerstone of any balanced national energy policy. U.S. gas production and delivery can be increased on the margin—in the medium term—through energy industry investments and policy measures. However, these efforts will not affect U.S. gas markets for several years due to their long lead times, and they will not ultimately reverse the long-term decline in U.S. gas production. Imports could also provide additional supply, but as LNG, they will come at a price premium, and also bear safety and national security risks by further exposing the U.S. to international energy markets. Since most new supply initiatives are likely to come at a price premium, market forecasts are for higher prices into the foreseeable future.

Given the limitations and cost premiums associated with natural gas supply options, Congress must consider options to manage demand as part of a balanced energy policy. Energy efficiency and conservation are proven resources for moderating energy demand, and are also the most effective tools to apply in the near-term to bring balance to gas markets. By combining aggressive demand management with prudent supply development, we can stabilize natural gas markets and husband this strategic fuel to support America's economic growth and environmental protection.

Efficiency's Track Record and Current Potential

Energy efficiency is a quiet but effective energy resource, contributing substantially to our nation's economic growth and increased standard of living over the past 30 years. Energy efficiency improvements since 1973 accounted for approximately 25 quadrillion Btu's in 2002, which is about 26% of U.S. energy use and more energy than we now get annually from coal, natural gas, or domestic oil sources.

Even though the United States is much more energy-efficient today than it was 25 years ago, enormous potential remains for additional cost-effective energy savings. Some newer energy efficiency measures have barely begun to be adopted. Studies by the Department of Energy's national laboratories, by ACEEE, and by other experts show that we can reduce national energy use 20% to 30% below baseline forecasts over the next 15-20 years.[1] [2] California turned to energy efficiency in its 2001 energy emergency,

[1] Interlaboratory Working Group, 2000, *Scenarios for a Clean Energy Future*. Washington, D.C.: Interlaboratory Working Group on Energy-Efficient and Clean-Energy Technologies, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy.

[2] Nadel and Geller, 2001, *Smart Energy Policies: Saving Money and Reducing Pollutant Emissions through Greater Energy Efficiency*, www.aceee.org/energy/reports.htm. Washington, DC: American Council for an Energy-Efficient Economy.

reducing energy use by 7%[3] at a cost of about 3 cents per kWh,[4] less than the typical average wholesale price of electricity.

While much of the research literature focuses on energy efficiency in the electricity sector, the gas-intensiveness of marginal electricity generation means that saving electricity produces significant natural gas savings from the electric power generation sector. In terms of direct natural gas end-use efficiency, ACEEE's preliminary research on natural gas energy efficiency potentials shows a number of cost-effective efficiency measures that would collectively save more than 10% of U.S. gas usage by 2020. A sample of these measures is shown in Table 1.

Table 1. A Sample of Natural Gas Energy Efficiency Measures

Measure	Current Efficiency	Efficiency Target	Units for Efficiency Target	Potential Gas Savings In 2020 (TBtu)	Average Cost of Saved Energy ($/therm)*
1 Ind'l management practices	Typ. plant	8%	savings	402	0.351
2 Comm'l building retrocommissioning	149	134	kBtu/sf	362	0.229
3 Res duct sealing & infiltration reduction	Avg. home	20%	H&C svgs	310	0.450
4 Residential windows	.64/.65	.33/.44	U-Factor/ SHGC	233	0.154
5 Commercial furnaces and boilers	standard units	Power burner	savings	181	0.082
6 New homes	Avg. home	30%	H&C svgs	178	0.401
7 Res. furnaces/boilers (equip. & install.)	82%	90%+	AFUE+	162	0.479
8 Sector-based comm retrofit (e.g. offices)	0.5	0.4	therms/sf	162	0.361
9 Advanced commercial glazing	1.3/.69	.45/.45	U/SHGC	145	0.301
10 Comm'l new construction	90.1-1999	30%	savings	140	0.322
11 Res. combo gas space & water htg unit	82/59	90/90	AFUE/EF	85	0.543
12 Comm'l cooking and ventilation	typ equip	improved		76	0.300
13 Major residential appliances	Federal Standards	21%	savings	53	-0.859
14 Res. gas water htg (stand-alone units)	0.59	0.62	Energy Factor	52	0.370
15 Bldg. operator training & certification	Typ O&M	Better		51	0.063
			TOTALl	2,590	

* Note: Cost of Saved Energy is the cost of a measure per unit of unit of fuel saved. Measures costing less than retail gas prices (currently averaging about $1.30/therm for residential customers) are cost-effective. A negative cost of saved energy means that savings in non-energy costs can fully pay for the measure.

Source: Nadel, Steven, 2002, *Screening Market Transformation Opportunities: Lessons from the Last Decade, Promising Targets for the Next Decade*, Washington, DC: American Council for an Energy-Efficient Economy available online at http://aceee.org/pubs/u022full.pdf.

[3] California Energy Commission, 2001, *Emergency Conservation and Supply Response 2001.* Report P700-01-005F. Sacramento, CA.

[4] Global Energy Partners, 2003, *California Summary Study of 2001 Energy Efficiency Programs, Final Report.* Lafayette, CA.

Documenting Efficiency's Effect on Reducing Wholesale Gas Prices

Energy efficiency investments can help reduce natural gas prices. In 2003, ACEEE conducted an analysis of the effect energy efficiency and renewable energy could have on natural gas wholesale prices. In the tight markets we are experiencing, small changes in demand or supply have large impacts on price. To test this market principle, we used one of the best available computer models of U.S. natural gas markets, designed and operated by Energy and Environmental Analysis, Inc., the firm who performed most of the modeling for the National Petroleum Council (NPC)'s 2003 natural gas study. We analyzed small (2-4%) changes in natural gas demand over the next 1-5 years.

What we found was that moderate gains in end-use efficiency over the next five years can reduce wholesale gas prices by about 20%, or about $1 per thousand cubic feet. This would bring substantial price relief to all gas consumers, particularly farmers and manufacturers. Achieving these results would cost about $30 billion in new investment, including about $7 billion in public expenditures, but would generate over $100 billion in direct economic benefits, including direct energy savings to customers who invest in efficiency and lower gas prices to all energy users. The ratio of benefits to costs would be more than three to one.[5]

Our findings are quite consistent with those of the NPC study. The NPC report calls for energy efficiency to offset about 4% of demand growth by 2010, and about 19% by 2025.[6] It also estimates that 2010 wholesale prices would fall by about 20% under its Balanced Future policy scenario.[7] Our analysis simply took a more detailed look at a specific efficiency investment scenario, using the same analytical approach and tools. We updated this analysis in 2004, under tighter market conditions. As one would expect, the energy efficiency investment scenario produced even more dramatic price drops in wholesale gas prices, up to 26% at the Henry Hub in 2010.[8]

A major finding of our study, which is not apparent in the NPC report, was that more than half of the natural gas savings came indirectly, through investments in electricity efficiency. This effect stems from the fact that natural gas has become the marginal generating fuel in many power markets, so that electricity savings tend to displace gas used for generation more than any other fuel. Also, because the average efficiency of natural gas generation remains relatively low, especially at peak times, saving one unit of electricity backs out several units of gas at the generator. Thus saving electricity is a key strategy for saving natural gas, and adding electricity-saving measures to the list in Table 1 would greatly expand the potential for gas demand reduction.

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[5] Elliott et al. 2003. *Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies,* http://aceee.org/energy/efnatgas-study.htm. American Council for an Energy-Efficient Economy, Washington, DC.

[6] National Petroleum Council. 2003. Op. cit., Vo. 1, page 8, Figure 3.

[7] Ibid., page 11, Figure 6.

[8] Elliott, R.N. 2004. *ACEEE Fall 2004 Update on Natural Gas Markets, http://aceee.org/energy/fall04ngmkt.pdf.* American Council for an Energy-Efficient Economy, Washington, DC.

Policy Recommendations

ACEEE recommends eight policy actions, involving federal, state, and private initiatives. Some of these, including appliance efficiency standards, tax incentives, increased authorizations for efficiency RD&D, and support for combined heat and power, were addressed in the H.R. 6 conference report and in S. 2095 in the 108th Congress. The others have proven successful at the state level, could be expanded to other states, and should be considered for inclusion in federal energy policy.

1. **Create and expand end-use efficiency performance standards and public benefits funds for utilities.** Texas's electricity restructuring law (SB-7 1999)[9] created a requirement for electric utilities to offset 10% of their demand growth through end-use energy efficiency, and enabled them to use public benefits funds for this purpose. Pennsylvania's new Advanced Energy Portfolio Standard includes end-use efficiency among other clean energy resources. Other states have set targets for energy savings from utility programs. Congress should set electric and gas end-user savings targets for utilities, with flexibility to achieve them through a market-based trading system. States should also reform their utility regulations, so that utility revenues and profits are sustained regardless of fluctuations in sales – several states have already taken this step. To help fund efficiency investment in this sector, 18 states collectively spend over $1 Billion on public benefits efficiency programs funded through utility bill fees. Other states, and Congress, should follow this example, and states with current programs should increase funding levels.
2. **Create tax incentives for high-efficiency technologies.** Congress should pass incentives for energy efficiency technologies immediately, based on the provisions in H.R. 6 and S. 2095 from the last Congress, with minor updates. Our specific recommendations are provided in our response to question 6.
3. **Accelerate federal efficiency standards.** Congress should adopt the standards contained in H.R. 6 and S. 2095, expanded to include recent consensus agreements with manufacturers. These agreements call for establishing specific negotiated standards on commercial packaged air conditioners, refrigerators and freezers and on residential ceiling fans and dehumidifiers. We are also working with manufacturers of other products and expect to complete several additional consensus agreements in the next month. In addition, the Department of Energy's appliance efficiency standards program currently has a rulemaking underway for residential heating equipment. DOE should accelerate this rule, allowing cold-weather states to elect a higher standard level, and including furnace fan efficiency in the standard. DOE is questioning whether it has authority to set separate standards for cold-weather states and for furnace fans. H.R. 6 and S. 2095 specifically grant authority to set furnace fan standards; Congress should expand this provision to clarify that DOE also has authority to set separate standards for cold and warm states, provided such standards meet all of the provisions in the underlying law.
4. **Support Advanced Building Codes.** Building codes are an important element in the efficient policy portfolio, insuring that buildings built today place minimum strain on tomorrow's energy supplies and put minimum pressure on market prices. The

[9] See http://texas.efficiencylink.net/ for additional information.

International Energy Conservation Code (IECC) is widely adopted in states, but many states need to update their codes. DOE should both push for more aggressive updates to model codes like the IECC and ASHRAE 90.1, and provide more support to states and local governments in implementing better codes.

5. **Expand support for Combined Heat and Power (CHP).** CHP generates electricity far more efficiently than the majority of the conventional natural gas generation. Congress should expand its support for CHP by passing the proposed CHP tax credit now under consideration as part of the package of energy efficiency and renewable tax credits. The Congress should also include language in the energy bill that encourages states and utilities to provide fair and reasonable interconnection and tariff treatment for new CHP systems.
6. **Increase funding for efficiency deployment and R&D programs.** We recommend Congress increase FY 2005 appropriations for federal programs that deliver energy savings to consumers, including the Energy Star programs, the Weatherization program, and DOE's suite of other deployment programs, and that the Administration follow suit in its FY 2006 budget request. These programs have been shown to be effective in the limited geographic areas, and at the limited funding levels in which they have operated. With added funding, they can quickly ramp up energy savings in the next few years. The Energy Star program in particular is positioned to achieve substantial short-term savings with additional funding – we recommend that an additional $20 million per year be provided for this highly successful program. Longer-term R&D on electricity- and gas-saving technologies is also needed.
7. **Conduct a national efficiency and conservation campaign.** The Administration should lead a partnership effort among efficiency manufacturers, farm organizations, utilities, states, and others to accelerate efficiency investments and encourage short-term behavior modifications. California spent about $30 million in 2001 on a concerted public awareness campaign; evaluations indicate that this campaign was responsible for about one-third of the energy savings realized in that year.

ACEEE is examining the savings in energy and natural gas available from each of these policies. On a preliminary basis, we estimate that the policies outlined above would save over 150 billion kilowatt-hours, almost 3 trillion cubic feet of natural gas, and over three Quads (Quadrillion Btu) of total energy for 2006 through 2008, and about 4 trillion kilowatt-hours, over 60 trillion cubic feet of natural gas, and more than 80 Quads cumulatively through 2020. More detailed estimates will be available in time for the January 24, 2005 Committee workshop.

These policies have been shown to be effective at the federal or state levels. They are also a good economic investment, yielding benefits over three-times greater than the combined private and public investments needed to achieve these savings. These efficiency initiatives are also the only near-term set of tools available to the federal government as it seeks to bring relief to natural gas markets. For these reasons, we urge Congress to make energy efficiency a major focus in its efforts to forge a balanced and effective energy policy for natural gas.

6. Tax Incentives
Could tax incentives help increase supply and/or reduce demand of natural gas?

ACEEE recommends tax incentives for energy efficient technologies as a core component of a sound national energy policy. Even at today's high energy prices, significant barriers to investment exist in many gas and electricity end-use markets. These barriers impede the investments needed to balance supply and demand. Tax incentives help overcome these barriers, at a much lower cost to the economy than allowing natural gas prices to remain high.

In general, we support the energy-efficiency tax incentives in H.R. 6 Conference Report and S. 2095 from the last Congress, but with a few refinements to reflect recent changes in the market and to increase natural gas savings. Specific items that should be included are as follows:

1. **Combined Heat and Power (CHP).** Schools, hospitals, and businesses can use CHP to cut their energy bills while reducing strain on power grids. High-efficiency CHP systems are also more efficient in their use of natural gas than most central station power plants. Due to these benefits, CHP is a priority in the President's National Energy Policy plan. A CHP investment tax credit similar to the one included in the H.R. 6 Conference Report should be included in new legislation with two modifications. First, the 15 MW eligibility cap on the provision should be raised to 50 MW. Second, provisions in the original Senate language inadvertently lost in conference that made recycled energy (e.g. waste heat recovery, heat engines and back-pressure turbines) eligible should be restored. The 15 MW cap originally was intended to limit tax expenditures, but the last Joint Tax scoring indicated that the CHP tax credit actually stimulated sufficient economic activity that it provided net tax revenues rather than expenditures at least up to a 50 MW unit. For larger sizes, many systems are likely to be installed without tax credits and costs to the Treasury increase significantly.

2. **Commercial Buildings.** This provision creates a deduction for businesses that make major efficiency improvements. Since commercial lighting and air conditioning are among the biggest components of peak electricity loads, this incentive will help prevent blackouts and will also save lots of natural gas. This provision was in both S. 2095 and the H.R. 6 Conference Report. We prefer the S. 2095 version as the incentives and savings are somewhat higher. Based on input from DOE and others, the latest Joint Committee on Taxation analysis shows this provision will cost significantly less than earlier estimates.[10]

3. **New and Existing Homes.** We build almost two million new homes each year; to keep them from straining power grids and raising energy prices, it is vital that they be as efficient as possible. Efficiency also makes homes more affordable to more families. To get maximum benefit from the credits, we ask that credits be offered for

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[10] Joint Committee on Taxation. May 2, 2004. Estimated Revenue Effects of S. 1637, the "Jumpstart Our Business Strength ('JOBS') Act," As Passed by the Senate. JCX-36-04.

homes both 30% and 50% better than model codes. We recommend the S. 2095 incentive amounts as providing more energy savings per federal dollar, and the Senate language on reference codes and certification as more balanced and complete.

One small refinement that is badly needed is to clarify that heating and cooling air distribution duct sealing and thermal envelope air sealing are both eligible for new and existing home credits. These measures reduce loss of heated air to the outside and unheated basements and attics. As shown in Table 1, these are two of the largest opportunities to reduce natural gas use in homes but the S. 2095 language is ambiguous on whether they are eligible for tax incentives. This change will not affect the cost caps per home but will just clarify that these measures are eligible within the existing cost caps. Specifically, we recommend that a new paragraph be added to section 1321(c)(5) and section 1329(f)(4) of S. 2095 as follows: "(D) Heating or cooling air distribution duct sealing, and thermal envelope air sealing, each of which must be documented by instrumented testing."

4. **Home heating and cooling equipment.** The largest direct natural gas use in homes is for furnaces and water heaters. And central air conditioners and heat pumps are a large indirect user of gas since a substantial portion of peak electricity comes from natural gas. S. 2095 contains modest provisions for tax incentives for furnaces and water heaters but air conditioner and heat pump incentives were dropped due to a lack of consensus in 2003. In light of our pressing natural gas problems, and an emerging consensus on air conditioner and heat pump incentives, we recommend that the S. 2095 provision for water heaters be retained, the provision for furnaces be strengthened, and a central air conditioner and heat pump provision be added.

   For furnaces, S. 2095 provides a $125 incentive for 95% efficient furnaces and boilers plus an additional $50 for an advanced air circulation fan. We believe this can be simplified and provide more gas savings if a single incentive is provided for a furnace or boiler with 92% efficiency[11] and an efficient air circulation fan that meets a new consensus efficiency specification developed by the Consortium for Energy Efficiency and the Gas Appliance Manufacturers Association.[12] We recommend an incentive of about $200 in the first year when the program begins, declining to $150 in the second year and $100 in the third year as this equipment becomes more popular. To further limit costs, incentives could be limited to replacement of furnaces in existing homes since condensing furnace retrofits are more expensive and more in need of incentives than condensing furnaces in new construction applications.

   For central air conditioners and heat pumps, we have agreed with the Air Conditioning and Refrigeration Institute (ARI) on a consensus recommendation. We recommend that a consumer tax credit be provided for units meeting the Energy Star specification in 2006-2008. This specification is scheduled to be finalized by EPA in March 2005 and will call for significant energy savings relative to the new 2006 federal efficiency standard for these products. We recommend a credit of $250 for

[11] 92% is preferred because there are many more units available at 92% than at 95%.
[12] See http://www.cee1.org/gas/gs-ht/gas_heat_specs.pdf .

the first two years and $100 for the third year for this technology. The credit ramps down in the third year, both to reduce cost to the Treasury and to ease the transition to a post-incentive market.

5. **Home Appliances.** H.R. 6 and S. 2095 both contain credits for clothes washers and refrigerators. These appliances are two of the largest energy users in the home and the credits could help millions of families control their utility bills while saving substantial energy for the nation. This provision was updated in 2003 to reflect changes in the appliance market and should be updated again. Specifically, we recommend that the clothes washer credit reference the 2007 Energy Star specification (due to be finalized by DOE in spring 2005) and that the refrigerator credit be refined to provide a $50 credit for 15% savings relative to the current federal standard, a $100 credit for 20% savings, and a $150 credit for 25% savings. These changes will better promote advanced equipment and will significantly increase the energy savings per federal dollar. These refinements are needed because the market share of 2004 Energy Star clothes washers and refrigerators has grown substantially in the past two years and the credit needs to be restructured to better emphasize advanced equipment. We also recommend that credits for more efficient dishwashers in Senator Smith's S. 2655 from the last Congress be included. We are now discussing changes along these lines with the Association of Home Appliance Manufacturers (AHAM) and hope to have consensus recommendations ready later this month. This consensus may differ in some particulars from what we discuss above.

We also support the vehicle provisions in S. 1149 from the last Congress, but don't go into detail here as the links with natural gas use are limited.

ACEEE has previously conducted and published analyses on the energy and financial savings from energy efficiency tax credits. We are now revising our earlier analyses with the latest data and expect to have revised estimates ready in time for the January 24, 2005 Senate workshop. Our *preliminary* results indicate that this package of tax incentives would save about 13 billion kilowatt-hours, over 200 billion cubic feet of natural gas, and over 0.2 Quads (Quadrillion Btu) for 2006 through 2008, and more than 400 billion kWh, nine trillion cubic feet of natural gas, and over 10 Quads cumulatively through 2020. More detailed estimates will be available in time for the January 24, 2005 Committee workshop.

7. Investment

What is needed to encourage more investment in natural gas supplies and infrastructure?

Energy efficiency is a resource comparable in policy analysis terms to new natural gas commodity supply, and efficiency contributes to natural gas markets in a fashion that is complementary to commodity supply. As is the case for new gas supplies, developing new efficiency resources requires investment. Most of this investment comes from designers, manufacturers, sellers, and installers of efficient technologies and from the energy consumers who purchase their products.

However, three decades of market experience has revealed serious and persistent barriers to energy efficiency investment. Public policy initiatives are needed to reduce these barriers so that efficiency can provide more resource value to the economy. Some might argue that efficiency investment flows automatically and efficiently through market forces, and that high natural gas prices thus contain their own remedy, since by economic theory price elasticity would cause demand to fall when prices rise. This argument contains a fundamental element of truth, and ACEEE believes in markets as a key focus for energy efficiency solutions.

However, several barriers in today's U.S. markets keep the laws of economics from being applied in their purest form. They include:

- **Falling energy intensity.** Over the last 30 years, U.S. energy intensity (measured in BTU per dollar of GDP) has fallen by more than 40%. While this is generally good news for the economy, it also has the effect of blunting the market-based response to high energy prices. When energy costs less as a percentage of the total cost of running a business, owning a home, or driving a car, consumers typically are less sensitive to price increases. This means it takes larger and larger price increases to induce a given level of change in energy demand. The implication is that relying solely on market response to price signals would require energy prices to rise to economically damaging levels before the market corrects itself. We should not, and need not have to incur such economic damage—judicious energy policy action can forestall needlessly high natural gas prices.
- **Income elasticity of demand.** Indications are that rising incomes in many demographic segments tends to increase demand for energy services. Households that can afford half-million dollar homes and $50,000 vehicles are relatively insensitive to energy costs. The falling-intensity effect compounds this phenomenon; more-efficient homes and vehicles shrink the cost of energy as a percentage of income, as well as a percentage of the cost of driving or homeownership
- **Current policies promote increased use of natural gas.** Environmental policies aimed at reducing air pollutant and greenhouse gas emissions have made natural the fuel of choice for power generation and industrial use in many areas. This tends to override fuel price considerations.
- **Lack of Price Transparency.** Price signals work only when customers receive clear, consistent, and timely price information. In today's gas markets, it is very

difficult to understand prices in ways that encourage efficiency investments. Several issues stem from this point:

- Contract structures, in which many utilities and customers purchase gas in annual or multi-year contracts, can delay the “bad news” of price increases, such that motivations for efficiency investment are delayed.
- Price volatility not only confuses customers on predicting future prices, it also reduces investors’ willingness to take risks on efficiency or on supply investments.
- Most customers see prices only retrospectively, after they receive bills for past consumption. And with today’s complex bills, calculating the full price per unit of energy and normalizing it for weather or other factors, takes a level of analytical ability beyond most customers.

These factors are currently insulating many consumers from the pending gas crisis. But they must not mislead Congress into waiting to take action on this problem. If we wait until most customers feel the full effect of today’s gas prices, the ensuing crisis could be much worse than if we act now to take prudent steps that will help keep markets in balance. Market forces will ultimately drive gas demand down, but the question is how soon and at what cost to our economy.

In addition to these broad barriers to energy efficiency investment, a variety of more specific market barriers to energy efficiency keep worthwhile investments and behavior changes from being made, even when prices rise. These barriers are many-fold and include: “split incentives” (landlords and builders often don’t make efficiency investments because the benefits of lower energy bills are received by tenants and homebuyers); panic purchases (when a product such as a water heater needs replacement, there often isn’t time to research energy-saving options); and bundling of energy-saving features with high-cost extra “bells and whistles.”

Energy efficiency is also hobbled by being a “distributed resource”. It is found in more than 100 million homes, over 5 million commercial buildings, and hundreds of thousands of factories. In most homes and smaller businesses, the information and technical skills needed to understand and pursue energy efficiency projects are not usually available. Moreover, the transaction costs of developing, financing and implementing a multitude of small projects are much higher than for a relatively few, large energy supply projects. This tends to shift investment capital toward the larger projects, even when studies show that the efficiency resource is more cost-effective.

For these reasons, policy and program initiatives are needed to overcome barriers to investment in energy efficiency, and to realize the benefits of energy efficiency for the economy and the environment as a whole. In our comments on question (5), we outlined eight policy initiatives that would serve to reduce barriers to investment in efficient technologies. Our analysis shows that $30 billion of combined public-private investment would flow from these initiatives, generating over $100 billion in benefits to the economy.