Facilitating Energy Conversion

Testimony by Lawrence B. Lindsey

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Thank you, Mr. Chairman and members of the Committee, for inviting me to testify on energy policy and tax reform. While generic in the principles it lays out, part of my testimony will deal specifically with aspects of the Natural Gas Act. Let me therefore begin with a point of full disclosure that goes beyond what is required by the Truth in Testimony Act. My company, The Lindsey Group, provides macroeconomic advice to a variety of companies around the world and some of them are in the energy business. That advice is unrelated to energy policy and we do not provide lobbying services of any kind. But, some of our clients in the energy business doubtless have a variety of interests in this act, many of which I may not even be aware of. I do know that one, Boone Pickens, is a supporter of the Natural Gas Act, but my testimony here today reflects my own personal views on this subject developed over many years dealing with matters of public policy, and not those of Mr. Pickens.

I am not normally inclined to support legislation that aims to steer private decision making through government incentives. Any such legislation should be held to a very high cost-benefit standard. First, any government incentives to affect private decision making should be tied to a clearly defined reason why the

market might not correct on its own. Second, there must be an externality at the national level which would justify that such a change in private sector behavior be in the national interest. Finally, the subsidy should be subject to rigorous cost benefit analysis and be held to a high standard for approval. With these as standards, let me provide an example of such a subsidy in the case of the Natural Gas Act.

Let me begin with an explanation of why the market is unlikely to correct a problem that currently exists in natural gas pricing that limits its use. Consider the very unusual disparity in the market between the pricing of BTUs delivered by oil and those delivered by gas. On a BTU basis a barrel of oil should be priced at about 8 times that of a thousand cubic feet of natural gas. Currently natural gas is around $4 while oil is in the mid-eighties, a disparity of more than 20 to 1.

This means that gas is very cheap, yet the market is not correcting the disparity through more use of natural gas as a motor fuel. The reason for this is provided by a basic economic model called “putty-clay”. At an early stage the underlying technology in an economy is free form – putty like – and is shaped based on the prices available at a given time. Once that technology is shaped, and we choose how to do things, it hardens into a form that is much less flexible. Lower cost alternatives may not be chosen because the costs involved in changing the underlying technological choice are prohibitive.

The best example that we all can relate to is the keyboard. We use something called the QWERTY system which was developed more than a century ago based on what was then observed to be an efficient arrangement of the keys on the key board. We now know that there are much more efficient keyboard arrangements which, if adopted, would allow us all to dramatically increase our typing speed. But all of us would have to learn the new system, and having a variety of keyboards around, where some of us use one and some use another, would mean they could not be interchangeable. Moreover, when you get to be my age re-learning a new keyboard and new way of typing would not only be prohibitively costly, it might well be impossible.

Right now our QWERTY system for fueling long distance trucks is diesel. That choice is embedded in not just the truck engine, but also, and more importantly, the energy distribution system which involves thousands of retail distributors of fuel. There is no incentive for any one truck owner to convert to natural gas since he or she would not be able to access the existing energy distribution system on a cross-country trip.

This is despite the fact that the saving from such a conversion might be considerable. A diesel powered 18-wheeler costs about $105,000. A natural gas powered truck costs $175,000. A diesel powered truck gets about 6 miles per gallon and is typically driven around 100,000 miles per year, burning 17,000

gallons of diesel. A truck driving the same distance on natural gas would burn about 2100 thousand cubic feet of natural gas. Diesel now costs about $4 dollars per gallon, making the annual fuel cost about $68,000. Gas delivered to a retail distributor might cost about $5 per thousand cubic feet, leading to a fuel cost of $10,500. This fuel saving of $57,000 per year means that the added cost of a natural gas vehicle would be covered in fuel saving in less than 15 months, suggesting a return on the capital investment of nearly 80 percent.

But, again, the problem is that there are about 9600 truck stops nationally where most long distance truckers refuel. It would cost about $1 million for each of these truck stops to add natural gas to its refilling options, creating an infrastructure cost to the industry of about $10 billion. But, just as it is no single truck owner's incentive to take advantage of the cost savings from natural gas fueling, it is in no single fuel retailer's interest to invest the $1 million to add natural gas as a fuel option if there aren't a lot of truck owners to use it.

Properly designed government policy could break this QWERTY problem by incentivizing new purchasers of trucks to buy natural gas powered vehicles. If government were to provide a tax credit of $70,000 per natural gas truck purchased, the up-front capital cost would be the same as a diesel fired truck. Based on rate trucks turn over, it would be reasonable to assume that in three years we would have a critical mass of about 350,000 such diesel fired trucks, spending

about $3.5 billion at retail distributors of natural gas. Once more retail distributors sell natural gas, conversion to natural gas by truckers would accelerate further. Alternatively, the subsidy could be given to the stations to add natural gas to their retail line. While I have not analyzed the numbers, this might be an even more cost-effective approach.

Second, there is a national externality involved in encouraging conversion to natural gas that centers on energy independence but may also include other issues such as carbon emission. If those 350,000 trucks converted to domestically produced natural gas, we would save about 150 million barrels of imported oil per year. How much is energy independence worth? That is in the eye of the beholder, but currently the government has a variety of programs in place to save on oil consumption that involve a quite high subsidy. For example, the Energy Information Agency reported that in 2007 government subsidies to ethanol and biofuels amounted to $5.72 per million BTUs and $2.82 per million BTUs for solar energy. Again, these are 2007 figures and today the solar subsidies in particular would be much higher. This works out to 65 cents per gallon for ethanol and 32 cents per gallon for solar, or $25 per barrel for ethanol and about half that for solar. In addition, the Electric Vehicle credit involves a subsidy to that approach that is roughly twice as much as even the ethanol subsidy.

Let us apply those subsidy rates to a cost-benefit calculation of a subsidy to purchase natural gas powered truck engines. At this rate of subsidy, the payoff to the national interest would be the equivalent of $11,000 per year at the ethanol rate and $5500 per year at the 2007 solar rate of subsidy. This is equivalent to roughly a 16 percent return to the country on the initial subsidy relative to ethanol and 8 percent relative to solar. In both cases, the return would have to be judged quite cost effective at the current cost of Treasury borrowing which would be around 2 percent for a security equivalent in life to a truck engine.

I would add that this implies a complete subsidy for the truck buyer to cover the price differential between the two types of engines. There is no necessary reason for this. One could, for example, impose a tax on natural gas purchases for motor vehicles. One could set that at the equivalent of $2 per thousand cubic feet and recap $5000 per vehicle per year while still leaving an enormous incentive for the purchase of a natural gas truck over a diesel truck. The conversion would still happen and the loss to the Treasury would be cut by about two-thirds over the budget forecast window.

In sum, I think that there can be an appropriate place for government subsidies to influence the choice of vehicle fuel technology. But, such choices should be subject to rigorous cost benefit analysis with a high threshold for approval. As an example, it is my view that a subsidy of the purchase of natural

gas powered large trucks would meet such a threshold, and that the particular incentives involved could be arranged in a way that would minimize the budgetary impact. Thank you.