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Response to testimony presented to the Senate Committee on Energy and Natural Resources
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Chairman Bingaman, Senator Murkowski et.al.

Again thank you for the opportunity to testify on S395. I believe that this bill, if passed, without question will be of significant benefit to every person living in the United States of America.

When I saw the list of people who would testify, I quietly said to myself, Howard, you should be proud as you are the only person to testify who has paid his own way to appear here today and that does not represent a group that has a significant vested interest.

You would expect that energy advocates and lighting manufacturers would oppose S 395. The energy advocates support any legislative or regulatory requirement that would reduce energy use, putting aside every other feature regarding quality, performance, and importantly, economics, as they have done here. The manufacturers support legislative and regulatory requirements that dictate that consumers must purchase lamps they would never buy if they were given freedom of choice. This new 2007 Act might even require the relighting of everyone's home, including replacing all the dimmers they may have installed. Now they have no choice. It would be a true test if every congressman tried living in their homes with no incandescent light bulbs.

What was presented in all the testimony, other than mine, is such a barrage of statistical data that it becomes meaningless. What continues to resonate very loudly, however, is the zealous nature with which they are steamrolling this issue and what they sidestep. Their message is delivered with a vehemence that is overplayed and worthy of pause and suspicion. Mercury is the issue that resonates on the street, and yet mercury is what the testifiers seemingly try to suppress. Other technologies, such as the so-called "high performance" incandescent are on the way and will naturally find their rightful place. Why then, the urgent rush to forcefully "get rid" (as per Cooper) of perfectly rational and useful products, to limit choice, promote personal peril and a host of other unknowns.

In the entire prepared testimony only one single paragraph by Steven Nadel addressed the mercury in CFLs. NEMA's "5Ls of Lighting" brochure states, "The bulb contains a small amount of mercury. Recycling is recommended." That is all NEMA had to say. Those who did bring mercury under scrutiny were the senators, particularly James E. Risch and Co-chairperson Murkowski. But then the issue is dropped.

As in "The Silver Blaze," where Sherlock Holmes solved the crime by noticing that the dog did *not* bark, I would consider the absence of all discourse on mercury irresponsible, highly suspect and key to the argument.

While the numerical data put forth on this issue to enlighten, inform and otherwise aid in the considerations leading to best practices, there are so many numbers and they have been used as indiscriminate weapons in defending a position. There is little context and no sense of proportion. Most everything is projected and monetary impact is rendered subjective. For example, Kathleen Hogan's testimony includes the following:

> "DOE projects that if S 395 were enacted, US primary energy consumption would increase 21 quads and greenhouse gas emissions could increase by more than 330 million metric tons over the next 30 years."

"Primary energy consumption" is based at the generating source. According to the DOE all this carbon tonnage can be avoided. Upon examination of that statement in combination with DOE figures utilized by the US Energy Information Administration, 21 quads of energy accumulated over 30 years amount to an increase of 0.018% in energy use for the US over the same time period. Hogan's figure of "21 quads" includes metal halide fixtures. Removing these yields an accumulated 15 quads. For general service and reflector incandescent lamps, the Bulb act would then contribute 0.013 % to US energy use over the next three decades. That has the same impact over 30 years as saving $1.44 a month out of a budget of $4000.00 per month.

Startling, yes? Lifting the hood on this reveals something so convoluted that we do not know whether the numbers are correct or at all meaningful. Even if I am off by a magnitude in the above, the contribution of incandescent is trivial, even less so over the long haul. And this is only one example worthy of further examination.

Additionally, the Hogan testimony states,

> "Energy saving options from efficient incandescent bulbs to CFLs to LEDs can be found on the warm side of the spectrum, providing the same light as less-efficient bulbs."

We know this to be patently false. The spectral output of CFLs and LEDs is not the same as the general service incandescent. And there is no mention across the hearing that, owing to the suppression of the halogen cycle, the lifetime of halogen lamps can be reduced if they are dimmed for long periods of time.

Further, the Maxwell School at Syracuse University claims that, among other factors, consumption is weighed more toward the price of energy than on available technology. Consumers attenuate their use based on how much they have to pay up front, and hypersensitivity to long term savings is a dream of academics and a useful concept wielded by bureaucrats.

Layer by layer, these governmental agencies and lobbying groups have built a bee's nest of information. My point here is that there is plenty of "evidence" that standards can save some energy, but very little

straightforward truth as to the magnitude of practical impact, and end results of such standardization. In fact, the results cannot be definitely known.

The fact-ridden information provided by the Consumer Federation of America (CFA) is a generic send-up of efficiency standards of all types, perhaps retro-fitted to serve as a quick defense against the passing of S 395. The prepared testimony of Mark Cooper does not include one instance of the words "incandescent" or "lamp." In fact, their "market imperfection" data was prepared for a proceeding on motor fuel, not lighting. "Lighting" is mentioned, but only in terms of the source type, as just another toilet or dishwasher to be regulated. Please refer to the hearing commentary of senator Paul Rand on S 398.

Cooper began his verbal testimony stating that, "Energy efficiency standards are consumer-friendly," and that, "The homes in which consumers live will command higher resale because they are more energy efficient." He continued with, "Efficiency standards enjoy widespread public support. Our opinion polls suggest that 95% of all Americans think it's beneficial to lower their consumption; they know it's better for their pocketbooks, and almost 3/4 support efficiency standards." However, their impression rests solely upon what survey subjects thought, not what they did. Subjects were asked questions of type…

- Do you think it is beneficial..?
- In your view, how important is each of the following ..?
- If energy efficiency increased price but reduced the cost of use, would you favor ..?
- Are you aware the standards ..?
- In principle, do you support or oppose ..?
- Do you feel the sum of the benefits ..?

Dr. Janice Funk, Harvard lecturer and neuropsychologist of Whittier Rehabilitation Hospital in Bradford, MA, tells me that there is repeatedly a wide discrepancy. Psychologists tell us there is wide discrepancy between what people say and what they do. As example, I have spoken with many current employees of the government, and with all the information at their fingertips, being intimately familiar with the issues and needs of this energy economy, most still do not buy CFLs. When faced with the choice in the aisle of their hardware store, they want three things:

1. they want to pay less
2. they want a light that's bright when they flip the switch, with no warm up
3. they want a light that doesn't make things look odd

Though consumers will say they believe in energy efficiency, they will admit they purchase what they want at the moment of decision, and they want to pay less every time. Even though they are familiar with the promise of long-term savings, I have heard that what really matters most to them is the current moment and what their family will tolerate. Even though testimony repeatedly tries to personify the data with the demeaning term, "pocketbook," humans are not motivated by long-term promises.

Cooper goes on to say, "Our analysis of the energy efficiency gap identifies a number of market imperfections that cause the market to undersupply energy efficiency… Standards are the ideal way to address these market imperfections."

Senator James E. Risch rejoined, "People in Idaho are just going nuts and they are astonished that the federal government is telling them what kind of light bulbs they have to put in their home. Where's this country gone? Dr. Cooper, what was the term you used? *Cooper: Imperfections.* Imperfections, that's right. Whenever I hear about 'imperfections in the marketplace,' I hate hearing that because I'm a free market guy, an open market guy. But the only thing that troubles me more is the government trying to fix it. I guarantee you, that is not gonna happen."

In concluding, Cooper essentially stated, "So, if you look at the marketplace and you see products that harm consumers … you can get rid of them by a performance standard that is neutral."

- Is it "neutral" to flatly "get rid" of a product that works perfectly?
- Why does supplying one product imply the forced obsolescence of another?
- Would it not be a "market failure" to, in turn, under-supply the low-cost and safer lamp that consumers know?
- Ultimately, is it valid to use motor fuel data to propel the wholesale removal of a simple and safe product from the market of choice?

The numbers are just that—numbers. And the plethora of numbers from all arenas (motor fuel data?) are being used to drive the words here, all funneling down to the emotive, "empower consumers," "lighting choices," and the abasing phrase "money in pocket."

The DOE is seeking to provide "regulatory certainty" for industry on the backs of the consumers they will sacrifice. It is a classic example of agenda-setting in the guise of stewardship.

- Senator James E. Risch went on, "To me, when I got here and heard about this law—and by the way, this law was not very well vetted out in the public—that they were going to put these mercury bulbs in every home, in every school in America, in hospitals … has anybody looked at the EPA recommendations put out January 11, 2011 as to what you should do if one of these mercury light bulbs breaks in your home?"

Cooper said, "Public opinion polls show that 70 percent or more of the public wants the government to do as much or more with respect to distracted driving, food safety, fuel economy, privacy, oil drilling, the environment, and financial services, as well as energy efficiency."

And he is right. This is what the government has always done … except, in the case of the CFL, which is (counter to all their arguments) being promoted as the replacement to the general purpose incandescent. Regardless of the technology on the horizon, this is the technology of the moment. LEDs are too expensive, OLEDs do not exist and high-performance halogen will probably be out of the financial reach for people lighting an entire home. The CFL has its place, but it should not exclude the healthy choice.

The difference between lighting and other appliances subject to regulation is that we did not evolve with dishwashers, battery chargers and set-top cable TV boxes. As the progeny of this planet, we evolved under sunlight, moonlight and alongside the incandescence of fire. As a species we are exquisitely tuned to light's qualities and rhythms on physical and neurological bases. From a cellular level upward, the

light that envelops us steers our very existence, and to impose limitations upon how we choose to illuminate our personal environment carries biological ramifications that reach far deeper than the effects of a longer defrost cycle. Likewise, we did not evolve with mercury, which, in unnatural concentrations, frays our nervous system and attacks our brains as does Alzheimer's disease.

If it is truly in the national interest to really reduce national energy use, there are ways to accomplish much better results by passing legislation regulating the energy use for heating, ventilating, and air conditioning (HVAC) and water heating systems. These systems use far more energy than lighting in both residential and commercial buildings. Pass a law requiring the use of ground source (sometimes called geothermal) heating and cooling systems and thus eliminating "conventional" HVAC systems. These systems can be used in most, if not all buildings. This can be done by simply legislating and raising minimum energy performance for all HVAC systems, both new and replacement, such that all "conventional" systems now regulated by DOE can no longer comply. This is exactly the same approach used with lighting efficiency. However, the energy saved will be significant. For lighting the savings will be miniscule. The technology for HVAC is mature and reliable.

Another measure is to pass legislation regulating the energy use for water heating systems. Pass a law requiring the use of heat pump water heaters and thus eliminating "conventional" water heating systems. This can be done by legislating and raising minimum energy performance for all water heating systems, both new and replacement, such that all "conventional" systems now regulated by DOE can no longer comply. These systems can be used in most, if not all new and existing buildings. This is exactly the same approach used with lighting efficiency. The technology is mature and reliable. Except the energy saved will be significant.

These two measures would quickly save untold amounts of energy, and require little more government effort than already exists.

The Energy Information Administration Estimates that 3.6% of energy is used for incandescent lamps. All the figures that were used in testimony were carefully crafted using only partial data to make the case for new technology look attractive. In fact, it is not.

While current law de facto requires the use mainly of CFLs, you and the public should be aware that the energy and pollution "savings" are not nearly as much as being claimed. In fact, the energy used to manufacture these new products, their plastic packaging and shipping costs from China have never entered their equations. In some cases energy is wasted. Yet the opponents of S 395 never mention this, which is a scientific and engineering fact.

In winter months, 44% of commercial buildings and 47% of residential buildings use electricity as the primary or secondary form of heating energy. In those buildings, the lesser amount of energy used by CFLs compared with incandescent lamps is replaced with electric heat, so there is little or no electricity, energy, or cost savings for the consumer. Yet the utility is required to now supply about 125% of the volt amps that were formerly used due to the low power factor of CFLs, which results in 25% more pollution from utility power plants than with incandescent lamps.

No mention was made of the potential health and fire hazards use of CFls might be responsible for. Evidence is piling up daily from around the world that problems may exist. It is too early for conclusive

numbers but is it worth the risk? Millions of people are stricken with Lupus and other autoimmune diseases. Many of these people are suffering from rashes, some quite severe. We may be promoting a product (the CFL) that is energy wasteful and simultaneously toxic. Is this worth the risk? Are we going to roll the dice and hope for the best in this quest to save some small amount of energy?

If everyone is given the choice in how to light their homes the risks disappear. People will buy the products that best serve their needs, that are not a financial burden to them, and there will be no impact on the energy saved in this country.

Additional responses to Senator's Questions

Chairman Bingaman

Mr. Brandston, in your testimony you state that the EISA 2007 "provides for a de facto ban on the traditional incandescent light bulb." There are energy-efficient incandescent bulbs available that meet the standard and they are virtually indistinguishable from the traditional incandescent bulb.

1. Why can't consumers who prefer incandescent bulbs, purchase the new more-efficient incandescent bulbs?

Answer: The new "more efficient" bulbs cost significantly more than the standard bulbs. In many households this would be a hardship. The calculated savings projected over time would not be worth the immediate outlay of scarce dollars. Further the new sources will not work in many existing lighting fixtures – this could be a hazard and a waste of energy.

1 a. If the BULB Act were to be enacted, then the Federal standards on incandescent bulbs would not come into effect. However, under the 10th Amendment of the Constitution, California would continue to have its standards and every other State would have the right to adopt energy efficiency standards for light bulbs.

Answer: That is true. But if the rationale for passing S395 were properly publicized, the educated electorate and local legislators would amend their codes to closely reflect the Federal example if it was properly written.

2. Do you agree that it is less burdensome to business and the economy to have a single Federal standard rather than multiple state standards?

Answer: I am not sure about that. I think this is a constitutional question on state's rights. There are many local building codes that meet the needs of the location and, to my knowledge, have not hampered business or trade.

Over three years ago Congress passed and President Bush signed EISA establishing the incandescent lamp standards with a starting date of January 1, 2012 for the 100 watt bulb. As a result, U.S. bulb manufacturers have made substantial investments to meet the new standards.

3. Do you think it is fair to U.S. businesses to repeal a standard after they have made substantial investments to comply with that law?

Answer: I believe that most lamp companies are always doing research and investing in new products to gain some market advantage. I know of several products that were developed that did not sell and

they were written off as market research gone wrong. This de-facto ban is a marvelous bit of marketing for those companies – they had a product that wasn't selling as well as anticipated – now the government is banning the favored product.

Senator Murkowski

1. What are the major differences between moving an appliance standard through the regulatory process and the legislative process?

Answer: As I understand it -- Two separate Government entities are working on the standard – the legislators are generally setting a goal, the regulators are setting a means of implementing that goal. When a Standard is developed by the Voluntary Standards Development Community it passes through a public review which does not bear the burden of meeting legislation, the only burden is to prove the standard serves the public at large.

2. How was consensus achieved on the proposed standards and how do you define "consensus" in this context? Was consensus achieved in 2007, as it relates to the new standards for the incandescent bulb?

Answer: From my point of view – there was no consensus – this was a dictatorial process.

3. In your testimony you spoke of the negative attributes of CFLs. Do you have any opinions on the other technologies discussed at the hearing?

Answer: The only other technology that I have concerns about are LEDs (Light Emitting Diodes). They contain many components that are considered dangerous and have not had sufficient time to be tested in many applications. In lighting, for the most part, there are no bad products – just bad applications. The LED industry at first totally misrepresented their products. That should give most of us a cause for concern. A recent French research study states these products may have a damaging effect on infant's eyesight. More work has to be done on this before we put these light sources in every home.

I have grave concern that there has not been any effort to alert or educate the public of any of the application negatives that have been piling up swiftly. The only effort expended so far has been to promote what I consider to be a toxic product that in truth does not save the energy.

4. How would the proposed new standards have impacted the various lighting work you have done over the course of your career?

Answer: I cannot begin to estimate the harm that these new proposed standards would have done to my work. Many of my projects would not have been able to meet the needs of my clients. If you cannot provide what is necessary for a project to be successful you have indeed wasted energy and all the money invested. I have been fortunate to have been given about 3000 lighting design commissions in 60 countries. They would not have been able to receive the recognition they achieved under the new standards.

I was fortunate to have started my career in the theater. There were no codes or standards for lighting in the theater. It just had to work. That simple dictum was amply illustrated on the relighting we did for The Statue of Liberty. It worked.

Senator Portman

1. I think one of the largest barriers to wide-spread deployment of energy efficiency technologies on both the industrial/commercial side and the residential side is education. As a consumer it is pretty difficult with the tools available to us today to wrap your head around how much energy you use in a day or a year, and then it is even tougher to figure out how much a certain energy efficiency

technology can eventually save you. I believe this uncertainty makes it hard for a consumer to commit to investing the upfront money in energy efficiency technology, and I think it is one of the reasons why so many get concerned when governments talk about mandates on energy efficiency. Simply put, the uncertainty leaves a lot of money on the sidelines. Do you agree? If so, what is the solution?

Answer: Dissemination of truthful information and education is the key. The testimony given today was a good example of how data can be spun to create an impression of doing good while indeed that has not been the case. Some of that spin was mandated by the energy policy we now have in place. As people invest, based on this manipulated data, they find it has misled them – that sets up barriers to further investment – so who do you trust? If a family member suffers from a light induced ailment – what does that uninformed consumer do?

We must have an education policy to accompany whatever technical strides we would like to achieve. The well informed investor can sort out the rest.

2. How do we develop metrics for consumers to base their decisions that is accurate across many different consumers, environments, and scenarios?

Answer: When developing metrics for the average consumer – these must be developed by those who work directly with that consumer group in creating their lighting. This cannot be properly achieved by fiat/mandate. A properly developed guideline will profit the user – all others will follow.

Central issue

Historically, the government of the United States has advanced the quality of the American way of life by putting safety above cost. They mandated taking lead out of paint, even if that made the paint more expensive; they removed the asbestos from our buildings; put more life boats on ships, and so on, always knowing the safer product was, in the long run, the better product for people. Many times over, these improvements increased cost, but there was always the underlying principle that in this country, human life and health were worth more than money. Now, however, they would like to turn that assumption on its head and needlessly promote the introduction of mass amounts of a known toxin into the environment by *removing* the alternatives—products with a long history of safety and reliability—thereby, removing American's freedom of choice.

One could (rightly) argue that there have been many public awareness campaigns that have been highly effective, such as littering, forest fires, smoking, etc. Thus, claiming the average homeowner isn't going to consult the EPA to learn how to recycle and dispose of these lamps (even though they won't, as Risch says) will probably not gain much attention. From Senator Risch, above, "…this law was not very well vetted out in the public; they were going to put these mercury bulbs in every home, in every school in America, in hospitals…" My questions/comments to them would be:

- Do the proponents of EISA 2007 have the right to the right to *force* every American to become a Hazmat worker?
- How you can you sit on Capitol Hill, while somewhere a pregnant mother must clean up the mercury from a broken CFL in her nursery?
- You can power an incandescent lamp with a wind turbine or a solar panel. You can power a CFL or an LED with a coal-burning generator. But when the lifetime of each is over, it's the mercury-containing CFL that remains the bigger threat to the environment.

The above proponents have made jiggered attempts to personify their schemes through a juggernaut of numerical acrobatics, undemonstrated consumer behaviors and affable verbiage. But it all flys in the face of personal health and wellbeing, which really does strike sharply at the level of home and hearth. I would say that their points are now irrelevant. In the practical realm of things the urge to ban the general incandescent occupies very little in the way of priority in the current economic environment, even in context of the overall sphere of energy policy. And yet, proliferating the market with toxic, foreign-made "efficient" product poses surprisingly far-reaching implications. They do not know what they do.

The history of federal regulation, from Prohibition to Sarbanes-Oxley to ethanol, to farm subsidies, to land management, to immigration quotas, to the progressive personal income tax, intervention and is replete with examples of intervention and unanticipated consequences, some regrettable in retrospect. DDT was supposed to lower the cost of farming and increase productivity. I think we can easily see that once you introduce something into the environment, it can prove very difficult, or impossible to remove. Truly, setting performance limits on the general incandescent could be the government's best idea since allowing DDT.

The search for efficiencies is a natural function of free markets and applies to this industry's relationship with consumers as surely as it does (and has) with all others. There are no imperfections. Free of bureaucratic micro-management of the choices available to light the kitchens of America, industry will continue to develop the lighting products that compete side by side in the marketplace, and in all respects the best will reign by dint of consumer choice. In the effort to demonstrate tangible progress toward a national energy policy, the DOE and others are committing regulatory interference, and putting into question the long-term health and safety of the nation's citizens and our environment. In response, the BULB Act should be passed.

Respectfully submitted,

Howard M. Brandston, FIES, Hon. FCIBSE, FIALD, FSLL, PLDA, LC.

PS: I would be glad to meet with the committee to assist in their work.
Please visit my web site www.concerninglight.com and look at the information and links on this subject in the "Commentary" section. It will give you a broad based overview of the current status on this issue and provide all my contact information.