ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

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By E-Mail

Ajit Jillavenkatesa
100 Bureau Drive
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Gaithersburg, MD 20899-1060

SOS_RFI@nist.gov

Re: Standardization feedback for Sub-Committee on Standards;
Docket No. 0909100442-0563-02

Dear Mr. Jillavenkatesa:

The Association of Home Appliance Manufacturers (AHAM), respectfully submits the following feedback on standardization for the Sub-Committee on Standards in response to the request for information published in 75 Fed. Reg. 76397 (Dec. 8, 2010), Docket No. 0909100442-0563-02.

AHAM represents manufacturers of major, portable and floor care home appliances, and suppliers to the industry. AHAM's membership includes over 150 companies throughout the world. In the U.S., AHAM members employ tens of thousands of people and produce more than 95% of the household appliances shipped for sale. The factory shipment value of these products is more than $30 billion annually. The home appliance industry, through its products and innovation, is essential to U.S. consumer lifestyle, health, safety and convenience. Through its technology, employees and productivity, the industry contributes significantly to U.S. jobs and economic security. Home appliances also are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs.

AHAM is also a standards development organization, accredited by the American National Standards Institute (ANSI). The Association authors numerous appliance performance testing standards used by manufacturers, consumer organizations and governmental bodies to rate and compare appliances. AHAM's consumer safety education program has educated millions of consumers on ways to properly and safely use appliances such as portable heaters, clothes dryers, and cooking products.

The Sub-Committee on Standards sought information on a number of questions regarding the effectiveness of federal agencies' participation in the development and implementation of standards and conformity assessment programs. The Sub-Committee stated that it plans to consider the feedback to develop case studies that federal agencies can consider in their future engagement in standards development and conformity assessment. In particular, the Sub-Committee is interested in comments that relate to the smart grid.

AHAM believes that industry is often the best group to drive the standards setting process because it is that group that is generally most familiar with product and other requirements and with consumer needs and expectations. Credible standards setting processes, like those in which AHAM is involved, are open and transparent and require technical expertise from industry and concerted efforts by affected parties and other stakeholders. Accordingly, we believe that federal agencies should leverage existing standards, including test procedures, which are developed through an open and transparent process. The same is true for standards and test procedures that are being developed in the area of the smart grid

AHAM is interested and involved in the development of the smart grid and related policies, and can provide a unique perspective from our member companies who will manufacture products that will become a part of our nation's future smart grid. From our perspective, the objective of the smart grid is to facilitate the development and use of new technology and systems that will allow consumers to automatically control their energy use and costs.

AHAM believes that in order for the smart grid to be successful, there are three essential requirements for the Smart Grid's interaction with consumers:[1]

1. Pricing must provide incentives to manage energy use more efficiently and enable consumers to save money.
2. Communication standards must be open, flexible, secure, and limited in number.
3. Consumer choice and privacy must be respected—the consumer is the decision maker.

In order to address one of those three essential requirements, AHAM completed an Assessment of Communication Standards for Smart Appliances, The Home Appliance Industry's Technical Evaluation of Communication Protocols, which is the industry's technical evaluation of the multitude of existing communications protocols designed for the smart grid. [2]

The assessment was built with a focus on consumers' needs. To represent those needs accurately, AHAM's approach was to use appliance consumers' requirements to drive identification of the best communication protocols to use for smart grid interfaces. In Six Sigma language, this is called the Voice of the Customer. To represent this voice, AHAM chose to use the Quality Function Deployment (QFD) tool.[3]

In addition, AHAM partnered with efficiency organizations to submit a petition to the ENERGY STAR program to recognize the benefits of smart appliances and to jump start the smart grid. This petition, which is part of the agreement between appliance manufacturers and energy efficiency advocates, asks the ENERGY STAR program to recognize the benefits of smart appliances and incorporate a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for smart-grid enabled appliances as soon as possible. A

[1] *See* AHAM, Smart Grid White Paper: The Home Appliance Industry's Principles & Requirements for Achieving a Widely Accepted Smart Grid (Dec. 2009), *available at* http://www.aham.org/ht/a/GetDocumentAction/i/44191.

[2] *Available at* http://www.aham.org/ht/a/GetDocumentAction/i/50696.

[3] The full QFD analysis is available at http://www.aham.org/ht/a/GetDocumentAction/i/50698%20.

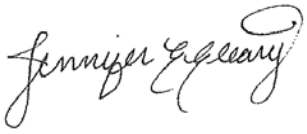
copy of the petition is attached to these comments at Attachment A.

The Pacific Northwest National Laboratory (PNNL) recently completed a cost/benefit analysis for the Department of Energy (DOE), which was included with the petition. PNNL determined that the annual benefits from having smart grid capabilities in an appliance are greater than the costs of an equivalent five percent increase in operational machine efficiencies.

To facilitate the development of the smart grid, AHAM believes that it would be useful for federal agencies to help fund standards oriented research, similar to the communications study AHAM undertook and the analysis done by PNNL. Areas that are ripe for research related to the smart grid are ancillary services, dynamic rates, and interoperability. In addition, federal agencies could help develop smart grid technologies by sponsoring and administering pilot projects similar to those underway in a few municipalities, on a larger, perhaps national, scale.

AHAM appreciates the opportunity to submit this feedback on standardization for the Sub-Committee on Standards.

Respectfully Submitted,



Jennifer Cleary
Director, Regulatory Affairs

ATTACHMENT A

ACEEE
American Council for an Energy-Efficient Economy

AHAM
ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

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January 6, 2011

The Honorable Gina McCarthy
Assistant Administrator
Office of Air and Radiation
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

The Honorable Cathy Zoi
Assistant Secretary
Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Assistant Administrator McCarthy and Assistant Secretary Zoi:

The Association of Home Appliance Manufacturers (AHAM) and efficiency organizations, which are being coordinated by the American Council for an Energy-Efficient Economy (ACEEE), have agreed to a number of recommendations related to new appliance efficiency standards and test procedures, smart appliances, and incentives to manufacture super-efficient appliances. As part of the agreement, the parties are jointly petitioning the ENERGY STAR program to provide a 5 percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria. Please find attached a petition to the ENERGY STAR program to implement one of the central pillars of the Energy Efficient and Smart Appliance Agreement of 2010.

We look forward to working with the ENERGY STAR program to advance the recommendations contained in this petition. Please do not hesitate to contact either of us if you have any questions or need any further information.

Sincerely,

Kevin Messner
Vice President, Government Relations
AHAM

Steven Nadel
Executive Director
ACEEE

Joint Petition To ENERGY STAR To Adopt Joint Stakeholder Agreement As It Relates To Smart Appliances

January 6, 2011

Association of Home Appliance Manufacturers[1]
American Council for an Energy-Efficient Economy
Natural Resources Defense Council
Alliance to Save Energy
Alliance for Water Efficiency
Northwest Power and Conservation Council
Northeast Energy Efficiency Partnerships
Consumer Federation of America
National Consumer Law Center
Earthjustice
California Energy Commission
Demand Response and Smart Grid Coalition

I. Introduction and Overview

The Joint Petitioners are pleased to present to the U. S. Environmental Protection Agency (EPA) and Department of Energy (DOE) the results of successful negotiations which resulted in an agreement ("the Joint Proposal") on federal minimum energy conservation standards for five products, and related test procedures, ENERGY STAR, and financial incentive provisions. The description of this package and an initial estimate of its impact can be found in Attachment 1.

Central to this Joint Proposal is the agreement to request from ENERGY STAR a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for smart-grid enabled appliances. The Joint Petitioners urge EPA and DOE to adopt the Joint Proposal, incorporating a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for smart-grid enabled appliances as soon as possible, but not later than March 31, 2011. The Joint Petitioners are representative of a wide range of expert and relevant points of view—including manufacturers of various sizes representing over 99% of the market; consumer, environmental, and advocacy groups; and a major public power planning agency—concerning ENERGY STAR for the subject products.

The agreement in its entirety, *see* Attachment 2, covers residential refrigerator/freezers, clothes washers, clothes dryers, room air-conditioners, and dishwashers. There are three main pillars of this agreement:

1. *Energy efficiency standards*: the agreement recommends new federal minimum efficiency standards that will save significant amounts of energy. Lawrence Berkeley

[1] Whirlpool, General Electric, Electrolux, LG Electronics, BSH, Alliance Laundry, Viking Range, Sub-Zero Wolf, Friedrich A/C, U-Line, Samsung, Sharp Electronics, Miele, Heat Controller, AGA Marvel, Brown Stove, Haier, Fagor America, Airwell Group, Arcelik, Fisher & Paykel, Scotsman Ice, Indesit, Kuppersbusch, Kelon, DeLonghi

National Laboratory (LBL) projects that the Joint Proposed Standards would save more than 9 quads of primary energy over 30 years. It would also result in nearly five trillion less gallons of water used over 30 years and reduce carbon emissions by approximately 550 million metric tons.

2. *Smart appliances*: the agreement hastens the production of smart appliances. As part of the agreement, the parties are jointly submitting this petition to the Environmental Protection Agency (EPA) and DOE to provide a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for products that meet a definition of "smart appliance." Further recognizing the opportunity for smart appliances to contribute to energy efficiency and the smart grid, the parties will work together to develop a proposal for incentives for appliances with "smart" capabilities. It is expected that the incentives for smart appliances may produce additional CO_2 emission reductions.

3. *Tax credit*: the agreement includes recommendations for updates and extensions of the manufacturer tax credit for the production of super-efficient dishwashers, clothes washers, refrigerators and freezers. These incentives encourage manufacturers to develop, commercialize, and sell very high efficiency products, helping to transform markets faster than with standards alone. The lower tiers of the current federal incentives are phased-out under the new agreement and new, higher tiers are added. LBL has estimated the tax credits for appliances would save an additional 0.67 quads of primary energy over 30 years.

This petition is only in regard to the ENERGY STAR program (minimum efficiency standards are a part of different petitions). Action on the tax credit and energy standards elements of the agreement will require consideration by Congress and the DOE.

Congress authorized the ENERGY STAR program "to identify and promote energy-efficient products and buildings in order to reduce energy consumption, improve energy security, and reduce pollution through voluntary labeling of, or other forms of communication about, products and buildings that meet the highest energy conservation standards." 42 U.S.C. § 6294a. The Joint Proposal to provide a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for products that meet an EPA-set definition of "smart appliance" advances those goals. The five percent credit will encourage the design and manufacture of these products. These products have the potential to reduce energy consumption and reduce cost to consumers. Accordingly, ENERGY STAR should adopt the five percent credit.

II. **The Joint Petitioners To and Supporters of the Agreement**

The American Council for an Energy Efficient Economy (ACEEE) is a nonprofit, non-partisan, organization dedicated to advancing energy efficiency as a means of promoting economic prosperity, energy security, and environmental protection. ACEEE fulfills its mission by conducting in-depth technical and policy assessments; advising policymakers and program managers; working collaboratively with businesses, public interest groups, and other

organizations; publishing books, conference proceedings, and reports; organizing conferences and workshops; and educating consumers and businesses.

The Association of Home Appliance Manufacturers (AHAM) represents manufacturers of major, portable and floor care home appliances, and suppliers to the industry. AHAM's membership includes over 150 companies throughout the world. In the U.S., AHAM members employ tens of thousands of people and produce more than 95% of the household appliances shipped for sale. The factory shipment value of these products is more than $30 billion annually. The home appliance industry, through its products and innovation, is essential to U.S. consumer lifestyle, health, safety and convenience. Through its technology, employees and productivity, the industry contributes significantly to U.S. jobs and economic security. Home appliances also are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs. AHAM represents the manufacturers of virtually all affected clothes dryers and room air conditioners manufactured and/or sold in the United States. AHAM is involved in a number of activities related to smart appliances, including advocating for government action, to helping align the high level architecture and communication protocols used by smart appliances.

The Alliance to Save Energy (ASE) is a coalition of prominent business, government, environmental, and consumer leaders who promote the efficient and clean use of energy worldwide to benefit consumers, the environment, the economy, and national security. Established as an NGO in 1977, to carry out its mission the Alliance undertakes research, educational programs, and policy advocacy; designs and implements energy-efficiency projects; promotes technology development and deployment; and builds public-private partnerships in the United States and other countries.

The Alliance for Water Efficiency is a stakeholder-based 501(c)(3) non-profit organization dedicated to the efficient and sustainable use of water, with 317 member organizations from water utilities, government agencies, businesses, industry, plumbing, appliance and irrigation manufacturers, retailers, environmental and energy efficiency advocates, and other stakeholders. Located in Chicago, the Alliance serves as a North American advocate for water efficient products and programs, and provides information and assistance on water conservation efforts.

The Appliance Standards Awareness Project (ASAP) is a coalition group dedicated to advancing cost-effective energy efficiency standards for appliances and equipment. ASAP works at both the state and federal levels and is led by a Steering Committee with representatives from consumer groups, utilities, state government, environmental groups, and energy-efficiency groups.

The Consumer Federation of America is an association of nearly 300 nonprofit consumer groups that was established in 1968 to advance the consumer interest through research, advocacy, and education.

The National Consumer Law Center ®, a nonprofit corporation founded in 1969, assists consumers, advocates, and public policy makers nationwide on consumer law issues. NCLC works toward the goal of consumer justice and fair treatment, particularly for those whose

poverty renders them powerless to demand accountability from the economic marketplace. NCLC has provided model language and testimony on numerous consumer law issues before federal and state policy makers. NCLC publishes an 18-volume series of treatises on consumer law, and a number of publications for consumers.

The Natural Resources Defense Council (NRDC) is a national environmental advocacy organization with over 1.3 million members and online activists. NRDC has spent decades working to build and improve DOE's federal appliance standards programs because of the important energy, environmental, consumer, and reliability benefits of appliance efficiency standards. NRDC participated in the enactment of the first federal legislation establishing efficiency standards, and has been active in all significant rulemakings since then.

Northeast Energy Efficiency Partnerships (NEEP) is a non-profit organization that facilitates regional partnerships to advance the efficient use of energy in homes, buildings and industry in the Northeast U.S. NEEP works to leverage knowledge, capability, learning and funding through regionally coordinated policies, programs and practices. As a regional organization that collaborates with policy makers, energy efficient program administrators, and business, NEEP is a leader in the movement to build a cleaner environment and a more reliable and affordable energy system.

The Northwest Power and Conservation Council is an interstate compact between the states of Idaho, Montana, Oregon and Washington authorized by the Northwest Power Act of 1980 (PL96-501). The Council is charged with ensuring that the Northwest's electric power system will provide adequate and reliable energy at the lowest economic and environmental cost to its citizens.

The Demand Response and Smart Grid Coalition (DRSG) is the trade association for companies that provide products and services in the areas of demand response, smart meters and smart grid technologies. DRSG works to educate and provide information to policymakers, utilities, the media, the financial community and stakeholders on how demand response and smart grid technologies such as smart meters can help modernize our electricity system and provide customers with new information and options for managing their electricity use.

Other supporters include the California Energy Commission and Earthjustice.

III. Rationale For The Negotiations

The Joint Petitioners entered into discussions on smart appliances as part of the overall agreement negotiation for two main reasons. First, it was thought that the smart grid can provide important energy efficiencies and reliability improvements and that there needs to be incentives to manufacturers to sell smart appliances to hasten the development of an effective smart grid. Second, smart appliances can provide more effective and efficient use of electricity, which can save energy, save consumers money on their electricity bills, and increase the use of renewable energy. The Joint Petitioners believe that both of these goals were achieved and will be borne out in the implementation of this proposal.

IV. The Negotiations Process

The parties' discussions commenced in the spring of 2010 and an agreement was finalized on July 30, 2010. Discussions were held, and empirically- and technically-based proposals were made relying on data and analysis provided by DOE's consultants. The Joint Petitioners' proposal also is supported by the Pacific Northwest National Laboratory's analysis on benefits of smart appliances, as discussed below.

V. The Joint Stakeholder Proposal

The Joint Proposal is to provide a five percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for the smart-grid enabled appliances that are included in the Joint Proposal, which includes residential refrigerator/freezers, clothes washers, clothes dryers, room air-conditioners, and dishwashers. A five percent credit means that smart appliances would be allowed to use five percent more energy than non-smart products that earn the Energy Star designation.[2] The proposal will save consumers money and save energy, and may help increase the use of renewable energy.

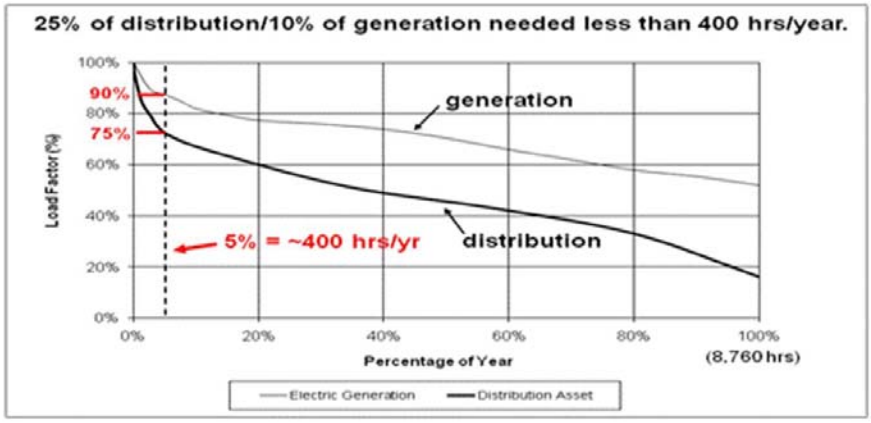
VI. Justification

A. The Problem: Electricity Use Is Increasing

EIA, in its 2010 *Annual Energy Outlook*, projects that electricity use will increase by more than 30 percent by 2035. Residential electricity use will increase by 23 percent from 2010-2035, due to growth in population and disposable income and continued population shifts to warmer regions with greater cooling requirements. Peak demand increases may be even more pronounced. One industry forecast of peak demand, which extrapolates the North American Electric Reliability Corporation's 2005 Peak Demand and Energy Projection Bandwidths, results in non-coincident peak demand that is 55 percent higher in 2030 than it was expected to be in

[2] Please note that the joint agreement and this petition does not cover what the Energy Star specification should be for non-smart appliances, against which the 5% credit would be calculated.

2008.[3] Summer peak load was expected to increase 430 GW in 2030 from the existing 781 GW. This forecast DOES NOT include expected demand response programs, but does include modest forecasted efficiency savings. Peak demand is the most costly because 10 percent of the generation and 25 percent of the transmission infrastructure are needed to service only 400 hours per year (see figure 1). However, the 2010 Annual Energy Outlook projects that electric power sector generating capacity will grow by only 8 percent from 2010 to 2030.



Source: Pacific Northwest National Laboratory

Figure 1

B. The Smart Grid Is Critical in Addressing the Increase in Electricity Use

As discussed below, the smart grid is an important part of efforts to address projected increases in electricity use. The Electric Power Research Institute (EPRI) estimates that the implementation of smart grid technologies could reduce electricity use by more than four percent annually by 2030.[4] And the residential sector is critically important to managing the electrical grid into the future. The residential sector represents 37 percent of electricity use and is the largest consuming sector of electricity (see figure 2).

[3] Ingrid Rohmund and Greg Wikler (Global Energy Partners, LLC), Ahmad Faruqui (The Brattle Group), Omar Siddiqui (Electric Power Research Institute) and Rick Tempchin (Edison Electric Institute), "Assessment of Achievable Potential for Energy Efficiency and Demand Response in the U.S. (2010 – 2030)," Paper prepared for 2008 ACEEE Summer Study on Energy Efficiency in Buildings, p. 5-264.

[4] Press Release, U.S. Department of Energy, Secretary Chu Announces Two Million Smart Grid Meters Installed Nationwide (August 31, 2010), *available at* http://www.energy.gov/news/9433.htm.

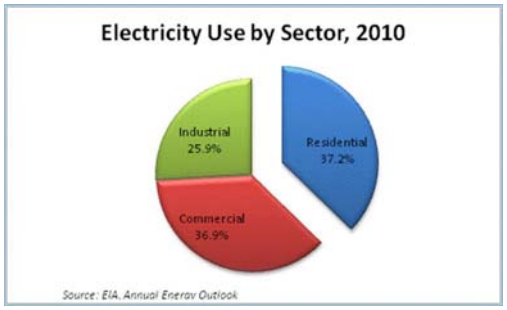


Figure 2

Demand response, augmented by the smart grid and smart appliances, will result in some energy savings and reductions in costs. The North American Energy Standards Board (NAESB) has defined demand response as "changes in electric use by demand-side resources from their normal consumption patterns in response to changes in the price of electricity, or to incentives designed to induce lower electricity use at times of potential peak load, high cost periods, or when systems reliability is jeopardized." [5] In other words, when an electric utility company or third party energy service provider encounters a problem, it can send a signal alerting the consumer of the complication so that the consumer can react by reducing load during this critical time period. Reduction in energy usage during critical periods is the result of a response to a request for lowered energy usage. Critical time reductions of energy use can be accomplished by either "shifting" usage to a non-critical time of the day or by "shedding" load to reduce peak power.

According to EPRI ". . . load reductions offered by demand response and load control programs facilitated by a Smart Grid can yield energy savings and reductions in carbon emissions."[6] And Secretary Chu has recognized that "[s]mart grid technologies will give consumers choice and promote energy savings, increase energy efficiency, and foster the growth of renewable energy resources."[7] Further evidence that reducing peak power is linked to saving energy, in the EIA's Electric Power Annual 2008 (Table 9.2) utilities reported for every 1kW of peak load reduction there is a corresponding 139 kWh of energy saved.

Reducing peak load provides several other benefits:

- provides relief during capacity-constrained periods
- reduces transmission congestion
- minimizes operation of peaking plants
- defers the need for new generation

According to a report released by Vice President Biden on August 24, 2010:

[5] "Measurement & Verification for Demand Response Programs," Recommendation to NAESB Executive Committee (July 29, 2009).

[6] "The Green Grid," Electric Power Research Institute, June 2008

[7] Press Release, U.S. Department of Energy, Secretary Chu Announces Two Million Smart Grid Meters Installed Nationwide (August 31, 2010), *available at* http://www.energy.gov/news/9433.htm.

> *Smart Grid technology, combined with supportive policy, allows for smarter use of energy, largely by increasing the transparency, measurement, and control of energy used by the players who supply, transmit, distribute, and demand it. Through automated sensors and controls as well as dynamic pricing, this intelligent infrastructure will make the electric system more reliable, empower consumers and utilities to use energy more wisely, help manage peak demand, enable larger scale use of renewable energy and electric vehicles, and reduce U.S. dependence on oil.*[8]

The Joint Petitioners' proposal for a five percent credit is exactly the type of supportive policy that will allow the smart grid to thrive and produce the above-enumerated benefits for consumers, utilities, and the environment.

C. Smart Appliances Benefit Spinning Reserves

To balance supply and demand continuously despite sudden, unexpected failures of generators and/or transmission lines, utilities typically maintain contingency reserves to compensate for such failures. Contingency reserves include: 10-minute spinning reserves, 10-minute non-synchronized reserves, and 30-minute operating reserves. The 10-minute spinning reserves are typically provided by generators supplying base-load power by operating the generators below their rated capacity, and then ramping them up when called upon to deliver spinning reserves. Despite their importance to power system operation, the larger the spinning reserve requirement, the greater the emissions.

In recent years, there has been considerable interest towards exploiting the enormous potential of demand response towards providing spinning reserves.[9] This is over and beyond peak-load reduction as discussed above. Residential loads capable of interacting with the grid (smart appliances) such as refrigerator/freezers, clothes washers, clothes dryers, room air-conditioners, and dishwashers are particularly suited as sources of 10-minute spinning reserves because the operation of such loads can be interrupted for short periods (up to 10 minutes) without causing any diminution of the quality of service for consumers. Furthermore, end-use load can often be curtailed almost instantaneously as opposed to generators that must ramp up and down subject to operating constraints in order to avoid equipment damage. Finally, given the potentially large number of responsive end-use loads, their aggregate response could be extremely reliable when called upon to provide spinning reserves. Thus, residential loads could obviate the need for maintaining some fossil-fuel based generation for providing spinning reserves thereby reducing operating costs and also lowering emissions.

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[8] Executive Office of the President of the United States and Vice President of the United States, "The Recovery Act: Transforming The American Economy Through Innovation," at 37 (August 2010), available at http://www.whitehouse.gov/sites/default/files/uploads/Recovery_Act_Innovation.pdf (emphasis added) [hereinafter "the Recovery Act Report"].

[9] Spinning Reserve From Responsive Load: http://certs.lbl.gov/pdf/spinning-reserves.pdf

Pacific Northwest National Laboratory (PNNL) has undertaken a study to evaluate the precise benefits of smart appliances towards providing both peak-load reduction and spinning reserves. An overview of this study is presented in Section E.

D. Definition of Smart Appliances and Product-specific Guidance

Defining smart appliances is challenging because it is a definition for a product that is still in its infancy, and a major purpose of this petition is to provide an incentive to increase the deployment across the country. Hence, it is important to clearly define the properties and capabilities of a 'Smart Appliance' to differentiate it from existing home appliances and ensure that the definition is not so restrictive that it stifles technology innovation and competition. The Joint Petitioners propose the following provisional definition of smart appliances:

Smart appliances are still in their infancy, presenting a significant definitional challenge. The Joint Petitioners believe it is important to clearly differentiate smart appliances from existing home appliances by defining smart appliance properties and capabilities. However, definitions must not be so restrictive as to stifle technology innovation and competition. The products must continue to comply with the applicable product safety standards -- the addition of smart technology cannot override existing safety protections and functions. Any reduction in load cannot adversely impact the product's inputs, e.g., clothes, foods, dishware.

The Joint Petitioners propose the following provisional definitions related to smart appliances. Any smart appliance must meet the definition of "smart appliance" and the product specific requirements below.

> **The term "smart appliance"** means a product that uses electricity for its main power source which has the capability to receive, interpret and act on a signal received from a utility, third party energy service provider or home energy management device, and automatically adjust its operation depending on both the signal's contents and settings from the consumer. The product will be sold with this capability, which can be built-in or added through an external device that easily connects to the appliance. The costs of such devices shall be included in the product purchase price.[10]
>
> These signals must include (but are not limited to) appliance delay load, time-based pricing and notifications for load-shedding to meet spinning reserve requirements. Any appliance operation settings or modes shall be easy for an average, non-technical consumer to activate or implement. Additionally, a smart appliance or added device may or may not have the capability to provide alerts and information to consumers via either visual or audible means. The appliance may not be shipped with pre-set time duration limits that are less than those listed below, but may allow consumer-set time duration

[10] If additional requirements are needed to activate the product's "smart" capabilities as purchased, then prominent labels and instructions must be displayed at the point of purchase and in product literature on what specifically consumers or utilities need to do to achieve these capabilities (e.g. "This product requires snapping in the compatible network module and utility installation of a smart meter or other device for use of capabilities that earned the ENERGY STAR label").

limits on smart operating modes, and will also allow consumers to override any specific mode (e.g. override a delay to allow immediate operation, limit delays to no more than a certain number of hours, or maintain a set room temperature).

The term "delay load capability" refers to the capability of an appliance to respond to a signal that demands a response intended to meet peak load deferral requirements, but which also could be used to respond to a sudden maintenance issue at another time of day.

The term "spinning reserve capability" means the capability of an appliance to respond to a signal that demands a response intended to temporarily reduce load by a short-term, specified amount, usually 10 minutes.

We further recommend product-specific definitions as provided below. Each of the following definitions includes a response to a "delay load signal" and a response to reduce load to provide spinning reserve services. A smart appliance needs to have the capability to meet both of these requirements, but not simultaneously.

a) Refrigerator/Freezers: a smart refrigerator/freezer must have the following minimum capabilities-

i) Delay load capability - upon receipt of a signal requesting a delay of load for a time duration not exceeding 4 hours, the product must shift defrost cycles beyond the delay period and do one of the following --

(1) shift ice maker cycles beyond the delay period, or

(2) reduce average wattage during the delay period by at least 9.6 watts relative to average load over a 24 hour period, and may shift this wattage beyond the delay period", and

ii) Spinning reserve capability - upon receipt of a signal requesting the start of a reduced load period for a time duration not exceeding 10 minutes, the product must restrict its average energy consumption during this time period to a maximum of 50 percent of the average load over a 24 hour period (unless there is a consumer initiated function, such as door opening or ice or water dispensing).

b) Clothes Washers: a clothes washer must have the following minimum capabilities -

i) Delay load capability - upon receipt of a signal requesting a delay of load for a time duration not exceeding either 4 hours or such other period that the consumer may select, the product must automatically delay the start of the operating cycle beyond the delay period, and

ii) Spinning reserve capability - upon receipt of a signal requesting the start of a reduced load period for a time duration not exceeding 10 minutes, the product must automatically reduce its average wattage during this time period by at least 50 percent relative to average wattage during this period in the operating cycle under DOE test conditions.

c) Clothes Dryers: a clothes dryer must have the following minimum capabilities -

i) Delay load capability - upon receipt of a signal requesting a delay of load for a time duration not exceeding 3 hours, the product must automatically delay the start of the operating cycle beyond the delay period, and

ii) Spinning reserve capability - upon receipt of a signal requesting the start of a reduced load period for a time duration not exceeding 10 minutes, the product must automatically reduce its average wattage during this period by at least 80 percent relative to average wattage during this period in the operating cycle under the DOE test conditions.

d) Room Air Conditioners: a room air conditioner must have the following minimum capabilities -

i) Delay load capability - upon receipt of a signal requesting a delay of load for a time duration not exceeding either 4 hours or such other period that the consumer may select, the product must automatically reduce its average wattage during this period by at least 25 percent relative to average wattage during this period in the operating cycle under the DOE test conditions, and

ii) Spinning reserve capability - upon receipt of a signal requesting the start of a reduced load period for a time duration not exceeding 10 minutes, the product must automatically reduce its average wattage during this period by at least 80 percent relative to average wattage during this period in the operating cycle under during the DOE test conditions.

e) Dishwashers: a dishwasher must have the following minimum capabilities-

i) Delay load capability - upon receipt of a signal requesting a delay of load for a time duration not exceeding either 4 hours or such other period that the consumer may select, the product must automatically delay the start of the operating cycle beyond the delay period , and

ii) Spinning reserve capability - upon receipt of a signal requesting the start of a reduced load period for a time duration not exceeding 10 minutes, the product must automatically reduce its average wattage during this period by at least 50 percent relative to average wattage during this period in the operating cycle under the DOE test conditions.

E. Benefits of Smart Appliances

PNNL has undertaken a study to evaluate the precise benefits of smart appliances (refrigerator/freezers, clothes washers, clothes dryers, room air-conditioners, and dishwashers) towards providing both peak-load reduction and spinning reserves through demand response. The benefits being considered are distinct from those arising due to traditional machine enhancements that enable operational efficiencies. The benefits include estimates of the production cost savings to utilities and the extent to which smart appliances can provide ancillary services to facilitate greater penetration of renewable generation sources (wind and solar in particular).

The analytical model developed by PNNL is based on generic smart appliance demand response capabilities, i.e., not limited to a particular manufacturer. The methodology adopted is based on various underlying parameters such as expected smart appliance penetration and usage rates, daily usage patterns, definitions of peak and off-peak periods, and other pertinent benefits-impacting assumptions. In establishing the monetary value of benefits, historical wholesale market clearing prices are drawn from various electric power markets including NYISO, CAISO, PJM, and ERCOT.

The model is based on ELCAP load shapes for daily usage patterns.[11] Appliance energy consumption is based on AHAM data and DOE standards and test procedures.[12] The valuation of benefits is different for each appliance, but for dryers, clothes washers, and dishwashers, the model first estimates the total on-peak and off-peak consumptions. Then, based on these consumptions, and annual hourly average energy market clearing prices, the wholesale production cost savings derived from shifting of a given percentage of peak load to off-peak periods is estimated. When it comes to spinning reserves, there are 3 components.

1. Load from dryers, clothes washers, and dishwashers that are operating during off peak.
2. Appliance loads not shifted from peak hours. Recall, only a certain percentage of loads are shifted from peak to off-peak hours. The remaining load during peak hours is available for spinning reserves.
3. Load shifted from peak to off-peak hours. This shifted load is also available for spinning reserves.

The annual hourly spinning-reserve market clearing prices are invoked to value these three spinning reserve components. The total operational cost savings or "benefits" are those arising from peak load shifting and spinning reserves.

The five percent smart appliance credit is then applied to the total annual operating cost of a given appliance to estimate the credit which is the "cost" applied towards making an appliance smart. Finally, the "benefits" to "cost" ratio is evaluated. The optimistic scenario generally assumes that all customers can receive grid signals and communicate these to the appliance and that all customers are willing to shift 100 percent of their on-peak loads. The pessimistic scenario generally assumes that 50 percent of customers can receive grid signals and communicate these to the appliance, that 70 percent of customers are willing to shift on-peak loads (90 percent in the case of the 10 minute shifts needed to serve spinning reserves), and that on average these customers will shift about 50 percent of their on-peak load out of the peak. The optimistic scenario assumes that shifts will move energy use out of a five-hour peak period on average, while the pessimistic scenario uses a four-hour average for shifts. A summary of the results are as follows and full report is attached:

> *As can be seen from **Table 1.1** and **Table 1.2**, in all the markets, in either optimistic or pessimistic assumption scenarios, the benefit-to-cost ratio for all appliances exceeds 100 percent. This is especially the case for the optimistic scenario, in which the benefits overwhelmingly exceed the cost as shown in **Table 1.1**. This means that the annual benefits from having smart grid capabilities in an appliance are greater than an equivalent five percent increase in operational machine efficiencies. The expectation then is that if ENERGY STAR adopts this proposal for a five percent incentive for smart appliances it will facilitate the growth of the smart-appliance industry.*

[11] Pratt, R.G., et al., 1989. "Description of Electric Energy Use in Single-Family Residences in the Pacific Northwest," End-Use Load and Consumer Assessment Program (ELCAP)," Pacific Northwest Laboratory, DOE/BP-13795-21, Richland, WA, April 1989

[12] http://www1.eere.energy.gov/buildings/appliance_standards/residential_products.html

Table 1.1: Benefit-to-Cost Ratios of Smart Appliances Based on "Optimistic" Assumptions

	DW	CW	RAC	Freezer	Refrigerator	Dryer
PJM 2006	528%	563%	733%	539%	536%	680%
ERCOT 2008	817%	871%	1060%	881%	877%	1054%
NYISO 2008	367%	403%	585%	357%	355%	462%
NYISO 2006	353%	389%	712%	346%	344%	442%
CAISO 2008	319%	356%	554%	313%	312%	396%

Table 1.2: Benefit-to-Cost Ratios of Smart Appliances Based on "Pessimistic" Assumptions

	DW	CW	RAC	Freezer	Refrigerator	Dryer
PJM 2006	136%	134%	131%	150%	150%	207%
ERCOT 2008	203%	200%	295%	230%	228%	337%
NYISO 2008	107%	106%	139%	112%	111%	147%
NYISO 2006	112%	112%	160%	119%	118%	160%
CAISO 2008	99%	100%	135%	102%	101%	134%

F. Synergies of Suite of Appliances

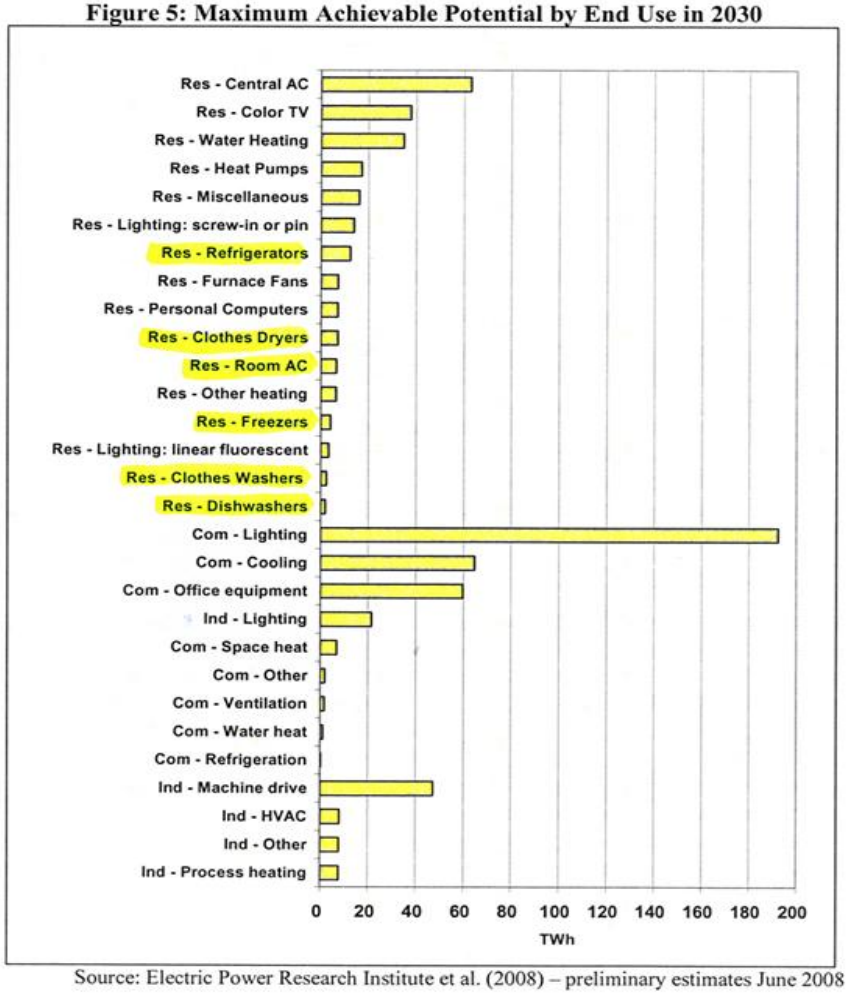
The benefits of smart appliances are greatly enhanced by the synergies provided by having multiple smart appliances in the home, hence the need for an across the board five percent credit to equally incentivize the deployment and use of "smart" features in all the products. For example, a suite of appliances in the home can better "represent" a power generation facility because of its flexibility to address load shifting and spinning-reserve requirements. Different products may provide strengths in different areas. For example, a refrigerator would likely have a high probability that its defrost operation would be shifted to a more desirable time (at any time of day or night) for the grid operations when needed, whereas a dryer, with its high load during a relatively short span of time usually during the day, would likely have a higher probability that its heat elements could be turned off or reduced for short periods of time during operation to reduce spinning reserve requirements. Thus, the synergies of a home suite with a broad mix of smart appliances would likely provide a correspondingly higher benefit to the environment, the consumer and the grid, than the additive benefits of each smart appliance evaluated separately.

G. Demand Response vs. Energy Efficiency

Increasing energy efficiency is not the only way to drive energy savings. As discussed above, demand response can also yield some energy savings. For example, cycling the dryer heating coil off while continuing to spin clothes allows use of the residual heat in the dryer, reducing heater-on time when the heater coil is restarted and yielding less total cycle energy use but a longer cycle time. The residential consumer and smart appliances are important to the success of demand response. Since late 2007 and after passage of the 2007 energy law, for example, efficiency savings were estimated by the Electric Power Research Institute (EPRI), including savings from refrigerators, dryers, room air conditioners, clothes washers, and dishwashers. EPRI found that the savings from these appliances were a small percentage of maximum achievable potential in 2030 in relation to other residential, commercial, and industrial uses.[13] Efficiency advocates believe that EPRI significantly underestimated the efficiency savings available from appliances (e.g., EPRI generally only looked at then-current Energy Star levels and not beyond). Still, efficiency advocates agree that as appliance efficiency continues to increase, remaining opportunities for appliance efficiency savings will decline Further information from the EPRI study is shown in Figure 3, which depicts that the maximum potential for efficiency savings in home appliances (highlighted in chart) that are affected by this petition is quite low compared with other products.

[13] Rohmund, Ingrid ,et. al (Global Energy Partners, Brattle Group, EPRI, EEI), Assessment of Achievable Potential for Energy Efficiency and Demand Response in the US (2010-2030)

Figure 5: Maximum Achievable Potential by End Use in 2030



Source: Electric Power Research Institute et al. (2008) – preliminary estimates June 2008

Figure 3

According to the EPRI assessment of achievable potential for energy efficiency and demand response in the U.S., demand response combined with increases in energy efficiency can offset 40 percent (173 GW) of the growth in summer peak demand by 2030 (see figure 4).[14]

[14] Ibid

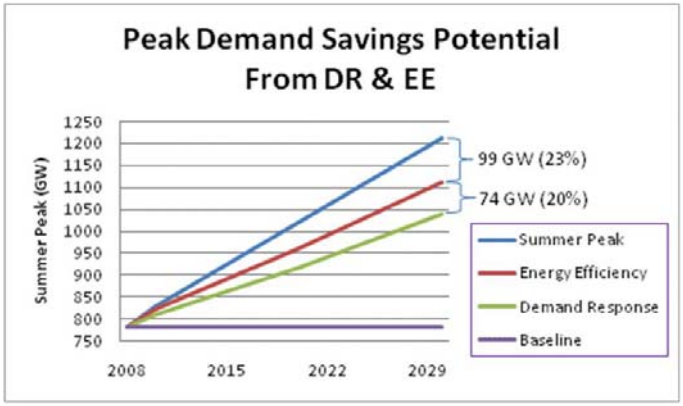


Figure 4

Significantly, residential customers offer as much demand response potential as small, medium, and large businesses combined (see figure 5).

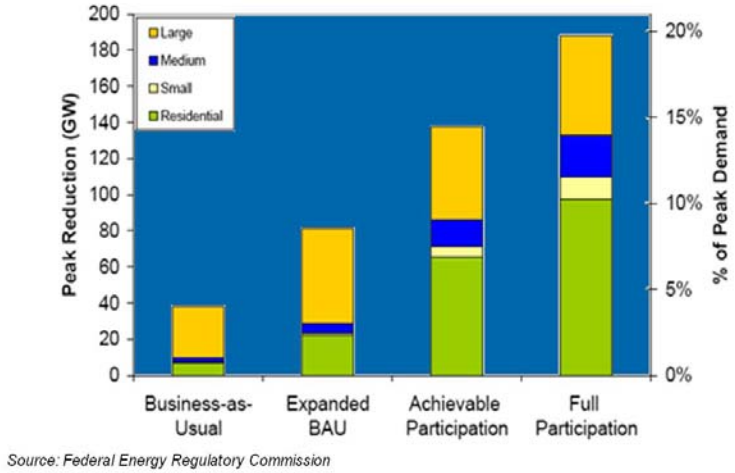
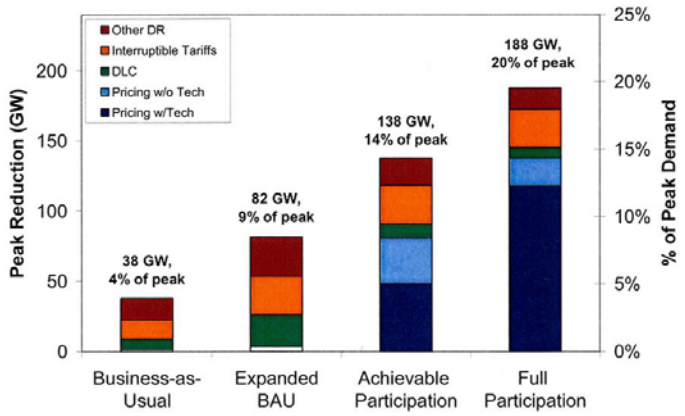


Figure 5

According to FERC, ". . . it is the residential class that represents most [sic] untapped potential for demand response. . . While residential customers provide only roughly 17 percent of today's demand response potential, in the AP [Achievable Participation] scenario they provide over 45 percent of the potential impacts."[15] The FERC National Assessment of Demand Response, June 2009, found that "pricing w/tech," (including smart appliances) offer more than half of the potential for peak demand reduction (see figure 6). Furthermore, as the PNNL study indicates, further gains are possible through the utilization of smart appliances for providing spinning reserves.

[15] "National Assessment of Demand Response," Federal Energy Regulatory Commission, June 2009



Source: FERC National Assessment of Demand Response, June 2009

Figure 6

H. Smart Appliances Are Untapped

It is expected that an increasing number of consumers will have access to smart meters over the next five years. According to the Recovery Act Report:

> . . . the Recovery Act recognized the opportunity to accelerate the deployment of components that make up a Smart Grid to support a modern, low-carbon economy and create a platform for innovation for new energy management and information services in homes and buildings. The combination of Recovery Act funds and private investments promise to add 18 million new smart meters to the eight million currently in use. This means 26 million smart meters will be in use by 2010, on track to reach 40 million by 2015 through public and private investment.[16]

However, in order for consumers to maximize the benefits they can obtain from these smart meters, it is important to incentivize the use of smart appliances in the home. The Joint Petitioners' proposed five percent credit will jump start this component of the smart grid, thus helping to achieve energy and other savings on an accelerated timeline.

I. Demand Reduction Yields Further Capacity Savings

Reducing demand also yields capacity savings. Reducing demand may have a 24 percent higher impact at the generating facility, which equates to even more capacity savings (see figure 7).

[16] The Recovery Act Report, *supra* n.4, at 39.

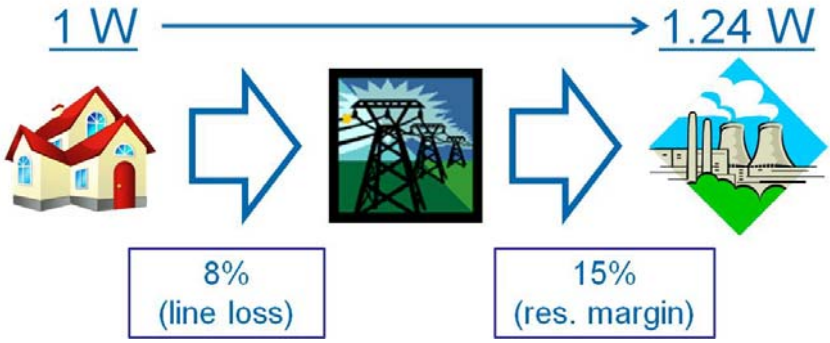


Figure 7 *(Source: The Brattle Group, Power of 5%)*

J. Increased Use of Renewable Energy

The benefit of the smart grid goes beyond energy savings. Due to environmental concerns, there has been increasing interest in recent years towards incorporating large amounts of renewable sources of energy such as solar and wind, and diminish the reliance on fossil-fuels to create a more diversified energy supply portfolio. For example, DOE has initiated a collaborative effort to explore the possibility of wind power supplying 20 percent of US electricity needs by the year 2030.[17] One of the key challenges involved with solar and wind as sources of energy is that they are intermittent and cannot be relied upon with certainty. Solar energy output can drop very quickly with passing clouds, while wind energy output changes very frequently, almost every hour. As a result, in order to balance supply and demand, a key objective of power system operation alluded to above, it is required to maintain energy reserves based on conventional generation sources like natural gas. But doing so works against the very purpose of incorporating solar and wind energy, namely, decreasing reliance on fossil fuels. Fortunately, demand response through smart appliances can be invoked to curtail and/or defer demand for power during periods when solar and wind energy are in short supply, and to shift the demand to when there is an abundance, enabling greater utilization of renewable energy.

Thus, smart appliances and smart grid can play an important role in facilitating greater utilization of intermittently available renewable resources such as solar and wind, from which will accrue reductions in CO_2 emissions.[18] The intermittent nature of the renewables is a critical impediment to greater impact. By developing a truly smart grid that can shift demand to when supply is available, this impediment gets reduced significantly. A dynamic response system like that envisioned for residential usage of smart appliances will enable renewable energy to become a more significant part of the total energy picture. This five percent energy credit for being smart grid enabled may be critical to increasing the use of renewable energy.

[17] http://www1.eere.energy.gov/windandhydro/wind_2030.html

[18] "The Green Grid," Electric Power Research Institute, June 2008

K. Smart Appliances Will Also Help Reduce Carbon Emissions

Recently, PNNL published a study that estimates the role of smart grid towards reducing carbon emissions.[19] In particular, the study evaluated the carbon reductions through nine smart grid mechanisms. PNNL found that carbon emissions can be reduced directly through smart grid applications, and indirectly by investing the operational savings resulting from smart grid into renewable sources of power generation and efficiency programs. The table below (see figure 8) summarizes the study's findings including the key conclusion: smart grid may facilitate a 12 percent direct carbon reduction, and a 6 percent indirect reduction.

Mechanism	Electric Sector Energy CO_2 Reductions	
	Direct	Indirect
Conservation Effect of Consumer Information and Feedback Systems	3%	-
Joint Marketing of Efficiency and Demand Response Programs	-	0%
Diagnostics in Residential and Small/Medium Commercial Buildings	3%	-
Measurement and Verification for Efficiency Programs	1%	0.5%
Shifting Load to More Efficient Generation	< 0.1%	-
Support Additional Electric Vehicles (EVs) / Plug-In Hybrid Electric Vehicles (PHEVs)	3%	-
Conservation Voltage Reduction and Advanced Voltage Control	2%	-
Support Penetration of Solar Generation (RPS > 25%)	(1)	(2)
Support Penetration of Wind Generation (25% RPS)	< 0.1%	5%
Total, Share of U.S. Electric Sector Energy and CO_2 Emissions	**12%**	**6%**

Figure 8. Nine Smart Grid based Carbon Reducing Mechanisms (Source: PNNL The Smart Grid: An Estimation of the Energy and CO2 Benefits)

The PNNL study does not explicitly identify the role of smart appliances in carbon reductions, but smart appliances could play a role in several of the carbon reducing mechanisms in the above table.

L. Smart Appliances Will Help Consumers Save Money

Smart appliances will also benefit the consumer. "The development of [smart grid tools for consumers] will enable both utilities and consumers to use electricity more efficiently, thereby reducing their costs."[20] For example, dynamic pricing of electricity creates the conditions that encourage consumers to change their or the appliances' behavior by using appliances when the

[19]Smart Grid: An Estimation of the Energy and CO2 Benefits, presentation to EPA, http://www.epa.gov/statelocalclimate/documents/pdf/pratt_presentation_3-23-2010.pdf

[20] The Recovery Act Report, *supra* n.4, at 40.

rates are lower, which if properly developed, will save consumers money on their total electricity bill. According to FERC's Assessment of Demand Response and Advanced Metering Report, there were an estimated 7.95 million installed advanced meters nationwide in 2009. These smart meters are already helping to reduce energy costs for families and businesses.[21] As stated above, EPRI estimates that the implementation of smart grid technologies could reduce electricity use by more than four percent annually by 2030, which would mean an electric bill savings of $20.4 billion for consumers and businesses around the country each year.[22]

VII. **Conclusion**

The Joint Petitioners recommend that the EPA and DOE adopt the Joint Proposal, providing a 5 percent credit to the energy performance level required to meet ENERGY STAR eligibility criteria for smart-grid enabled appliances contained in the Joint Proposal. We believe that the broad consensus in support of the proposed credit will allow ENERGY STAR and the consumers to benefit from smart appliances and the smart grid more quickly, avoiding lost energy savings and savings on electricity bills. We urge EPA and DOE to expedite the adoption of this proposal on as accelerated a schedule as possible, but preferably no later than March 31, 2011.

Joint Petitioners

Manufacturers

Kevin Messner
Vice President, Government Relations
Association of Home Appliance Manufacturers

Advocates

Steven Nadel
Executive Director
American Council for an Energy Efficient Economy

On Behalf of –

[21] Press Release, U.S. Department of Energy, Secretary Chu Announces Two Million Smart Grid Meters Installed Nationwide (August 31, 2010), *available at* http://www.energy.gov/news/9433.htm.

[22] *Ibid.*

Members of Major Appliance Division:
Whirlpool
General Electric
Electrolux
LG Electronics
BSH
Alliance Laundry
Viking Range
Sub-Zero Wolf
Friedrich A/C
U-Line
Samsung
Sharp Electronics
Miele
Heat Controller
AGA Marvel
Brown Stove
Haier
Fagor America
Airwell Group
Arcelik
Fisher & Paykel
Scotsman Ice
Indesit
Kuppersbusch
Kelon
DeLonghi

Appliance Standards Awareness Project
Natural Resources Defense Council
Alliance to Save Energy
Alliance for Water Efficiency
Northwest Power and Conservation Council
Northeast Energy Efficiency Partnerships
Consumer Federation of America
National Consumer Law Center

ATTACHMENT I

Energy Efficient and Smart Appliance Agreement of 2010

Supporters

Association of Home Appliance Manufacturers
American Council for an Energy-Efficient Economy
Appliance Standards Awareness Project
Natural Resources Defense Council
Earthjustice
Alliance to Save Energy
Northwest Power and Conservation Council
Northeast Energy Efficiency Partnerships
California Energy Commission
Demand Response and Smart Grid Coalition
Consumer Federation of America
National Consumer Law Center
Alliance for Water Efficiency

Agreement Overview

SAVES ENERGY/INCREASES ENERGY INDEPENDENCE

- Improves product energy efficiency and saves more than 9 Quads of energy over 30 years (U.S. uses ~100 quads)

SAVES WATER

- Requires and incentivizes clothes washers and dishwashers to use nearly 5 trillion less gallons of water over 30 years

REDUCES GHG EMISSIONS

- 30-year savings ~550 MMT CO2

SAVES CONSUMERS MONEY

- Net savings to consumers in the billions of $

SMART GRID AND ENERGY STAR

- Jump-starts the Smart Grid by helping to deploy smart appliances nationwide and enable consumers to better take advantage of demand-response and real-time pricing opportunities
- Recognizes smart appliance contributions through ENERGY STAR

Agreement Overview

JOBS

- Impacts 46,000 manufacturing jobs (19,000 direct; 27,000 supply chain/support) and creates new jobs, including bringing back to the US jobs that were outsourced in earlier years

MANUFACTURER INCENTIVES

- Incentivizes manufacturers to increase the production of super-efficient products—over and above ENERGY STAR levels—thereby saving even more energy and water and encouraging more job creation

DOE EFFICIENCIES

- Frees up resources now devoted to rulemakings on these products

New Refrigerator Standards

- 20-30% energy savings relative to current standards for major product categories.
- New standards take effect Jan. 1, 2014
- DOE to develop new test procedure to measure ice-maker energy use by Dec. 31, 2012. This is used for standard effective ~2016.

Refrigerator/Freezer Energy Savings by Category

% Savings	Classes
30%	Auto defrost freezers
25%	Top-mount and side-by-side R/F Manual defrost freezers
20%	Bottom-mount R/F
10-25%	Various smaller categories
	Standards are 5% lower for built-in units

New Clothes Washer Standards

- Initial standards effective Jan. 1, 2015
- Different standards for top-loaders and front-loaders
  - Top-loader standards have two phases
- Front-loaders: 43% energy savings and 52% water savings relative to current standard
- Top-loaders: 26% energy savings and 16% water savings (2015), 37% energy savings and 37% water savings (2018)

Clothes Washer Standards
(MEF/WF)

Category	Current Standard	2015 Standard	2018 Standard
Top-load, std size	1.26/9.5	1.72/8.0	2.0/6.0
Front-load, Std size		2.2/4.5	
Top-load, Compact	0.65/18.4	1.26/14.0	1.81/11.6
Front-load, Compact	N/A	1.72/8.0	

Clothes Dryer Standards

- 5% energy savings using current test procedure.
- In addition, test procedure modified to address effectiveness of auto termination. This provides significant additional energy savings from reduced over-drying.
- Standard takes effect Jan. 1, 2015

Room Air Conditioner Standards

(Effective June 1, 2014)

Product Description	Change in Standard	New Standard (EER)
Without Reverse Cycle w/Louvers		
<6,000	15%	11.2
6,000 to 7,999	15%	11.2
8,000-13,999	12%	11.0
14,000 to 19,999	11%	10.8
20,000-27,999	11%	9.4
≥28,000	6%	9.0
Without Reverse Cycle w/o Louvers		
< 6,000	13%	10.2
6,000 to 7,999	13%	10.2
8,000-10,999	14%	9.7
11,000-13,999	13%	9.6
14,000-19,999	11%	9.4
≥20,000	11%	9.4
With Reverse Cycle		
< 20,000 w/Louvers	10%	9.9
≥ 20,000 w/Louvers	11%	9.4
< 14,000 w/o Louvers	11%	9.4
≥ 14,000 w/o Louvers	10%	8.8
Casement		
Casement Only	10%	9.6
Casement-Slider	11%	10.5

Dishwasher Standards

- Improve efficiency of standard and compact dishwashers.
  - Standard units to 307 kWh/yr, 5.0 gal/cycle
  - Compact units to 222 kWh/yr, 3.5 gal/cycle
- Same as the July 2011 ENERGY STAR specification
- Reduces energy use 14% and water use 23%
- Takes effect Jan. 1, 2013

Smart Appliances

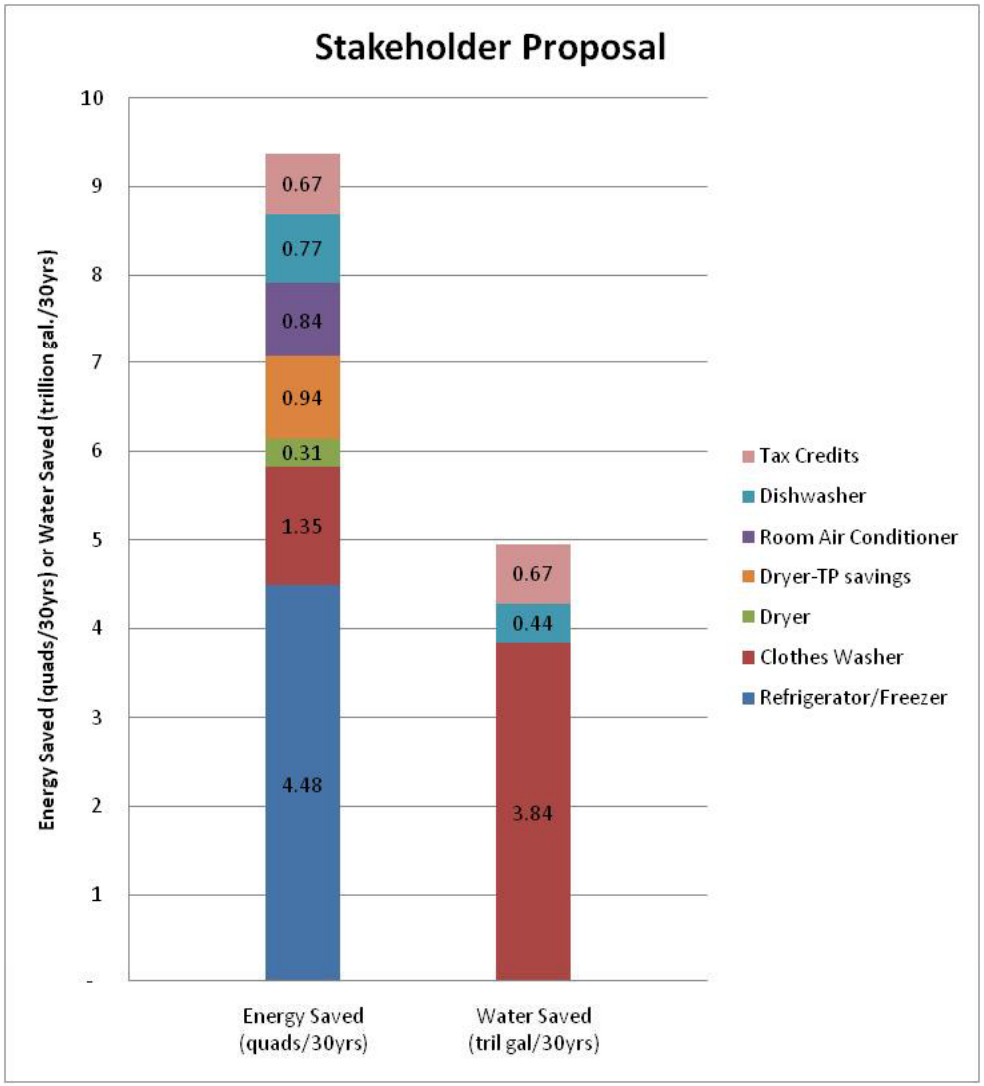
- Parties will jointly petition EPA to provide a 5% credit on energy use for products that meet an EPA-set definition of “smart appliance”.
  - Will include ability to push some energy use to off-peak periods when receive a signal from the utility.
- Parties will also work together to develop a proposal for tax or other incentives for appliances with “smart” capabilities.

Proposed Tax Incentives

(extension of current incentives that expire 12/31/10)

Product	Level	Amount	Year
Clothes washer-Top Load	2.2 MEF/4.5 WF	$175	capped in 2011, nothing after 2011
Clothes washer-Top Load	2.4 MEF/4.2 WF	$200	uncapped in 2011-2013
Clothes washer-Front and Top Load	2.8 MEF/3.5 WF	$250	uncapped in 2011-2013
Refrigerator	30% better than current standard	$150	capped in 2011-2013
Refrigerator	35% better than current standard	$200	uncapped in 2011-2013
Freezers	30% (auto deforst) and 25% (manual defrost) better than current standards	$150	capped in 2011-2012; no incentive 2013
Freezers	40% (auto deforst) and 35% (manual defrost) better than current standards	$200	uncapped in 2011-2013
Dishwasher*	307 kWh/5.0 WF	$25	capped in 2011, no incentive after 2011
Dishwasher*	295 kWh/4.25 WF	$50	capped in 2011-2013
Dishwasher*	280 kWh/4.0 WF	$75	uncapped in 2011-2013
* extra 0.5 WF for greater than 12 place settings			

Energy and Water Savings from Standards



ATTACHMENT 2

Energy Efficient and Smart Appliance Agreement of 2010
Refrigerator/Freezer

Product Class	Product Description	January 1, 2014		
		Change in Standard	Revised Standard Equation	
			Slope	Intercept
Standard size				
Automatic Defrost Refrigerator-Freezers				
3	Top Freezer w/o TTD ice	25%	7.35	207.0
6	Top Freezer w/ TTD ice	25%	7.65	267.0
4	Side Freezer w/o TTD ice	25%	3.68	380.6
7	Side Freezer w/ TTD ice	25%	7.58	304.5
5	Bottom Freezer w/o TTD ice	20%	3.68	367.2
5a/19	Bottom Freezer w/ TTD ice	20%	4.00	431.2
Manual & Partial Automatic Refrigerator-Freezers				
1	Manual Defrost	20%	7.06	198.7
2	Partial Automatic	20%	7.06	198.7
All Refrigerators				
1a	Manual Defrost	20%	7.06	198.7
3a	Automatic Defrost	25%	7.35	207.0
All Freezers				
8	Upright with manual defrost	25%	5.66	193.7
9	Upright with automatic defrost	30%	8.70	228.3
10	Chest with manual defrost	25%	7.41	107.8
10a/20	Chest with automatic defrost	30%	10.33	148.1
Compact Size				
Automatic Defrost Refrigerator-Freezers				
13/15	Top Freezer and Bottom Freezer	15%	10.80	301.8
14	Side Freezer	20%	6.08	400.8
Manual & Partial Automatic Refrigerator-Freezers				
11	Manual Defrost	25%	8.03	224.3
12	Partial Automatic	25%	5.25	298.5
All Refrigerators				
11a	Manual defrost	25%	8.03	224.3
13a	Automatic defrost	25%	9.53	266.3
All Freezers				
16	Upright with manual defrost	10%	8.80	225.7
17	Upright with automatic defrost	10%	10.26	351.9
18	Chest	10%	9.41	136.8
Built-ins				
Automatic Defrost Refrigerator-Freezers				
3B	Top Freezer w/o TTD ice	20%	7.84	220.8
4B	Side Freezer w/o TTD ice	20%	3.93	406.0
7B	Side Freezer w/ TTD ice	20%	8.08	324.8
5B	Bottom Freezer w/o TTD ice	15%	3.91	390.2
5aB	Bottom Freezer w// TTD ice	15%	4.25	458.2
All Refrigerators				
3aB	Automatic Defrost	20%	7.84	220.8
All Freezers				
9B	Upright with automatic defrost	25%	9.32	244.6

Energy Efficient and Smart Appliance Agreement of 2010
Clothes Washers

Product Description	New Standard Jan. 1, 2015		New Standard Jan. 1, 2018	
	Change in Standard	New Standard (MEF/WF)	Change in Standard	New Standard (MEF/WF)
Top-Loading, Compact (less than 1.6 cubic feet capacity)	48%/24%	1.26/14.0	64%/37%	1.81/11.6
Top-Loading, Standard	26%/16%	1.72/8.0	37%/37%	2.0/6.0
Front-Loading, Standard	43%/52%	2.2/4.5	N/A	N/A
Front-Loading, Compact (less than 1.6 cubic feet capacity)	new	1.72/8.0	N/A	N/A

Energy Efficient and Smart Appliance Agreement of 2010
Dryers

Product Description	January 1, 2015	
	Change in Standard	New Standard (EF)
Vented Electric Standard	5%	3.17
Vented Electric Compact 120V	5%	3.29
Vented Electric Compact 240V	5%	3.05
Vented Gas	5%	2.81
Vent-less Electric Compact 240V	new	2.37
Vent-less Electric Combination Washer/Dryer	new	1.95

Energy Efficient and Smart Appliance Agreement of 2010
Room Air Conditioners

Product Description	June 1, 2014	
	Change in Standard	New Standard (EER)
Without Reverse Cycle w/Louvers		
<6,000	15%	11.2
6,000 to 7,999	15%	11.2
8,000-13,999	12%	11.0
14,000 to 19,999	11%	10.8
20,000-27,999	11%	9.4
≥28,000	6%	9.0
Without Reverse Cycle w/o Louvers		
< 6,000	13%	10.2
6,000 to 7,999	13%	10.2
8,000-10,999	14%	9.7
11,000-13,999	13%	9.6
14,000-19,999	11%	9.4
≥20,000	11%	9.4
With Reverse Cycle		
< 20,000 w/Louvers	10%	9.9
≥ 20,000 w/Louvers	11%	9.4
< 14,000 w/o Louvers	11%	9.4
≥ 14,000 w/o Louvers	10%	8.8
Casement		
Casement Only	10%	9.6
Casement-Slider	11%	10.5

Energy Efficient and Smart Appliance Agreement of 2010
Dishwashers

Product Description	January 1, 2013	
	Change in Standard	New Standard
Standard (≥ 8 place settings plus 6 serving pieces)	14% & 23%	307 kWh/year & 5.0 gallons/cycle
Compact (< 8 place settings plus 6 serving pieces)	15% & 24%	222 kWh/year & 3.5 gallons/cycle

Agreement on Minimum Federal Efficiency Standards,
Smart Appliances, Federal Incentives and
Related Matters for Specified Appliances

July 30, 2010

THIS AGREEMENT memorializes the commitments made by the undersigned representatives of the organizations (the "Joint Stakeholders") regarding joint recommendations for new energy and water conservation standards, test procedures, tax incentives and Energy Star criteria for specified major home appliances. The Joint Stakeholders will jointly submit to the United States Congress and the Administration (including, but not limited to the Department of Energy (DOE) and the Environmental Protection Agency (EPA)) this Agreement and the specific recommendations herein in such form as will facilitate their adoption. The Joint Stakeholders agree to pursue a multi-pronged approach designed to achieve Congressional and regulatory implementation of all the elements contained in the agreement. Any changes to this agreement must be mutually agreed to by the joint Stakeholders.

1. The Joint Stakeholders will jointly submit to Congress and, in good faith, proactively seek enactment of the energy and water conservation standards contained in Attachment I. The Joint Stakeholders will submit to Congress recommended amendments to the Energy Policy and Conservation Act enacting these standards (Attachment II). These amendments include revised standards for refrigerator/freezers, clothes washers, clothes dryers, room air conditioners and dishwashers.

2. Not later than August 1, 2010, the Joint Stakeholders shall submit this agreement to DOE. The Joint Stakeholders shall jointly propose that DOE issue final rules adopting each of the energy conservation standards contained in Attachment I and the amendments presented to Congress and will proactively advocate for DOE adoption of these standards. The Joint Stakeholders agree that the recommended standards address all of the statutory criteria that the Department is required to take into account in promulgating new energy and water conservation standards for the affected products with respect to the specified efficiency criteria.

3. For refrigerators/freezers, clothes washers, room air conditioners and clothes dryers, the Joint Stakeholders shall submit comments to each product's DOE docket supporting the recommendations. For refrigerator/freezers, such comment shall be filed not later than August 10, 2010; for clothes dryers and room air conditioners, not later than September 10, 2010 and for clothes washers not later than October 31, 2010. In the case of dishwashers (for which no rulemaking is currently underway) not later than September 15, 2010, the Joint Stakeholders shall petition DOE to initiate a rulemaking and to publish a final rule by September 2011.

4. The Joint Stakeholders have made no agreement concerning the appropriate levels for standby or off mode energy consumption and agree that stakeholders will comment to

DOE as they view appropriate during DOE's rulemaking process for each of the affected products, as applicable.

5. The Joint Stakeholders agree that pending amendments to test procedures for the affected products should be completed by DOE, subject to input from all stakeholders and agree to recommend that DOE translate the standards contained in this agreement to equivalent levels specified under revised test procedures.

6. The Joint Stakeholders agree to jointly petition DOE to initiate a rulemaking by January 1, 2012 to be completed by December 31, 2012 to revise the test procedure for refrigerators/freezers to incorporate measured ice maker energy use. The Joint Stakeholders will make good faith efforts to work collaboratively through AHAM's HRF-1 task force to arrive at a joint test procedure recommendation. AHAM will invite the non-manufacturer signers to this agreement to designate a participant for the task force only for the development of this initial test procedure for refrigerators/freezers to incorporate measured ice maker energy use. As part of the petition to be filed, the Joint Stakeholders further agree to petition DOE for rulemaking to incorporate measured ice maker energy use into an amended refrigerator standard to be completed within six months of a revised test procedure incorporating measured ice maker energy use based on the procedure recommended by AHAM's HRF-1 task force and to recommend that this amended standard take effect three years after a final rule is published. This commitment to petition for rulemaking and standards revisions applies whether a specific consensus test procedure is developed by AHAM's HRF-1 task force or not.

7. The Joint Stakeholders agree to submit the letters and attachments recommending certain modifications to the test procedures for refrigerator/freezers, clothes washers and clothes dryers contained in Attachment III, IV and V not later than August 1, 2010. The Joint Stakeholders agree that each party may advocate for any other modifications to the test procedures, provided such modification is not in direct contradiction to the attached recommendations.

8. The Joint Stakeholders will jointly submit to Congress recommendations for extending the existing federal manufacturer tax credits for specified appliances as described in Attachment VI.

9. The Joint Stakeholders will in good faith jointly develop and proactively support the adoption of federal tax credits or other incentives for widespread deployment and effective integration of smart-grid enabled versions of appliances subject to this agreement across the United States.

10. The Joint Stakeholders will jointly petition EPA and DOE no later than September 30, 2010 to provide a 5% credit to the energy performance level required to meet ENERGY STAR eligibility criteria for smart-grid enabled appliances that are subject to this agreement.

11. Any filings, proposals or responses to DOE notices shall be consistent with this Agreement and the parties shall file rulemaking petitions, file comments or take other actions with respect to DOE or other regulatory agencies consistent with this Agreement.

12. The Joint Stakeholders agree to cooperate with each other in the preparation of press releases and public statements in support of this Agreement.

13. The Joint Stakeholders agree to support and cooperate with each other to obtain passage of the legislation described in the Agreement, including advocacy in Congress and to the Administration. The Joint Stakeholders agree to develop and jointly recommend legislative history concerning the recommended amendments.

14. The Joint Stakeholders agree to consult with and obtain consent from all parties before supporting, advocating or agreeing to changes in the legislation. Such consent will not unreasonably be withheld.

15. The Joint Stakeholders agree not to attempt to overturn or revise, or to file or support any legal or legislative challenge to, the recommendations once adopted, whether by Act of Congress or by rule. The Stakeholders agree to support DOE in a manner as each one deems to be reasonable and appropriate in defending any legal, legislative, or administrative challenge to a final rule that adopts the proposed standards. This provision will still apply if DOE, on its own volition, adopts a rule that includes minor deviations from Attachment I. The Joint Stakeholders agree to consult with respect to their responses to any deviation from the recommendations and to make good faith efforts to respond jointly.

16. The Joint Stakeholders agree to implement the commitments made in this Agreement individually or in groups. Each Joint Stakeholder will respond in good faith to reasonable requests by other Joint Stakeholders for joint implementation of any of these commitments.

17. Any additional mutually agreed to changes to this agreement will be provided to Congress and the Administration as necessitated.

18. Nothing in this Agreement is intended to inhibit in any way efforts by individual stakeholders to research, develop, or market products to standards that differ from those contemplated by this Agreement, provided such products are in compliance with applicable laws and regulations.

19. Nothing in this Agreement is intended to direct any technical or product design approach to achieving efficiency standards and the parties shall not take any act to establish any such common approach.

20. This Agreement is hereby agreed to, in counterparts, by the undersigned Joint Stakeholders. This Agreement binds the undersigned Joint Stakeholders, their

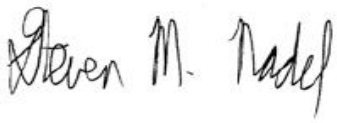
employees, their agents, and any successors and will take effect when all signatures are affixed. This agreement applies until December 31, 2012, except clause 15 which applies until December 31, 2013.

Joint Stakeholders

Manufacturers

Joseph McGuire
President
Association of Home Appliance Manufacturers

Advocates



Steven Nadel
Executive Director
American Council for an Energy Efficient Economy

On Behalf of –

Members of Major Appliance Division:
Whirlpool
General Electric
Electrolux
LG Electronics
BSH
Alliance Laundry
Viking Range
Sub-Zero Wolf
Friedrich A/C
U-Line
Samsung
Sharp Electronics
Miele
Heat Controller
AGA Marvel
Brown Stove
Haier
Fagor America
Airwell Group
Arcelik
Fisher & Paykel
Scotsman Ice
Indesit
Kuppersbusch
Kelon
DeLonghi

Appliance Standards Awareness Project
Natural Resources Defense Council
Alliance to Save Energy
Alliance for Water Efficiency
Northwest Power and Conservation Council
Northeast Energy Efficiency Partnerships
Consumer Federation of America
National Consumer Law Center

Attachments

(I) Recommended energy and water conservation standards
(II) Recommended legislative amendments
(III) Recommendations concerning refrigerator test procedures
(IV) Recommendations concerning clothes washer test procedures
(V) Recommendations concerning clothes dryer test procedures
(VI) Recommended legislative amendment for tax incentives