

The New Landscape for Appliance Efficiency Standards

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ABSTRACT

In 1974, California became the first state in the United States to mandate energy efficiency standards for appliances. The first four regulations—for refrigerators, freezers, room air conditioners, and central air conditioners—paved the way for new and expanded standards both in California and many other states, as well as providing motivation for a national appliance standards program in the U.S. and around the world. Thirty-three years later, the California Energy Commission continues to periodically strengthen and expand the existing standards. Although the objective remains the same—to economically reduce California’s energy consumption—the strategies to reach that end have evolved over the past three decades.

This paper provides policy makers and efficiency advocates an understanding of the changing landscape for conceptualizing and establishing state appliance standards. We expand upon several themes including: 1) new policy objectives forming in response to climate change; 2) challenges between federal and state standards programs; and 3) the need for strategic coordination with voluntary initiatives and international standards activities in light of increasing technological complexity. We offer recommendations to address these framework changes by using specific examples from the recent standards activity in California.

Introduction

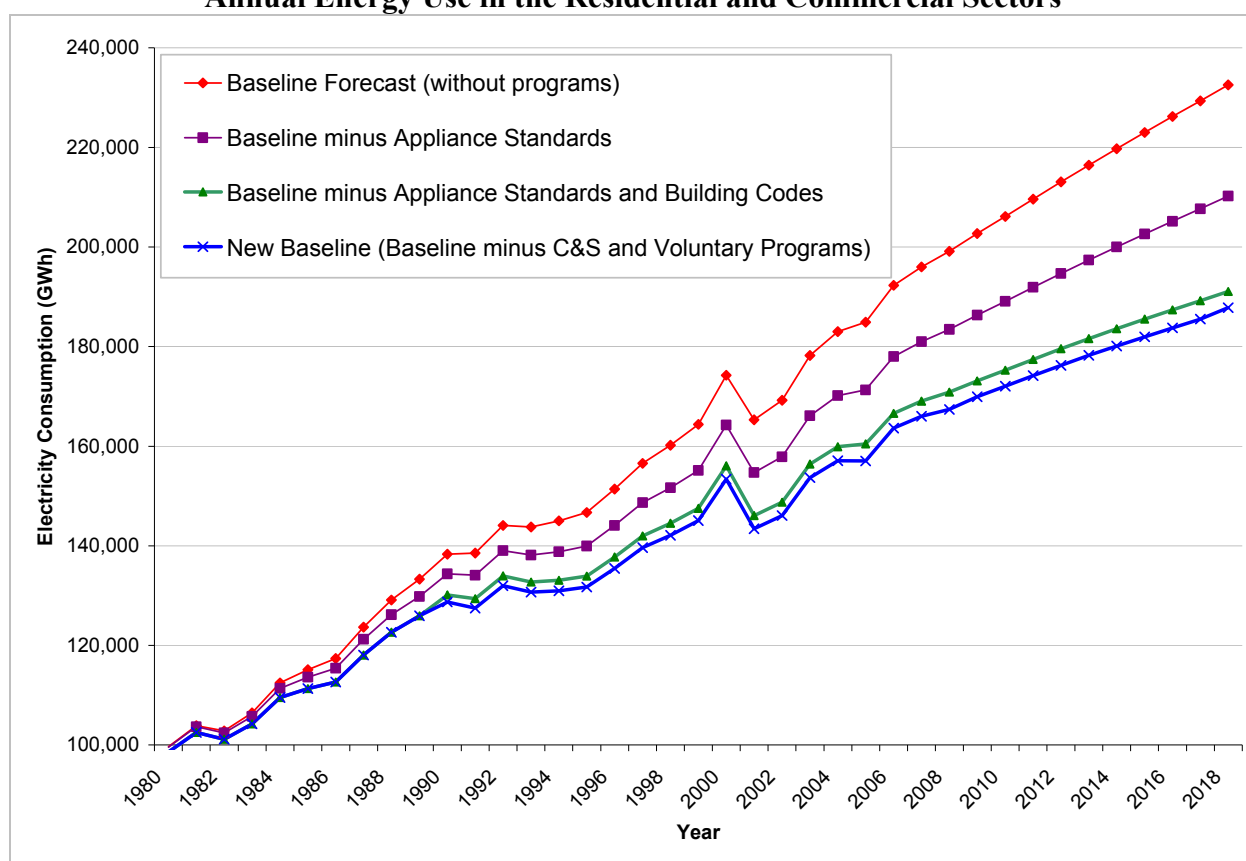
In 1974, California was the first state in the country to mandate energy efficiency standards for appliances. Those first four regulations—for refrigerators, freezers, room air conditioners, and central air conditioners—paved the way for new and expanded standards both in California and many other states, as well as providing motivation for the national appliance standards program implemented by the U.S. Department of Energy (DOE). In 1975, Congress passed the initial federal appliance standards legislation, known as Energy Policy and Conservation Act (EPCA) and was amended three years later to expand its scope.¹ After stonewalling by the Reagan Administration during the early 80s, this was followed by additional acts in 1987 and 1988 known as National Appliance Energy Conservation Amendments. In addition to establishing which products were to be covered by the DOE appliance standards program, the legislation established “preemption” provisions, which allow states to apply for a waiver from federal preemption for more rigorous local standards where a unique and compelling need is demonstrated. Thirty-three years after the program was first established, the federal government and states such as California continue to periodically strengthen and expand the scope of their regulations.

At the national level, by 2004 the DOE had developed and in some cases updated standards for 39 residential and commercial products. At a cost to the government of

¹ EPCA 1975 focused on major residential appliances. The National Energy Conservation Policy Act of 1978 amended EPCA to add Part C of Title III, which established an energy conservation program for certain industrial equipment.

approximately two dollars per household, the federal residential standards adopted so far have been estimated to contribute \$1,180 of net-present-value savings per household to the U.S. economy during the lifetimes of the products included (Wiel & McMahon 2005; Metz et al. 2007). The energy savings impacts are greater in California. Figure 1 below shows the energy savings impact of California's appliance efficiency standards (Title 20)², building energy standards, and voluntary programs on the total annual electricity consumption in the commercial and residential sectors for California's three large investor owned utilities (IOUs) and the two largest municipal utilities. Appliance standards have become a substantive energy "resource" throughout the country and in particular California. While these combined efficiency efforts to date have substantially reduced energy consumption over time, they fall far short of stopping or reversing total load growth as shown in Figure 1.

Figure 1. Estimates and Forecasts of California Conservation Programs Impacts on Total Annual Energy Use in the Residential and Commercial Sectors



Note: Y-axis starts at 100,000 GWh to show greater detail. Savings from appliance standards, building codes, and voluntary utility program are for the PG&E, SCE, SD&E, SMUD, and LADWP utility areas. Residential and Commercial sectors make up approximately two-thirds of total statewide consumption. Sources for estimates are from Table 6, Table 42, and Form 1.1b of CEC 2007.

These savings impact, while impressive, might have been larger had DOE stayed on schedule. Appliance standards adoption activity, especially at the federal level was significant

² Title 20 incorporates federal appliance standards, so the impacts in Figure 1 include both California and federal standards.

through the early 1990s; Congress established coverage of 14 primarily residential products in 1987 and another 12 primarily commercial products in 1992. Unfortunately, DOE's implementation of updated and new standards stalled out two years later and did not really recover until a 2006 court consent decree.³ In response to policy shifts discussed below, appliance standards adoption activity has increased markedly since 2004. California, despite a lack of cooperation from the federal government, adopted 23 standards in 2004, another four in 2006. With the assistance of the Appliance Standards Awareness Project (ASAP) and its Model Legislation support, since 2001 twelve other states have adopted or are in the process of adopting between four and twenty different product standards (ASAP & NEEP 2008). In August 2005, Congress passed the Energy Policy Act (EPAc) of 2005 which established 16 federal standards and directed DOE to conduct rulemakings for five additional products (Nadel 2006).⁴ Most recently, the Energy Independence and Security Act of 2007 (EISA 2007) established ten new standards, including standards for three newly covered products based on State standards. EISA 2007 also directed DOE to initiate nine additional federal standards update rulings (ASAP & ACEEE 2007).

Table 1. Estimated Energy and GHG Savings from Proposed California Efficiency Standards

Topic	Estimated Measure Life	First Year Savings in 2010			Savings in 2020		
		Electricity (GWh)	Peak Demand (MW)	GHGs (MMTCO ₂ e)	Electricity (GWh)	Peak Demand (MW)	GHGs (MMTCO ₂ e)
General Purpose Lighting: Tier 2	2	2832	106	1.48	5,664	106	2.95
Televisions	10	233	32	0.12	2,330	320	1.21
General Purpose Lighting: Tier 1	2	926	64	0.48	926	64	0.48
Battery Chargers	4	416	52	0.22	1,664	208	0.87
Set Top Boxes	4	268	31	0.14	1,072	122	0.56
Linear Fluorescent Fixtures	25	31	9	0.02	312	220	0.16
Decorative String Lights	6	116	2	0.06	696	12	0.36
Portable Lighting Fixtures	20	34	3	0.02	340	65	0.18
Computer Monitors	4	100	14	0.05	400	54	0.21
Plug-in Luminous Signs	10	32	3	0.02	324	35	0.17
Metal Halide Fixtures	14	19	5	0.01	190	70	0.10
Nightlights	10	14	1	0.01	140	8	0.07
Power Supply for Signage	10	5	5	0.00	50	50	0.03
Illuminated street number signs	20	1	0	0.00	6	-	0.00
Total Savings		5,027	326	2.6	14,115	1,333	7.4
Percent of California total:							
Electricity / Peak Demand / GHGs		1.8%	0.5%	0.5%	4.4%	1.8%	1.2%
Percent of GHGs from electric sector only				1.8%			4.4%
Percent of 2020 AB 32 electric sector reduction goal (~48 MMTCO ₂ e)							15%

Notes: 1/Values are estimates as of May 11, 2008. 2/Assumes an effective standard date of January 1, 2010. 3/Savings in 2020 are ten-years worth of savings or savings after stock turnover if the estimated measure life is less than ten years. 4/ General purpose lighting savings are Californian estimates for accelerating Federal EISA 2007 standard levels one year for Tier 1 and two years for Tier 2.

Acknowledgements: Values are taken from research and reports developed by the PG&E Title 20 Technical team, which includes ACEEE, Davis Energy Group, Ecos Consulting, Energy Solutions, Lighting Wizards, and LED Consulting.

Sources: See CEC 2008 for reports and recommendations for each topic; 2010 and 2020 CA electricity and demand estimates are from CEC 2007; GHG values are based on an avoided emissions factor of 0.000531 million metric tons of carbon dioxide equivalent (CO₂e) per gigawatt-hour delivered (derived from CA EPA 2006).

³ State of New York v. Bodman/NRDC v. Bodman, Nos. 05 Civ. 7807/05 Civ. 7808 (SD.N.Y.)(consent decree filed Nov. 6, 2006)).

⁴ The standards established by EPAc 2005 and EISA 2007 were based on California and other state standards.

The pace continues at the state level in California. The California Energy Commission (CEC) opened up its latest appliance regulations (docket number 07-AAER-3) in December 2007. The focus will be on lighting measures in 2008 in an effort to comply with AB1109 (Huffman) directions requiring completion of lighting standards by the end of 2008. Table 1 identifies the new slate of proposed California Title 20 standards (including subsequent federal standards in the case of general service lamps) with preliminary estimates of savings at full stock turnover. The current list of proposals represents an estimated 14,000 GWh per year of savings and peak demand reduction of more than 1,300 once the full stock turns over--over four percent of California's current annual energy use (CEC 2007).

Using California's recent appliance proceedings as a point of reference, we explore the changing dynamics that underlie the appliance efficiency regulatory "landscape" and make recommendations for future standards setting processes to assist advocates and policy makers to maximize the effectiveness.

Shifting Standards Landscape

The appliance standards landscape has changed rather dramatically over the last decade in ways that have important implications for setting standards in the future. These changes are related to recent, fundamental environmental policy shifts as well as increased standard setting activities at the federal level, differing characteristics of the primary end uses targeted for standards, and evolution in the strategic processes by which standards are set. These changes bring both challenges and opportunities for standards advocates and developers. An awareness of the new landscape is important for effective advocacy of appliance and equipment regulations.⁵

New Policy Priorities

Until recently, the primary underlying motivations for ongoing appliance standards development has been protecting natural resources and lowering aggregate societal costs of energy use. However, the war in Iraq and increasing public acceptance of the "peak oil" concept has reawakened a broadly held sense of urgency to begin refocusing on energy self-sufficiency and fuels conservation. More significantly, the groundswell of public awareness and concern about climate change risks has led to recent policies that seek to slow and reverse the rate of carbon emission of our economy. Because energy production is one of the primary sources of anthropogenic carbon, decreasing the carbon intensity of the energy sector is a fundamental opportunity and policy goal. While the federal government has not implemented robust climate policies, states, municipalities and corporations have developed their own climate change mitigation policies.

For example, in 2006 California passed Assembly Bill 32 (AB32), which requires that California return to its 1990 levels of carbon emissions by 2020.⁶ To help meet the AB32 goals,

⁵ Not only are these issues important to standards advocates, but they are becoming increasingly important and relevant to voluntary program implementers, who are also being impacted by some of the same forces.

⁶ California has managed to hold the growth in per capita energy consumption flat in recent decades. However, increasing population results in higher total electric demand, despite the comparatively aggressive energy efficiency policies and voluntary utility programs in California. Figure 1 suggests California must double or triple its delivery of energy efficiency achievements in the very near term if it is to flatten its load growth curve.

Assembly Bill 1109 (known as the Huffman Bill) was passed in 2007 and directed the CEC to take dramatic and immediate action to support AB32 goals through lighting efficiency. AB1109 requires a 50% across the board reduction in residential lighting energy use and a 25% reduction in commercial building lighting and outdoor lighting energy use by 2018. AB1109 is unprecedented in its scope and rigor. Also, Governor Schwarzenegger articulated longer term policy goals for carbon reduction of 80% by 2050 in line with the Intergovernmental Panel on Climate Change (IPCC) goals. These and other California climate policy documents, as well as many of policies statements from around the country and the world, specifically highlight building and appliance standards as an important component of the energy reduction “wedge” for CO2 reduction plan.

A number of implications for standards setting strategies result from this developing policy priority. Perhaps most significant will be the overall support for the standards development process. Industry stakeholders will tend to retreat from more ideological opposition (e.g., “standards are bad for Americans”) to more pragmatic, product-specific positions, and regulatory staff and politicians will redouble their availability and efforts to attend to the opportunities presented by new regulations. This can already be seen in the increase in federal and state standards setting in the last few years.

Also very important is the fact that now standards can be tied to specific end goals relating to aggregate energy use, rather than slowly lifting the floor for the sake of incremental per unit savings. For example, Table 1 shows the aggregate estimated carbon reduction impact for the current “2008” slate of Title 20 proposals. Assuming all standards are adopted, based on preliminary analyses, 7.4 MMT of CO2 equivalent can be mitigated. Thus, the Title 20 2008 proceeding promises to deliver roughly 15% of the AB32 electric generation reduction goal in 2020. While there are other efficiency strategies to obtain the remaining 85% required reduction, standards are comparatively cost effective. Policy makers therefore can and should assign significant allocations of overall carbon reduction goals to the appliance standards programs. Standards advocates and developers should, therefore, express proposed standards impacts in terms of carbon reduction as well as energy savings in order to garner more support and potentially more rigorous standards levels.

A more specific policy interpretation standards developers should push is reframing the interpretation of the enabling language for both the federal and state appliance programs. The DOE’s statutory and frequently stated objective is to “select energy conservation standards that achieve the maximum improvement in energy efficiency that is technologically feasible, economically justified, and will result in significant energy savings” (DOE 2006). Yet, the final standards levels tend towards the lowest lifecycle cost. Instead, the goal should be to seek out the most efficient level that is still economic and feasible. Refocusing federal efforts on more aggressive standards levels may require updated interpretations of certain other regulatory benchmarks (e.g., permissible manufacturer impacts), but could result in more rigorous standards levels allowing billions of dollars more of societal net present value and greater energy savings. Rarely, have pre-2005 federal standards pushed the envelope of available efficiency technology. Furthermore, as noted in recent standards advocate comments to DOE, if DOE would “monetize pollution reduction benefits” including CO2 in the benefit-cost analyses used to set the standard levels, the relative cost-effectiveness of the more efficient levels would increase, generally favoring more stringent standards (deLaski 2008, 10). DOE must be encouraged to make these changes to its analyses.

Accelerated standards development can be disruptive to voluntary efficiency program operations and penalize some voluntary program administrators by removing savings opportunities from their portfolios if no attribution is given for their codes and standards work. As program administrators are given more aggressive overall efficiency portfolio goals, this conflict could create substantial interference with the level of vigor with which these same parties pursue and support standards setting opportunities. In California, the standards efforts in recent years have been largely driven by California IOUs. Seeing this conflict, the California Public Utility Commission has allowed IOUs to receive credit toward their efficiency goals and incentive payments for supporting development of energy efficiency codes and standards beginning with the 2006/2008 program cycle. In addition, IOU appliance standards support activities are held out as a central element of the California Energy Efficiency Strategic Plan for the period 2009-2020 being developed at the direction of the California Public Utilities Commission (PG&E, Sempra & SCE 2008).⁷

The potential standards development resources of utilities are unmatched by any other standards advocate groups, which generally consists of a few, very effective, non-profit public interest groups and, of course, a small number of active state government employees.⁸ Beyond the power of the purse, utilities, as large for-profit corporations looking after the interests of their millions of customers, bring a complementary “corporate” presence to the advocates’ side of the debate, frustrating efforts of those opponents who wish to present the standards debate as “progress and economy versus environmental fringe elements”. Standards advocates, therefore, should support other states in “decoupling” utility earnings from electric sales and other policy changes that directly encourage utilities to pursue codes and standards opportunities.

Regulatory Agency Trends

DOE reengagement in federal standards rulemaking. The combination of growing awareness of climate risk, increasing concerns about energy independence resulting from the war in Iraq, and court mandates have spurred DOE into action. Consequently, DOE has established timelines and is in the process of implementing catch up proceedings for the 18 products rulemakings on which it was already far behind schedule. DOE is also moving forward with new product rulemakings established by Congress in EPA 2005 and EISA 2007. The combined list of rulemakings represents an ambitious plan compared to the quiescence of the last two decades.

Another trend that should be noted is the increase in “negotiated” federal standards. Recognizing the importance of fast tracking broadly supported standards proposals, EISA 2007 created an accelerated consensus standards pathway within the DOE rulemaking procedures that allows expedited promulgations of broadly supported standards. Similarly, EISA 2007 tightened the process for DOE to adopt ASHRAE 90.1 equipment standards levels so that ASHRAE levels become enshrined in DOE regulations within eighteen months, unless DOE deems more aggressive standards for those products are feasible. More advocate participation in these

⁷ An example of the numerous references to aggressive standards development in this document is strategy 7, entitled “Support Aggressive Enhancement and Enforcement of California Building Energy Codes and Standard”, which asserts, “To achieve the high levels of energy savings envisioned in this Plan, energy codes & standards must be strongly enhanced – both by increasing their stringency and by covering more end-uses.” (PG&E, Sempra, SCE 2008)

⁸ The most engaged non-profits include American Council for an Energy Efficient Economy, Appliance Standards Awareness Project, Alliance to Save Energy, and the Natural Resources Defense Council.

negotiations, especially in the form of market research and technical analysis, strengthens the advocates position in the negotiations, leading generally to better standards.

The implications for the accelerated federal standards setting pace are several-fold. On one hand, the increased activity at DOE should lead to many updates and new standards. This is certainly a good thing on a national basis, but due to preemption, it increasingly restricts the options of states. Traditionally, state standard making has been the engine that drives the federal standards adoption process. Generally, DOE standards are likely to be weaker than what would be set by those states most motivated and active in setting their own standards. Some worry that with the unprecedented rulemaking schedule, DOE may not have the time or resources to fully explore all legitimate efficiency opportunities while analyzing standards levels. Even if the DOE program could be counted on to adopt specifications as aggressive as those implemented by some states, the longer development cycle creates substantial lost opportunities in terms of net present value and carbon mitigation for states trying to meet aggressive carbon reduction goals. While California's code upgrade cycle is one to three years (with a one year delay in effectiveness after adoption) the DOE's schedule ranges from six to eight years.⁹ The discounting caused by delaying a single standard by just a few years can reduce benefits to California by billions of dollars. States' ability to develop more aggressive update levels and to enforce standards that have subsequently become federal standards is increasingly limited.¹⁰ As a result, standards advocates must consider more aggressive (and therefore more politically challenging) standards levels for products knowing that such levels could soon become the basis of a federal standard, which preempts any future adjustments at the state level.

Federal preemption of state standards. For years, the federal preemption waiver process seemed like an important safety valve for the shortcomings of the one-size-fits-all federal standards. Pursuant to statute, states may successfully petition DOE to waive preemption if they demonstrate unusual and compelling state interest, refute burdens on industry, and demonstrate minimal impacts on consumer utility. The recent denial of a California waiver petition for the California residential clothes washer water-factor standard, however, demonstrated the difficulty meeting stringent DOE waiver petition requirements. In practice, appliance manufacturers can claim excessive burdens, dispute cost increases to their products, and withhold information based on proprietary interests. The authors found that the research and analysis required to satisfy the waiver petition requirements were more costly than developing the state standards in the first place.

While the DOE denial of the California waiver request has had a chilling effect on states considering preemption waiver petitions, it highlighted the un-workability of the waiver provisions in combination with DOE's inability (or at least unwillingness) to develop standards that vary by region as part of its rulemakings. It is not therefore surprising that EISA 2007 authorized DOE to consider one national and one regional residential furnace standard and one national and two regional central air conditioning standards. Additionally, this legislation created specific waivers from preemption for one or more states on a few selected standards:

⁹ Recently, EISA 2007 stipulated a shorter schedule for consensus standards and ASHRAE 90.1 standards for selected products.

¹⁰ From the California IOU perspective, the recent trend towards substantive increases in scope of DOE standards is cause for concern. California appliance standards are the lowest-cost component of IOU public purpose energy-efficiency portfolios. Increased federal preemption will limit California's ability to strengthen regulations; savings from these more stringent standards that were being counted on for meeting PG&E's CPUC savings goals through 2013 may be reduced as a result of preemption.

metal halide luminaires, general service incandescent lamps, and walk-in coolers and freezers. The development of these provisions suggests that Congress values the leadership roles taken by states on the forefront of standard setting and wishes to leverage this work to drive the federal standards process. Because these preemption exceptions are limited to specific products, however, the preemption problem is largely unsolved. States and standards advocates should evaluate pursuing federal legislation and other policy changes more favorable to state's rights for appliance efficiency regulation. Proscribed freedom from preemption for at least some states and regions is critical so that the current, vigorous federal standards program does not--by virtue of its own relative success--suppress the more potent state and regional standards development process upon which the federal program has historically been so dependent.

Support tools for state standard setting. In the last few years, standards stakeholders, especially American Council for an Energy Efficient Economy (ACEEE) and ASAP have been actively working to facilitate adoption of appliance and equipment standards by interested states. ASAP has been promoting "Model Bills" to states for appliance standards since 2003 and has assisted the 11 states (besides California) that have already or are in the process of adopting a number of appliance standards since 2001. By leveraging previous state code development work and collaborative research, these organizations raise awareness of the opportunities for states to set standards and lower the costs associated with developing the standards documentation. More recently, ASAP has worked with several states to create a web-based service that allows participating states to leverage information from the California appliance certification database in order to generate the list of products compliant under their own regulations. Building from California's certification process in this way saves the other participating states much of the cost of maintaining their own certification and database management systems and was designed to encourage more states to adopt their own standards. States and regulators should look for ways to take advantage of such networks and shared services.

New Standards Development Strategies

Increasing technical complexity. Existing and scheduled federal and state standards now address many of the big, single measure opportunities, such as refrigerators and water heaters. Increasingly, the new opportunities are more diffuse and complicated. The consumer electronics category is a good example. This is the one end-use category whose per capita energy consumption is increasing rapidly. The anticipated aggregate impacts are staggering; research conducted for PG&E showed that consumer electronics energy use (based on 33 different products) represented approximately 18% of PG&E's residential and small commercial electricity sales and that it was likely to grow at an annual rate of a six percent between 2005 and 2010 (Chase, Ramos & Pope 2006). With few exceptions, however, these impacts are large only at the aggregate level. Individual unit savings are small—on the order of a few to 50 kWh per year. The impact is large because the total number of units (such as battery charger products) is so great.

The situation is urgent because products saturation rates are increasing rapidly at the same time levels of functionality (and energy intensity) are increasing rapidly (e.g., larger and larger big screen TVs). The diffuse nature of the savings and other complexities of these product categories make voluntary programs more difficult to implement. Thus, standards may be a relatively more important efficiency strategy for these types of products. Pursuing these

standards setting opportunities, however, presents several challenges, including rapidly moving baselines, complexity of regulating products with multiple features and overlapping functionality, and avoiding restriction of innovation and consumer utility. Historically, appliance standards have been based on applying technical developments of the preceding 5-10 years and products with design cycles and useful lives longer than the standard setting process. To successfully regulate consumer electronics such as TVs, however, standards need to be based on the most current technical and cost data. Analyses may need to forecast future performance based on prototypes and product trends in order to still be relevant and non-harmful to innovation 3 years hence. Substantial energy efficiency opportunities can be cost-effectively harvested if energy efficiency is a prioritized, initial design criteria due to a forward looking standard when a product category is first brought to the market.¹¹ While setting standards prior to product introduction is a complicated matter, it eliminates the problem of stranded investments in manufacturing infrastructure that so often works against efforts to set maximally efficient, yet cost effective standards. Whether or not rapidly evolving products already have high market saturations, standards developers must more aggressively anticipate future savings opportunities in their analyses.

Interaction with national voluntary programs. As ENERGY STAR®, Consortium for Energy Efficiency (CEE) and other voluntary programs expand in scope, more and more there is an intentional effort to synchronize standards development with their specifications. These programs are important for encouraging development of new high efficiency products and are generally preferred by industry over mandatory standards. While leveraging ENERGY STAR® and CEE specifications for use as standard levels has become more common in the past few years it can be a complicated dance and the strategy provides both advantages and disadvantages.

Traditionally, ENERGY STAR® pursues the top 20-25% most efficient products while standards developers tended to pursue standards levels that might eliminate the bottom quarter of products. Shorter design cycles and more aggressive standards setting objectives are pushing standards levels closer to voluntary program levels. Targeting standards at established ENERGY STAR® or CEE specification levels presents a number of strategic and tactical benefits. Because industry design and manufacturing investments have already been targeted at that level, standards developers benefit from useful market information and certified performance data sets as well as industry networks formed around the voluntary program. In recent years, an approach that has generally worked well is to stage the effective date of a standard based on Voluntary levels a year or three after the Energy Star level takes effect.

This convenient, smoothly staged solution does not always work for both sides, however. The current television standards proposal in California provides a good example of a potential trend--standards developers pushing out in front of ENERGY STAR® in terms of timing or rigor. The Title 20 TV proposal relies in part on the specifications recently released by ENERGY STAR®, which will be effective in November 2008. The qualification levels for larger screen TVs are less stringent than the typical Energy Star goal of top 25%. For example, the authors' analysis suggests that 42-inch TVs would have a 47% qualification rate if implemented in

¹¹ California established a digital television adaptor (DTA) standard before the product existed in the U.S. market. During the process major manufacturers said publicly that a compliant product couldn't be built so California advocates had a low cost prototype developed. The prototype demonstrated that compliance was not difficult with newly existing parts. Following the California developments, the Energy Star and the Federal Communications Commission soon adopted their own related standards.

California; TVs over 50 inches qualify at a rate of 61%. These qualification rates will likely increase between now and the November 1, 2008 effective date. Thus, there is a strong motivation to set a Title 20 standard that is more stringent than Energy Star Tier 1 levels for larger size TVs in order to achieve significant savings by the time a Title 20 standard becomes effective a year or two later.

If the state succeeds in surpassing ENERGY STAR® specification stringency, there is a potentially confusing situation for consumer and trade allies. Thus, in some cases, an existing or developing ENERGY STAR® level can become a political barrier to overcome in the state standard setting process. Additionally, extra tight linkages between ENERGY STAR® and state regulations may make some in industry wary of letting the ENERGY STAR® program get “too aggressive” in setting voluntary specifications. These situations can negatively affect the ENERGY STAR® brand. The increased urgency driving state standards setting activity discussed in previous sections will create more situations in the future where standards proposals meet or exceed ENERGY STAR®, CEE and other voluntary programs. This situation underscores the argument that ENERGY STAR® should fully implement a multi-tier (“Save More”) approach, which includes an aggressive “stretch” performance specification. Especially for rapidly innovating product categories such as consumer electronics, this would help avoid situations where state standards push beyond ENERGY STAR® all together. It would not, however, necessarily solve the problem of a state’s standards occasionally being more stringent than the lower ENERGY STAR® level. State standards developers and the ENERGY STAR® program need to look for solutions to these tensions.

International coordination efforts. International interests in codes and standards is also on the rise and the benefits of international coordination of testing and performance specifications are clear (IPCC, 2007).¹² In the same way that a U.S. federal standard is more appealing to industry than a patchwork of dissimilar state standards, a globally consistent test method and performance mandate can be more desirable, at least in product categories reasonably consistent products from one market to another (e.g., consumer electronics). Rather than a state developing its own test method for a new product category, it can be beneficial to reference international test methods and align state standards with advanced international standards (or proposals).

Tighter linkage of incentive programs and standards. As the pressure on standards developers to deliver greater energy efficiency increases, strategic incentive (e.g., rebate) programs become an important standards development tool. Historically, standards opportunities have not been a central program design consideration for efficiency programs. This is beginning to change, however. Where policy rules balance the tension between standards impacts and voluntary programs, the establishment of targeted voluntary programs designed explicitly to support future standards can be a very effective strategy. For example, PG&E is contemplating options for “upstream” incentive programs for portable fixtures and linear fluorescent fixture standards that would be designed to support and complement the passage the two related standards proposed to CEC for the 2008 rulemaking. Standards developers should look for opportunities to collaborate with voluntary program developers to find and exploit such opportunities.

¹² The external power supply standard is one clear example. Ecos Consulting and other proponents of labeling and standards for external power supplies actively integrated efforts by ENERGY STAR®, CEC, PG&E and international stakeholders to develop internationally consistent labeling and measurement protocols. This effort facilitated the adoption of a robust California standard that has since been replicated at the national level by EISA 2007.

Conclusions

Appliance standards have contributed significantly to efficiency improvements to date. The landscape for conceptualizing, developing and ultimately adopting state appliance standards is, however, changing. To help meet new and future climate focused policy goals, standards setting agencies and supporting stakeholders must be aware of these trends as they seek to find ways to expand and accelerate the standards development process. Long term strategic energy savings goals will increasingly drive the standards process. There are two key implications of this shift. First, for the first time, energy savings goals will be recalibrated to address aggregate energy use (e.g., incorporate consideration of population/product saturation growth as with AB1109), rather than pursuing traditional efforts such as eliminating the bottom 25% of products in a given product category. Second, the political environment will be more accepting of aggressive standards. As the portfolio of products not yet addressed shrinks due to the accelerated federal standard program, the opportunities left for the states are increasingly complex. Dynamic product categories, such as consumer electronics, require strategic approaches that are more anticipatory, address new technologies as they develop, and align with voluntary programs and international efforts. Ultimately, the degree to which future state standards can contribute to energy reduction goals will depend in part on how effectively standards development bodies and stakeholders address the changing landscape.

References

- [ASAP & ACEEE] Appliance Standards Awareness Project and American Council for and Energy Efficiency Economy. 2007. "Appliance Efficiency Standards in the 2007 Energy Bill: Key Facts." Washington DC: American Council for and Energy Efficiency Economy. December 2007.
- [ASAP & NEEP] Appliance Standards Awareness Project and Northeast Energy Efficiency Partnership. 2008. "Energy Efficiency Standards Adopted and Pending by State (Updated February 2008 by Appliance Standards Awareness Project and Northeast Energy Efficiency Partnership)." www.standardsasap.org/documents/StatestandardsstatusgridFebruary2008update.pdf Boston, Mass.: Appliance Standards Awareness Project.
- [CEC] California Energy Commission. 2007. "California Energy Demand 2008-2018" CEC-200-2007-015-SF2. Sacramento, Calif.; California Energy Commission.
- [CEC] California Energy Commission. 2008. Documents for 2008 Appliance Rulemaking. Website [as of May 11, 2008] <http://www.energy.ca.gov/appliances/2008rulemaking/documents/index.html#011508>.
- [CA EPA] California Environmental Protection Agency. 2006. *Documentation of Inputs to Macroeconomic Assessment of the Climate Action Team Report to the Governor and Legislature*. Sacramento, Calif.: California Environmental Protection Agency. January 2006.

Chase, Alex, Ryan Ramos, and Ted Pope. 2006. *Consumer Electronics: Market Trends, Energy Consumption, and Program Recommendations*. PG&E Application Assessment Report #0513. Energy Solutions.

deLaski, Andrew (Appliance Standards Awareness Project). 2008. Joint advocates' comment letter regarding DOE Docket Number EERE-2007-BT-STD-0016/(RIN) 1904-AB50 Fluorescent Lamp Ballast Rulemaking Framework. March 12, 2008.

[DOE] Department of Energy. 2006. *Rulemaking Framework Document for General Service Fluorescent Lamps, Incandescent Reflector Lamps, and General Service Incandescent Lamps*. Washington, DC: U.S. Department of Energy.

Metz, B., O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds). 2007. *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, NY. Cambridge University Press.

Nadel, Steven, Andrew deLaski, Maggie Eldridge, & Jim Kleisch. 2006. *Leading the Way: Continued Opportunities for New State Appliance and Equipment Efficiency Standards. Updated from and Supersedes Report A051*. Washington, DC: American Council for an Energy-Efficient Economy.

[PG&E, Sempra, SCE]. Pacific Gas and Electric Company, San Diego Gas and Electric Company, Southern California Edison, and The Gas Company (Sempra Energy Utility). 2008. California Energy Efficiency Strategic Plan (Supplemental Draft), Rulemaking 06-04-010, March 6, 2008. <http://www.californiaenergyefficiency.com/docs/IOU%20Supplemented%20Draft%20EE%20Strategic%20Plan%203.06.08.pdf>. Sacramento, Calif.: California Public Utilities Commission.

Wiel, Stephen and James McMahon. 2005. *Energy Efficiency Labels and Standards: A Guidebook for Appliances, Equipment and Lighting, 2nd Edition*. (LBNL-45387). Washington DC. Collaborative Labeling and Appliance Standards Program.