

# Update to “States Go First: How States Can Save Consumers Money, Reduce Energy and Water Waste, and Protect the Environment with New Appliance Standards”

## Appliance Standards Awareness Project December 2018

In our 2017 report, “States Go First,”<sup>1</sup> we estimated state-by-state potential savings from 21 recommended state-level appliance standards. For our state appliance standards recommendations for 2019, we updated our 2017 analysis to reflect the most up-to-date information for the 18 standards we are recommending that states adopt.<sup>2</sup>

For 2019, we are recommending that states adopt standards for the following products:

- Air compressors
- Air purifiers
- Commercial dishwashers
- Commercial fryers
- Commercial hot-food holding cabinets
- Commercial steam cookers
- Computers and computer monitors
- Faucets
- High CRI fluorescent lamps
- Portable air conditioners
- Portable electric spas
- Residential ventilating fans
- Showerheads
- Spray sprinkler bodies
- Toilets (water closets)
- Uninterruptible power supplies
- Urinals
- Water coolers

As described below, our new analysis reflects the following:

- A few changes to the scope of products covered and recommended standard levels;
- Updated information on annual shipments and current market penetration; and
- Updated assumptions for energy prices and emissions factors.

We also made significant updates to our analysis for high CRI fluorescent lamps to reflect more recent market data.

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<sup>1</sup> [appliance-standards.org/sites/default/files/States%20Go%20First.pdf](http://appliance-standards.org/sites/default/files/States%20Go%20First.pdf).

<sup>2</sup> For 2019 we are not recommending that states adopt standards for audio/video equipment, pool pump replacement motors, or telephones, which are the three additional products that we included in our 2017 analysis.

We assumed a compliance date of 2021 for all the standards except portable air conditioners,<sup>3</sup> and we estimated savings from sales through 2035. Our updated analysis uses 2017\$ for costs and utility bill savings.

The attached table shows our updated assumptions for national annual shipments, average lifetime, per-unit savings, per-unit incremental cost, and current market penetration for each of the 18 products.

#### Product scope and standard levels

For our 18 recommended standards for 2019, the scope of products covered is the same as that in our 2017 report except for residential ventilating fans. In our 2017 report we analyzed standards for residential ventilating fans encompassing range hoods and bathroom/utility room fans. Our recommended standard for 2019 applies only to bathroom/utility room fans.

Our recommended standard levels for the 18 products are the same as those in our 2017 report except for residential lavatory faucets and urinals. In our 2017 report we analyzed standards for residential lavatory faucets and urinals that were equivalent to recent standards adopted in California. For our new analysis we analyzed standards equivalent to EPA's WaterSense levels.

#### Annual shipments and current market penetration

For our new analysis we used up-to-date estimates of annual shipments for 2021.<sup>4</sup> For products with an ENERGY STAR specification, we used shipment information from the ENERGY STAR Unit Shipment Report for 2017.<sup>5</sup> The other sources we used for estimates of annual shipments are the same as those we used for our 2017 report, except for high CRI fluorescent lamps which we address below.

We also incorporated the most recent data on the estimated market share of products already meeting our recommended standard levels. For air purifiers, we updated the estimated market penetration using the AHAM Verifide product list.<sup>6</sup> For commercial fryers and water coolers, we used data on market penetration from the ENERGY STAR Unit Shipment Report for 2017. Finally, for the plumbing products (faucets, showerheads, toilets, and urinals), we used data from the DOE Compliance Certification Database.<sup>7</sup> For the remaining products, the market penetration estimates in our 2017 report represent the most recent available data.

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<sup>3</sup> For portable air conditioners we assumed a compliance date of 2022.

<sup>4</sup> For portable air conditioners we used an estimate of annual shipments for 2022.

<sup>5</sup>

[www.energystar.gov/ia/partners/downloads/unit\\_shipment\\_data/2017/2017%20Unit%20Shipment%20Data%20Summary%20Report.pdf?5a2d-4437](http://www.energystar.gov/ia/partners/downloads/unit_shipment_data/2017/2017%20Unit%20Shipment%20Data%20Summary%20Report.pdf?5a2d-4437).

<sup>6</sup> [www.ahamdir.com/aham\\_cm/site/pages/index.html?code=r.rac.AboutThisProgram](http://www.ahamdir.com/aham_cm/site/pages/index.html?code=r.rac.AboutThisProgram).

<sup>7</sup> [www.regulations.doe.gov/certification-data/#q=Product\\_Group\\_s%3A\\*](http://www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A*).

## Energy prices and emissions factors

We updated our assumptions for energy prices based on state-by-state electricity and natural gas prices for 2017 and EIA's energy price projections in AEO 2018.<sup>8</sup> For emissions factors for NO<sub>x</sub>, SO<sub>2</sub>, and CO<sub>2</sub>, we used EIA's projections for each of the NERC regions from AEO 2018.

## High CRI fluorescent lamps

For our 2017 report, for high CRI fluorescent lamps we assumed that in the standards case, consumers would replace a failed T12 lamp with a new T8 lamp and ballast. For our new analysis, we assumed that consumers would replace a failed T12 lamp with an LED tube lamp, which we believe is the more likely scenario given the wide availability and low cost of LED tube lamps. We assumed purchasers would select either "Type A" LED tube lamps, which are drop-in replacements, or "Type B" LED tube lamps, which require bypassing the existing lamp ballast.

We updated our estimates of annual shipments for high CRI fluorescent lamps based on NEMA's linear fluorescent lamps sales index for lamp shipments through 2017.<sup>9</sup> The NEMA lamps index shows that between 2015 and 2017, T12 shipments declined by about 20% per year on average. We applied this 20% annual rate of decline to project T12 shipments for 2018 through 2035.

We updated the allocation of total T12 shipments to the residential and commercial sectors using data from the 2015 Lighting Market Characterization<sup>10</sup> on the stock of T12 lamps by sector and average annual operating hours. We also incorporated data from NEMA on the portion of lamps sold through the retail channel and the commercial channel and the portion of T12 lamps sold through the commercial channel that are 34 W vs. 40 W.

We also updated our estimates of per-unit savings and incremental costs for high CRI fluorescent lamps. We used data on input wattages of 40 W T12 lamps in the residential sector and 40 W and 34 W lamps in the commercial sector from DOE's analysis for the 2009 general service fluorescent lamps final rule.<sup>11</sup> For LED tube lamps, we used assumptions for rated wattages based on products currently available on the market. We used updated estimates of annual operating hours in the residential and commercial sectors from the 2015 Lighting Market Characterization to calculate per-unit annual energy use in the base case and the standards case. Finally, we estimated per-unit costs for T12 lamps and LED tube lamps based on currently-available products.

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<sup>8</sup> [www.eia.gov/electricity/sales\\_revenue\\_price/pdf/table4.pdf](http://www.eia.gov/electricity/sales_revenue_price/pdf/table4.pdf); [www.eia.gov/naturalgas/annual/pdf/table\\_024.pdf](http://www.eia.gov/naturalgas/annual/pdf/table_024.pdf); [www.eia.gov/outlooks/aeo/](http://www.eia.gov/outlooks/aeo/).

<sup>9</sup> [www.nema.org/Intelligence/Indices/Pages/Linear-Fluorescent-Lamp-Indexes-Continue-Year-Over-Year-Decline-in-Fourth-Quarter-2017-while-T-LED-Market-Penetration-Incre.aspx](http://www.nema.org/Intelligence/Indices/Pages/Linear-Fluorescent-Lamp-Indexes-Continue-Year-Over-Year-Decline-in-Fourth-Quarter-2017-while-T-LED-Market-Penetration-Incre.aspx).

<sup>10</sup> [www.energy.gov/sites/prod/files/2017/12/f46/lmc2015\\_nov17.pdf](http://www.energy.gov/sites/prod/files/2017/12/f46/lmc2015_nov17.pdf).

<sup>11</sup> [www.regulations.gov/document?D=EERE-2006-STD-0131-0147](http://www.regulations.gov/document?D=EERE-2006-STD-0131-0147).