

Payback and Life-Cycle Cost Analysis **Requirements for Standards Rulemaking**

By statute, DOE must prepare and consider both “payback” and life-cycle cost (“LCC”) analyses in determining whether standards are economically justified. Specifically, DOE must consider:

- Whether “the additional cost to the consumer of purchasing a product complying with an energy conservation standard level will be less than three times the value of the energy . . . savings during the first year that the consumer will receive as a result of the standard” (*i.e.*, a payback analysis);¹ and
- The “savings in operating costs throughout the estimated average life of the covered product . . . compared to any increase in the price of, or in the initial charges for, or maintenance expenses of” the product that are “likely to result from the imposition of the standard (*i.e.*, a life cycle cost analysis).²

The statutory language makes it clear that both types of analysis are designed to assess the economic justification of standards *from the perspective of product purchasers: i.e.*, through a comparison between the costs required efficiency improvements would impose on purchasers and the operating cost savings purchasers could expect those efficiency improvements to provide. Unfortunately, DOE has not always performed these analyses correctly.

In particular:

- DOE has sometimes excluded relevant efficiency investments from its analyses and has sometimes accounted for non-relevant efficiency investments (*i.e.*, for the costs of, and savings provided by, products *other than* those covered by the standard at issue);
- DOE has calculated the operating cost savings resulting from efficiency improvements using energy price estimates that do not represent the actual savings (*i.e.*, reductions in monthly utility bills) that those improvements would provide;
- DOE has relied on cost estimation techniques that do not provide a reasonable assessment of the costs required efficiency improvements would impose on consumers; and
- DOE has used discount rates that do not appropriately reflect the economic impacts experienced by individual residential and commercial consumers.

DOE has recognized that the purpose of payback and LCC analyses is to assess the costs of required efficiency improvements and the savings they would provide from the perspective of product purchasers, and has therefore proposed to use private discount rates for purposes of such

¹ 42 U.S.C. § 6295(o)(2)(B)(iii).

² 42 U.S.C. § 6295(o)(2)(B)(i)(II).

analyses.³ Consistent with that proposal, additional Process Rule revisions are warranted to ensure that payback and LCC analyses are performed as required to reflect contemporary consumers. These additional revisions are outlined below.

1. For purposes of payback and LCC analysis, DOE should assume that a standard would have no adverse impact on product sales.

DOE recognizes that consumers may react to the increased cost of higher-efficiency products by declining to purchase such products. Consideration of such market impacts is critical for evaluation of many of the issues DOE must consider in standards development. However, consumer *reaction to the economics* of a particular efficiency investment does nothing to alter the economics being reacted to, and it is the economics of required efficiency improvements that payback and LCC analyses are intended to assess.

Unfortunately, DOE has sometimes excluded customer-declined efficiency investments from its payback and LCC analyses, and there is at least one case in which it preferentially excluded high-cost efficiency investments from its analysis, assumed that purchasers in those cases would choose alternatives to products with the required efficiency improvements, and prepared purported payback and LCC analyses reflecting the investment outcomes for the resulting mix of products.⁴ This analysis was problematic in several respects. Most obviously, it failed to answer the core question that payback and LCC analysis are supposed to address: the question of how the cost consumers would have to pay for a required efficiency improvement would compare with the operating cost savings that efficiency improvement would provide. In addition, DOE's alternative analysis claimed regulatory benefits resulting – not from the efficiency improvements a standard would require – but from assumed actions taken in response to the *costs the required efficiency improvements would impose*. By this logic, a standard could be “economically justified” on the grounds that required efficiency improvements would be so costly that consumers would no longer purchase products subject to the standards.

DOE should confirm that the question for purposes of payback and LCC analysis is what the economics of a required efficiency improvement would be from the purchaser perspective, *not how purchasers would react to those economics*. Further, the process rule should be amended to ensure that payback and LCC analyses account for the economics of required efficiency improvements in all cases in which purchasers would decline to invest in such improvements in the absence of a standard. In short, the process rule should specify that – for purposes of payback and LCC analysis – DOE must account for all “rule outcome” cases *with the assumption that the standard under consideration would have no adverse impact on product sales*.

Again, while the adverse impact a standard would have on product sales should be ignored *for purposes of payback and LCC analysis*, it does not follow that it should be ignored for purposes

³ See 84 Fed. Reg. 3910 at 3952 (February 13, 2019) (proposing the use of private discount rates designed to reflect the economic impact of investment decisions on individual residential and commercial consumers).

⁴ See Spire's January 6, 2016 comments in the docket for DOE's residential furnace rulemaking, Document ID EERE-2014-BT-STD-0031-0309, at pp. 62-65.

of other analyses as well. For example, the impact a standard would have on product sales is critical in the consideration of manufacturer and utility impacts, and is also important when DOE is estimating the energy savings a standard would provide (because required efficiency improvements can only provide energy savings to the extent that products with those improvements are purchased and used). These differences in analytical approach are required by the different purposes the analyses serve.

2. For purposes of payback and LCC analysis, DOE should use the marginal energy prices actually paid by consumers to estimate the savings required efficiency improvements would provide.

DOE has proposed to use “the mid-range energy price and demand scenario of the [Energy Information Agency’s] most current AEO [Annual Energy Outlook]” to analyze the “the likely impact of appliance standards on typical users.” 84 Fed. Reg. 3910 at 3952 (February 13, 2019). To the extent this refers to payback and LCC analysis, a change in approach is required, because average prices presented in the AEO do not reflect the actual differences in operating costs that energy savings would provide. Because the purpose of payback and LCC analysis is to assess the economics of required efficiency improvements from the standpoint of product purchasers, the relevant question is what the impact of efficiency improvements would be on the energy bills purchasers pay, and that impact would be based on the marginal energy prices consumers pay. Unfortunately, DOE’s existing approach for determining the marginal energy prices for natural gas is incorrect; this is an issue that Spire has addressed many times before⁵ and will address in further comment on May 6th. The principle is nevertheless clear: for purposes of payback and LCC analyses, DOE must use energy prices designed to quantify the actual utility bill savings required efficiency improvements would provide. Neither DOE’s proposed approach nor its current approach are adequate in this regard.

3. For purposes of payback and LCC analysis, DOE should collect and consider market data on actual product, installation, and maintenance costs.

DOE has routinely relied upon elaborate “built-up” estimates of product, installation, and maintenance costs while dismissing direct evidence of the prices consumers actually pay for equipment, installation and maintenance. Both DOE’s methodologies and the results of such analyses have been the subject of substantial criticism, particularly when – as has repeatedly been the case – DOE’s estimated costs are substantially lower than available market data suggests (e.g. installation bids for real consumers).⁶

Whatever advantages DOE’s methodology might provide in other contexts, it obviously makes sense to focus on direct evidence of what consumers are paying for specific efficiency improvements when – as is the case in the context of payback and LCC analysis – the only question is what consumers would need to pay for such improvements. Market data may not

⁵ See Spire’s January 6, 2016 comments in the docket for DOE’s residential furnace rulemaking, Document ID EERE-2014-BT-STD-0031-0309, at pp. 81-86.

⁶ See Spire’s January 6, 2016 comments in the docket for DOE’s residential furnace rulemaking, Document ID EERE-2014-BT-STD-0031-0309, at pp. 71-73 and 91-94.

always be sufficient to address these issues by itself, but – in cases where products capable of achieving a standard are already available in the market – such data certainly provides the appropriate starting point for analysis and it would be unreasonable to rely instead on estimates based on elaborate analysis of indirect and often crude information. Accordingly – where products satisfying the standard under consideration are already available in the market – DOE should collect and consider direct evidence of the cost (including product purchase, installation, and maintenance costs) of such products.