



July 14, 2026

REPORT#E26-520

Retail Product Portfolio: High-Performance Dryer Naturally Occurring Baselines Review

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Executive Summary

The Retail Product Portfolio (RPP) program at the Northwest Energy Efficiency Alliance (NEEA) coordinates with utilities and national retailers through the ENERGY STAR® Retail Products Platform (ESRPP) to increase the assortment and sales of energy-efficient consumer products, including high-performance clothes dryers.

Cadmus used the following research objectives (ROs) to guide this study:

- **RO1.** Review NEEA’s naturally occurring baseline¹ (NOB) for ENERGY STAR (v1) clothes dryers and make recommendations, as needed, to revise forecast to account for potential delays in revised federal standard implementation and enforcement.
- **RO2.** Assess if revisions are needed for NEEA’s heat pump clothes dryer NOB to better reflect the market for combination units², given that this NOB was developed using data for stand-alone dryer units.
- **RO3.** Explore what NEEA’s NOB approach may gain from developing separate baselines for compact and standard clothes dryer drum sizes³ and make recommendations for revisions, if appropriate.

NEEA provided Cadmus with previous third-party reviews of its clothes dryer naturally occurring baselines (NEEA 2016a; 2016b), a Microsoft Excel file containing the current high-performance clothes dryer NOBs and associated assumptions, and documentation of NEEA participation in the most recent clothes dryer standards review cycle. In addition, Cadmus performed secondary research on executive order #14514 (Federal Registrar 2025)⁴ and federal standard revision cycles (Congressional Research Services 2025), then conducted three interviews with market experts to address the research objectives listed above.

Cadmus had three conclusions and four recommendations, described in more detail in the main body of the report.

Conclusion RO1: Due to perceived market uncertainty around the implementation of upcoming federal efficiency standards (including those for clothes dryers), it is difficult to develop an assumption regarding the rate of expected growth for program-qualified products. While a final rulemaking for the

¹ A naturally occurring baseline (NOB) is a counterfactual forecast. It predicts how market penetration may have changed for a product category over a period of twenty years if NEEA and its partners *had not* been involved in Market Transformation activities during that time. NEEA develops an NOB for the Northwest region: Idaho, Montana, Oregon, and Washington.

² A ‘combination unit’ refers to a product that combines washing machine and clothes drying functionality within the same drum.

³ Compact drum sizes are defined by the Environmental Protection Agency (EPA) as having a drum size less than 4.4 cubic feet. Standard drum sizes have a 4.4 cubic feet capacity or greater (ENERGY STAR 2024).

⁴ <https://www.federalregister.gov/documents/2025/01/29/2025-01956/unleashing-american-energy>.

clothes dryer federal standard has a required compliance date of March 1, 2028 (US DOE 2026), market experts interviewed for this study stated their uncertainty in it being implemented as finalized, due to the wide-ranging scope of executive order 14154 (Federal Registrar 2025), which could delay the market saturation date⁵ for these products in NEEA's NOB for ENERGY STAR clothes dryers. NEEA's current ENERGY STAR clothes dryer NOB (which has not been significantly revised since it was last reviewed in 2016) assumes that without NEEA and its partners' influence, a federal standard revision requiring the current level of energy efficiency in ENERGY STAR clothes dryers would have had a compliance date in 2029. However, even with NEEA and its partners' interventions in the market, the current compliance date is only one year ahead of what was predicted. Since it seems the timing and scope of the current federal standard compliance date of 2028 would have been further delayed without NEEA's intervention, and the executive order 14154 compounds implementation uncertainty, making an adjustment to the NOB market saturation date seems advisable.

Recommendation RO1a: Revise the market saturation date for ENERGY STAR clothes dryers in the NOB from 2029 to 2035 to reflect NEEA and its partners' influence on the federal clothes dryer standard. This change would acknowledge that NEEA and its partners' interventions likely resulted in 95% market saturation a full federal rule-making cycle ahead of when it may have been anticipated without these interventions (see Figure 1). If the implementation of the current standard is delayed, NEEA should modify the NOB to account for the implementation delay.

Recommendation RO1b: Continue to track the status of the clothes dryer federal efficiency standard to determine the likelihood of an implementation delay and adjust the NOB market saturation date accordingly.

Conclusion RO2: While several factors could affect the NOBs for heat pump combination and stand-alone clothes dryers differently, there is minimal evidence of a significant divergence in NOB curves and timing. Several differences exist between combination units and stand-alone heat pump clothes dryers, namely the consumer use case, technology, and governing federal standards. However, Cadmus did not find evidence that any of the NOB input factors would be significantly different from each other for these two styles of clothes dryer, other than a potential difference in market share growth rate, which was flagged by the three interview respondents for this study and through conversations with NEEA staff. While these audiences shared that combination units could have a slightly faster market share growth rate than stand-alone clothes dryers, manipulation of the NOB curve to reflect potential growth rate difference did not result in significant changes to the overall shape or timing of the NOB

⁵ Market saturation reflects the maximum potential market share that the energy efficiency measure can achieve. Typically, NEEA's models assume that market saturation occurs one year after the compliance date of a new federal standard mandating the energy efficiency measure. Also, NEEA's market saturation for both high-performance dryer NOBs is 95%. The market share percentage below 100% and the one-year time delay are part of building a conservative estimate, reflecting the possibility that people may purchase old stock that does not reflect the new federal standard's energy efficiency capabilities.

curves, most likely because the market penetration (below 1%) and expected saturation (5%) bounding the curve were low values.

Recommendation RO2: Continue to include combination units and stand-alone heat pump clothes dryers in the same NOB. However, if NEEA decides to develop a distinct Market Transformation strategy for combination units, NEEA should explore the creation of an NOB only for combination laundry units.

Conclusion RO3: The factors that influence the NOB for compact and standard-size heat pump clothes dryers do not substantially differ. Compact dryers have a relatively small market size (1.8% as of NEEA's research in 2020), and only 11% of eligible clothes dryers are classified as compact on ENERGY STAR's qualified products list (QPL). Further, consumers continue to show a preference for standard-sized units.

Recommendation 3: Compact dryers do not represent a large enough market share to require a separate NOB. NEEA should continue to track market share and compact dryer product development trends to adjust market growth rates as needed. Should a significant change occur, NEEA should reassess the need for a separate NOB.

Introduction

NEEA Naturally Occurring Baselines

NEEA develops naturally occurring baselines (NOBs) for products it targets through its Market Transformation initiatives to enable a comparison of actual market share to an estimated counterfactual of what would have happened without NEEA and its partners' intervention. NEEA's high-performance clothes dryer NOBs are currently split into two measure identifiers: ENERGY STAR® clothes dryers and heat pump clothes dryers.

The NOBs for ENERGY STAR and heat pump clothes dryers are based on the following inputs:

- Market penetration at the start of NEEA's clothes dryer initiative (Initial)
- Estimate of achievable market saturation (Saturation)
- Assumed year in which adoption will accelerate without NEEA's intervention (Take-off point)
- Number of years required for high-performance dryers to be widely adopted without NEEA's intervention (Takeover)
- Growth rate factor (Factor)⁶

NEEA supported the ENERGY STAR Version 1.0 Clothes Dryer specification that took effect January 1, 2015, as well as the updates that went into effect in 2024 with v1.1 requiring machines to default to testing setting presets and provide energy savings reporting to consumers (ENERGY STAR 2014; 2024). The NEEA NOB for ENERGY STAR clothes dryers assumes that the U.S. Department of Energy (DOE) would implement a federal minimum efficiency standard comparable to the ENERGY STAR Version 1.0 specification in 2029. The ENERGY STAR clothes dryer NOB has an initiative start date in 2015 and assumes an initial market penetration of 14% for ENERGY STAR dryers and the first dramatic and sustained increase in new product sales taking place in 2020. The maximum technically achievable units in the market are assumed to be 95% market share.

Similarly, for the heat pump clothes dryer NOB, the NEEA initiative started in 2015, with an initial market penetration estimate of 0% and the first dramatic and sustained increase in new product sales predicted to take place in 2022. The maximum technically achievable units in the market are assumed to be 5% market share.

⁶ A growth rate factor influences the slope of the Naturally Occurring Baseline (NOB) sigmoid curve, where faster growth is reflected in a steeper slope.

Research Objectives and Methods

Cadmus' work addressed three core research objectives:

- **RO1.** Review NEEA's naturally occurring baseline⁷ (NOB) for ENERGY STAR (v1) clothes dryers and make recommendations, as needed, to revise forecast to account for potential delays in revised federal standard implementation and enforcement.
- **RO2.** Assess if revisions are needed for NEEA's heat pump clothes dryer NOB to better reflect the market for combination units⁸, given that this NOB was developed using data for stand-alone dryer units.
- **RO3.** Explore what NEEA's NOB approach may gain from developing separate baselines for compact and standard clothes dryer drum sizes⁹ and make recommendations for revisions, if appropriate.

To answer these research objectives, Cadmus completed the activities listed in **Error! Reference source not found..**

Table 1. Research Activities

Activity	ROs Addressed	Activity Details
Standards and Policy Analysis	1	• Review of Technical Support Documents for Clothes Dryer federal standard • Review of executive orders proposing federal standard revision
Secondary Research	1, 2, 3	• Review of previously published evaluation of NEEA clothes dryers NOBs. • Review of NEEA's current clothes dryers NOB assumptions and work on the federal standard. • Review of the ENERGY STAR Qualified Products List (QPL) and existing market data
Market Expert Interviews	1, 2, 3	• Interviews (n=3) with one federal program manager, one senior manager of regulatory affairs at a dryer manufacturer, and one consulting firm principal. • Key topic areas: ○ What is the current state of the market and market penetration for high-performance clothes dryers (including specific questions for combination and heat pump units)? ○ To what degree do experts view the federal efficiency standard for clothes dryers as a driver or barrier for high-performance dryer uptake?

⁷ A naturally occurring baseline (NOB) is a counterfactual forecast. It predicts how market penetration may have changed for a product category over a period of twenty years if NEEA and its partners *had not* been involved in Market Transformation activities during that time. NEEA develops an NOB for the Northwest region: Idaho, Montana, Oregon, and Washington.

⁸ A 'combination unit' refers to a product that combines washing machine and clothes drying functionality within the same drum.

⁹ Compact drum sizes are defined by the Environmental Protection Agency (EPA) as having a drum size less than 4.4 cubic feet. Standard drum sizes have a 4.4 cubic feet capacity or greater (ENERGY STAR 2024).

Results: RO1. ENERGY STAR Clothes Dryer NOB Review

This section provides two detailed findings related to Cadmus' review of NEEA's ENERGY STAR clothes dryers NOB to assess its alignment with the current policy landscape.

Current Clothes Dryer Standard Implementation Date

A core factor influencing NEEA's clothes dryer NOB is the federal regulation of minimum allowable efficiency levels. On March 12, 2024, DOE published a direct final rule establishing a new energy conservation standard for consumer clothes dryers (89 FR 18164, Docket No. EERE-2014-BT-STD-0058)¹⁰. The current energy efficiency standard (10 CFR 430.32(h)) and the updated 2028 standard are shown in Table 2 **Error! Reference source not found.**below. NEEA provided several documents to Cadmus highlighting NEEA involvement in the federal rulemaking process for clothes dryers over the past decade, such as records of NEEA comments on proposed standards and testing procedures. These documents showed the work done by NEEA to help influence the specifications in the standard set to go into effect in 2028.

Table 2. Clothes Dryers Federal Efficiency Standard

Product Class	Current Minimum CEF (lb/kWh)	Updated Minimum CEF (lb/kWh)	Percent Increase
(i) Electric, Standard (4.4 cubic feet ("ft ³ ") or greater capacity)	3.73	3.93	5%
(ii) Electric, Compact (120 volts ("V")) (less than 4.4 ft ³ capacity)	3.61	4.33	20%
(iii) Vented Electric, Compact (240V) (less than 4.4 ft ³ capacity)	3.27	3.57	9%
(iv) Vented Gas, Standard (4.4 ft ³ or greater capacity)	3.3	3.48	5%
(v) Vented Gas, Compact (less than 4.4 ft ³ capacity)	-	2.02	-
(vi) Ventless Electric, Compact (240V) (less than 4.4 ft ³ capacity)	2.55	2.68	5%
(vii) Ventless Electric, Combination Washer-Dryer	2.08	2.33	12%

Approximately 10 months after the federal standard (document id EERE-2014-BT-STD-0058-0064) was finalized, executive order 14154 was published on Jan 20, 2025 stating, "It is the policy of the United States: (f) to safeguard the American people's freedom to choose from a variety of goods and appliances, including but not limited to lightbulbs, dishwashers, washing machines, gas stoves, water

¹⁰ As part of DOE's customary and required process in publishing and finalizing Direct Final Rules (DFRs), DOE also published a notice of proposed rulemaking (NPR) at the same time as the subject Direct Final Rule (<https://www.regulations.gov/document/EERE-2014-BT-STD-0058-0064>). DOE published this NPR in case adverse comment is received on the DFR that necessitates resolution via rulemaking. DOE did not receive any negative comments on the DFR and, on Oct 8, 2024, confirmed the effective and compliance dates originally published in the DFR (https://www.regulations.gov/document/EERE-2014-BT-STD-0058-0075?utm_medium=email&utm_source=govdelivery).

heaters, toilets, and shower heads, and to promote market competition and innovation within the manufacturing and appliance industries” (Federal Registrar 2025). This executive order also included directions to agency heads to develop and begin implementing action to suspend federal regulation surrounding consumer appliances.

Market Experts Believe the Clothes Dryer Federal Standard Compliance Date May be Delayed

Market experts noted the current conflict between executive order 14154 and the clothes dryer federal standard compliance date and suggested a delay in compliance date may occur. Through an interview, an expert with ten years of experience in the clothes dryers market said it is likely that federal efficiency standards for consumer appliances such as clothes dryers will be rolled back to the original legislative level, “similar to that of residential lightbulbs.” Another interviewee agreed with this opinion stating it is possible that the DOE will withdraw this federal standard during this administration, but that the standard could be re-instated in a subsequent administration. If it were to be re-instated in a subsequent administration, this interviewee felt that it would likely follow the standard six-year cycle of regulatory rulemaking.

However, since this standard has already been approved, it is possible that the standard may be re-instated more quickly than the standard six-year cycle. If this occurs, it would likely follow a similar pattern to the federal standard revision for residential lightbulbs. The Energy Independence and Security Act of 2007 (EISA) set the U.S. on the path to increase the efficiency of residential lightbulbs for manufacturers and set a 2020 date to enforce an efficiency requirement of 45 lumens per watt. These rules were finalized in May 2022, with full enforcement beginning in July 2023. This resulted in a three-year delay to the implementation of efficiency standards for residential lightbulbs from the original regulatory timeline, as they were originally proposed to take effect in January 2020.

RO1 Conclusion and Recommendations

Conclusion RO1: Due to perceived market uncertainty around the implementation of upcoming federal efficiency standards (including those for clothes dryers), it is difficult to develop an assumption regarding the rate of expected growth for program-qualified products. While a final rulemaking for the federal standard for clothes dryers has a required compliance date of March 1, 2028, market experts interviewed for this study stated their uncertainty in it being implemented as finalized, due to the wide-ranging scope of executive order 14154, which could delay the market saturation of clothes dryers meeting the current ENERGY STAR v.1.1 energy efficiency specifications in NEEA’s NOB. NEEA’s current ENERGY STAR clothes dryer NOB (which has not been significantly revised since it was last reviewed in 2016) assumes that without NEEA and its partners’ influence, a federal standard revision requiring the current level of energy efficiency in ENERGY STAR clothes dryers would have had a compliance date in 2029. However, even with NEEA and its partners’ interventions in the market, the current compliance date is only one year ahead of what was predicted. Since it seems the timing and scope of the current federal standard compliance date of 2028 would have been further delayed without NEEA’s intervention and the executive order 14154 compounds implementation uncertainty, making an adjustment to the ENERGY STAR NOB market saturation year seems advisable. Also, while we had one interviewee’s input

that there was a possibility for a shortened rule-making cycle of three years to occur, from review of available materials and discussions with NEEA staff, it seemed that in most cases, standards are reviewed and implemented on a six-year rulemaking cycle.

Recommendation RO1a: Revise the market saturation date for ENERGY STAR clothes dryers in the NOB from 2029 to 2035 to reflect NEEA and its partners' influence on the federal clothes dryer standard. This change would acknowledge that NEEA and its partners' interventions likely resulted in 95% market saturation a full federal rule-making cycle ahead of when it may have been anticipated without these interventions (see Figure 1). If the implementation of the current standard is delayed, NEEA should modify the NOB to account for the implementation delay.

Figure 1. ENERGY STAR Clothes Dryer Baseline Penetration

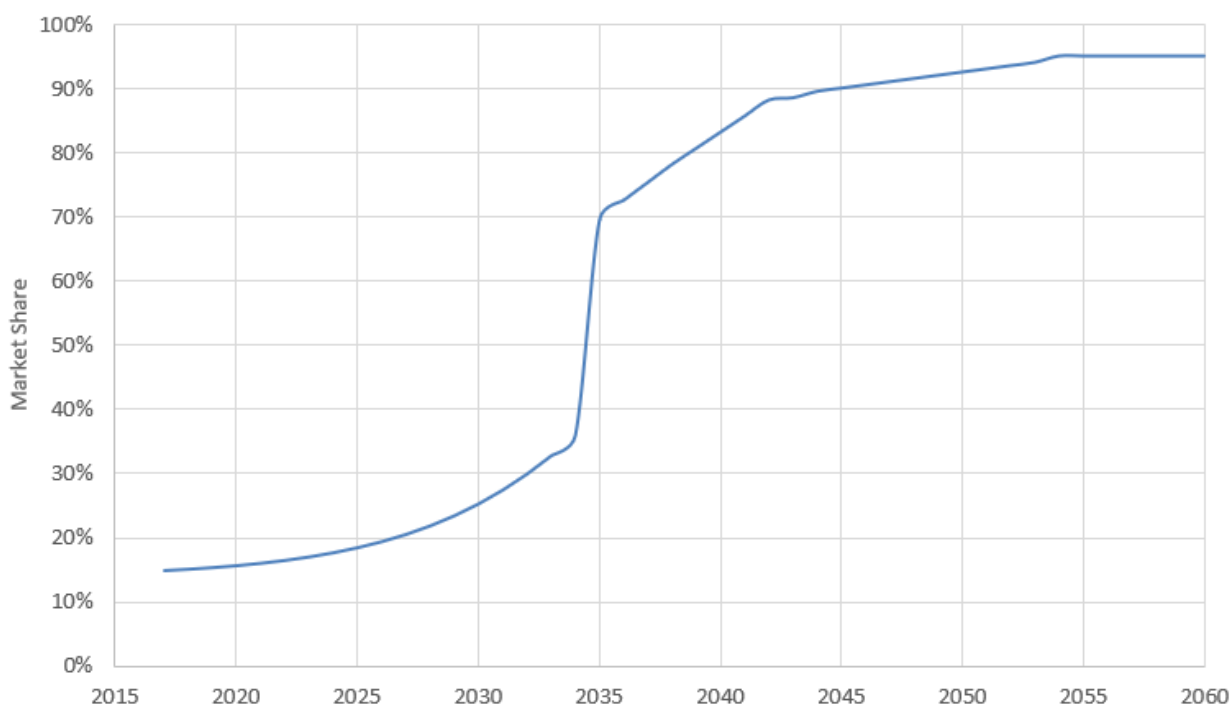


Table 3 below shows the input factors for the NOB, both the current factors and the ones used in Cadmus' recommendation in Figure 1.

Table 3. Clothes Dryers NOB Current and Recommended Inputs

Inputs	Current	Recommended
Market penetration at the start of NEEA's clothes dryer initiative (Initial)	14%	14%
Estimate of achievable market saturation (Saturation)	95%	95%
Year when assumed market baseline = ENERGY STAR v1.1	2029	2035
Number of years required for high-performance dryers to be widely adopted without NEEA's intervention (Takeover)	10	10
Growth rate factor (Factor)	81.0	79.0

Recommendation RO1b: Continue to track the status of the clothes dryer federal efficiency standard to determine the likelihood of an implementation delay and adjust the NOB take-off point accordingly.

Results: RO2. Heat Pump Dryer NOB Review

This section provides two detailed findings related to Cadmus' review of NEEA's Heat Pump Dryer NOB to determine if a revision is needed to account for both stand-alone and combination units.

While Penetration is Low, Combination Units' Market Share May Grow More Quickly than that of Stand-Alone Heat Pump Dryers

NEEA's provided sales data showed very low penetration of all combination units – below 1% market share – in 2020. Furthermore, the vast majority of combination units reported were not ENERGY STAR certified units, meaning they would not be captured by the NOB for heat pump dryers. However, all three of the market experts interviewed stated that they are seeing an increase in market traction for combination units due to their space saving capabilities, relatively high efficiencies as newer models often incorporate heat pump technology, ease of installation, and an increase in storage bin capacities compared to prior models. An interviewed market expert also noted that manufacturers like GE and Whirlpool have been leading the market for heat pump combination units and are starting to see additional market traction with this technology.

Combination units and stand-alone heat pump dryers may grow at different rates due to their different use cases and appeal to consumers. On the one hand, combination unit NOB growth will likely be driven by increasing demand from urban consumers and those living in apartments or multifamily households, where the space-saving capabilities of these machines are highly valued. From 2020 to 2024, multifamily housing stock in the state of Washington grew by 8% annually, whereas the single-family housing stock growth rate declined by 15% over the same period (Washington Center for Real Estate Research 2024). Thus, as the housing stock shifts to have a higher share of multifamily units, it is reasonable to assume that demand for space-saving units may increase. On the other hand, stand-alone heat pump dryer NOB growth will likely be driven by consumer demand for energy savings compared to traditional electric dryers. However, given the small current market share for both combination units and stand-alone heat pump dryers and a likely low market cap without NEEA intervention, significant divergence in market share between these two products is unlikely in the foreseeable future.

Combination Units are a Different Technology than Stand-Alone Dryers

Through an interview, an expert with ten years of experience in the clothes dryer market referred to combination laundry units as a different product due to the differences in technology used (that is, not all combination units use heat pump technology) and the ways the units are assessed for energy efficiency (i.e., the applicable federal regulations). Further, differences exist between combination units and stand-alone dryers in the voluntary specifications they may qualify for. To qualify for an ENERGY STAR label, stand-alone clothes dryers only need to meet ENERGY STAR clothes dryer product specifications (Version 1.1), whereas combination units must meet specifications for both clothes dryers and clothes washers (Version 8.1) (ENERGY STAR 2014; 2018). As noted in the section for RO #1, the washing machine federal standard was specifically mentioned in Executive Order 14154, making it possible that a standard rollback may occur for washing machines. Should this occur, combination units

may have a different timing of federal standard revisions than stand-alone clothes dryers and potentially different take-off points.

RO2 Conclusion and Recommendation

Conclusion RO2: While several factors could affect the NOBs for heat pump combination and stand-alone clothes dryers differently, there is minimal evidence of a significant divergence in NOB curves and timing. Several differences exist between combination units and stand-alone heat pump clothes dryers, namely the consumer use case, technology, and governing federal standards. However, Cadmus did not find evidence that any of the NOB input factors would be significantly different from each other for these two styles of clothes dryer, other than a potential difference in market share growth rate, which was flagged by the three interview respondents for this study and through conversations with NEEA staff. While these audiences shared that combination units could have a slightly faster market share growth rate than stand-alone clothes dryers, manipulation of the NOB curve to reflect potential growth rate difference did not result in significant changes to the overall shape or timing of the NOB curves, most likely because the market penetration (below 1%) and expected saturation (5%) bounding the curve were low values.

Recommendation 2: Continue to include combination unit and stand-alone heat pump clothes dryers in the same NOB. However, if NEEA decides to develop a distinct Market Transformation strategy for combination laundry units, NEEA should explore the creation of a NOB only for combination units.

Results: RO3. Exploration of Developing Compact and Standard-Size Clothes Dryer NOBs

This section provides two detailed findings related to Cadmus' exploration of developing additional NOBs for compact and standard sized clothes dryers.

ENERGY STAR QPL and NEEA Market Research Suggests Low Compact Size Clothes Dryer Market Share

Compact dryers are defined as having a clothing drum capacity of less than 4.4 cubic feet from both federal standards and ENERGY STAR specifications. The ENERGY STAR qualified product list (QPL) currently has 11% of their available products classified as compact and 89% classified as standard size. While this QPL does not include sales data, it can be reasonably assumed that compact dryers make up a significantly smaller high-performance dryers market size than standard size clothes dryers.

NEEA's market research published in 2020 also reflects the relatively small market size of compact units. This market data shows the compact units' market share of annual sales at 1.8% of the total market. Because compact dryer units make up such a small percentage of the high-performance dryer market, it is unlikely NEEA will see substantial benefit from adding a measure identifier to identify compact units in its NOB.

Market Experts Supported Low Market Share Finding for Compact Dryers

In interviews with market experts, two of the interviewees described compact dryer units in the United States market as not performing well initially, as the market expanded to include more high-performance dryers. One market expert theorized that this is largely due to U.S. consumers preferring larger-sized units, even though compact units often cost less to operate and have higher efficiencies overall. This market expert also noted that standard-sized high-efficiency dryers have had higher market penetration over the last five years and suggested that compact units do not provide the desired capacity for residences with more than two people. Standard size dryers may also be preferred because many residences are equipped with laundry space that is already sized for standard dryers, with a compact unit failing to completely fill out the space. This market expert added that compact dryers are viewed as specialty products and would only be pursued where space saving benefits outweigh the longer drying times or smaller load sizes, which they felt was a major barrier to uptake of compact dryers.

Due to the market uptake barriers for compact dryers identified by market experts above, it is reasonable to assume that market share for compact dryers may grow at a slower rate when compared to standard size dryers. While a specific theoretical growth rate to apply to NEEA's NOB is difficult to determine from market expert feedback and secondary research, a growth rate of half or less for compact dryers relative to standard size dryers is a reasonable and defensible assumption. This assumption is supported by NEEA's 2020 market data, as stated in the section above. It shows that 97% of the market use standard size dryers, with compact units making up just 1.8%. With such a large

difference in market share as of 2020, the growth rate of compact dryer units is clearly lower than that of standard size dryers.

Cadmus verified that select global market research companies have clothes dryers' point of sale data divided by census regions that include data on clothes dryer capacities from 2022 to 2025. It may be of interest to NEEA to purchase this data to verify the assumed low market share of compact dryers in recent years.

RO3 Conclusion and Recommendation

Conclusion 3: The factors that influence the NOB for compact and standard-size heat pump clothes dryers do not substantially differ. Compact dryers have a relatively small market size (1.8% as of NEEA's research in 2020), and only 11% of eligible clothes dryers are classified as compact on ENERGY STAR's QPL. Further, consumers continue to show a preference for standard-sized units.

Recommendation 3: Compact dryers do not represent a large enough market share to require a separate NOB. NEEA should continue to track market share and compact dryer product development trends. Should a significant change occur, NEEA should reassess the need for a separate NOB.

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Appendix A. Interview Guide

Research Objectives	Corresponding Question Numbers
What is the current state of the market and market penetration for high-performance clothes dryers?	Section B
How do experts view the federal standards for energy conservation in clothes dryers as a driver or barrier for high-performance dryer uptake?	Section C

Audience: Experts on the clothes dryer market

Purpose: To assess how NEEA’s NOB (naturally occurring baseline) for heat pump dryers in all-in-one laundry units may or may not need to be revised due to the modeling being based on stand-alone laundry units and not combination units, assess the impact of changes in federal standards for clothes dryers, and adjust the market penetration modeling approach for high efficiency clothes dryers depending on finding.

These in-depth interviews will be conducted by Cadmus staff. Interviews will be scheduled in advance of the call via email. The interview will take around 30 minutes. This information will be included in the email invitation.

Target: 4 completes

Recruitment Email: NEEA Contacts

To: [EMAIL]

From: [YOUREMAIL]

Subject: Clothes Dryer Interview Request for NEEA Study

Hi [Contact Name],

NEEA is conducting research on high-performance clothes dryers and I thought you would be an important contact to speak with, since you [insert reason you recommended them]. We are trying to learn more about the current state of the clothes dryer market in the US, including how federal standards uncertainty may be affecting businesses, as well as any insights you are able to share about the market penetration of high-performance dryers.

Would you be open to speaking with our contractor about your expertise? His name is Jay Harvey and he is copied here, in case you have any questions about the study itself.

Thanks,

[NEEA staff member]

Recruitment Email 2: NEEA contacts (follow-up by Jay)

Hi [Contact Name],

Thank you for your interest in the high-performance dryers study that I'm running on behalf of NEEA. In appreciation of your time, **we will provide you with a \$100 gift card**. The interview should take about 30 minutes. All responses will be de-identified and attributed to roles and titles, as opposed to respondents by name. Do you have time to participate in the next couple of weeks? Alternatively, if you think someone else within your organization would be a better fit for the interview, could you introduce us?

I will conduct all of the interviews, but if you'd like to speak with someone from NEEA about the validity of the research, Zdanna King (Senior Market Research and Evaluation Scientist at NEEA), is happy to talk more about the study and how results will be used in their programs (email zking@neea.org). Thanks,

[Jay Harvey, [Title, Org, email]

Recruitment Email: non-NEEA contacts

Subject: Clothes Dryer Interview Request for NEEA Study

Hi [FIRST NAME],

Cadmus, on behalf of the Northwest Energy Efficiency Alliance (NEEA) is conducting research on high-performance clothes dryers. Our team identified you as an important contact to speak with regarding this market. As part of our study, we would like to schedule an interview with you to discuss several topics, including the federal standards landscape, market saturation estimates, and the influence of several product features, among other topics.

In appreciation of your time, **we will provide you with a \$100 gift card**. This interview should take about 30 minutes. Do you have time to participate in the next couple of weeks? Alternatively, if you think someone else within your organization would be a better fit for the interview, could you introduce us?

These interviews will be conducted by Jay Harvey from Cadmus; you can reach Jay at Jay.Harvey@cadmusgroup.com.

If you have any questions about the validity of this research, please reach out to Zdanna King from NEEA by email at ZKing@neea.org.

Thanks,

[NAME]

A. Introduction and Interviewee Details

Thank you for taking the time to speak with me. For this study on high-performance dryers for NEEA, Cadmus is conducting in-depth interviews with various market experts.

[IF NOT A NEEA CONTACT] The Northwest Energy Efficiency Alliance (NEEA) is a non-profit organization that works with the market to advance energy-efficient technologies in ways that promote reliability, comfort, and economic benefits for Northwest consumers and businesses.

For this interview, NEEA is interested in better understanding the market for high- performance clothes dryers in the Northwest (including Idaho, Montana, Oregon, and Washington), but you can talk in terms of national trends if that's more applicable to the situation and your expertise.

The purpose of these interviews is to get a better understanding of the current state of the market for high-performance clothes dryers and the likeliness of the current national administration's support for the new federal clothes dryer standards with a compliance date in 2028. We will use the information you provide to inform our understanding of the current baseline of market penetration for high-performance dryers without NEEA's intervention. The interview will take about 20 minutes.

- A1. To start, please tell me about your experience with the high-performance clothes dryer market.

B. Market Characteristics

The next several questions concern the market for clothes dryers. We'll start with a few broad questions before diving into specifics.

- B1. What changes or trends have you observed in dryer technology over the last several years?
1. *What factors do you see driving consumer purchasing decisions for dryers in the current market? (e.g. price, performance, features, brand)*
- B2. In your opinion, how has the market reacted to combination laundry units (washer and dryer) and heat pump combination laundry units? Are they becoming more common?
- B3. In your opinion, what kinds of dryers are most likely to be installed in...
1. *New construction single family homes:*
 2. *Single family homes (retrofits):*
 3. *New construction multi-family homes:*
 4. *Multi-family homes (retrofits):*

C. Energy Conservation Standards

My next set of questions regard energy conservation standards and their impact on the dryers market. We use this information to help predict the potential uptake of high-performance dryers.

- C1. Energy conservation standards are set by the U.S. Department of Energy (DOE), with new standards for residential clothes dryers taking effect in March 2028. However, the US administration has signaled that these standards (and associated test procedures) may be delayed. Have you been following this issue?
- C2. In your opinion, how likely is it that dryer standards will be delayed beyond 2028?
- C3. In February of this year, there was an executive order instructing agency heads to look for rules not to enforce, making it possible that the administration could maintain the dryer standards compliance date in 2028, but that there would be no action to enforce these standards. Have you been following this issue?
 - 1. *In your opinion, how likely is it that the government would maintain the product standard for dryers, but choose not to enforce it?*
- C4. How might uncertainty around federal standards and their enforcement affect the market for high-performance dryers?
 - 1. *[IF not addressed] How might this affect manufacturers or distributors?*

D. Closing

Thank you for participating in this interview. As part of this research effort, Cadmus will be talking to other experts about these same topics.

- D1. Is there anything else about high-performance dryers that you'd like to discuss that we did not ask about?
- D2. Is it okay if I reach out to you with additional questions that may arise during the evaluation?
- D3. The last question I have is to confirm where we can send your \$100 gift card. Could you please provide the email address where should send it? This contact information will only be used to provide you with the gift card and won't be sold or disclosed to third parties.
 - 1. *Email:*
 - 2. *Don't want one*

Again, thank you so much for your time and input; we really appreciate it. Feel free to contact me if you think of anything else or have any questions. Have a nice day.