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## Reduced Wattage Lamp Replacement: Market Intervention Strategies, Market Size and Next Steps

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# Memorandum

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In September 2016, Cadeo, as a subcontractor to Navigant, completed the first Market Progress Evaluation Report (MPER) for the Northwest Energy Efficiency Alliance's (NEEA) Reduced Wattage Lamp Replacement (RWLR) initiative. In May 2017, NEEA asked Cadeo to further explore three RWLR research topics:

1. How, since the beginning of 2016, have the incentive structures, stocking practices, and other strategies employed by participating RWLR distributors impacted their reduced wattage (RW) lamp sales?
2. Are there aspects of those RW-specific strategies that NEEA could use to promote other efficient lighting or non-lighting products in the future through a similar midstream initiative?
3. What is the current size the non-residential lighting maintenance market in the Pacific Northwest?

To investigate these questions, Cadeo completed the following research tasks:

**Distributor Log Review.** NEEA meets regularly with its participating distributors. During these meetings, RWLR managers take detailed notes of their discussions, which they catalog on NEEAnet. Cadeo reviewed each participating distributor's log to identify the RW sales strategies each employed since January 2016. We then mapped the strategies mentioned in each log to that distributor's monthly RW sales to assess, to the extent possible, the effectiveness of identified strategies on RW market penetration (MP).

**Distributor Interview Review.** Cadeo did not interview any participating distributors as part of this research. However, we did revisit the recordings and notes from the distributor interviews that we completed last summer (as part of the first MPER) to mine any information related to sales strategies.

**Initiative Manager Interview.** We interviewed two members of RWLR's management team to gain their perspectives on how various distributor strategies impacted RW sales.

**Market Size Analysis.** To answer NEEA's question regarding the size of the non-residential four-foot linear fluorescent lamp (LFL) maintenance market, Cadeo assessed two independent market size estimates: one that relies on national LFL shipment data and one from the Bonneville Power Administration's soon-to-be completed regional non-residential lighting stock model.

## About this memo

The remainder of this memo presents our findings, which we have provided in two sections. The first section discusses the market intervention strategies – both successful and less successful – used by distributors to drive RW sales. The second section offers our review of regional LFL market size estimates.

This memo is anonymized and uses aliases (e.g., Distributors A-M) in lieu of participating distributor names.

## Market Intervention Strategies

Our research identified a wide range of market intervention strategies employed by RWLR management and participating distributors to shift the regional LFL market to RW lamps. Our review of the available information revealed that some of these strategies were more effective than others.

In general, we could assign the identified market intervention strategies to one of the following three categories based on the strategy's apparent effectiveness:

- **"We're on to something!"**
- **"It's tough to say..."**
- **"Let's try something else"**

We have organized our findings accordingly.

Before reviewing the findings below, it is critical to note that non-residential lighting market that RWLR seeks to transform does not lend itself to clear tests of causation. That is, it is often not possible to definitively attribute a specific market intervention strategy with a fluctuation in monthly RW sales. This is, in part, because there can be significant lags between when a strategy is first implemented and when it – ideally – produces the desired effect. An effort to convert the LFL stock at select regional branches, for example, could take months or even years to complete. It is also because market transformation requires persistent and diversified intervention. Consequently, RWLR typically employs multiple demand- and supply-side strategies – promotion, training, marketing, etc. – simultaneously, which can obscure the impact of any individual strategy.

While these caveats are important context for interpreting our findings, the team was able to identify types of strategies that, in general, were more or less effective driving higher RW MP over the last year and half.

It is also important to note that RWLR management is also recording the relative success of distributor's market intervention strategies using a centralized tracking spreadsheet. RWLR uses the "Distributor Tactic Tracking Tool" to record when specific distributors tried a tactic, which branches participated, and how effective the tactic was three months, six months, nine months, and a year after it was launched. Over time, the tool will become a powerful resource for documenting how various tactics influence the market.



**“We’re on to something!”**

**Frame every 32W sale as a lost opportunity to increase revenue.**

NEEA typically offers participating distributors a per-lamp incentive, as well as escalating RW MP bonuses (\$5,000 for 20% market share, \$10,000 for 30%, etc.). This means that every time a distributor sells a 32W lamp instead of a RW lamp they are forgoing RWLR incentives that would increase their personal compensation and/or bolster the company’s bottom-line. For smaller distributors, the lost opportunity might be relatively small (less than \$1,000 dollars). However, for larger distributors, the total amount of lost RWLR incentives can be quite sizable – upwards of \$50,000 in just one month.

Over time, RWLR management has determined that framing discussions with distributors around the concept of 32W sales as a lost opportunity for increasing revenue and/or compensation is an effective strategy. Specifically, RWLR management draws attention to the lost opportunity of 32W lamp sales by providing select distributors with a table that explicitly states – in dollars – the total incentives the distributor left on the table that month. This monthly report also notes the additional number of RW lamps sales necessary to meet the agreed upon MP bonuses.

RWLR management continues to adjust the exact format and content of the lost opportunity tables to maximize their impact, but our review of the logs and discussion with RWLR management indicated the lost opportunity message resonates with distributor staff and has proven to be an effective motivator.

Distributor B is a great example of how these monthly reports can increase RW MP. RWLR management began providing lost opportunity reports to Distributor B, the largest RWLR participant by LFL unit sales, in January 2017. The reports break down sales of 32W, 28W, and 25W lamps for each branch, as well as lost opportunities for each branch and Distributor B overall as a company. Again, while other factors – many of which we discuss later in this memo also contribute to changes in RW sales – Distributor B has experienced an increase in RW MP in 2017 (24%) relative to 2016 when they did not receive the lost opportunity reports (10%).

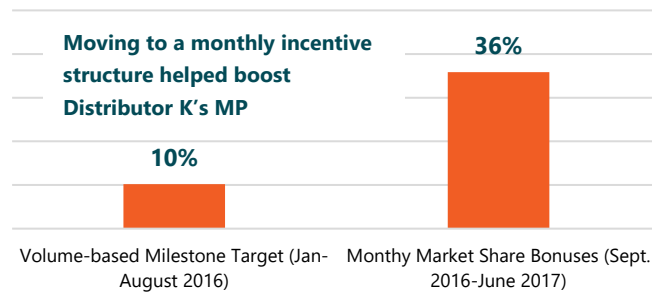
**More frequent and more targeted incentive structures.**

When RWLR launched, many of the MP bonuses established with distributors were annual and/or company-wide volume targets. The initiative’s distributor leads reported back that it was difficult to retain a RW focus over such an extended period and that their staff were not sufficiently motivated by such long-term payoffs. Consequently, RWLR has shifted toward a model that uses shorter-term, and, in some instances, branch-specific targets. These shorter-term, more achievable targets serve as important stepping stones for participating distributors. It allows distributors, particularly distributors new to RWLR, to have early success and to take an incremental approach to transitioning from 32W to RW lamps.

For example, RWLR’s original promotion with Distributor K included a large, lump sum bonus when the distributor hit 25,000 total RW sales.

When RWLR and Distributor K renegotiated in September 2016, the promotion transitioned to a monthly bonus model for MP rates above an agreed upon threshold. This, along

with other factors, likely contributed to the change in Distributor K’s RW MP: 10% under the previous promotion (January through August 2016) and 36% after the start of the new promotion (September 2016 through June 2017).



Unlike some other distributors, Distributor M and Distributor D developed an incentive structure that is specific to branches based on their sales volume. The incentives are structured to include per lamp incentives, stocking conversion stipends, and MP bonuses. Other distributors, such as Distributor F and Distributor H, have started to move from a company-wide target to branch-specific targets as well through their own corporate strategies. This strategic shift can ignite the intra-distributor competitive fires previously noted.

**Leverage distributor’s competitive spirit.**

Electrical distributors are sales-oriented organizations that typically employ sales-motivated staff. Sales-motivated staff often have competitive personalities and want to perform well relative to their peers within an organization, as well as against competing other distributors in the market. By providing distributors with concrete information about their sales levels, RW MP, and lost opportunity relative to peers within their organization or, more generally, relative to other branches or even other participating distributors, the initiative can leverage these competitive instincts to drive higher RW sales.

RWLR management did note that they observed a difference between the effectiveness of some staff incentives (e.g., a pre-determined incentive amount per case sold) and staff promotions (e.g., branch staff competing for a monetary or non-monetary prize). RWLR management indicated that the former strategy was, in general, more effective. They also pointed out that the relative success of staff incentives and promotions also depended somewhat on the distributor’s familiarity and/or comfort with these kind of marketing strategies outside of or prior to RWLR. When these strategies were already part of the company’s existing sales culture, such as was the case for Distributor B’s Cash for Cases campaign, the strategies, not surprisingly, tended to be more successful.

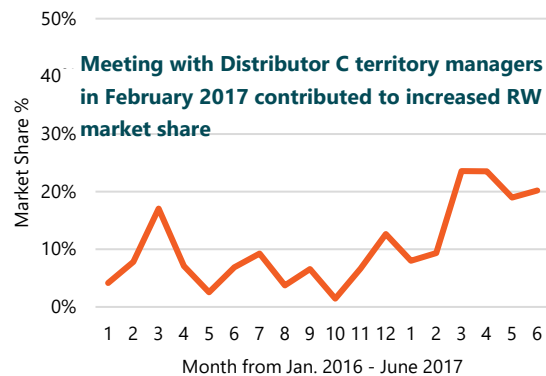
**With granularity comes clarity.**

Branch-specific assessments can also provide RWLR managers and distributors, throughout the organization, with greater clarity. Enabling company and regional managers to track how the initiative is impacting individual branches provides the information that these managers need to affect change within their organization. RWLR management noted that providing richer, more granular data was critical for improvement in RW MP for both Distributor B and Distributor C.

Further, since some branches are more resistant to RW lamps and sales volumes can vary significantly by branch, company-wide RW market shares can be misleading or difficult to interpret and translate into programmatic action. Assessing and incentivizing branches individually recognizes the meaningful differences that exist within a distributor’s organization. It can avoid reigning in the enthusiasm of a particularly successful branch when the company’s overall RW MP does not meet expectations, as well as offer motivation to more recalcitrant branches.

**The more the merrier.**

Over the course of 2016, Distributor C only experienced two months with double digit RW MP – one of which was due to purchases by single large customer. As part of initiative’s comprehensive plan to target, incentivize, and convert stocking practices at 15 specific Distributor C branches, RWLR also held a meeting in February 2017 with distributor territory managers that had not previously been actively involved in the initiative. The meeting appeared to bear immediate fruit as Distributor C posted



24% RW MP in both March and April 2017. Although May and June exhibited a slight decline in RW MP, it still hovered around 20%, significantly higher than the 2016 average MP.

Distributor C’s recent meeting with territory managers is indicative of a broader trend noted by RWLR management; a trend toward increased involvement by corporate, territory, and branch management. RWLR management felt a more inclusive model – versus a model that relies primarily on a single point-of-contact with each distributor to champion the initiative and disseminate information – is more effective given the highly-fragmented nature of the distributor organizations, as well as the non-residential lighting market in general. In most cases, there are multiple decision makers within a given distributor often with competing priorities and agendas. Opening the discussion to more stakeholders within the distributor’s organization increases RWLR visibility and, ideally, buy-in. It also affords more time for distributor staff to engage directly with RWLR management, express any concerns, and get more comfortable with RW lamps and RWLR’s mission. This type of open communication also provides a forum for stakeholders throughout the distributor’s company to provide feedback on larger, organizational efforts (like stocking changes) early in the initiative’s incentive structure design process. RWLR management noted this process was important for Distributor D and Distributor M.

The distributor logs, as well as our discussion with RWLR management, also revealed that RWLR is increasingly involving manufacturers and their local sales representatives. For example, the logs indicate that Distributor H began including their RW manufacturer’s inside sales contact in their monthly meetings beginning October 2016, and this has become common practice moving forward. Including their manufacturer contact allows Distributor H to hear of larger trends in the LFL market and how to better

target sales. Manufacturers, both corporate staff and their local representatives, also benefit from a seat at the table. From their perspective, participation in the meetings strengthens their overall relationship with the distributor and provides them with greater insight into how the distributor operates. Since the distributor is, in practical terms, the manufacturer's client, these benefits are significant.

Other distributors, such as Distributor J, have also started to include their partner manufacturer in monthly meetings. Similarly, Distributor B added their Philips representatives to their RWLR meetings in 2017 – after initially expressing a reluctance to broadening their internal discussion to include the manufacturer. RWLR management noted that Philip's inclusion was a turning point for Distributor B and the initiative.

In general, engaging corporate manufacturers and regional manufacturer representatives in more meaningful way can also result in improved stocking, training, and special pricing agreements that can improve distributor and customer's RW value proposition.

**Stocking conversions are not a silver bullet, but they are an essential part of the RWLR arsenal.**

A core element of RWLR's logic model is that changing distributor stocking practices is an essential step to shifting the market to RW lamps. Greater RW stocking ensures RW lamps are readily available to customers successfully converted away from 32W lamps. Full conversion to RW lamps can also force the hand of reticent customers in need of LFLs quickly.

In practice, RWLR management reported that changing distributor stocking practices is important although difficult and time consuming. RWLR management also noted that shelf stock is not a silver bullet and works best when coupled with other intervention strategies.

There are clear stocking conversion success stories though: in September 2016, one of Distributor M's Washington branches converted all but one box of their T8 LFL inventory to RW lamps and has consistently had the distributor's highest RW MP. Other Distributor M branches in Washington, have also succeed with stocking conversions. Distributor A's greater Seattle branch also moved to "default" strategy; that is Distributor A phased out 32W products and defaulted all subsequent orders to 28W unless the customer expressed a specific need for 32W. Distributor A reported that their greater Seattle branch customers have been happy and the branch has met its RW MP targets. Distributor H too has seen RW MP success after phasing out 32W products earlier this spring.

However, the initiative's greatest stocking conversion success may be coming soon. In June 2017, Distributor B – the largest RWLR distributor in terms of annual LFL sales – notified RWLR management that they will too "turn off" 32W stock replenishments at all their Northwest branches and transition instead to RW lamps. Given Distributor B's size, this change, should it occur as planned, will be a turning point in RWLR's ongoing effort to transform the regional LFL maintenance market.

In some instances, stock conversions can be hard to implement though, often requiring buy-in from several managers and changes to a distributor's ordering mechanism. In some cases, select distributor branches are willing to try it and have succeeded (like one of Distributor E's Montana branches), while others (like Distributor M's greater Seattle branch) are adamantly opposed.

RWLR management also noted that the theory that RW MP would take off after a branch converted has also more recently been called into question. Earlier we cited Distributor C's increased MP after a meeting with territory managers; another aspect of the distributor's plan was a stock conversion. However, per RWLR management, Distributor C's increases in RW MP have not met Distributor C or NEEA's expectations given the extent of their stocking conversion. However, there can be a lag between the stocking conversion and increase in RW MP companywide: looking at specific branches such as those in Oregon, RW MP has increased substantially.

In addition to the time lag, restocking primarily impacts in-branch sales. It depends on the branches' location and customer base, but these types of sales typically make up roughly half of a distributor's total lighting sales, the other half being project sales. Larger customers are placing larger orders outside the branch (i.e., project sales) and are less dependent on the particular lamps that distributor has in stock. Also, as noted above, larger customers are commonly subject to more restrictive purchasing arrangements that can also limit their ability to switch to RW.

### "It's tough to say..."

#### **Focusing on the big fish.**

Many of the distributor logs include discussion about distributors identifying their largest 32W customers and targeting them for RW education and, ideally, conversion. Going after the largest maintenance customers – such as school districts, hospitals, or retail chains – is a logical path to both increasing distributor-specific RW market penetration and driving market transformation regionally.

During the past years, distributors have employed a variety of strategies to reach and convert these customers. For example, in mid-2016 Distributor J piloted a major customer RW giveaway program through which they gave targeted customers up to 1,500 free RWs – if the customer committed to changing their default orders to RW. Distributor J successfully enlisted a school district in the pilot before losing their day-to-day RWLR contact and, with him, the program's momentum. Because of Distributor J's change in leadership, the viability of the pilot remains unclear.

Other distributors focused on key accounts from the start. Upon enrolling in the program, Distributor M targeted a handful of their large industrial customers. The logs indicate that one of the division leaders was responsible for setting up "energy efficiency focused meetings with larger customers." These meetings can include the distributor's lighting specialist, as well as a manufacturer representative. The team believes this attributed to Distributor M's quick success in growing RW market penetration. Other distributor logs, including Distributor B and Distributor C, detail successful implementation of this strategy.

While targeting the largest customers is a conceptually sound strategy, it can also be difficult to implement in practice. First, the very identification of "large" customers can be problematic. Since customers order in varying intervals, amounts, and methods (centralized vs. disaggregated locations) establishing a threshold for "large" customers and then identifying them can be time-consuming and uncertain. Also, large customers are often beholden to state or federal purchasing lists and/or requirements, as well as potentially already receiving favorable pricing on 32W lamps due to their volume.



Further, distributors typically interact with these customers differently – through their key account lighting specialist – and can be more risk averse and reluctant to rock the boat with important customers.

## “Let’s try something else”

### Look – they did it!

Almost every distributor log mentions case studies, i.e., examples of distributor customers that have switched from 32W to RW lamps. In some cases, the distributor is inquiring whether RWLR management can provide a case study that the distributor can share with its customers. This is a common request when distributors first enroll in RWLR. In other instances, it’s RWLR asking whether the distributor has any success stories that NEEA’s marketing team can use to create a case study.

The logic behind case studies is clear: it’s evidence that another customer made the switch – and it worked. However, RWLR management noted that it is less clear how effective case studies have been encouraging other distributor customers to adopt RW lamps. Specifically, RWLR management said they had never had a distributor report back that a case study was instrumental in causing a customer to convert to RW lamps.

### Stopping by.

To support participating branches, RWLR management sometimes enlisted Evergreen Consulting to visit participating distributors in-person. During these visits, Evergreen’s lighting staff would provide information and training about RW lamps, as well as about the initiative overall. While some of the distributor logs noted that these visits were informative and that Evergreen staff were well-received, RWLR management felt, overall, that the visits were not particularly effective. Given the cost of in-person visits, it is important that the initiative’s investment bear fruit.

## Transferability of Strategies

NEEA asked Cadeo to consider how transferrable these RW-specific strategies are for future initiatives that promote other efficient lighting or non-lighting products using a similar midstream model. We believe that all the successful strategies highlighted above that were used by RWLR management – providing lost opportunity reports, leveraging competitive instincts, setting branch-specific, stair stepped targets and incentives, and opening the initiative discussion to a wider set of stakeholders, including partnering manufacturers – are strategies that work well for electrical distributors in general and are not specific to RW lamps.

It is also likely that some, or all, of these strategies will work for other types of distributors, such as HVAC distributors. However, it is not possible to know that definitively until tested. Regardless, the lessons NEEA has learned from working with electrical distributors as part of RWLR will offer a solid starting point for engaging non-electrical distributors.

RWLR’s success gathering sales data as part of RWLR also bodes well for all any future distributor-based, mid-stream initiatives. While it’s possible that distributors will express greater concern about sharing sales



data for other non-lighting parts of their business, it's clear from a review of the distributor logs – as well as the distributor interviews that were part of the recent RWLR Market Progress Evaluation Report – that RWLR has earned the confidence of participating distributors. This confidence will likely serve NEEA well if it seeks to expand the current platform to include other efficient products.

## Market Size

NEEA also asked Cadeo to investigate the size of linear lamp replacement market in the Northwest. Because no definitive market size estimates are available, NEEA's RWLR program has relied on the working assumption that roughly 10 million linear lamps are sold in 2013 and that total sales would decline annually. This estimate is based on findings of various regional market research efforts.<sup>1</sup> Per RWLR management, the initiative's current market size assumption for 2017 is approximately 8.8 million lamps. This implies a 12% decline in total market over the last four years. With the emergence of TLEDs and LED's overall NEEA sought to reevaluate this market size estimate and assess the rate of its decline.

To this end, the team investigated two secondary sources to determine whether this assumption could be updated: The National Electrical Manufacturer's (NEMA) Linear Fluorescent Lamp Index and the Bonneville Power Administration's recently completed non-residential regional lighting market model.

## NEMA Lamp Index

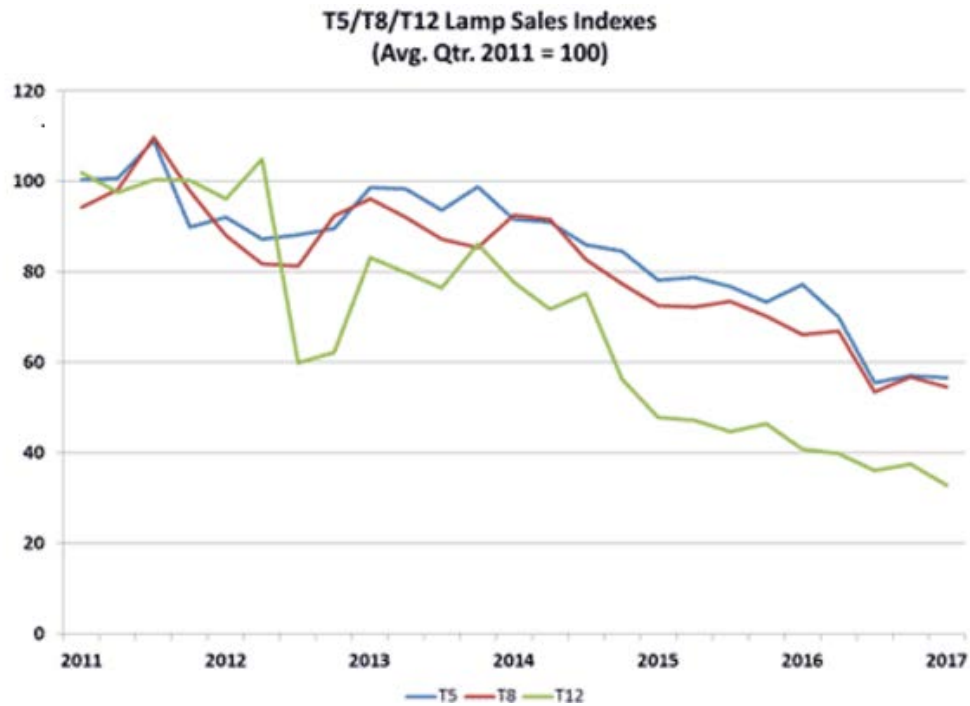
The NEMA Linear Fluorescent Lamp Index<sup>2</sup> reports two measures of the linear lamp market on a quarterly basis. First, it indexes the national sales of T8, T12, and T5 lamps relative to (i.e., normalized to) each lamp type's average quarterly sales volume in 2011. Figure 1 illustrates these quarterly indices below through 3Q16, which is the latest available data from NEMA.

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<sup>1</sup> See, for example: <https://neea.org/docs/default-source/reports/reduced-watt-lamp-replacement-market-characterization-and-baseline-report.pdf?sfvrsn=12>

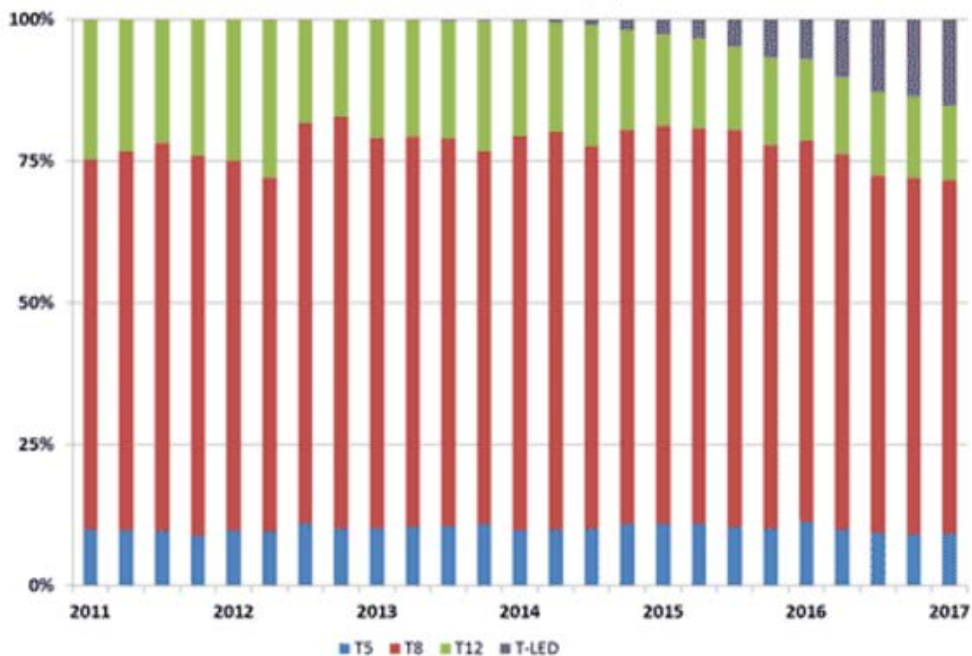
<sup>2</sup> Available online at: <http://www.nema.org/news/Pages/Linear-Fluorescent-Lamp-Indexes-Decrease-in-the-First-Quarter-of-2017.aspx>

Figure 1. NEMA Linear Fluorescent Lamp Index, First Quarter 2017



Second, NEMA reports the market share of these lamp types, as well as TLEDs. The market share of each lamp type is shown below in Figure 2.

Figure 2. NEMA Linear Lamp Market Penetration by Lamp Type, First Quarter 2017



Note that these graphs reflect national shipments, rather than regional shipments, and comprise all 'purchase events' (new construction, retrofit, and replacement for both the non-residential and residential sector), rather than just lamp replacement. For these reasons, the total sales volumes shown in Figure 1 overstate the relevant sales volume for RWLR. (Later in this section, we detail several adjustments we make to the above NEMA sales volumes to allow for a more direct comparison to RWLR's regional sales estimate.)

Regardless of these definitional differences, the NEMA sales indices clearly show that the linear lamp market, even including TLEDs, has declined nationally since 2011, and that the decline has accelerated since 2014. Compared to the average quarter in 2011, sales of linear fluorescent T8, T5, and T12 in the first quarter of 2017 have fallen approximately 45%, 45%, and 65%, respectively. While the rates of decline are slightly less since 2013 – RWLR's baseline year – the total decline in the market size seen in the NEMA data greatly exceeds RWLR's previous internal assumption.

This substantial fall off is likely to due to several factors:

- **Longer-Life T8s.** Over the last decade manufacturers have introduced and promoted longer-life T8 lamps. As the average lifetime of the T8 lamps in the installed stock increased, their turnover cycle slowed. Because of the significance of the T8 market, which in recent years has constituted between two-thirds and three-quarters of all linear lamp sales, even the modest increase in average T8 lamp lifetime has likely contributed to the overall linear lamp market's decline.
- **Fewer Linear Fluorescent Retrofits.** In addition, unprecedented retrofit activity occurred in the decade preceding 2014, with widespread conversion of T12 to T8 fixtures and HID to T5 or T8 fixtures. The tremendous success of T8 and T5 lamps in the retrofit market drove lamp sales totals over this time. As the retrofit market for T8s and T5s approached saturation, these lamps' sales totals lost a significant tailwind. This too has contributed to the declines shown in the NEMA lamp indices.
- **LEDs.** Most recently, LEDs, particularly TLEDs, have emerged as an alternative to the traditional linear fluorescent lamp market. LED luminaires have taken market share from linear fluorescents in the new construction and retrofit markets, while TLEDs have penetrated the replacement market particularly in portions of the Pacific Northwest where utilities offered hefty incentives.

While the NEMA data only provide relative totals for each quarter, Cadeo tracks the quarterly indices against confidential national shipments data from 2011 (the base year for the indices), which provides absolute sales totals for linear fluorescent lamps.<sup>3</sup> By applying the NEMA indices to that sales data, we can estimate what was the national LFL market (excluding T5 lamps) was in the 2015 (the most recent full year for which NEMA data is available; using partial the incomplete 2016 data would ignore any seasonality.) The team then scaled that number down to account for the Northwest's share of national commercial square footage, estimated at 4%. Thus, we calculate a top-down Northwest market size estimate of roughly 8.5 million T8 lamps and 1.9 million T12 lamps in 2015 (again, that includes all purchase events

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<sup>3</sup> The team adjusted the 2011 total sales upwards to account for non-NEMA manufacturers. The standard adjustment applied for this purpose is 10%, based on NEMA's data covering 90% of lamp shipments.



and sectors). This estimate includes only 4-foot linear fluorescent T8 and T12 lamps (and excludes 2-ft, U-shaped and 8-foot lamps).

## BPA Non-Residential Model

BPA’s non-residential lighting market model is a stock turnover model that estimates the annual Northwest sales of all major lamp types, including linear lamps. The model, built by Navigant Consulting with support from Cadeo, estimates 14.7 million 4-foot linear lamps were sold in 2015, across all purchase events.<sup>4</sup> The two most important inputs that drive the BPA model’s market size estimate are the installed stock and the turnover assumptions. The installed stock counts are based on the NEEA’s 2014 Commercial Building Stock Assessment. In our judgement, the CBSA is the most reliable characterization of the installed lighting stock in the Northwest. BPA’s turnover assumptions (which drive replacements and therefore sales totals) are primarily a function of operating hours and lamp lifetime. Operating hours are those recommended by the Regional Technical Forum by building type. Lamp lifetime assumptions for T8 and T12 lamps are based on Department of Energy data. New construction growth and lighting retrofit assumptions, both consistent with the Northwest Power and Conservation Council’s 7<sup>th</sup> Plan assumptions, also contribute to the total linear lamp sales estimate generated by the BPA model.

## Comparison

The NEMA estimate is a top-down assessment of the Northwest market size, while the BPA estimate is a bottom-up assessment based on sales and stock data. These two approaches yielded differing estimates, as shown in Table 1 below.

**Table 1. Estimated 2015 Market Size for Four-Foot T8 and T12 Lamps**

Source of Estimate	Estimated 2015 Lamp Sales (rounded to nearest 100,000)
NEMA Lamp Indices	10.4 million
BPA Lighting Market Model	14.7 million

In our view, all the critical assumptions that drive the BPA model’s estimates for the total market are reasonable and based on the best available information. That its market size estimate would diverge so significantly from the top-down estimate based on NEMA’s sales data is therefore puzzling. The top-down approach has considerable uncertainty however: when a large number (total national sales) is scaled down by single factor (4% of the U.S.), the precision of the scalar will be magnified when comparing the result to a smaller number (BPA’s regional estimate). Both market size estimates in Table 1 are higher than NEEA’s internal planning estimate for 2015 (~9.4M), although the NEMA-based estimate is much closer.

Currently, data collected from RWLR participating distributors sum to approximately 3.5M regional LFL sales annually. This volume, using the initiative’s internal planning market size estimate of ~9.4M LFLs in

<sup>4</sup> The BPA model’s estimate includes both 4-foot and 8-foot lamps, so the team adjusted the estimate downward by 3% to remove 8-foot lamps to allow for direct comparison to the NEMA estimate. This adjustment was based on BPA’s 2015 sales data.



2015, implies that participating distributors represent roughly a third of all LFL sales in the region. Interestingly, RWLR management – as part of their efforts to increase participation in the initiative and affect regional transformation – have had difficulty “finding” the other two-thirds of estimated regional lamp sales. Previous RWLR outreach efforts have not identified any other major distributors operating outside the initiative, meaning the balance of regional annual LFL sales – if the ~9.4M value is assumed to be accurate – are likely generated by a combination of smaller distributors, Big Box retailers, and/or national accounts (i.e., large end-users working directly with manufacturers, which may ship from outside the region).

At this time, it is not possible to fully reconcile the disparity between the NEMA, BPA lighting model, and RWLR internal planning market size estimates – or between these three estimates and the known volume of LFL sales coming through RWLR. The NEMA and BPA lighting model offer additional market size data points – and therefore additional context and insight – but they also add to the existing uncertainty surrounding to the long-standing question facing RWLR: What is the actual size of the regional LFL market that the initiative seeks to transform?

However, there is no doubt the national linear lamp market is declining rapidly due to a confluence of factors, namely slower turnover cycles, saturation of retrofit opportunities, and the penetration of LEDs and TLEDs. According to the NEMA Index, national T8 and T12 lamp sales have fallen 8.6% and 16.5% annually since 2011. The decline appears to have accelerated after 2014. The next few NEMA lamp index updates will prove critical to assessing the pace of the decline.