The Commonwealth of Massachusetts

DEPARTMENT OF PUBLIC UTILITIES

D.P.U. 17-05 November 30, 2017

Petition of NSTAR Electric Company and Western Massachusetts Electric Company, each doing business as Eversource Energy, Pursuant to G.L. c. 164, § 94 and 220 CMR 5.00 et seq., for Approval of General Increases in Base Distribution Rates for Electric Service and a Performance Based Ratemaking Mechanism.

ORDER ESTABLISHING EVERSOURCE'S REVENUE REQUIREMENT

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A. Introduction

Eversource proposes to implement what it calls a "Grid-Wise Performance Plan," which has two components (Exh. ES-GWPP-1, at 9). First, the Companies propose to implement a PBR mechanism that would adjust base rates annually in accordance with a revenue cap formula (Exh. ES-GWPP-1, at 9). Second, the Companies propose to spend $400 million in incremental grid modernization-related capital investment over the next five years, commencing January 1, 2018 (Exh. ES-GWPP-1, at 9-10). The Companies' PBR proposal is addressed below. The Companies' proposed grid modernization investments are addressed in Section X.B below.

B. Companies PBR Proposal

1. Introduction

Eversource's proposed PBR uses a revenue cap formula to adjust distribution rates annually (Exh. ES-PBRM-1, at 5). Eversource states that it designed the proposed PBR to work in tandem with its proposed revenue decoupling mechanism (Exh. ES-PBRM-1, at 6). The PBR would adjust the base revenue requirement approved in this proceeding, which serves as the target revenue for the revenue decoupling mechanism, according to the following formula:

$PBRAF_T = (GDPPI_{T-1} - X - CD) + [(Z + GMP)_T / \text{Base Revenue}_{T-1}]$, where

$PBRAF_T$ is the adjustment to the annual revenue target;

$GDPPI_{T-1}$ is a price inflation index;

X is a productivity offset;

CD is a consumer dividend;

Z is an adjustment for exogenous costs (positive or negative);

GMP is an adjustment for additional incremental grid modernization investments; and

Base Revenue is the base distribution revenue requirement.

(Exhs. ES-PBRM-1, at 44; RR-DPU-51, Att. (a) at 329-334 (proposed M.D.P.U. No. 532)).

In addition, Eversource proposes to adopt an earnings sharing mechanism that would provide a credit to customers if earnings exceed the ROE approved in this proceeding by more than 200 basis points (Exhs. ES-GWPP-1, at 65; ES-PBRM-1, at 44). Each element of the Companies' proposed revenue cap formula and PBR mechanism are described in more detail below.

2. Formula Elements

a. Productivity Offset

Eversource proposes a productivity offset ("X factor") to be calculated as:

$X = (\%\Delta TFP_I - \%\Delta TFP_E) + (\%\Delta W_E - \%\Delta W_I)$, where

$\%\Delta TFP_I$ is the percentage change in electric distribution industry total factor productivity growth;

$\%\Delta TFP_E$ is the percentage change in economy wide total factor productivity growth;

$\%\Delta W_E$ is the percentage change in economy wide input price growth; and

$\%\Delta W_I$ is the percentage change in electric distribution industry input price growth.

(Exh. ES-PBRM-1, at 34-35, 40).

The X factor consists of the differential in expected productivity growth between the electric distribution industry and the overall economy, and the differential in expected input price growth between the overall economy and the electric distribution industry (Exhs. ES-GWPP-1, at 46; ES-PBRM-1, at 34). To determine the proposed X factor, Eversource conducted a productivity study of U.S. electric distribution total factor productivity ("TFP") and input price growth over the period 2001 to 2015 (Exhs. ES-PBRM-1, at 46; ES-PBRM-2). Eversource used two different samples for its productivity study: (1) a sample of 67 electric distribution companies intended to represent the overall U.S. electric distribution industry ("nationwide LDCs"); and (2) a sample of 17 electric distribution companies intended to represent the distribution industry in the Northeast U.S. ("regional LDCs") (Exh. ES-PBRM-1, at 46). For economy wide TFP and input price growth the Companies used official U.S. government sources (Exh. ES-PBRM-1, at 46).[172]

TFP is defined as the ratio of total output to total input (Exh. ES-PBRM-1, at 30). Total output consists of all the services produced by the relevant unit of production (e.g., a firm or an industry) (Exh. ES-PBRM-1, at 30). Total input includes all resources used by the unit of production in providing those services (Exh. ES-PBRM-1, at 30). Eversource used number of customers as the sole productivity study output measure (Exh. ES-PBRM-1, at 68). For the input measure, Eversource constructed a quantity index of total input for each firm and each year based on individual labor, materials, and capital quantity indices (Exh. ES-PBRM-1, at 69-72).

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172 The sources used by the Companies were FERC Form 1, Bureau of Labor Statistics Employment Cost Index and Consumer Price Index for all Urban Consumers, and the Bureau of Economic Analysis Gross Domestic Product Price Index and Federal Reserve Economic Data (Exh. ES-PBRM-1, at 69-72).

The results of the Companies' study indicate that, for the period 2001-2015, the average growth in productivity for the regional LDCs was equal to -0.41 percent, while the average productivity growth for the nationwide LDCs was equal to -0.46 percent (Exh. ES-PBRM-1, at 47-48). For the same period, the average input price growth for regional LDCs was equal to 4.10 percent, while the average input price growth for the nationwide LDCs was equal to 4.13 percent (Exh. ES-PBRM-1, at 47-48, 75-76). Eversource's productivity study indicates that the economy-wide average productivity growth during the 2001 to 2015 period was 0.92 percent, and the average input price growth was 2.95 percent (Exh. ES-PBRM-1, at 50).

Eversource calculated its proposed productivity offset using the productivity and input price growth indices for the nationwide LDCs rather than the regional LDCs (Exh. ES-PBRM-1, at 61). Inputting the results of the productivity study into the productivity formula, Eversource calculated a proposed productivity offset equal to -2.64 percent (RR-DPU-8).[173]

b. Inflation Index and Floor

Eversource proposes to base the price inflation index included in the revenue cap formula on the Gross Domestic Product Price Index ("GDP-PI") as measured by the U.S.

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173 Eversource initially calculated a proposed productivity offset equal to -2.56 percent (Exhs. ES-GWPP-1, at 46; ES-PBRM-1, at 52, 61). During the course of the proceeding, the Companies corrected an error in the productivity study, resulting in an updated proposed productivity factor of -2.64 percent (RR-DPU-8).

Commerce Department (Exh. ES-GWPP-1, at 47).[174] Under the Companies' proposal, the inflation index would be calculated as the percentage change between the current year's GDP-PI and the prior year's GDP-PI (Exh. ES-GWPP-1, at 47). For each year, the GDP-PI would be calculated as the average of the most recent four quarterly measures of GDP-PI as of the second quarter of the year (Exh. ES-GWPP-1, at 47).[175] Additionally, Eversource proposes to include an inflation floor of one percent for the revenue cap formula (Exh. ES-GWPP-1, at 12, 47-48).

c. Consumer Dividend

Eversource proposes to implement a consumer dividend of 25 basis points, or 0.25 percent, when inflation exceeds two percent (Exhs. ES-GWPP-1, at 54; ES-PBRM-1, at 8, 60, 66-67). The Companies state that a consumer dividend is often included in first generation PBR plans to capture the increased productivity growth associated with the transition from cost of service ratemaking to incentive regulation (Exhs. ES-GWPP-1, at 49-50; ES-PBRM-1, at 54).

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174 The GDP-PI is a measure of the U.S. economy-wide inflation in the prices of final goods and services (Exhs. ES-PBRM-1, at 31-32, 34).

175 This information is published each September in the Survey of Current Business, a publication of the U.S. Commerce Department, Bureau of Economic Analysis. (Exh. ES-GWPP-1, at 47).

d. Grid Modernization Stretch Factor

Eversource states that its proposed commitment to spend $400 million in incremental grid modernization investments over five years represents an implicit stretch factor,[176] equal to approximately 1.08 percent (Exhs. ES-GWPP-1, at 53-56; ES-PBRM-1, at 54, 60). The Companies calculated an average annual revenue requirement associated with the grid modernization base commitment spending to arrive at a 1.08 percent implicit stretch factor (Exh. ES-GWPP-1, at 54).

e. Grid Modernization Plan Factor

As part of the proposed PBR formula, Eversource proposes to include an adjustment for incremental grid modernization investments outside of the grid modernization base commitment ("GMP factor") (Exhs. ES-GWPP-1, at 12, 18, 69; ES-PBRM-1, at 8). The Companies propose that the GMP factor will be set to zero unless and until the Department authorizes or requires grid modernization investment above the $400 million commitment proposed in this proceeding (Exhs. ES-GWPP-1, at 12, 18, 69; ES-PBRM-1, at 8). During the first five years of the PBR plan, should the Department, in this proceeding or in Grid Modernization, D.P.U. 15-122, authorize or require spending above this amount, the Companies propose to recover the associated revenue requirement through the GMP factor (Exhs. ES-GWPP-1, at 12, 18, 69; ES-PBRM-1, at 8).

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176 Eversource states that, while not an explicit part of the PBR formula, the grid modernization base commitment is an implicit stretch factor within the proposed PBR framework because the Companies will essentially absorb the revenue requirement associated with $400 million of grid modernization investment until the next base rate case (Exhs. ES-GWPP-1, at 53-56; ES-PBRM-1, at 5, 7-8).

f. Exogenous Cost Factor

The Companies propose to recover exogenous costs, which they define as positive or negative changes that are beyond the Companies' control and not reflected in either the GDP-PI or otherwise, in the PBR formula ("Z factor") (Exhs. ES-GWPP-1, at 12, 60; ES-PBRM-1, at 8, 44). The Companies propose to calculate the exogenous cost factor as a percentage of the previous year's base revenues. The factor would be zero unless an exogenous cost event occurs (Exhs. ES-GWPP-1, at 12, 60-62; ES-PBRM-1, at 44).

Eversource proposes that the following criteria must be met for exogenous cost recovery: (1) that the cost change is beyond Eversource's control; (2) that the change arises from a change in accounting requirements or regulatory, judicial, or legislative directives or enactments; (3) that the change is unique to the electric distribution industry as opposed to the general economy; and (4) that the change meets a threshold of "significance" for qualification (Exh. ES-GWPP-1, at 60-61).[177] Eversource proposes that the significance threshold for exogenous costs be set at $5 million for calendar year 2018 for NSTAR Electric and WMECo combined and, thereafter, be subject to annual adjustments based on changes in GDP-PI, as measured by the U.S. Commerce Department (Exh. ES-GWPP-1, at 62).

[177] Eversource requests that the Department find that costs related to two potential future events will be eligible for exogenous cost recovery where the significance threshold is met: (1) costs related to incremental property taxes that arise from additional communities in the Companies' service area converting to the RCNLD valuation method; and (2) costs related to a FERC decision to modify the Companies' transmission tariffs in light of the consolidation of NSTAR Electric and WMECo into a single entity (Exh. ES-GWPP-1, at 63-64).

g. Earnings Sharing Mechanism

As part of the PBR, the Companies propose to adopt an asymmetrical earnings sharing mechanism ("ESM") with a deadband of 200 basis points (Exhs. ES-GWPP-1, at 12, 65-66; ES-PBRM-1, at 8). The proposed earnings sharing mechanism would trigger a sharing of earnings with customers on a 75/25 basis (i.e., 75 percent to shareholders, 25 percent to ratepayers) if and when the actual distribution ROE exceeds 200 basis points above the ROE authorized in this proceeding (Exh. ES-GWPP-1, at 65).[178] If and when the actual ROE exceeds 300 basis points above the ROE authorized in this proceeding, Eversource proposes to share earnings with customers on a 50/50 basis (Exh. ES-GWPP-1, at 65). For any year in which the ROE is above the deadband, the Companies propose that the percentage of earnings that is to be shared with customers be credited to customers in the succeeding year and that the impact of this prior year adjustment be excluded from the calculation of any subsequent year's sharing (Exh. ES-GWPP-1, at 66). The Companies acknowledge that any earnings sharing adjustment would be subject to a full investigation in an adjudicatory proceeding (Exh. ES-GWPP-1, at 67).

178 The Companies propose that distribution ROE be calculated using distribution earnings available for common equity and the capital structure approved by the Department in this proceeding (Exh. ES-GWPP-1, at 67). The Companies propose that the calculation exclude incentive payments such as energy efficiency incentives, transition-incentive mitigation, and long-term contract remuneration. Additionally, the Companies propose that the calculation exclude any service-quality penalties as well as any amounts recognized in the current period resulting from regulatory or court settlements related to prior periods (Exh. ES-GWPP-1, at 67).

h. PBR Term

In the Companies' initial filing, the Companies did not specify a term for the PBR (Exhs. ES-GWPP-1, at 55; ES-PBRM-1, at 45, 54). During the course of the proceeding, Eversource proposed a five-year PBR term with an accompanying rate case moratorium, provided that Eversource may file for rate relief if the actual ROE falls more than 200 basis points below the ROE approved in this case (Exh. AG-33-8; Tr. 2, at 421-422).

i. Metrics

As described in Section X.B below, Eversource proposed a series of metrics to be used to monitor and evaluate the Companies' progress towards its grid modernization base commitment goals (Exh. ES-GMBC-1, at 132). The Companies did not, however, propose any separate metrics to track its performance under the PBR.

C. Positions of the Parties

1. Attorney General

The Attorney General argues that the Department should reject the proposed PBR. The Attorney General claims: (1) the PBR will not result in just and reasonable rates; (2) the PBR fails to meet the Department's requirements for implementing incentive-based ratemaking; and (3) that there are significant issues with multiple elements of the PBR (Attorney General Brief at 12-17, 20-21, 24-34; Attorney General Reply Brief at 77, 85-91).[179]

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179 TEC and WMIG explicitly adopted the Attorney General's arguments regarding the PBR (TEC and WMIG Reply Brief at 5-8). In addition to the Attorney General's arguments, TEC and WMIG claim that the PBR will not be understood by consumers

First, the Attorney General claims that the proposed PBR will impose unnecessary rate increases and, therefore, will not result in just and reasonable rates. Accordingly, the Attorney General argues that the Department must reject the PBR (Attorney General Reply Brief at 77). More specifically, the Attorney General argues that the proposed PBR is not incentive regulation but a cost recovery mechanism that guarantees Eversource $188 million in rate increases in the first four years (Attorney General Reply Brief at 77, 85). The Attorney General contends that the PBR will raise rates by 4.4 percent in 2019, 4.9 percent in 2020, 4.9 percent in 2021, and another 4.6 percent in 2022 (Attorney General Reply Brief at 77, citing Exh. DPU-40-8, Att.). The Attorney General claims that there is no need for these annual PBR rate increases because the Companies can and have earned appropriate returns under cost-of-service ratemaking (Attorney General Reply Brief at 5). In particular, the Attorney General argues that the Companies earned the highest returns on common equity in Massachusetts during 2013 and 2016 (Attorney General Brief at 2-3; Attorney General Reply Brief at 5).

In addition, the Attorney General argues that the Companies have numerous reconciling mechanisms and incentive programs in place that allow them to successfully operate in the changing dynamics of the electric utility market (Attorney General Reply Brief at 5). For example, the Attorney General maintains that, over the past four years, the Companies have received over $16 million a year in energy efficiency incentives (Attorney General Reply Brief at 5). Further, the Attorney General asserts that, with revenue

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and lacks the simplicity that the Department seeks when setting rate structures (TEC and WMIG Reply Brief at 6-8).

decoupling, other Massachusetts utilities have earned revenues sufficient to allow for long gaps between rate cases (Attorney General Reply Brief at 6).

Second, the Attorney General argues that the Companies have not met the Department's criteria for implementing for incentive-based ratemaking (Attorney General Brief at 10). Specifically, the Attorney General maintains that the proposed PBR focuses excessively on cost recovery, is not designed to achieve specific, measurable results, and will not lead to administrative cost efficiencies (Attorney General Brief at 10-12, 20, citing D.P.U. 96-50 (Phase I) at 242). The Attorney General asserts that the PBR, in conflict with Department precedent, is nearly exclusively focused on cost recovery (Attorney General Brief at 12, citing D.P.U. 96-50 (Phase I) at 242). The Attorney General posits that the Companies have presented the PBR proposal as a substitute for a cost recovery mechanism that addresses all of the Companies' capital spending (Attorney General Brief at 12-14; Attorney General Reply Brief at 85). The Attorney General argues that the Companies' admission that the proposed PBR is meant to replace a cost recovery mechanism shows that the PBR is excessively focused on cost recovery (Attorney General Brief at 12-13).

The Attorney General contends further that the proposed PBR lacks the specific, measurable metrics that Department precedent requires (Attorney General Brief at 12-14, citing D.P.U. 96-50 (Phase I) at 242). The Attorney General maintains that the Companies have not identified any targeted metrics to measure the PBR's success (Attorney General Brief at 14). While the Companies have presented general goals regarding advancing clean energy, cost efficiency, service quality, and grid modernization, the Attorney General maintains that these goals are inadequate because they lack the performance targets or measures needed to evaluate the Companies' efforts (Attorney General Brief at 14-17).

In addition, the Attorney General argues that, although the Companies contend that the PBR will reduce regulatory costs, the Companies could not identify a single administrative filing that the PBR would eliminate (Attorney General Brief at 17, citing Tr. 3, at 539-540). Instead, the Attorney General claims that the PBR will increase the administrative burden through an annual PBR compliance filing (Attorney General Brief at 17, citing Tr. 3, at 531).

Third, the Attorney General argues that there are significant issues with multiple elements of the proposed PBR. With regard to the proposed earnings sharing mechanism, the Attorney General argues that the deadband is too large and the Companies will retain the majority of profits until the highest earnings levels (Attorney General Brief at 32). The Attorney General further argues that the earnings sharing mechanism's regressive structure, which gives the Companies a lower percentage of profits as earnings increase, will not benefit ratepayers (Attorney General Brief at 33). Because the Companies will share a lower percentage of profits as earnings increase, the Attorney General maintains that the Companies will have no incentive to take the risks required to attain the highest earnings levels (Attorney General Brief at 33). If the Department approves a PBR, the Attorney General recommends that the earnings sharing mechanism be modified so that the Companies' share of earnings starts lower and increases as both earnings and the Companies' risk increase (Attorney General Brief at 33).

With regard to the proposed term of the PBR, the Attorney General argues that the Department should bar the Companies from filing a rate case during the five-year term (Attorney General Reply Brief at 90-91). The Attorney General argues that if, as the Companies suggest, they can file a rate case whenever they choose, ratepayers would receive no benefit from the PBR (Attorney General Brief at 33-34; Attorney General Reply Brief at 90-91).

With regard to the X factor, the Attorney General argues that the Companies use a flawed TFP study to calculate the X factor (Attorney General Brief at 24-32). The Attorney General claims that the resulting X factor is too low and unprecedented (Attorney General Brief at 20-21, 24-26). In critiquing the Companies' TFP study, the Attorney General argues that the Companies' study should include not just capital costs and O&M expense, but also other labor and materials accounts, such as customer accounts, sales, and a portion of administrative and general expense (Attorney General Brief at 28, citing Exh. AG/DED-1, at 50, 53-54). Because the Companies did not consider these factors, the Attorney General argues that their analysis excludes major productivity improvements from technological advances (Attorney General Brief at 28-29, citing Exh. AG/DED-1, at 50, 55; Tr. 8, at 1523-1524).

The Attorney General also argues that the Companies' TFP study excludes certain peer utilities, preventing an accurate determination of the Companies' productivity (Attorney General Brief at 30). Further, the Attorney General claims that the Companies give additional, unjustified weight to larger utilities, despite the fact that the TFP study already scales these utilities for size (Attorney General Brief at 30).

In addition, the Attorney General contends that, contrary to Department precedent, the Companies' TFP analysis relies solely on the number of customers, without accounting for peak demand (Attorney General Brief at 31, citing D.P.U. 96-50 (Phase I) at 277). The Attorney General asserts that using number of customers alone is inappropriate because it is not the sole driver of costs (Attorney General Brief at 31, citing AG/DED-1, at 59, 62-63; Tr. 3, at 494-496). Further, the Attorney General insists that the Companies' use of customer numbers as an output measure is inappropriate because the Companies provide distribution services, not customers (Attorney General Brief at 31, citing Exh. AG/DED-1, at 62-63).

Finally, the Attorney General claims that the Companies use an improper method to calculate their capital quantity index (Attorney General Brief at 31). The Attorney General asserts that because the Companies do not consider general plant or employ the more widely used geometric decay method, their analysis does not consider gradual depreciation, overstates capital inputs, and produces an inaccurately high degree of utility inefficiency (Attorney General Brief at 31, citing Exh. AG/DED-1, at 63-64). For all these reasons, the Attorney General maintains that the Companies' TFP analysis is limited and cannot be used to accurately determine Eversource's total productivity (Attorney General Brief at 28-31).

The Attorney General also argues that the negative X factor proposed by the Companies will guarantee unnecessary rate increases (Attorney General Brief at 20-21). In particular, the Attorney General maintains that the proposed X factor will raise rates by more than 2.5 percent above inflation each year (Attorney General Brief at 20-21). According to the Attorney General, if approved by the Department, it would be the first negative (and by far the lowest) X factor used in North America (Attorney General Brief at 24-25). The Attorney General argues that the Companies have not shown that, over the past 15 years, negative productivity growth is common in the electric distribution industry (Attorney General Reply Brief at 86). Therefore, the Attorney General argues that a negative X factor, as proposed by the Companies, is unsupported by the record and should be rejected (Attorney General Brief at 20-21, 24-32; Attorney General Reply Brief at 86-90). If the Department implements a PBR for the Companies, which the Attorney General argues it should not, the Attorney General asserts that her analysis should be used to determine the X factor (Attorney General Brief at 32).

2. Acadia Center

Acadia Center argues that the Department should deny the proposed PBR and, instead, approve a capital cost recovery mechanism for the Companies (Acadia Center Brief at 13-14). Acadia Center asserts that the design of the proposed PBR is unprecedented and that every intervenor that addressed the issue has urged the Department to reject the proposed PBR (Acadia Center Brief at 13; Acadia Center Reply Brief at 2). Acadia Center also claims the proposed PBR is poorly designed and will not benefit ratepayers (Acadia Center Brief at 13). According to Acadia Center, the proposed PBR lacks the incentives or performance metrics needed to ensure that ratepayers will benefit (Acadia Center Brief at 13; Acadia

Center Reply Brief at 3-4). Instead, Acadia argues that the PBR's X factor, combined with an unjustified inflation floor, will guarantee annual rate increases without any requirement that ratepayers receive benefits (Acadia Center Brief at 13). Alternately, Acadia Center argues that a capital cost recovery mechanism will retain important ratepayer protections and Department oversight (Acadia Center Brief at 13-14).

3. Cape Light Compact

Cape Light Compact argues that the Companies have not satisfied Department precedent regarding PBRs (Cape Light Compact Brief at 45, citing D.P.U. 94-158, at 54, 57, 64-66). First, Cape Light Compact claims that the Companies have not shown that the proposed PBR is more likely to achieve the Department's ratemaking goals than cost of service regulation (Cape Light Compact Brief at 45). Cape Light Compact argues that the PBR will increase rates each year at a pace well above inflation (Cape Light Compact Brief at 46). Cape Light Compact also claims that these additional rate increases come without demonstrated benefits to customers (Cape Light Compact Brief at 45). According to Cape Light Compact, the proposed PBR puts the risk for capital projects on ratepayers, while the Companies receive most of the financial returns (Cape Light Compact Brief at 45). While the Companies expect certain efficiency gains, Cape Light Compact maintains that the proposed PBR does not deliver corresponding benefits to ratepayers (Cape Light Compact Brief at 46-47). Cape Light Compact also maintains that the Companies' assertion that the PBR is needed to make up for negative sales growth is not credible (Cape Light Compact Brief at 47). Further, Cape Light Compact argues that the Companies' sales have fallen since 2005 and, as the Companies accept, revenue decoupling is designed to address this concern (Cape Light Compact Brief at 47, citing Exh. ES-GWPP-1, at 22-23).

Second, Cape Light Compact challenges the Companies' proposed X factor (Cape Light Compact Brief at 53). In particular, Cape Light Compact argues that the Companies' calculations cannot be relied upon because their TFP study is not sufficiently robust (Cape Light Compact Brief at 53-54). Cape Light Compact claims small changes to the analysis or sample produce drastic changes (Cape Light Compact Brief at 53-54). This volatility, according to Cape Light Compact, shows that the X factor is not reliable (Cape Light Compact Brief at 53-54). In addition, Cape Light Compact alleges that the reliability of the Companies' expert witness is in question because he has changed his analysis since he testified before another utility regulator in 2016 (Cape Light Compact Brief at 54, citing Exh. CLC-PLC-1, at 15 n.9).

If the Department accepts the proposed X factor, Cape Light Compact argues that it will lock in efficiency levels that have fallen and allow the Companies to keep the value from future efficiency improvements (Cape Light Compact Brief at 53). Cape Light Compact maintains that the Companies' improving efficiencies demonstrate that the rate increases from the proposed PBR are inappropriate (Cape Light Compact Brief at 53-55).

Third, Cape Light Compact argues that the proposed PBR should not have an inflation floor (Cape Light Compact Brief at 55). Cape Light Compact claims that this asymmetric proposal is unprecedented and puts additional inflationary risk on ratepayers (Cape Light Compact Brief at 55, citing Exhs. AG-DED-1, at 45; AG-28-5, Att. (a); Tr. 3, at 544 et seq.). Cape Light Compact posits that the proposed inflation floor is unfair to ratepayers and should be rejected because it protects the Companies with guaranteed revenues when inflation is low but provides no protection to ratepayers when inflation is high (Cape Light Compact Brief at 55-56).

Fourth, Cape Light Compact argues that the proposed PBR lacks needed performance metrics (Cape Light Compact Brief at 56, citing Exh. CLC-PLC-1, at 18). Specifically, Cape Light Compact claims that the PBR lacks specific metrics that will affect the Companies' revenues and, instead, only includes metrics that track spending without any link to performance (Cape Light Compact Brief at 56-57). Cape Light Compact argues that actual incentive mechanisms are needed to ensure progress towards the Companies' goals and benefits from the PBR (Cape Light Compact Brief at 57). Cape Light Compact further suggests that the Department should also establish performance metrics and penalties related to how well the Companies work with public agencies on issues such as equipment aesthetics, pole safety, the coordination of public-way construction, communication regarding service reliability and restoration, and land-use planning (Cape Light Compact Brief at 58-59).

Fifth, Cape Light Compact argues that the earnings sharing mechanism unfairly benefits the Companies (Cape Light Compact Brief at 59). Specifically, Cape Light Compact claims that the earnings sharing mechanism allows the Companies to retain all earnings in the proposed deadband and the majority of the earnings above the deadband (Cape Light Compact Brief at 59). Because the Companies will receive a smaller percentage of earnings at the highest levels of the earnings sharing mechanism, Cape Light Compact argues that the earnings sharing mechanism gives the Companies little incentive to innovate and achieve efficiencies that benefit ratepayers (Cape Light Compact Brief at 58). Cape Light Compact urges the Department to adopt an earnings sharing mechanism that gives the majority of initial earnings to ratepayers and increases the Companies' percentage as earnings and the Companies' risk increases (Cape Light Compact Brief at 59).

Sixth, Cape Light Compact argues that the Department should adopt a five-year term for the PBR (Cape Light Compact Brief at 60). Cape Light Compact claims that this measure is necessary to maximize the Companies' incentives to be efficient and protect ratepayers (Cape Light Compact Brief at 60). To the extent the Department determines it is permitted by Section 94, Cape Light Compact maintains that the Department should review the Companies' rate schedules after five years and then extend the PBR term by an additional two years (Cape Light Compact Brief at 60-61).

4. CLF

CLF argues that the Department should reject the proposed PBR because it is not in the public interest (CLF Brief at 13-14). CLF claims that the proposed PBR is deeply flawed and will result in unreasonable rate increases without providing any incentive for the Companies to make efficient investments that serve the public interest (CLF Brief at 13-14). According to CLF, any argument that the annual rate increases are needed to address negative sales growth fails because the Companies have had negative sales growth since 2005, without a corresponding loss in revenues (CLF Brief at 18).

CLF makes three specific critiques of the proposed PBR formula (CLF Brief at 17). First, CLF argues that the deadband in the earnings sharing mechanism is too large and the sharing percentages skew towards the Companies (CLF Brief at 17). According to CLF, the earnings sharing mechanism gives the Companies a disproportionate share of the benefit, discouraging them from taking risks for the ratepayers' benefit (CLF Brief at 17).

Second, CLF argues that the Companies have not justified an inflation floor of one percent (CLF Brief at 17). CLF argues the inflation floor and lack of an inflation ceiling provide asymmetric benefits that favor the Companies (CLF Brief at 17).

Third, CLF argues that the proposed X factor is too low (CLF Brief at 17). CLF claims that it will increase rates faster than necessary, resulting in a windfall for the Companies (CLF Brief at 17).

5. DOER

DOER asserts that, although the PBR does not require the Companies to make any investments in the distribution system or grid modernization, the PBR will allow the Companies to collect an additional $507 million in revenues over five years (DOER Brief at 18). According to DOER, because the Companies would receive these additional revenues regardless of their actions, the Companies will have an incentive to keep hundreds of millions of dollars and not invest in the distribution system (DOER Brief at 19). DOER argues that, without explicit incentives or investment requirements, the PBR lacks the necessary regulatory oversight (DOER Brief at 19-20). In contrast, DOER maintains that while a capital tracker does not require investment, it would at least tie revenues to actual investment, provide incentives to the Companies, and be less costly than the PBR (DOER Brief at 20-21; DOER Reply Brief at 7-9). For these reasons, DOER asserts that the Department should reject the PBR and implement a capital tracker to address the Companies' capital investments (DOER Brief at 21-22; DOER Reply Brief at 7-9).

Should the Department wish to implement incentive-based ratemaking, instead of a capital tracker, DOER argues that the Department should make two changes to the Companies' proposed PBR. First, DOER asserts that the annual PBR increase should only be a percentage of the base rates that the Department sets in this proceeding and not compound previous annual PBR increases (DOER Reply Brief at 10-12).

Second, DOER argues that the proposed PBR should be streamlined by eliminating the exogenous cost factor and the earnings sharing mechanism (DOER Reply Brief at 13). DOER claims that both of these variables could result in contested proceedings each year and add to the administrative burden (DOER Reply Brief at 13). According to DOER, eliminating the exogenous cost factor and earnings sharing mechanism would increase the PBR's efficiency (DOER Reply Brief at 13).

6. Sunrun and EFCA

Sunrun and EFCA argue that the Companies have failed to show that the proposed PBR will result in just and reasonable rates (Sunrun and EFCA Brief at 5). Sunrun and EFCA also maintain that the Companies have not shown that the PBR is more likely than current regulation to advance the goals of safe, reliable, and least cost energy service (Sunrun and EFCA Brief at 5, citing D.P.U. 96-50 (Phase I) at 241-242).

Sunrun and EFCA argue that the proposed PBR will put ratepayers at risk because it lacks performance metrics as required by Department precedent (Sunrun and EFCA Brief at 5, citing D.P.U. 96-50 (Phase I) at 241-242). Further, Sunrun and EFCA argue that ratepayers will be left without legitimate protection from questionable projects the Companies may undertake because the Companies claim that cost recovery could be withheld only if the Companies fundamentally neglect their obligations (Sunrun and EFCA Brief at 12).

Finally, Sunrun and EFCA dispute the Companies' claim that the proposed PBR will save $70 million by eliminating the need for capital cost recovery mechanisms (Sunrun and EFCA Brief at 5, citing Exhs. ES-PBRM-1, at 65; DPU-40-8; Tr. 2, at 421-423). According to Sunrun and EFCA, it is not plausible that the Companies will need capital cost recovery mechanisms because the Companies have not filed a rate case in years and have still earned a reasonable return (Sunrun and EFCA Brief at 5).

7. UMass

UMass argues that the Department should reject the PBR and, instead, approve a capital cost recovery mechanism for the Companies (UMass Brief at 3). UMass claims that the Companies have not demonstrated that a capital cost recovery mechanism is inadequate or, alternately, why a PBR is necessary to achieve the Companies' goals (UMass Brief at 3). UMass asserts that the Companies have admitted that, without the PBR, they have started grid modernization, provided top-tier service quality, implemented cost reductions, and made tremendous progress with productivity (UMass Brief at 10-11, citing Exh. ES-CAH-1, at 6;

Tr. 1, at 6, 66-68, 351-356, 391). UMass argues that these achievements demonstrate that a PBR is not necessary (UMass Brief at 3, 11).

Moreover, UMass argues that the proposed PBR is inappropriate because it places additional and unnecessary risk on ratepayers (UMass Brief at 4). Under a capital cost recovery mechanism, UMass argues that the Companies would have to fund their capital investments and then seek recovery by showing the prudence of those investments (UMass Brief at 4). UMass contends that this scenario forces the Companies to bear the initial risk of capital investments (UMass Brief at 4). Under the PBR, however, UMass argues that the Companies would receive upfront funding for capital projects and they would keep that funding regardless of a project's prudence (UMass Brief at 4). Therefore, UMass argues that the PBR attempts to shift the financial burden of an imprudent capital project from the Companies to ratepayers (UMass Brief at 4). While UMass maintains that future capital investment is necessary, it argues that the risk of the investments should fall on the Companies and not ratepayers (UMass Brief at 4-5).

8. Vote Solar

Vote Solar argues that Department should reject the proposed PBR because it lacks the performance metrics that are required by Department precedent for ratepayer protection (Vote Solar Brief at 12-13, citing Incentive Regulation, D.P.U. 94-158, at 34 (1995)). Vote Solar argues that the existing service quality metrics do not relieve the Companies of their obligation to adopt separate performance metrics related to the PBR (Vote Solar Reply Brief at 6). According to Vote Solar, without the required metrics, the Companies have not met their burden to demonstrate that the PBR is in the public interest (Vote Solar Brief at 12-13).

With respect to the proposed X factor, Vote Solar argues that Eversource accepts that total output consists of all services that the Companies produce and, therefore, the Companies' reliance on customer count as the TFP study's output results in a skewed X factor (Vote Solar Brief at 6-7, citing Tr. 3, at 493-494, 497-489). Vote Solar asserts that while customer count is a convenient output choice, it underestimates the Companies' outputs and decreases the X factor because customer count is not a key driver of costs (Vote Solar Brief at 6-7). In addition, Vote Solar argues that Companies' X factor calculation is very volatile (Vote Solar Brief at 9-10). Vote Solar contends that the Companies' analysis shows significant year-to-year variation in productivity and the Companies have not shown that their selective averaging of data has addressed this volatility and produced a reliable X factor (Vote Solar Brief at 9-10, citing Exhs. VS-RB-Surrebuttal-1, at 10-11; AG/DED-1, at 64). Because the Companies' TFP study is not robust enough to be reliable, Vote Solar argues that the Department should not adopt the Companies' proposed X factor (Vote Solar Brief at 9-10).

If the Department implements a PBR, Vote Solar claims that its own analysis eliminates the volatility from the Companies' analysis (Vote Solar Brief at 12-13). Rather than using a TFP study, Vote Solar calculates an annual allowed revenue growth by using the average annual revenue growth from the utilities in the Companies' TFP study (Vote Solar Brief at 13, citing Exhs. VS-RB-1, at 33; DPU-VS-1-7). Vote Solar asserts that those utilities had average annual revenue growth of 2.33 percent and, therefore, a reasonable X factor is an amount that when subtracted from inflation equals 2.33 percent (Vote Solar Brief at 15).

9. Companies

The Companies argue that the Department should approve its PBR, as proposed, as it will result in just and reasonable rates (Companies Reply Brief at 31-32). According to Eversource, its proposed PBR formula replicates the average cost trend for the electric distribution industry and no party has refuted its justification for the PBR (Companies Reply Brief at 31-32). Further, Eversource argues that no party has offered a viable alternative to the PBR as proposed (Companies Reply Brief at 31-32).

The Companies claim that the intervenors fail to address or misconstrue the revenue challenges that the Companies face (Companies Brief at 298-300, 306). For example, the Companies assert that, contrary to the intervenors' claims, revenue decoupling does not make the Companies whole for lost sales (Companies Brief at 298). According to the Companies, revenue decoupling only protects against a decline in sales to levels below test year sales (Companies Brief at 298). By contrast, the Companies contend that revenue decoupling does not restore lost sales growth (Companies Brief at 298-300, 306). The Companies argue that, in the past, growth in sales is what has allowed utilities to function without annual rate increases (Companies Brief at 300). Now, with declining sales and costs that grow faster than inflation, the Companies assert that annual PBR rate adjustments are essential (Companies Brief at 298-300).

Further, the Companies argue that, in recent years, they have been able to operate without annual rate increases only because of exceptional circumstances (Companies Brief at 303-308). For example, through mergers and non-merger-related efficiencies, the Companies claim to have had over $600 million in savings opportunities from 1999 through 2009 (Companies Brief at 304). The Companies maintain, however, that these types of savings opportunities are no longer available (Companies Brief at 304-305).[180] Even with these additional revenue sources, the Companies maintain that NSTAR Electric's actual ROE was only 9.44 percent in 2016, as compared to an authorized ROE of 10.5 percent and WMECo's actual ROE was only 5.6 percent, as compared to an authorized ROE of 9.6 percent (Companies Brief at 308).

According to the Companies, the proposed PBR and a capital cost recovery mechanism would each result in annual rate adjustments that would have a similar impact on ratepayers (Companies Brief at 297). Eversource argues, however, that a capital cost recovery mechanism would require the Companies to file at least one rate case during the next five years (Companies Brief at 297, 314-316, citing Exhs. DPU-19-3; DPU-40-8).

In addition, the Companies claim that the intervenors have overstated the financial impact of the PBR (Companies Brief at 314-316). Specifically, the Companies highlight

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180 Eversource maintains that, from 2006 through 2012, NSTAR Electric was eligible for annual inflation-based adjustments under a rate settlement approved by the Department in D.T.E. 05-85 and, while some adjustments continued through 2012, these revenue opportunities are now gone (Companies Brief at 305). In addition, the Companies maintain that approximately $50 million in annual lost base revenues for NSTAR Electric will end when it adopts revenue decoupling in this proceeding (Companies Brief at 307).

DOER's mistaken claim that the PBR would result in $500 million in rate increases (Companies Brief at 315, citing DOER Brief at 4 n.15). The Companies assert that the $500 million cited by DOER are the five-year aggregate revenues under the PBR, not the sum of the annual rate increases (Companies Brief at 315). Further, the Companies argue that this revenue amount is roughly equivalent to the $498 million in revenues that would be collected if DOER's suggested capital cost recovery mechanism were approved (Companies Brief at 315, citing Exh. DPU-40-8). In addition, the Companies contend the Attorney General's claim that the PBR will result in annual adjustments of $188 million over five years is also overstated (Companies Brief at 315, citing Attorney General Brief at 21).

The Companies also claim that ratepayers will be protected under the PBR because the explicit and implicit stretch factors will require the Companies to perform better than the average utility (Companies Brief at 320). Specifically, Eversource maintains that, because the PBR operates under a revenue cap, the Companies will absorb the additional costs of new customers and these costs will act as an implicit stretch factor (Companies Brief at 36). Further, the Companies assert that, under the PBR, Eversource will continue to be a top-tier performer on service quality and electric reliability (Companies Brief at 321).

The Companies argue that the proposed PBR provides a more efficient regulatory approach than a capital cost recovery mechanism (Companies Brief at 332). Because the Companies have committed to a five-year stay-out period under the PBR, Eversource argues that the PBR will reduce administrative burden and rate case expense (Companies Brief at 317-318). With a decreased administrative burden, the Companies claim that the PBR will create an environment with a greater focus on cost savings (Companies Brief at 334). By contrast, the Companies assert that a capital cost recovery mechanism imposes a far greater and more costly administrative burden than a PBR (Companies Brief at 332, citing D.P.U. 15-155, at 40). The Companies contend that the annual PBR rate adjustment filings will be much less complex and require substantially fewer resources than capital cost recovery filings (Companies Brief at 332).

Next, the Companies claim that they correctly calculated the proposed X factor (Companies Brief at 337-343, 347-360, 365-371). Eversource disputes the intervenors' claim that the proposed X factor is unlike any other X factor adopted in North America (Companies Brief at 337). The Companies assert that the jurisdictions that have adopted a higher X factor also have adopted capital cost recovery mechanisms or used higher industry inflation levels and, therefore, these factors are comparable to the Companies' all-inclusive PBR (Companies Brief at 337).[181]

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181 For example, the Companies maintain that the Alberta Utilities Commission essentially implemented a negative X factor in 2016 because it approved a capital cost recovery mechanism on top of the X factor, and used industry inflation indices, instead of the lower economy wide inflation measure that the Companies employ (Companies Brief at 337, citing Tr. 3, at 499-500, 511; RR-DPU-7, at 7). In addition, the Companies argue that the British Columbia Public Utilities Commission, in effect, set a negative X factor, because the 0.93 percent X factor it allowed had only a 0.1 percent stretch factor and included a capital cost recovery mechanism that allowed rate changes from six to eight percent each year (Companies Brief at 337, citing Tr. 3, at 499-500, 511; RR-DPU-7, at 7). The Companies assert that, while the Ontario Energy Board set its X factor at zero, it used the higher industry inflation indices and allowed two supplemental capital cost recovery mechanisms (Companies Brief at 338, citing Report of the Ontario Energy Board (OEB), Renewed Regulatory Framework for Electricity Distributors: A Performance-Based Approach at 18 (Oct. 18, 2012)). Finally, the Companies argue that the California Public Utilities

Further, Companies argue that the calculation of an X factor must consider the type of inflation used (Companies Brief at 349). Here, the Companies determined inflation based on the general economy, which they claim is appropriate because there are no widely reported measures of industry-specific inflation (Companies Brief at 348-350). Because they did not use a higher, industry-specific measure of inflation, the Companies argue that their proposed X factor appropriately includes adjustments to the industry input price growth and the industry specific TFP growth (Companies Brief at 349).

In addition, the Companies argue that customer count is the appropriate output to use to determine TFP growth (Companies Brief at 352-353, citing Exh. ES-PBRM-Reubuttal-1, at 29-31). For revenue-per-customer caps, the Companies claim that the output should reflect elements associated with revenue generation (Companies Brief at 353). Because rates essentially are determined by limits on the increase in revenue per customer over time, the Companies assert that customer count is the proper output (Companies Brief at 353). In fact, the Companies claim that using customer count as the output produces a more positive X factor than using kWh sales (i.e., -2.64 with customer number vs. -4.04 with kWh sales) (Companies Brief at 352, citing RR-DPU-7).

The Companies maintain that the alternative methods to calculate the X factor, as presented by intervenors, are flawed (Companies Brief at 353). For example, the Companies argue that Vote Solar's proposal to use historical revenue growth to calculate the X factor is

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Commission authorized Southern California Edison Corporation and Pacific Gas & Electric Company to implement annual adjustments in 2016 and 2017 that are similar in percentage terms to the adjustments the Companies seek under the PBR (Companies Brief at 338-339).

faulty because it does not take commodity revenues into account (Companies Brief at 353). Further, the Companies contend that historical revenue growth has never been used as a PBR output (Companies Brief at 353). Additionally, Eversource disputes Vote Solar's argument that the Companies' TFP study is not significantly robust (Companies Reply Brief at 43-44). While Vote Solar claims that the TFP study is too volatile, the Companies argue that the uncontested evidence shows that the TFP study results in an X factor that falls within a 95 percent confidence interval (Companies Reply Brief at 44, citing Tr. 3, at 506-507).

Further, the Companies argue that the time period of the TFP study (i.e., 2001 to 2015) is appropriate because earlier data are not reliable (Companies Reply Brief at 45-47, citing Tr. 3, at 647-648; RR-DPU-7). In earlier periods, the Companies claim that there was a direct correlation between electric usage and economic growth (Companies Reply Brief at 45-47, citing Tr. 3, at 647-648; RR-DPU-7). According to the Companies, however, post-2000 data show that energy efficiency efforts and other conservation measures have created a very wide divergence between electric usage and economic growth (Companies Reply Brief at 45-46, citing Tr. 3, at 647-648). Therefore, the Companies claim that pre-2001 data are unreliable to establish forward-looking rates (Companies Reply Brief at 45-47).

Moreover, the Companies argue that substantial evidence supports the adoption of the PBR, as proposed (Companies Brief at 343). According to the Companies, the Attorney General's PBR witness has no experience determining an X factor and this lack of experience was evident in the significant corrections he made to his calculations (Companies Brief at 343, citing Exh. Sch. DED-4).[182] Further, the Companies criticize the sample size in the Attorney General's TFP study (Companies Brief at 355). The Companies argue that the Attorney General's witness, without justification, truncated the number of companies in Eversource's study (Companies Brief at 355). The Companies claim that removing such data from their study is a substantial flaw that undermines the Attorney General's entire analysis of the X factor (Companies Brief at 355). In addition, the Companies argue that the Department should give no weight to the Attorney General's claim that the Companies should have included Maine utilities in their study (Companies Brief at 355; Companies Reply Brief at 48). Eversource contends that the Attorney General presented no evidence to show that Maine utilities are peers to the Companies (Companies Brief at 355; Companies Reply Brief at 48).

The Companies also argue that the Attorney General's witness used an improper method (i.e., the geometric decay method) for determining capital input quantity (Companies Brief at 355-356; Companies Reply Brief at 49). The Companies claim that the Attorney General's witness did not have the data needed to properly use the geometric decay method, asserting that essential data were missing for more than 20 percent of the sample companies (Companies Brief at 356). Further, the Companies contend that the Attorney General's witness did not explain why excluding 20 percent of the companies from his sample did not compromise the analysis of capital input quantity (Companies Brief at 356).

182 The Companies argue that, after correcting mistakes, the Attorney General's witness changed his calculation of the X factor from 0.73 percent to -1.36 percent (Companies Brief at 343).

Separately, Eversource disputes the Attorney General's argument that the method used by the Companies to determine capital input quantity (i.e., the one hoss shay method) does not account for the gradual depreciation of capital and leaves capital stock undepreciated until it is retired (Companies Brief at 368). According to Eversource, the Bureau of Labor Statistics ("BLS"), which is the federal agency that develops multi-factor productivity studies, uses a method that is similar to the method used by the Companies (Companies Brief at 368-370; Companies Reply Brief at 49). Additionally, the Companies dispute the Attorney General's claim that the Companies' expert has used the geometric decay method in previous testimony and studies (Companies Brief at 370, citing Exh. AG-10; Tr. 3, at 556, 564-565). Instead, the Companies assert that its witness used the one hoss shay method to determine capital input quantity in the cited study and testimony (Companies Brief at 370, citing Exhs. AG-6; AG-8; AG-10; Tr. 3, at 556, 563-575).

Additionally, Eversource disputes the Attorney General's claims regarding sample weighting in the Companies' TFP study (Companies Brief at 357). The Companies assert that they appropriately weighted the study companies by the number of customers each serves, which they maintain is consistent with their use of customer growth as the study's output measure (Companies Brief at 357-358). According to the Companies, using a simple average of the peer company's group average, as suggested by the Attorney General, would incorrectly give the same weight to small and large utilities even though small utilities are unlikely to be representative of the customer growth experienced by larger utilities like Eversource (Companies Brief at 358). The Companies further contend that using a simple average inappropriately would give the ten smallest utilities in the study the same weight as the ten largest utilities, when the ten largest utilities serve over 18 times more customers (Companies Brief at 358-359). Therefore, the Companies argue that their use of sample weighting is correct (Companies Brief at 358-359).

Next, the Companies dispute the Attorney General's contention that a productivity analysis should include customer accounts, customer sales, and a portion of administrative and general expenses (Companies Brief at 359-360; Companies Reply Brief at 49). The Companies claim that these expenses include non-distribution costs; however, there is no dispute that a TFP study should include only distribution expenses (Companies Brief at 359; Companies Reply Brief at 49). By using these expenses, the Companies argue that the Attorney General's witness has "contaminated" his productivity analysis with non-distribution cost elements (Companies Brief at 360; Companies Reply Brief at 49).

The Companies argue that Attorney General's witness further distorted his productivity analysis by attributing 100 percent of general plant to distribution services (Companies Brief at 365-66, citing Exh. ES-PBRM-Rebuttal-1, at 44-45). The Companies claim that when the Attorney General's witness tried to correct this error, he again applied a higher percentage of general plant than intended to distribution services (Companies Brief at 366-367, citing Tr. 13, at 2694). Therefore, the Companies argue that the Attorney General's productivity analysis is not reliable (Companies Brief at 366-367).

The Companies dispute the Attorney General's claim that there is no record evidence showing negative productivity growth in the electric distribution industry over the last

15 years (Companies Reply Brief at 42-43). The Companies maintain that the Attorney General attempted to support her position by using the BLS utilities sector data (Companies Reply Brief at 42-43, citing Attorney General Reply Brief at 86). Eversource asserts, however, that the electric distribution industry and the utilities sector are distinct (Companies Reply Brief at 43). According to the Companies, the BLS utilities sector includes data for many industries such as natural gas, steam, water, sewage removal, electric generation, and electric transmission and, therefore, that data are not representative of the electric distribution industry (Companies Reply Brief at 43, citing Tr. 3, at 506-507). Conversely, the Companies argue that their TFP study presents the only reliable data regarding productivity growth in the electric distribution industry (Companies Reply Brief at 43).

Further, the Companies argue that there is no merit in the intervenors' critiques of the other elements of the PBR. For example, the Companies argue that the PBR is not excessively focused on cost recovery (Companies Brief at 322). Instead, Eversource argues that Department precedent fully intended incentive ratemaking to act as a substitute for cost of service ratemaking, which is, according to the Attorney General's own witness, a form of cost recovery (Companies Brief at 322, citing D.P.U. 94-158, at 42-43; Exh. ES-9).

The Companies also argue that an inflation floor of one percent is required to ensure the Companies have the necessary revenue support to implement required capital investments (Companies Brief at 34). Further, the Companies assert that the proposed consumer dividend of 25 basis points when inflation is greater than two percent is appropriate and shows the

Companies' commitment to give customers a tangible benefit in the PBR (Companies Brief at 36).

The Companies do not agree with DOER's position that the annual PBR rate adjustments only should be a percentage of the base rates set in this proceeding (Companies Reply Brief at 54). According to the Companies, the costs that drive the need for a PBR are cumulative and, therefore, the annual adjustments should be cumulative, as well (Companies Reply Brief at 54).

In addition, the Companies dismiss the Attorney General's and Cape Light Compact's arguments regarding extending the length of the stay-out period (Companies Brief at 372-373). The Companies assert that they have committed to a five-year stay-out period (Companies Brief at 372-373). The Companies argue that extending the stay-out period beyond five years is inappropriate because, in the past, stay-out periods in excess of five years have been problematic (Companies Brief at 372-373).

In addition, the Companies claim that the earnings sharing mechanism's current structure should not be changed, as suggested by the Attorney General and Cape Light Compact, because the mechanism will provide the correct incentives during the stay-out period (Companies Brief at 372-373). The Companies argue that their proposed deadband is narrower and more favorable to ratepayers than other earnings sharing mechanisms that the Department has approved (Companies Brief at 38, citing D.P.U. 96-50 (Phase I) at 326; D.T.E. 03-40, at 500; D.P.U. 05-27, at 405). Further, the Companies argue that DOER's recommendation to eliminate the earnings sharing mechanism and exogenous cost factor is inappropriate because they are both basic and essential elements of the PBR (Companies Reply Brief at 55).

In response to intervenors' arguments regarding performance metrics to protect ratepayers during the term of the PBR, the Companies maintain that they will continue to be subject to the existing service qualities metrics with specific, measurable results (Companies Brief at 324-325). The Companies claim that the existing service quality metrics and the potential for service quality penalties address concerns regarding a lack of transparency under the PBR and ensure that there will be Department oversight throughout the PBR term (Companies Brief Reply at 42). Further, the Companies argue that the stretch factors within the PBR operate as measurable achievement indicators (Companies Brief at 325).

In sum, the Companies argue that their proposed PBR formula replicates the average cost trend for the electric distribution industry and will produce just and reasonable rates (Companies Reply Brief at 31-32). Eversource maintains the proposed PBR will provide the necessary revenues to address declining sales, while eliminating the significant administrative burden that would result from a capital cost recovery mechanism (Companies Brief at 297-300, 314-16, 332, 334). Further, the Companies assert that both the explicit and implicit stretch factors in the PBR will protect ratepayers and ensure that Companies perform at a high level (Companies Brief at 320). For these reasons, the Companies argue that the Department should approve the PBR as proposed (Companies Brief at 320).

D. Analysis and Findings

1. Introduction

In the sections below, we review our ratemaking authority and reaffirm that, pursuant to Section 94, the Department may implement PBR as an adjustment to cost of service/rate of return regulation. Further, we discuss the factors the Department has used to review incentive regulation proposals. Finally, we review the Companies' PBR, as proposed, to determine whether it is in the public interest and will result in just and reasonable rates.

2. Department Ratemaking Authority

Pursuant to Section 94, the Legislature has granted the Department extensive ratemaking authority over electric and local gas distribution companies. The Supreme Judicial Court has consistently found that the Department's authority to design and set rates is broad and substantial. E.g., Boston Real Estate Board v. Department of Public Utilities, 334 Mass. 477, 485 (1956). Because Section 94 authorizes the Department to regulate the rates, prices, and charges that electric and local gas distribution companies may collect, this authority includes the power to implement revenue adjustment mechanisms such as a PBR. See Boston Gas Company v. Department of Telecommunications and Energy, 436 Mass. 233, 234-235 (2002).

The Department is not compelled to use any particular method to establish rates, provided that the end result is not confiscatory (i.e., deprives a distribution company of the opportunity to realize a fair and reasonable return on its investment). Boston Edison Company v. Department of Public Utilities, 375 Mass. 1, 19 (1978). The Supreme Judicial Court has held that a basic principle of ratemaking is that "the [D]epartment is free to select or reject a particular method as long as its choice does not have a confiscatory effect or is not otherwise illegal." American Hoechest Corporation v. Department of Public Utilities, 379 Mass. 408, 413 (1980), citing Massachusetts Electric Company v. Department of Public Utilities, 376 Mass. 294, 302 (1978).

In addition, G.L. c. 164, § 76 grants the Department broad supervision over electric and local gas distribution companies. Under G.L. c. 164, § 76, the Department has the authority to establish reasonable rules and regulations consistent with c. 164, as needed, to carry out its administration. D.P.U. 07 -50-B at 26-27. See also Cambridge Electric Light Company v. Department of Public Utilities, 363 Mass. 474, 494-496 (1973).

Although the Department traditionally has relied on cost of service/rate of return regulation to establish just and reasonable rates, there are many variations and adjustments in the specific application of this model to individual utilities as circumstances differed across companies and across time. D.P.U. 07-50, at 8. Over the years, many electric and local gas distribution companies subject to the Department's jurisdiction have operated under PBR or PBR-like plans. See e.g., D.T.E. 05-85; D.T.E. 05-27; D.T.E. 03-40; D.T.E. 01-56; D.T.E. 01-50; D.T.E. 99-47, at 4-14.

Consistent with the discussion above, the Department reaffirms that we may implement PBR as an adjustment to cost of service/rate of return regulation under the broad ratemaking authority granted to us by the Legislature under Section 94.[183] The standards by

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[183] In addition, pursuant to G.L. c. 164, § 1(E), the Department is authorized to promulgate rules and regulations to establish and require performance based rates for gas and electric distribution companies.

which the Department will review the Companies' specific PBR proposal are addressed below.

3. Evaluation Criteria for PBR

The Department must approach the setting of rates and charges in a manner that (1) meets our statutory obligation under Section 94 to ensure rates that are just and reasonable, not unjustly discriminatory, or unduly preferential, and (2) is consistent with long-standing ratemaking principles including fairness, equity, and continuity. D.P.U. 07-50, at 10-11. Further, the Department must establish rates in a manner that balances a number of these key principles to reflect and address the practical circumstances attendant to any individual company's rate case. D.P.U. 07-50-A at 28. The Department has implemented PBRs or PBR-like mechanisms when it has found that such regulatory methods would better satisfy our public policy goals and statutory obligations. See e.g., D.P.U. 96-50 (Phase I) at 261; D.P.U. 94-158, at 42-43; NYNEX Price Cap, D.P.U. 94-50, at 139 (1995).

As part of our generic investigation of incentive ratemaking in D.P.U. 94-158, the Department examined the criteria by which PBR proposals for electric and local gas distribution companies would be evaluated. D.P.U. 94-158, at 52-66. The Department found that, because incentive regulation acts as an alternative to traditional cost of service regulation, incentive proposals would be subject to the standard of review established by Section 94 which requires that rates be just and reasonable. D.P.U. 94-158, at 52. Further, the Department determined that a petitioner seeking approval of an incentive regulation proposal like PBR is required to demonstrate that its approach is more likely than current regulation to advance the Department's traditional goals of safe, reliable, and least-cost energy service and to promote the objectives of economic efficiency, cost control, lower rates, and reduced administrative burden in regulation. D.P.U. 94-158, at 57. Finally, the Department stated that well-designed incentive mechanisms should provide utilities with greater incentives to reduce costs than currently exist under traditional cost of service regulation and should result in benefits to customers that are greater than would be present under current regulation. D.P.U. 94-158, at 57.

In addition to these criteria, the Department established a number of additional factors it would weigh in evaluating incentive proposals. D.P.U. 94-158, at 57. These factors provide that a well-designed incentive proposal should: (1) comply with Department regulations, unless accompanied by a request for a specific waiver; (2) be designed to serve as a vehicle to a more competitive environment and to improve the provision of monopoly services; (3) not result in reductions of safety, service reliability, or existing standards of customer service; (4) not focus excessively on cost recovery issues; (5) focus on comprehensive results; (6) be designed to achieve specific, measurable results; and (7) provide a more efficient regulatory approach, thus reducing regulatory and administrative costs. D.P.U. 94-158, at 58-64. The Department discusses these criteria and factors in the context of our evaluation of Eversource's PBR proposal in the subsections below.

4. Rationale for PBR

There is a fundamental evolution taking place in the way electricity is produced and consumed in Massachusetts. This evolution has been driven, in large part, by a number of legislative and administration policy initiatives designed to address climate change and foster a clean energy economy through the promotion of energy efficiency, demand response, and distributed energy resources, and the procurement of long-term contracts for renewable energy. An Act Relative To Green Communities, St. 2008, c. 169 ("Green Communities Act"); An Act Establishing the Global Warming Solutions Act, St. 2008, c. 298 ("Global Warming Solutions Act"); An Act Relative to Competitively Priced Electricity in the Commonwealth, St. 2012, c. 209, § 36 ("Green Communities Act Expansion"); Global Warming Solutions Act, § 83; Green Communities Expansion Act, § 83A; Establishing an Integrated Climate Change Strategy for the Commonwealth, Executive Order No. 569, Office of the Governor, Commonwealth of Massachusetts (September 16, 2016). To varying degrees, this evolution is changing the operating environment for electric distribution companies in Massachusetts.

As described above, the Companies propose to implement PBR that would adjust rates annually in accordance with a revenue cap formula (Exh. ES-GWPP-1, at 9). The Companies maintain that, given specific changes that have taken place as a result of the Commonwealth's aggressive efforts to achieve clean energy goals, they no longer can operate effectively under cost of service regulation (Exh. ES-GWPP-1, at 19-25; Companies Brief at 298-300, 306). No longer able to retain sales growth revenues between rate cases after decoupling, the Companies maintain that PBR is essential for them to offset the effects of increasing operating and capital costs (Exh. ES GWPP-1, at 20; Tr. 2, at 413-415; Companies Brief at 298-300). And, unlike a capital cost recovery mechanism, Eversource maintains that the proposed PBR is designed to provide it with strong incentives to control costs (Exh. ES-GWPP-1, at 11; DPU-19-2; DPU-19-3; DPU-19-10; DPU-19-22; DPU-24-18; DPU-44-2; AG-18-3; AG-18-4; AG-33-4; VS-1-1; Tr. 8, at 1518; Companies Brief at 16, 29, 318-319, 323, 332, 336).

Conversely, a number of intervenors argue that the Companies' proposed PBR is not in the public interest and should be rejected in its entirety (Attorney General Reply Brief at 77; Acadia Center Brief at 13-14; Cape Light Compact Brief at 45, 61-62; CLF Brief at13-14; DOER Brief at 21-22, Sunrun and EFCA Brief at 5; UMass Brief at 3; Vote Solar Brief at 12-13). The Attorney General argues that Eversource's proposed PBR is excessively focused on cost recovery in contravention of D.P.U. 94-158, at 58-64 (Attorney General Brief at 10-12, 20). In addition, intervenors claim that Eversource has operated very effectively in recent years and can continue to operate effectively under cost of service regulation (Attorney General Reply Brief at 5; Acadia Center Brief at 13-14; CLF Brief at 18; DOER Brief at 20-21, Sunrun and EFCA Brief at 5-7; UMass Brief at 3, 10-11; Vote Solar Brief at 12-13). Further, in lieu of PBR, intervenors maintain that a capital cost recovery mechanism would adequately address the challenges the Companies face as a result of the changing dynamics in the electric distribution industry (Attorney General Reply Brief at 38-39; Acadia Center Brief at 13-14; Acadia Center Reply Brief at 13; CLF Brief at 15; DOER Brief at 20-24; DOER Reply Brief at 7-9; NECEC Brief at 19-20, 23; Sunrun and EFCA Brief at 24; TEC and WMIG Brief at 8; UMass Brief at 3).

For the reasons discussed below, the Department finds that the Companies have demonstrated that they require an alternative to traditional cost of service/rate of return ratemaking. Further, the Department finds that, based on the evidence presented in this case, the Companies have demonstrated that PBR, as compared to a capital cost recovery mechanism, will provide them with greater incentives to reduce costs and will result in benefits to customers that are greater than would be present under current regulation.

Stakeholder efforts to pursue the Commonwealth's clean energy goals have been remarkably successful. For example, Massachusetts has earned the number one ranking for the seventh consecutive year in the American Council for an Energy-Efficient Economy's State Energy Efficiency Scorecard.[184] Eversource has demonstrated that a primary effect of the Commonwealth's clean energy efforts has been a decline in its levels of kWh sales (Exhs. ES-GWPP-1, at 23-24; Attachment DPU-19-3, at 3, 10; AG-18-15; SREF-1-4). Between 1995 and 2005, the Companies experienced average annual sales growth of 2.25 percent (Exhs. DPU-47-1; AG-18-15; SREF-1-4). From 2006 to 2016, however, the Companies experienced an average annual decline in sales of 0.44 percent (Exhs. Attachment DPU-19-3, at 3, 10; DPU-47-1; AG-18-15; SREF-1-4).

At the same time as its sales are declining, Eversource has shown that its distribution system is growing and that its capital and operating costs are increasing in ways that it has not experienced in the past (Exhs. ES-GWPP-1, at 19-22, 41, 74-75; DPU-47-1). Factors driving Eversource's increasing costs include: (1) system reliability improvements;

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184 See www.mass.gov/eea/pr-2017/massachusetts-named-most-energy-efficient-state.html.

(2) system resiliency improvements to address the effects of climate change; (3) distribution system changes to allow for two-way power flows; (4) cyber-security needs; and (5) mitigation of environmental impacts related to distribution infrastructure (Exh. ES-GWPP-1, at 19-20, 41-42, 74-75).

Between rate cases, electric distribution companies, such as Eversource, have traditionally relied on revenues from sales growth to fund capital investments that are intended to ensure safe and reliable service (Exh. DPU-19-19; Tr. 2, at 464-466). See, e.g., D.P.U. 15-155, at 22-23, 40; D.P.U. 13-90, at 35; D.P.U. 10-70, at 47. While revenue decoupling protects existing sales revenues,[185] it does not address the loss of sales growth revenues between rate cases, which Eversource has historically relied upon (Exh. DPU-19-19; Tr. 2, at 464-468).

In response to decoupling, the Department has allowed companies to adopt various capital cost recovery mechanisms in cases where a company has adequately demonstrated its need to recover incremental costs associated with capital expenditure programs between base distribution rate cases. D.P.U. 15-155, at 40, 51-54; D.P.U. 15-80 at 50; D.P.U. 10-55, at 121-122, 132-133; D.P.U. 09-39, at 79-80, 82; D.P.U. 09-30, at 133-134. Despite intervenors' assertions to the contrary, we find that Eversource has demonstrated that

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185 In 2008, the Department implemented revenue decoupling in order to remove the disincentive for local gas and electric distribution companies to invest in measures, such as energy efficiency, that reduced sales. D.P.U. 07-50-A at 4. The Department found that revenue decoupling: (1) aligns the financial interests of the companies with policy objectives regarding the efficient deployment of demand resources; and (2) ensures that the companies are not harmed by decreases in sales associated with any increased use of demand resources. D.P.U. 07-50-A at 31-32, 48-50.

declining sales, combined with lost sales growth has resulted in negative revenue impacts for the Companies (Exhs. ES-GWPP-1, at 11, 23-24; 40-41; DPU-19-3; DPU-24-4; AG-18-3; AG-21-7; Tr. 1, at 71-72).

For the reasons discussed above, we find that Eversource has demonstrated that a change is warranted in this case with respect to the Department's historical ratemaking approach (Exhs. DPU-19-2; DPU-19-9; DPU-19-10; DPU-19-19; DPU-24-18; DPU-24-23; DPU-44-2; DPU-47-1; AG-18-15, Att.; AG-28-6; Tr. 1, at 17-19; Tr. 4, at 789-792). The approach we adopt must address lost sales growth and allow Eversource to best meet its public service obligations in terms of providing safe, reliable, least-cost service to customers and ensure that the Commonwealth's clean energy goals are met. D.P.U. 94-158, at 57.

The Attorney General maintains that the Companies' PBR proposal is overly focused on cost recovery and, therefore, should be rejected (Attorney General Brief at 10-12, 20, citing D.P.U. 94-158). A PBR, like all ratemaking mechanisms, must have a certain focus on cost recovery. Here, the Department finds that a main focus of the proposed PBR is to allow the Companies to effectively meet their public service obligation and, therefore, is not overly focused on cost recovery.

As noted above, several intervenors suggest that a capital cost recovery mechanism may be an appropriate substitute for PBR in this case[186] (Attorney General Reply Brief at 38-39; Acadia Center Brief at 13-14; Acadia Center Reply Brief at 13; CLF Brief at 15;

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186 As discussed in Section X.B.3 below, the Department has determined that it is in the public interest to remove the grid modernization base commitment investments from the PBR. Accordingly, the capital cost recovery mechanism we address here would be designed to recover capital investment costs unrelated to grid modernization.

DOER Brief at 20-24; DOER Reply Brief at 7-9; NECEC Brief at 19-20, 23; Sunrun and EFCA Brief at 24; TEC and WMIG Brief at 8; UMass Brief at 3). For the reasons discussed below, the Department finds that Eversource has demonstrated that a capital cost recovery mechanism would not be superior to PBR based on the facts and circumstances of this case.

With a capital cost recovery mechanism, the Companies have shown that they would file at least one (and possibly two) base rate cases over the next five years (Tr. 1, at 79-80; Tr. 2, at 368, 422, 424, 432, 448-449; Tr. 3, at 485-486). By comparison, the Companies have committed to refrain from filing a base rate case during the five-year term of the PBR (see Section IX.5.g below) (Exh. AG-33-8; Tr. 2, at 421-422). In addition, review of capital cost recovery mechanism filings can result in significant administrative burden and expense as compared to review of annual PBR filings, which should be less complex and require fewer resources. See, e.g., D.P.U. 15-155, at 36, 60, 86-89, 136. Accordingly, the Department finds that PBR will reduce administrative burden. Further, we find that PBR will reduce the potential for multiple rate cases where all distribution costs are updated (with the attendant rate case expense) (Tr. 3, at 634).

In addition, the Department finds that Eversource has demonstrated that PBR is superior to a capital cost recovery mechanism in terms of its ability to satisfy the Department's public policy goals and statutory obligations. Rather than directing its focus on specific capital investments, PBR will provide the Companies with greater incentives to be efficient and allow them to focus on developing innovative solutions in furtherance of the

Commonwealth's clean energy goals[187] (Exhs. ES-GWPP-1, at 9-10; DPU-19-2; Attachment DPU-19-3; DPU-19-10; DPU-19-9; DPU-19-22; DPU-24-18; DPU-44-2; AG-18-3; AG-18-4; AG-33-4; VS-1-1; Tr. 8, at 1518).

Finally, we are not persuaded by the Attorney General and DOER's arguments that the revenue stream generated by the PBR would be significantly higher than that of a capital cost recovery mechanism (Exhs. Attachment DPU-19-3, at 8-11; DPU-40-8; DPU-24-23; Tr. 2, at 422, 424). Instead, the Department finds that, after factoring in the number of likely base rate increases over a five-year period, a capital cost recovery mechanism and PBR would generate comparable revenue streams (Exhs. Attachment DPU-19-3, at 8-11; DPU-24-23; DPU-40-8; DPU-44-5; Tr. 2, at 422, 424).

Based on the findings above, the Department has determined that Eversource has demonstrated that PBR is more likely than current regulation to advance the Department's goals of safe, reliable, and least-cost energy service, while also promoting the objectives of economic efficiency, cost control, lower rates, and reduced administrative burden in regulation. D.P.U. 94-158, at 57. In addition, the Department has determined that PBR will provide the Companies with greater incentives to reduce costs and should result in benefits to customers that are greater than would be present under current regulation. D.P.U. 94-158, at 57. Finally, the Department has determined that PBR will allow the Companies to focus on cost saving and innovation, which will enable initiatives designed to address climate

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[187] As discussed in Section IX.D.h below, the Department intends to develop a number of PBR-specific metrics to measure the Companies' performance and the full range of benefits that will accrue under the PBR.

change and foster a clean energy economy, in furtherance of the Commonwealth's clean energy goals. Below, the Department addresses the PBR formula elements and whether the proposed formula, as a whole, appropriately balances ratepayer and shareholder risk and will result in just and reasonable rates.

5. PBR Formula Elements

a. Productivity Offset

i. Introduction

In the context of a PBR, a productivity offset, or X factor, is the difference between the differential in expected productivity growth between the electric-distribution industry and the overall economy and the differential in expected input price growth between the overall economy and the electric distribution industry (Exhs. ES-GWPP-1, at 46). In combination with the inflation factor, the X factor is designed to represent the expected unit cost performance of an average performing company in the industry (Exhs. ES-GWPP-1, at 46; ES-PBRM-1, at 45). As described above, Eversource calculated a proposed productivity offset in the instant case equal to -2.64 percent (RR-DPU-8). Although she does not argue on brief that the Department should adopt it, the Attorney General's witness calculates a productivity offset of -1.36 percent for her nationwide LDC sample and -0.95 percent for her regional LDC sample (Exh. AG/DED-Surrebuttal-1, Sch. DED-Surrebuttal-1, at 1).

The Attorney General maintains that the Companies' proposed X factor is lower than any X factor approved to date for a North American energy utility (Attorney General Brief at 24-27). Further, the Attorney General argues that Eversource's proposed productivity offset is unsupported by reliable measures of U.S. utility productivity growth (Attorney

General Brief at 24-27). The Companies counter that, while other jurisdictions may have approved X factors that are higher, these jurisdictions have also adopted capital cost recovery mechanisms or used industry inflation levels that, when taken into consideration, make the Companies' proposed X factor comparable (Companies Brief at 337). Further, regarding the measures of utility productivity cited by the Attorney General, Eversource argues that BLS data are not strictly limited to the electric distribution industry and, therefore, are not a useful measure of the Companies' productivity (Companies Reply Brief at 43).

The Attorney General notes that no other jurisdiction in North America has approved a negative X factor to date (Exh. AG/DED-1, at 47-48; Tr. 3, at 583-585). This fact does not, however, preclude the possibility of an X factor that is negative. In fact, other jurisdictions have acknowledged that an X factor may be positive or negative (Exh. VS-1-13, Att. (a) at 48). Whether an X factor is positive or negative is determined solely by the relationship between outputs and inputs in a given industry, and there is no reason to dismiss the possibility that the electric distribution industry may be in a period exhibiting changes that result in decreasing output given a similar or increasing level of inputs (see Exh. ES-PBRM-1, at 47). For these reasons, the Department cannot find that the proposed X factor is unreasonable merely because it is negative or lower than any productivity offset approved to date. Rather, in the sections below, the Department reviews the Companies' TFP study to determine whether it was conducted in a reasonable manner using appropriate assumptions.

ii. TFP Study Parameters

To determine the proposed X factor, Eversource conducted a productivity study of U.S. electric distribution TFP and input price growth over the period 2001 to 2015 (Exhs. ES-PBRM-1, at 46; ES-PBRM-2). Eversource considered two different samples for its TFP study: (1) a sample of 67 nationwide LDCs intended to represent the overall U.S. electric distribution industry; and (2) a sample of 17 regional LDCs intended to represent the distribution industry in the Northeast U.S. (Exh. ES-PBRM-1, at 46). As described below, Eversource ultimately used the nationwide sample for its TFP study (Exh. ES-PBRM-1, at 61).

The Attorney General contends that both the nationwide and regional LDC samples selected by the Companies exclude certain relevant peer utilities and, therefore, result in a flawed analysis with questionable reliance on a peer average that does not represent the Companies' own productivity or that of comparable peers (Attorney General Brief at 30). Eversource counters that the utilities cited by the Attorney General are not relevant peer utilities to the Companies (Companies Brief at 355; Companies Reply Brief at 48). Eversource further maintains that the nationwide LDC sample has been used in other TFP studies and is robust because it represents 75 percent of electric distribution customers in the country (Exh. ES-PBRM-1, at 68; Tr. 3, at 562-563, 635; Tr. 8, at 1483-1485).

Because it represents a significant portion (i.e., 75 percent) of electric distribution customers in the country and is sufficiently robust, the Department is persuaded that the Companies' sample of 67 nationwide utilities is reasonably representative of the U.S.

distribution industry and is a reliable basis to establish TFP (Exh. ES-PBRM-1, at 61; Tr. 8, at 1483-1485). With regard to the regional LDC sample, the Companies selected 17 out of 43 available investor owned utilities to represent the electric distribution industry in the northeast United States, which represents 40 percent of investor owned LDCs in the region (Exhs. ES-PBRM-1, at 46, 77; DPU-40-4, Att.). The regional LDC sample contains seven Eversource and National Grid operating companies, which raises some concerns about sample endogeneity (Exh. DPU-24-16).

Eversource calculated industry TFP over the period 2001 to 2015 (Exhs. ES-PBRM-1, at 47-51, 61). Vote Solar argues that this 15-year time period is too short, resulting in a TFP study that is not robust (Vote Solar Brief at 10). The Companies maintain that significant changes in the electric distribution industry render earlier data unreliable and, therefore, data from 2001 to 2015 are most indicative of future productivity expectations (Exh. ES-PBRM-1, at 62; Tr. 3, at 508-509, 642-646).

As Eversource acknowledges, longer time periods generally are better indicators of future expectations and use of a full data set will ensure robust, reliable results (Tr. 3, at 642-646). The Department is persuaded, however, that, in the instant case, the benefit of using more recent data from 2001 to 2015 to incorporate non-trivial industry changes (as discussed in greater detail below) outweighs possible sacrifices to the study's robustness inherent with the use of a shorter time period.

iii. TFP Study Execution/Components; Input Price and Productivity Differentials

Eversource's proposed X factor includes two components: (1) an input price differential, which calculates the average annual difference in input price growth between the overall economy and the electric distribution industry from 2001 to 2015; and (2) a productivity differential, which calculates the average annual difference in productivity growth between the electric distribution industry and the overall economy from 2001 to 2015 (Exh. ES-PBRM-1, at 27, n. 25). The input price and productivity differentials are intended to reflect the average annual difference in productivity and input price growth between the electric distribution industry and the overall economy from 2001 to 2015. Considered jointly, these differentials are meant to reflect the average annual increase in industry unit costs (Exhs. ES-GWPP-1, at 46; ES-PBRM-1, at 28).[188]

The sum of the differentials serves as a proxy for the growth in per unit costs that a particular company should have experienced from 2001 to 2015, if it were an average performing company (Exhs. ES-GWPP-1, at 46; ES-PBRM-1, at 28, 46). A company that achieved lower-than-average growth in unit costs during this period would have the opportunity to earn additional profits (Exh. ES-PBRM-1, at 46). Conversely, a company whose growth in unit costs exceeded the average might realize lower-than-anticipated profits (Exh. ES-PBRM-1, at 46).

188 For companies operating in a competitive market, the prices charged for a product or service are determined by the prices of the inputs used to produce the product or service, adjusted for any productivity gains exhibited in combining those inputs to produce the product or service (Exh. ES-PBRM-1, at 28).

The Department must first determine whether it is more appropriate to base Eversource's historic input price and productivity growth differentials on the historic productivity and input price growth indices of either regional or nationwide LDCs. With respect to input price growth, Eversource's TFP study indicates that, between 2001 and 2015, regional LDCs experienced an average annual input price growth rate of 4.10 percent, while nationwide LDC input prices grew at an average annual rate of 4.13 percent (Exh. ES-PBRM-1, at 47-48). With respect to productivity growth, Eversource's TFP study indicates that, between 2001 and 2015, regional LDCs experienced an average annual productivity growth of -0.41 percent, while nationwide LDCs experienced an average annual productivity growth of -0.46 percent (Exh. ES-PBRM-1, at 47-48). Given the small difference between the regional and nationwide growth rates in each instance and the substantial presence of Eversource and National Grid operating companies in the regional sample which could result in sample endogeneity, we find that use of nationwide LDC input price growth and nationwide LDC productivity growth will maintain a high degree of statistical reliability and preserve the function of the input price and productivity growth rates as true industry-wide averages (Exhs. ES-PBRM-1, at 30, n.30; DPU-24-16).

Next, the Department addresses the appropriate output measure to use in the calculation of average annual productivity growth. As described above, Eversource calculated annual productivity growth using TFP, which is defined as the ratio of total output to total input (Exh. ES-PBRM-1, at 30; Tr. 3, at 487-489). Annual gains or losses in productivity are measured as the percentage change in TFP, which is calculated as the percentage change in total output less the percentage change in total input (Exh. ES-PBRM-1, at 30-31).

Traditionally, the Department has approved TFP studies that use both customer count and a measure of sales (i.e., kWh sales) as output measures. See D.P.U. 96-50 (Phase I) at 275-278; D.T.E. 03-40, at 476. Eversource used number of customers as the sole output measure for its TFP study (Exh. ES-PBRM-1, at 30; Tr. 3, at 491). Several intervenors maintain that the Companies' use of number of customers as the sole output measure is problematic because total output consists of all of the products and services produced by the relevant firm or industry (Attorney General Brief at 31; Vote Solar Brief at 6-7).

The Department has previously expressed concern with the use of number of customers as the sole indicator of LDC output growth. D.P.U. 07-50-A at 48-49; D.P.U. 96-50 (Phase I) at 275-276.[189] As Eversource recognizes, while the number of customers is a driver of the costs needed to operate gas or electric distribution systems, it does not capture all of the reasons for changes in costs associated with providing distribution services (Exh. ES-PBRM-1, at 49; Tr. 3, at 495). D.P.U. 07-50-A at 48-49. For example, a distribution company may make capital expenditures to replace existing assets and the magnitude of capital replacement required has little or no correlation with levels of customer

[189] Certain economists have concluded that number of customers is an appropriate output measure in determining the productivity offset for a revenue-per-customer PBR, because the number of customers directly affects a utility company's revenues (Exhs. ES-PBRM-1, at 36-38; ES-PBRM-Rebuttal-1, at 31 n.44; Tr. 3, at 626-631; RR-DPU-6, Att. at 129-130). The Companies have not, however, proposed a revenue-per-customer PBR. Instead, the Companies propose a revenue cap PBR where the annual revenues resulting from any PBR adjustments are unrelated to changes in the number of customers (Exhs. ES-PBRM-1, at 39-40).

growth (Exh. ES-PBRM-1, at 49; Tr. 3, at 494-495, 633-634). D.P.U. 07-50-A at 48-49. Instead, these capital expenditures are influenced by factors such as the age of the assets, changes in technology, past patterns of customer growth and increases in the load to serve (Exh. ES-PBRM-1, at 49; D.P.U. 07-50-A at 48-49.

Because of significant changes in the electric distribution utility industry, use of kWh sales as an alternate output measure may also be flawed. In particular, successful energy efficiency programs have led to decreased energy consumption, which has resulted in decreased kWh sales for electric distribution utilities (Exh. ES-GWPP-1, at 21-26; Tr. 1, at 32, 71; Tr. 5, at 986; Tr. 8, at 1474, 1538). D.P.U. 07-50-A at 3, 6. In addition, the introduction of a growing amount of distributed energy resources into the distribution system decreases kWh sales (Exh. ES-GWPP-1, at 22, 25-26). In this current environment, electric distribution utilities may exhibit kWh sales data that are unrelated to distribution system investments or other customer service inputs (see Tr. 3, at 494-495, 633-634).

Given the discussion above, the Department concludes that both output measures used in traditional TFP studies (i.e., kWh sales and customer count) present challenges. The record does not contain the data necessary to allow us to consider a non-traditional output measure. In these circumstances, the Department finds that Eversource has demonstrated that customer count is a reasonably reliable TFP output measure as it is less affected than kWh sales by the industry changes discussed above (Exh. ES-GWPP-1, at 21-26; Tr. 1, at 32, 71; Tr. 5, at 986; Tr. 8, at 1474, 1538). D.P.U. 07-50-A at 3, 6. Going forward, any distribution company conducting a TFP study should consider and present data regarding alternative or non-traditional output measures that are designed to capture all of the products and services it provides.

The Attorney General raises several other issues with respect to the execution of Eversource's TFP study. First, the Attorney General argues that the Companies' inputs should include not only labor and materials costs booked to distribution O&M expense but also an allocated portion of labor and materials costs associated with customer accounts, sales, administrative and general expenses, and general plant (Attorney General Brief at 28-30). The Companies counter that these accounts should not be included because they contain non-distribution expenses (Companies Brief at 359-360; Companies Reply Brief at 49). As the adjustments affect the distribution revenue requirement, the Department finds that it is not appropriate to include any non-distribution cost elements in the input index.

The Attorney General also argues that Eversource used an improper method to calculate the capital quantity index; specifically it used the one hoss shay method rather than the geometric decay method (Attorney General Brief at 31).[190] The Attorney General contends that a geometric decay method is more appropriate here because it considers gradual depreciation of capital, whereas the one hoss shay method does not (Attorney General Brief at 31). Alternately, the Companies maintain that the one hoss shay method is consistent with the method that the BLS uses to develop multifactor productivity studies (Companies Brief at 368-370; Companies Reply Brief at 49). Further, the Companies claim that the Attorney

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[190] The one hoss shay method assumes that the flow of services received for capital is constant at full productive efficiency up until its retirement, whereas the geometric decay method assumes that the productivity of an asset decreases at a constant percentage rate (Tr. 3, at 554-555, 569).

General's calculation of the capital quantity index using the geometric decay method is unreliable because she excluded data from more than 20 percent of the sample companies (Companies Brief at 356, 370-371).

While the gradual depreciation of capital assets is necessary for accounting and cost recovery purposes, a capital asset's contribution to a company's productivity remains relatively constant until it is retired (Tr. 3, at 554-558). As Eversource correctly notes, the BLS relies on a method similar to the one hoss shay method for its multifactor productivity studies (Exh. ES-PBRM-1, at 69; Tr. 3, at 554-558). For these reasons, the Department finds that Eversource's use of the one hoss shay method to calculate the capital quantity index is appropriate.

Finally, the Attorney General raises concerns about the method used by Eversource to calculate the industry productivity growth rate (Attorney General Brief at 30). Once Eversource determined the quantity of output and the quantities and total prices of total input for each firm and each year, it used these data to calculate the industry productivity growth rate (Exh. ES-PBRM-1, at 73; ES-PBRM-2). In calculating the industry average annual productivity growth, Eversource weighted each company's TFP by its relative number of customers (Exh. ES-PBRM-1, at 73). The Attorney General argues that weighting the companies by their relative number of customers is inappropriate because the TFP estimates are already scaled for size given that productivity is a relative measure comparing a utility's inputs to its outputs (Attorney General Brief at 30). Even if such weighting is found to have a legitimate basis, the Attorney General asserts that Eversource's actual adjustment is both limited and selective (Attorney General Brief at 30). Specifically, the Attorney General claims that there are a number of differences between utilities that could affect the productivity estimates (e.g., regulatory environment, geography, service territory characteristics) and that only adjusting for size without adjusting for all other possible factors results in a weighted average that is selective and arbitrary (Attorney General Brief at 30-31). Eversource maintains that weighting for size is necessary given that the output measure is number of customers (Companies Brief at 358). Without such weighting, the Companies contend that the ten largest firms (which serve 45.3 percent of the customers in the study) have the same weight as the ten smallest firms (which serve 2.5 percent of the customers in the study) (Companies Brief at 358-359). Because the output measure is number of customers, the Department finds that weighting to account for utility size may result in more representative industry-average TFP data. Accordingly, the Department concludes that the Companies' weighting of TFP estimates is appropriate.

Based on the findings above, the Department has determined that that Eversource's input price differential of -1.29 percent and productivity growth differential of -1.35 percent were determined in a reasonable manner.

iv. Conclusion

In the sections above, the Department has determined that the Companies' TFP study was conducted in a reasonable manner using appropriate data and assumptions. Accordingly, the Department has determined that the resulting input price differential of -1.29 percent and productivity growth differential of -1.35 percent were determined in a reasonable manner.

Accordingly, the Department will use these inputs to calculate an appropriate productivity offset for the Companies.

Eversource maintains that the proposed X factor of -2.64 percent would allow it to absorb the $400 million grid modernization base commitment investment (Companies Brief at 36, 403). The average annual revenue requirement associated with the $400 million base commitment investment is represented by an implicit stretch factor of 1.08 percent (Exhs. ES-GWPP-1, at 54; ES-PBRM-1, at 60; AG-21-2, Att. at 1; Tr. 2, at 240-242; Tr. 8, at 1553-1559, 1595-1597; Companies Brief at 403). To the extent that the Department determines it is appropriate to remove the grid modernization base commitment from the PBR, the Companies maintain that they would not object to making the 1.08 percent explicit and removing it from the X factor (Exhs. ES-GWPP-1, at 54; ES-PBRM-1, at 60; AG-21-2, Att. at 1; Tr. 2, at 240-242; Tr. 8, at 1553-1559, 1595-1597; Companies Brief at 403).

For reasons discussed in Section X.B.3 below, the Department has determined that it is in the public interest to remove the proposed grid modernization base commitment investments from the PBR. Accordingly, the Department will reduce Eversource's proposed X factor by 1.08 percent, representing the estimated revenue requirement associated with the $400 million grid modernization base commitment investment (Exhs. ES-GWPP-1, at 54; ES-PBRM-1, at 60; AG-21-2, Att. at 1; Tr. 2, at 240-242; Tr. 8, at 1553-1559, 1595-1597; Companies Brief at 403). Accordingly, the Department approves an X factor of -1.56 percent.

b. Inflation Index and Floor

In D.P.U. 94-50, at 141, the Department found that the GDP-PI is the most accurate and relevant measure of output price changes for the bundle of goods and services whose TFP growth is measured by the BLS. In addition, the Department found that GDP-PI is: (1) readily available; (2) more stable than other inflation measures; and (3) maintained on a timely basis. D.P.U. 94-50, at 141. In the instant proceeding, no party disputes that the GDP-PI is an appropriate measure for inflation in a revenue cap PBR formula. Accordingly, the Department approves the Companies' use of GDP-PI as an inflation index in the PBR formula.

As described above, Eversource proposes to include an inflation floor of one percent in the revenue cap formula, meaning that if inflation drops below one percent, the Companies would fix the inflation component of the PBR formula at one percent (Exh. ES-GWPP-1, at 12, 47-48). The Attorney General, Cape Light Compact, and CLF argue that the proposed inflation floor is unprecedented and unjustified (Attorney General Brief at 21; Cape Light Compact Brief at 55-56; CLF Brief at 17). The Companies concede that there are no other examples of incentive regulation plans that include a floor on inflation (Tr. 3, at 544). Eversource's primary justification for its proposed inflation floor stems from its commitment to spend $400 million over five years on grid modernization investments (Exhs. ES-GWPP-1, at 47-48; DPU-24-6; DPU-44-4; DPU-44-5, AG-28-6; Tr. 2, at 314). However, as discussed in Section X.B.3 below, the Department has determined that it is in the public interest to address the grid modernization base commitment investments outside of the PBR.

Based on the foregoing, the Department finds that the Companies have not demonstrated that an inflation floor is a necessary or reasonable component of its PBR formula. Accordingly, the inflation component of the PBR formula shall strictly reflect GDP-PI, as outlined above.

c. Consumer Dividend

The consumer dividend is intended to reflect expected future gains in productivity due to the move from cost of service regulation to incentive regulation. D.P.U. 96-50 (Phase I) at 165-166, 280. As a deduction to the PBR adjustment, the consumer dividend is designed to allow ratepayers to share in these aforementioned gains (Exh. ES-GWPP-1, at 56). In the instant proceeding, Eversource proposes to apply a consumer dividend of 25 basis points (or 0.25 percent) when inflation exceeds two percent (Exhs. ES-GWPP-1, at 54; ES-PBRM-1, at 8, 60, 66-67). No party addressed this particular component of the Companies' PBR proposal on brief.

The Companies acknowledge that the determination of a consumer dividend is largely subjective and that there is a lack of quantitative, empirical basis for establishing its magnitude (Exhs. ES-GWPP-1, at 55; ES-PBRM-1, at 55; DPU-19-21). Although the Department has previously approved consumer dividends greater than 25 basis points, we recognize that Eversource's recent ratemaking history includes a series of rate freezes for both NSTAR Electric and WMECo (Merger Settlement at Art. II (3)). D.P.U. 96-50 (Phase I) at 281; D.P.U. 05-85 Settlement, at Art. II. Accordingly, it is reasonable to expect that Eversource's future gains in productivity may be somewhat lower than would be expected in a move from pure cost of service regulation to PBR (Exhs. ES-GWPP-1, at 56-57; DPU-19-21).

The Companies submit that the consumer dividend represents an explicit, tangible customer benefit in the PBR (Exhs. ES-GWPP-1, at 49, 56; ES-PBRM-1, at 66-67). We agree. Accordingly, in order to ensure that an appropriate share of the benefits of future gains in productivity will accrue to ratepayers, the Companies shall include in the PBR formula a consumer divided of 25 basis points (or .25 percent) when inflation exceeds two percent.

d. Grid Modernization Plan Factor

Eversource proposes to include a GMP factor in its PBR formula. The GMP factor would be used to recover approved: (1) investments in grid modernization above the $400 million base commitment proposed in this proceeding; and (2) incremental grid modernization investments proposed in D.P.U. 15-122 (Exhs. ES-GWPP-1, at 12, 18, 69; ES-PBRM-1, at 8; DPU-24-8). As discussed in Section X.B.3 below, the Department has determined that the Companies' grid modernization plan investments will be addressed outside of the proposed PBR mechanism. Accordingly, the Companies shall remove the proposed GMP factor from the PBR formula.

e. Exogenous Cost Factor

In D.P.U. 94-158, at 62, the Department recognized there may be exogenous costs, both positive and negative, that are beyond the control of a company and, because the company is subject to a stay-out provision, may be appropriate to recover (or return) through the PBR. The Department has defined exogenous costs as positive or negative cost changes actually beyond the Company's control and not reflected in the GDP-PI. D.P.U. 94-50, at 172-173. These include, but are not limited to, incremental costs resulting from: (1) changes in tax laws that uniquely affect the relevant industry; (2) accounting changes unique to the relevant industry; and (3) regulatory, judicial, or legislative changes uniquely affecting the industry. D.P.U. 96-50 (Phase I) at 291; D.P.U. 94-50, at 173. The Department has cautioned against expansion of these categories to a broader range. D.P.U. 96-50 (Phase I) at 290-291; D.P.U. 94-158, at 61-62.

In the instant proceeding, Eversource proposes to adopt a definition of exogenous costs that is consistent with the definition adopted by the Department in D.P.U. 94-50. Accordingly, the Department finds that the Companies' proposed definition of exogenous costs is appropriate.

In order to avoid costly regulatory process over minimal dollars, the Department has found that exogenous cost recovery must be subject to a significance threshold that is noncumulative (i.e., exogenous costs cannot be lumped together into a single total for purposes of determining whether the threshold has been met). D.T.E. 01-56, at 22-23; D.T.E. 99-19, at 26; D.P.U. 96-50 (Phase I) at 292-293; D.P.U. 94-50, at 173. The significance threshold is determined based on a percentage of the company's total operating revenues, taking into account the term of the PBR insofar as the effects that inflation will have on the threshold in the later years of the PBR. D.T.E. 01-56, at 11-14; D.P.U. 98-128, at 57.

Eversource has proposed an exogenous cost significance threshold of $5 million for the combined entity of NSTAR Electric and WMECo for calendar year 2018, subject to annual adjustments thereafter based on changes in GDP-PI (Exh. ES-GWPP-1, at 62). Although the Department must consider the facts and circumstances of each case, in several prior cases, the Department has found that an exogenous cost significance threshold was reasonable where it was equal to a multiple of 0.001253 times a company's total operating revenues. D.T.E. 05-27, at 396; D.T.E. 03-40, at 491; D.T.E. 01-56, at 22-26; D.P.U. 98-128, at 53-56.[191]

On a consolidated basis, Eversource's total test year operating revenues were $3,249,892,540 (see Exhs. ES-DPH-2 (East), Sch. DPH-5, at 1 (Rev. 3); ES-DPH-2 (West), Sch. DPH-5, at 1 (Rev. 3)).[192,193] Consistent with our prior precedent and the facts of this case, the Department finds that $5 million is a reasonable exogenous cost significance threshold for the Companies that have total operating revenues of $3,249,892,540 and that are implementing a multi-year PBR plan of the overall design approved herein.

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191 In support of its proposal, the Companies maintain that the Department recently approved an exogenous cost significance threshold of 0.003212 times a company's total annual distribution revenues (Exh. ES-GWPP-1, at 61, citing D.P.U. 12-25). Although Bay State Gas Company proposed to adopt a significance threshold based on the above calculation, the Department declined to adopt the expense adjustment factor at issue and, therefore, did not address the reasonableness of the proposed exogenous cost significance threshold in that case. D.P.U. 12-25, at 331-334.

192 NSTAR Electric's and WMECo's total operating revenues for the test year were $2,769,893,671 and $479,998,869, respectively (Exhs. ES-DPH-2 (East), Sch. DPH-5, at 1 (Rev. 3); ES-DPH-2 (West), Sch. DPH-5, at 1 (Rev. 3)).

193 Multiplying Eversource's consolidated operating revenues of $3,249,892,540 by a factor of 0.001253 equals $4,072,115.

In addition, the Companies have proposed that the exogenous cost significance threshold be subject to annual adjustments based on changes in GDP-PI as measured by the U.S. Commerce Department (Exh. ES-GWPP-1, at 62). The Department is satisfied that this proposal appropriately takes into account the effects that inflation will have on the threshold in the later years of the PBR. D.T.E. 01-56, at 11-14; D.P.U. 98-128, at 57. Accordingly, we set the Companies' threshold for exogenous cost recovery at $5 million for each individual event in calendar year 2018, subject to annual adjustments thereafter based on changes in GDP-PI as measured by the U.S. Commerce Department. Based on the foregoing analysis, the Department approves the Companies' proposed exogenous cost factor as a component of the PBR formula.

Exogenous cost recovery requires that a company provide supporting documentation and rationale to the Department for a determination as to the appropriateness of the proposed exogenous cost. D.T.E. 99-19, at 25; D.P.U. 98-128, at 55; D.T.E. 98-31, at 17-18. Additionally, any company seeking recovery of an exogenous cost bears the burden of demonstrating the propriety of the exogenous cost and that the proposed exogenous cost change has not been incorporated into the GDP-PI. D.P.U. 96-50 (Phase I) at 292-293; D.P.U. 94-50, at 171. For these reasons, the Department will not prejudge the qualification of any future events as exogenous costs (e.g., an adverse ruling on a municipal property tax issue and any future transmission formula rate changes mandated by FERC). Instead, at the time it seeks exogenous cost recovery, Eversource must demonstrate that the event meets both the definition and threshold for exogenous costs approved herein.

f. Earnings Sharing Mechanism

The Department has found that earnings sharing mechanisms may be integral components of incentive regulation plans. D.P.U. 94-50, at 197, n. 116. Specifically, the Department has found that earnings sharing mechanisms provide an important backstop to the uncertainty associated with setting the productivity factor. D.P.U. 96-50 (Phase I) at 325; D.P.U. 94-50, at 197.

The Companies propose to implement an asymmetrical earnings sharing mechanism with a deadband of 200 basis points (Exhs. ES-GWPP-1, at 12, 65-66; ES-PBRM-1, at 8). Under the Companies' proposal, earnings would be shared with ratepayers on a 75/25 basis (i.e., 75 percent to shareholders, 25 percent to ratepayers) if and when the calculated distribution ROE exceeds the ROE authorized in this proceeding by 200 basis points (Exh. ES-GWPP-1, at 65). If and when the calculated ROE exceeds the ROE authorized in this case by more than 300 basis points, Eversource proposes to share earnings with ratepayers on a 50/50 basis (Exh. ES-GWPP-1, at 65). For any year in which the ROE is above the deadband, the Companies propose to credit the percentage of earnings to be shared to customers in the succeeding year and exclude the impact of this adjustment in calculating any earnings sharing for the subsequent year (Exh. ES-GWPP-1, at 66).

The Attorney General argues that the proposed earnings sharing deadband of 200 basis points is too large and could result in outcomes where ratepayers see little to no benefits from the PBR (Attorney General Brief at 32). In addition, the Attorney General and Cape Light Compact argue that the design of the Companies' proposed earnings sharing mechanism gives too much upside earnings potential to the Companies and too little potential benefit for customers (Attorney General Brief at 32-33; Cape Light Compact Brief at 59).

An earnings sharing mechanism offers an important protection for ratepayers in the event that expenses increase at a rate much lower than the revenue increases generated by the PBR (Tr. 2, at 435-436; Tr. 3 at 643). See D.P.U. 10-70, at 8 n.3; D.P.U. 05-27, at 404-405. For this reason, the Department finds that there is a significant benefit to implementing an earnings sharing mechanism as part of the PBR adopted in this case. However, as discussed below, the Department finds that certain modifications to the Companies' proposed earnings sharing mechanism are necessary in order to appropriately balance the risks to shareholders and ratepayers under the PBR.

As noted above, the Companies propose to adopt a deadband of 200 basis points (Exhs. ES-GWPP-1, at 12, 65-66; ES-PBRM-1, at 8). The Department has previously approved earnings sharing mechanisms with deadbands of 200 basis points or greater. D.T.E. 05-27, at 405; D.T.E. 03-40, at 500; D.P.U. 96-50 (Phase I) at 326. Here, with the changes to the tiered structure and earnings percentages discussed below, the Department finds that a 200-basis point deadband is both consistent with Department treatment of such mechanisms in the past and is reasonable to apply in this instance.

The Department finds that a 200-basis point deadband will provide the Companies with a strong incentive to pursue savings. However, in order to appropriately balance shareholder and ratepayer risk under the PBR as designed, the Department finds that the benefits of any earnings above the deadband must inure largely to ratepayers. Accordingly, we find that a mechanism that shares earnings with ratepayers on a 75/25 basis above the 200-basis point deadband (i.e., 75 percent to ratepayers and 25 percent to shareholders) is appropriate in this case. This ratio will provide the Companies both adequate incentives to pursue savings and also protect ratepayers from an unforeseen financial windfall for the Companies as a result of the implementation of the PBR.

Finally, the Department declines to adopt a tiered structure as proposed by the Companies. As the Companies' witness acknowledged, a tiered sharing structure can create perverse cost containment incentives at the margin that can encourage misreporting or changes in spending (Tr. 8, at 1515). The Department finds that a non-tiered earnings sharing mechanism will resolve any concerns regarding incentives at the margin and achieve the goals of simplicity and administrative efficiency.

In conclusion, the Department finds that the Companies' PBR shall include an earnings sharing mechanism that sets a 200 basis points deadband above the Companies' authorized ROE. If the Companies' earned distribution ROE falls within or below the deadband, there will be no sharing. If the Companies' earned distribution ROE exceeds the deadband, shareholders and ratepayers will share earnings 25 percent and 75 percent, respectively.

g. PBR Term

Eversource's initial PBR proposal did not provide for an explicit term or stay-out provision (see Exhs. ES-GWPP-1; ES-PBRM-1). Instead, the Companies maintained that the PBR was designed to operate for "the long term" (Exhs. DPU-24-1; DPU-47-1; AG-33-8;

Tr. 2, at 421). During the course of the proceeding, Eversource proposed to adopt a PBR five-year term and associated stay-out provision where the Companies would have the ability to file for rate relief if the actual ROE falls more than 200 basis points below the ROE approved in this proceeding (Exh. AG-33-8; Tr. 1, at 421-422).

Intervenors argue that the Department should bar the Companies from filing a rate case during the five-year term (Attorney General Reply Brief at 90-91; Cape Light Compact Brief at 60). They argue that if the Companies are allowed to file a rate case during the five-year term, then ratepayers would receive little benefit or protection from the PBR (Attorney General Brief at 33-34; Attorney General Reply Brief at 90-91; Cape Light Compact Brief at 60).

The Department has found that a well-designed PBR should be of sufficient duration to give the plan enough time to achieve its goals and to provide utilities with the appropriate economic incentives and certainty to follow through with medium- and long-term strategic business decisions. D.P.U. 96-50 (Phase I) at 320; D.P.U. 94-158, at 66; D.P.U. 94-50, at 272. The Companies acknowledge that a stay-out provision is one of the ways to ensure strong incentives for cost containment (Exhs. DPU-24-1; DPU-47-1; AG-33-8; Tr. 2, at 421). In addition, the Department has stated that one benefit of incentive regulation is a reduction in regulatory and administrative costs. D.P.U. 96-50 (Phase I) at 320; D.P.U. 94-158, at 64.

Previous PBR plans approved by the Department have had terms of five years or longer. See, e.g., D.T.E. 01-56, at 10; D.P.U. 96-50 (Phase I) at 320. In the instant case, the Department finds that a five-year term will give the plan enough time to achieve its goals and will provide the Companies with the appropriate economic incentives for cost containment and long-term planning. Further, we find that a five-year term will establish an appropriate interval over which to review the Companies performance over the initial term of the PBR.[194]

As noted above, a stay-out provision provides an important benefit to ratepayers as it will ensure that there are strong incentives for cost containment under the PBR. Accordingly, the Department will adopt a stay-out provision in conjunction with the five-year term. The Department declines to adopt Eversource's proposal to allow an explicit off-ramp where the Companies earned ROE is more than 200 basis points below the ROE approved in this case. The Department finds that such provision would not be in the public interest as it would undermine the intent of a defined PBR term and would not provide the proper incentives for cost containment and long-term planning, and would not ensure a reduction of regulatory and administrative costs.

Although we do not approve an explicit off-ramp provision, the Department notes that extraordinary economic circumstances have always been a recognized basis for any gas or electric company to petition the Department for changes in tariffed rates. D.T.E. 03-40, at 497 n.263, citing D.T.E. 98-128, at 56; D.T.E. 98-31, at 18. This review is consistent

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194 Section 94 provides that electric distribution companies shall file rate schedules no less than every five years. The Companies maintain that Section 94 does not specify that such schedules must be designed to allow for an increase in base rates and, therefore, the Department may allow a PBR with a term of longer than five years (Exh. DPU-47-1, at 2).

with G.L. c. 164, § 93 and Section 94 and with the general requirement that rates must be just and reasonable. D.T.E. 03-40, at 497 n.263. Statute, of course, governs and, where need be, supersedes any regulatory arrangement prescribed by the Department. D.T.E. 98-27, at 14-21. Nonetheless, the Department fully expects that the Companies will not file a base rate case during the term of the PBR and that any rate relief sought under Section 94 would be of last resort. Should the Companies seek to change base rates before the end of the PBR term, that action would be a significant consideration in that Section 94 proceeding and would likely have a negative effect on the Companies' resulting ROE, based on the Department's standard for establishing ROE.

For the reasons discussed above, the Department finds that the Companies' PBR shall operate for a five-year term starting January 1, 2018. Additionally, absent a showing of extraordinary economic circumstances, the Companies shall not file a proceeding under Section 94 that seeks to change base rates prior to the end of the PBR term.

h. Metrics

As discussed above, the Companies have demonstrated that the electric distribution industry is rapidly changing and that PBR is the appropriate ratemaking model to allow them to adapt to this change. The Department must find, however, that the PBR we approve in this proceeding will result in just and reasonable rates. G.L. c. 164, § 94; D.P.U. 96-50 (Phase I) at 242; D.P.U 94-158, at 52-66. One factor that the Department considers in reaching this determination is the extent to which the PBR is designed to advance policy and other Department objectives to ensure that ratepayer benefits will result. D.P.U. 96-50

(Phase I) at 242. In this regard, the Department has determined that a PBR (1) should be designed to achieve specific, measurable results, and (2) should identify, where appropriate, measurable performance indicators and targets that are not unduly subject to miscalculation or manipulation. D.P.U. 94-158, at 63-64. The Department has further found that broader performance indicators are preferred, and should be tied to the stated goals of a program and consistent with the Department's regulatory goals. D.P.U. 94-158, at 63-64. Finally, the Department has determined that a well-designed PBR should present a timetable for program implementation and specific milestones for program tracking and evaluation. D.P.U. 94-158, at 64-65.

Here, intervenors argue that the Companies' proposed PBR lacks specific, measurable metrics to measure the success of the PBR (Attorney General Brief at 14; Cape Light Compact Brief at 56-57; Sunrun and EFCA Brief at 9; Vote Solar Brief at 12-13). Eversource maintains that PBR-specific metrics are not necessary because the Department's existing service quality metrics, with the related potential for penalties, will continue to apply to the Companies during the term of the PBR (Companies Brief at 325-326). In addition, the Companies argue that specific PBR-related metrics are not necessary because the increased efficiency that will result from the PBR is a measurable achievement that is already contained within the PBR formula in the form of the consumer dividend (Companies Brief at 324-325; Companies Reply Brief at 40-42).

Eversource's proposed metrics solely relate to spending for the grid modernization base commitment and do not contain any measurable performance indicators or targets to assess the Companies' performance or the benefits achieved under the PBR (Exhs. ES-GMBC-1, at 132; ES-GMBC-3; AG-18-26; DPU-41-7; Tr. 12, at 2387-2388). As discussed in Section X.B.3 below, the Department has determined that it is in the public interest to remove the grid modernization investments from the PBR and the Department will address the establishment of appropriate metrics designed to advance the Department's grid modernization objectives as part of our forthcoming Order in D.P.U. 15-122.

As recognized by the Companies, the Department's service quality metrics (and associated penalties) will remain in place during the term of the PBR.[195] The Department will continue to rely on these rigorous service quality metrics to gauge whether sufficient investment is occurring on the Companies' distribution system to maintain the reliability of electric service to customers. See, e.g., Revised Service Quality Guidelines, D.P.U. 12-120-D (2015). The service quality metrics and consumer dividend do not, however, capture the full range of benefits that the Companies maintain, and that the Department expects will accrue from implementation of the PBR.

The Companies argue the PBR is designed to operate as a mechanism for maintaining alignment between costs and revenues so that they can continue to operate their system in support of the Commonwealth's clean energy goals, including the provision of safe, reliable and resilient electric service with a minimal environmental impact (Companies Reply Brief at 12). The Department found above that PBR should result in benefits to ratepayers

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195 The Department notes that the maximum service quality penalty that can be assessed against the Companies grows as the Companies' annual revenues for distribution and transmission operations increase. G.L. c. 164, § 1*I*.

because, among other reasons, it will allow Eversource the flexibility to focus on cost saving and innovation to meet the Commonwealth's clean energy goals. In exchange for this flexibility, the Department finds that it is appropriate to establish PBR-specific metrics to measure the Companies' performance and gauge the extent to which these critical policy benefits accrue.

Eversource had demonstrated that its costs are increasing due to several changes in the electric distribution industry including: (1) the need to rebuild the distribution system to allow for reliable two-way power flows; (2) the need to improve system resiliency to withstand climate-change impacts; (3) the emergence of a greater need for cybersecurity; (4) an increased need to minimize environmental effects from distribution infrastructure; (5) incorporating the emergence of digital technology and consumer engagement in energy consumption; and (6) recruiting and retaining a non-traditionally skilled workforce (Exh. DPU-19-3, Att.). Through the adoption of the PBR, the Department recognizes Eversource requires the degree of flexibility to adapt to these changes.

Accordingly, in order to measure the full range of benefits that will accrue under the PBR, the Department finds that it is appropriate to establish a set of broad performance metrics in the following three categories that are tied to the goals of the PBR and consistent with the Department's regulatory objectives: (1) improvements to customer service/engagement; (2) reductions in system peak; and (3) strategic planning for climate adaptation.

The Department acknowledges that the evidentiary record in this case is not sufficient to establish final performance metrics and benchmarks at this time. In this Order, the Department will establish the categories in which the metrics will be developed. After input from the Companies and intervenors, the Department will adopt final metrics and benchmarks in a compliance phase of this proceeding.[196]

The metrics that the Department establishes in this proceeding will be used for reporting purposes and to determine whether the PBR is working as designed and providing benefits to ratepayers. Going forward, the Department intends to consider whether it may be appropriate to establish incentives or otherwise tie earnings under the PBR to performance metric outcomes.

First, the Companies shall develop metrics and appropriate benchmarks to measure improvement in the level of customer satisfaction and customer engagement. The Department has often recognized the importance of customer satisfaction and its direct alignment with ratepayer interests. See D.P.U. 12-120-D at 56; D.P.U. 12-25 at 161; D.P.U. 10-55, at 253-254; D.P.U. 12-120; D.P.U. 04-116-C at 16-17. Under the PBR, the Companies will have the ability to focus their customer engagement to adjust to the changing energy market. As the Companies note, customers are becoming more active participants in how they get their power and manage their electricity consumption (Exh. DPU-19-3, Att.). For example, the Companies must change to adapt to customers that are more reliant on mobile applications and devices (see Exh. DPU-19-13).

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196 As discussed further below, the Companies will be required to submit a compliance filing containing proposed metrics and benchmarks consistent with the categories and design criteria established in this Order. The Department will investigate the proposed metrics in a compliance phase of this proceeding.

When developing the proposed customer satisfaction/engagement metrics, the Companies must consider customers both who are producers and consumers of electricity. In addition, the Companies shall establish a baseline associated with those metrics in order to measure improvements over the term of the PBR.[197] Regarding customer satisfaction, the metrics should be designed to account for factors outside of the Companies' control, such as commodity prices or weather. To control for these types of outside variables, the Department finds that it is appropriate for a third party to benchmark the Companies' performance relative to their utility peers.

Second, the Companies shall develop a metric and appropriate benchmark to measure reductions in peak system demand. System peak demand is the primary driving force in the cost of electric supply and the need for new generation, transmission, and distribution investments.[198] D.P.U. 12-76-B at 10-12. Customers benefit from reductions in sales and peak demand through lower capacity and commodity prices (i.e., lower bills). See e.g.,

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197 Examples of ways the Companies may seek to improve customer satisfaction/engagement include, but are not limited to: (1) investments in technologies such as billing and tracking systems to improve customer access to information; (2) improved mobile device and digital communication support; and (3) improvements in distributed energy resource interconnections (Exh. DPU-19-13). Further, notwithstanding the findings of this Order, the Companies may consider in these efforts to improve customer satisfaction for inclusion within the context of the PBR, including, but not limited to various payment program options, dispute resolutions, and opportunities for community engagement.

198 According to the State of Charge Report, during 2013 to 2015 the top one percent of most expensive hours accounted for eight percent of customers' annual spending on electricity. The top ten percent of hours during these years, on average, accounted for 40 percent of annual electricity spending (Exh. ES-GMBC-6, at 5-6).

Three-Year Plans Order, D.P.U. 15-160 through D.P.U. 15-169 at 93 (2016); Order on Bill Impacts, D.P.U. 08-50-D at 11 (2012).

In designing the system peak demand metric, the Companies must create a structure that is weather normalized and appropriately anchored in measureable parameters that are within the Companies' control. The Companies should set baseline reductions during peak event conditions, rather than a year-to-year reduction.[199] In addition to weather normalizing, the target should recognize the historical trends in system peak demand and account for year-to-year variances over the five-year term of the PBR.[200] There are many additional functions within the Companies' control that affect peak demand (e.g., theft, line loss, upgrading standard technology, employing time of use rates, demand response, energy efficiency, energy storage, Volt/VAR optimization). The Companies should consider all aspects of their business (e.g., traditional capital investment, grid modernization investment, energy efficiency, behind the meter generation) to set a single overarching demand target. However, the Companies should identify a separate benchmark to allow for identification of the portion of the overall demand target that is enabled by investments under the PBR.

Finally, the Companies shall develop metrics and appropriate benchmarks to measure progress towards climate adaptation and greenhouse gas reductions. The Global Warming

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199 Peak events, which are often weather dependent, are not comparable on a year-to-year basis (see Tr. 1, at 138-139).

200 The Department notes that despite a record hot summer in New England in 2016, the Companies' system peak demand in 2016 was six percent less than the peak experienced ten years earlier in 2006 (i.e., 4,958 MW in 2006 as compared to 4,653 MW in 2016) (Exh. DPU-19-3, Attachment DPU-19-3, at 3).

Solutions Act mandates the following reductions in greenhouse gas emissions: (1) ten to 25 percent from 1990 levels by 2020; and (2) at least 80 percent of 1990 levels by 2050. G.L. c. 21N, § 4(a). The Department must consider reasonably foreseeable climate change impacts, including additional greenhouse gas emissions, when considering and issuing administrative approvals or decisions. G.L. c. 30, § 61. Further, Governor Baker's Executive Order 569 requires each agency to develop a climate adaptation plan to assess the potential risk to critical infrastructure assets from natural disasters and climate change. On both bases, the Companies are obligated to make progress towards climate adaptation and greenhouse gas reductions. Accordingly, the Department finds that establishment of metrics to measure progress towards climate adaptation and greenhouse gas reductions is reasonable and appropriate.

The Companies are responsible for providing a safe and reliable electric system. In order to develop the climate adaptation metric, the Companies must conduct their own climate adaptation study to identify those areas under the Companies' control that are most vulnerable to climate change and could jeopardize system reliability. The Department finds that requiring the Companies to develop a climate adaptation plan is within the Companies' control, in line with current emergency response planning, and in the public interest. Further, we find that this process will help guide future infrastructure investments and advance the Commonwealth's clean energy goals. Therefore, the Department directs the Companies to develop a climate adaptation plan for their assets, including an assessment of the potential risk to these assets from climate change (e.g., risks to the underground system from sea level rise, emergency response plans for severe weather, etc.).

As part of the climate adaptation plan, the Companies shall assess the estimated carbon emissions from their existing assets. After the completion of the plan, the Companies shall propose a greenhouse gas reduction target. The proposed target shall be based solely on assets under the control of the Companies.

Within 90 days of the date of this Order, the Companies shall, consistent with above the directives, submit: (1) proposed customer satisfaction/engagement metrics and benchmarks, including a third party benchmark to measure the level of customer satisfaction/engagement over the term of the PBR; (2) a proposed system peak demand reduction metric and benchmark to measure reductions of demand during peak events from current levels; and (3) a proposed climate adaptation plan designed to inventory and address the Companies' at risk assets and the emissions from those assets. The results of the climate adaption plan will be used to develop future metrics and benchmarks to measure the Companies' progress towards climate adaptation and greenhouse gas reductions.

E. Conclusion

In the sections above, the Department has reviewed the Companies' proposed PBR and has found that it is more likely than current regulation to advance the Department's traditional goals of safe, reliable, and least-cost service and to promote the objectives of economic efficiency, cost control, lower rates, and reduced administrative burden in regulation. In addition, the Department has found that the proposed PBR will provide Eversource with greater incentives to reduce costs than currently exist and should result in benefits to customers that are greater than would be present under current regulation. Further, the Department has found that the proposed PBR better satisfies our public policy goals and statutory obligations, including promotion of the Commonwealth's clean energy goals and mandates.

With the modifications to the PBR formula required herein, the Department finds that the PBR appropriately balances ratepayer and shareholder risk and will result in just and reasonable rates pursuant to G.L. c. 164, § 94. Accordingly, the Department approves Eversource's proposed PBR, subject to the modifications required herein.

Eversource shall submit an annual PBR compliance filing, including all information and supporting schedules necessary for the Department to review the proposed PBR adjustment for the subsequent rate year. Such information shall include the results and supporting calculations of the PBR adjustment factor formula, descriptions and accounting of any exogenous events, and an earnings sharing credit calculation for the year two years prior to the rate adjustment. In addition, Eversource shall file revised summary rate tables reflecting the impact of applying the base rate changes provided in the PBR compliance filing. Eversource is directed to submit its annual PBR compliance filing on or before September 15th each year, commencing in 2018 and continuing for the five-year term of the PBR. Consistent with our findings in Section IX.D.5.g above, the PBR shall continue in effect for a total of five consecutive years starting January 1, 2018, with the last adjustment taking effect on January 1, 2022.[201]

X. GRID MODERNIZATION PROPOSAL

A. Introduction

The Department seeks to encourage electric distribution companies to adopt grid modernization technologies and practices that will enhance the reliability of electricity service, reduce costs of operating the electric grid, mitigate price increases and volatility for customers, and empower customers to adopt new electricity technologies and better manage their electricity use. Modernization of the Electric Grid, D.P.U. 12-76-A at 1 (2013). The Department has defined grid modernization as functions that fall within four broad objectives: (1) reducing the effects of outages; (2) optimizing demand, which includes reducing system and customer costs; (3) integrating distributed resources; and (4) improving workforce and asset management. Modernization of the Electric Grid, D.P.U. 12-76-B at 9 (2014).

The Department directed each electric distribution company to submit a ten-year grid modernization plan designed to make measurable progress towards each of these four objectives as well as a short term investment plan addressing the specific initiatives that they expect to undertake in the first five years of the plan. D.P.U. 12-76-B at 15-16; Modernization of the Electric Grid, D.P.U. 12-76-C (2014). The Companies filed their grid modernization plan, including a short-term investment plan, on August 19, 2015. The Department docketed the Companies' grid modernization plan filing as D.P.U. 15-122.

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201 Because the earning sharing adjustment lags the PBR adjustment by one year, the last earning sharing adjustment would take effect on January 1, 2024.