



Residential Lighting Roadmap

May 16, 2018



BLACKSTONE
GAS COMPANY



Columbia Gas

EVERSOURCE



nationalgrid



- Provide the Council with a roadmap by May 16, 2018 which will describe their strategy and timeline for addressing the transformation of the lighting market.

The PAs' waning ability to claim electric savings in the rapidly transforming lighting market has been the subject of much discussion in 2017. This challenge will have a substantial influence on the development of the 2019-2021 Plan and subsequent Plans. The Council asks that the PAs provide a roadmap by May 16, 2018 that clearly describes their strategy and timeline with respect to future lighting incentives. This important information will be crucial to the Council's informed engagement in the Plan development process.

Residential Lighting in Massachusetts

Residential Lighting 2016-2018



- In 2016 alone, almost 11 million efficient lightbulbs were incentivized through the residential and low income programs bringing over \$320,000,000 in benefits to Massachusetts consumers.
- Over 1,000 retail stores partner with our programs to promote efficient lighting.
- The programs fully transitioned to promoting all LEDs in 2017, amplifying the adoption of LEDs in Massachusetts households.

Recent Massachusetts Residential Lighting Evaluation Results



- Massachusetts programs continued to have a strong impact on saturation and penetration of LEDs through early 2018.
- Between 2009 and 2018, Massachusetts experienced a steady increase in efficient bulb saturation and a corresponding decrease in incandescent bulb saturation.
- In the US, market shares for LEDs and halogens are increasing, whereas market shares for incandescents and CFLs are contracting. In Massachusetts, bulb shares followed the same trend, but our programs have helped spur an even higher incidence of LEDs.
- Most lighting suppliers are predicting an increasingly strong LED market through 2022. The programs are positively influencing this change.

Federal Lighting Policies

Energy Independence and Security Act (EISA)



- Phase I in effect (2012-2014), set minimum lamp efficiency standards
- Phase II – EISA 2020: Backstop of 45 lumens per watt
 - Would bar the manufacture, import, and sales of *general service lamps* (GSLs), i.e. screw-in A-lamps, that don't meet the backstop.
 - Halogens are not expected to meet the backstop efficiency levels (efficiencies for halogens are in the 16-22 lumens/watt).
 - Supposed to go into effect on Jan 1, 2020, but deadline to adopt was missed.
 - Manufacturers have responded by reducing the number of CFL's produced.
 - Uncertain when it will go into effect, but could be as late as 2022 or 2023.
 - Adds uncertainty to what the market will look like in the 2019-2021 term.

- The future of Phase II of EISA is currently uncertain. After DOE issued two rulemakings in January 2017, the National Electrical Manufacturers Association (NEMA) filed a petition to review the DOE rulemakings and ultimately reached a settlement agreement with DOE. In exchange for NEMA agreeing to withdraw its petition, the DOE agreed to re-open and complete the GSL rulemaking. Initially, reports were that the DOE would issue revised rules in September of 2017, but as of February 2018, the DOE has not indicated if and how it will complete the rulemakings.
- As currently drafted, EISA Phase II will prohibit the manufacture, import, and sale of non-compliant bulbs. This may mean that, unlike Phase I, where the effects of EISA lagged implementation, Phase II effects may precede implementation (planned for January 1, 2020). While the DOE has left Phase II enforcement specifics somewhat vague, preliminary indications are that a sell-through period is likely, and DOE specifically said that they may delay enforcement for some bulb categories.

Residential Lighting for Massachusetts for 2019-2021

Residential Lighting Savings in 2019-2021 Plan



- For the 2019-2021 Plan, savings, expected useful life (EUL), and net-to-gross ratios (NTGRs) for lighting measures were derived using the results of our evaluation studies and taking into account the uncertainty around EISA 2020.
- This is a collaborative process between the PAs, the EEAC consultants, and the evaluation contractor.
- Lighting savings are still occurring, but the PAs can claim less of them.

2016-2018 vs. 2019-2021 A-Line LED NTGRs



	2016	2017	2018	2019	2020	2021
Residential Upstream	90%	80%	70%	35%	30%	25%
Direct Install (Residential Multi-Family, HES)	82%, 100%	82%, 95%	82%, 90%	45%*	40%*	35%*

*placeholder for April 30 Draft Plan

- NTGRs show the percentage of measure savings is attributable to our programs.
- NTGRs are decreasing significantly compared to the 2016-2018 three year plan.
- Lower NTGRs means the savings we can claim for the program are much lower than 2016-2018 term.

2016-2018 vs. 2019-2021 A-Line LED EUL



	PLAN			ACTUAL	PLAN		
	2016	2017	2018	2017	2019	2020	2021
Residential Upstream	9	8	8	5	5	5	4
Direct Install (Multi-Family, HES)	9	9	9	5	5	5	4

- The lifetime of a measure is the number of years a measure will be in use.
- Expected useful life (EUL) is the number of years the PAs can claim savings for that measure. It is based on evaluation results and updated prospectively for each plan and retrospectively for each program year.
- Lifetime savings = annual savings * EUL
- EULs for 2019-2021 plan are much lower than the 2016-2018 plan, which means planned lifetime savings are lower.
- Lifetime savings are reduced each year to reflect the idea that LEDs will steadily become the default option for customers; PAs can only claim savings when we are influencing the customer's choice.

2016-2018 vs. 2019-2021 A-Line LED NTGRs and EULs



Isolating the impact of NTGR and EUL changes on residential upstream lighting savings potential past 2018

(example uses 1,000 units to show the full impact of NTGR and EUL changes)

Year	Quantity	Gross Annual kWh	NTGR	Net Annual kWh
2017	1,000	35,000	80%	28,000
2019	1,000	35,000	35%	12,250

Year	Quantity	Annual kWh	EUL	Lifetime kWh
2017	1,000	35,000	8	280,000
2019	1,000	35,000	5	175,000

The Future of Residential Direct Install



- PAs will continue to offer bulbs in all of its direct install programs in 2019-2021, although less savings will be attributable to the Programs.
- Direct install is still cost effective for 2019-2021; PAs will continue to offer.
- Residential initiatives with direct install potential are changing.
 - The realignment will place more emphasis on non lighting measures, but lighting will continue to be offered when there is an opportunity.

The Future of Residential Upstream Lighting



- PAs will continue to offer bulbs in our upstream programs in 2019-2021, although less savings will be attributable to the Programs.
- Upstream lighting is still cost effective for 2019-2021; PAs will continue to offer.
- In response to the decrease in NTG and EUL changes, PAs will be reducing our incentives per bulb, which will presumably decrease our sales volume for 2019-2021. We've talked to manufacturers and retailers about this, and our volume estimates based on those conversations are reflected in the April 30 plan.
- The Retail Initiative will continue to introduce new products and expand the reach of existing products to diversify our energy efficiency offerings.