Emera Maine

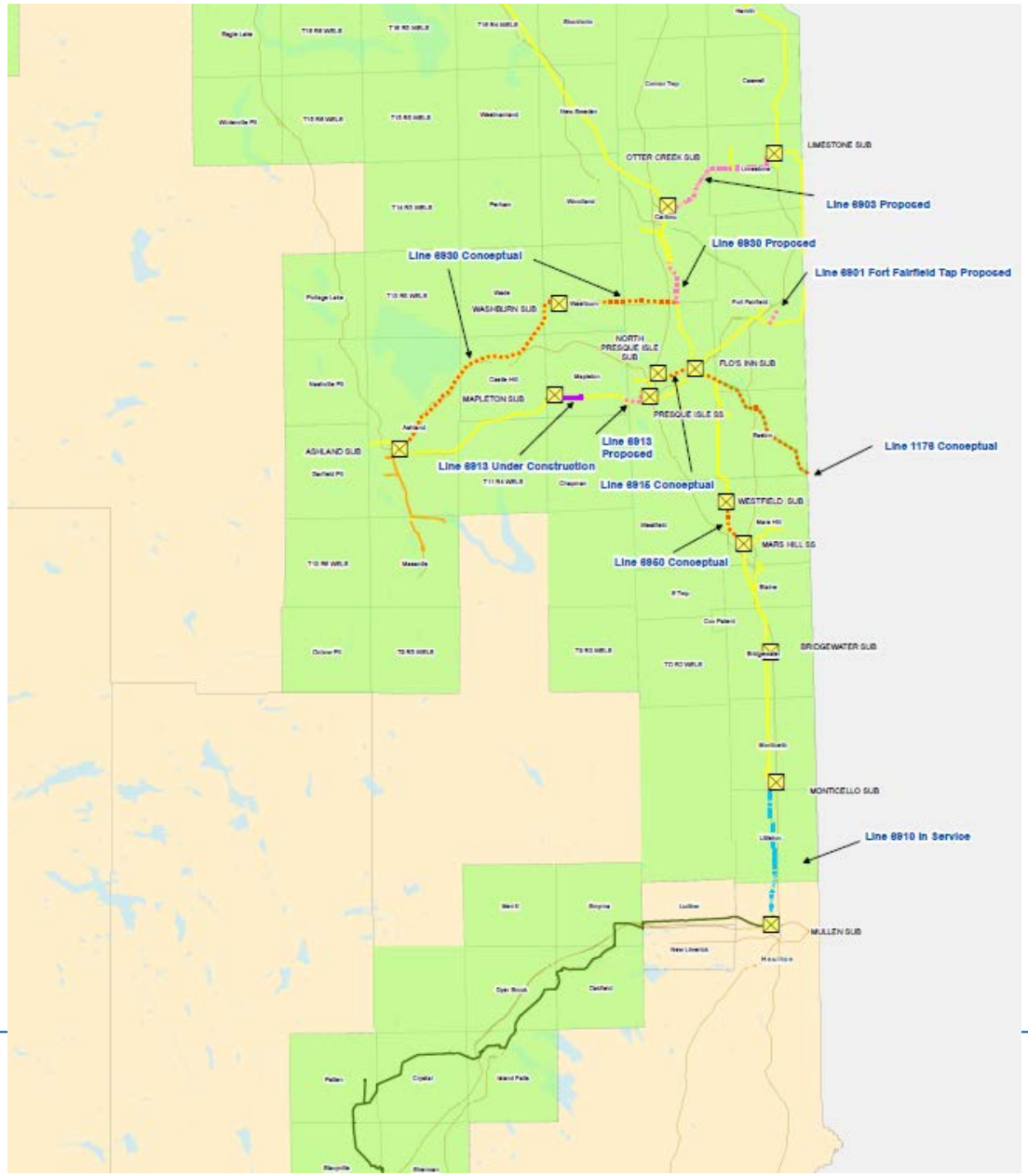
JUNE 27, 2018

Northern Maine Planning Advisory Group Meeting

Meeting Agenda

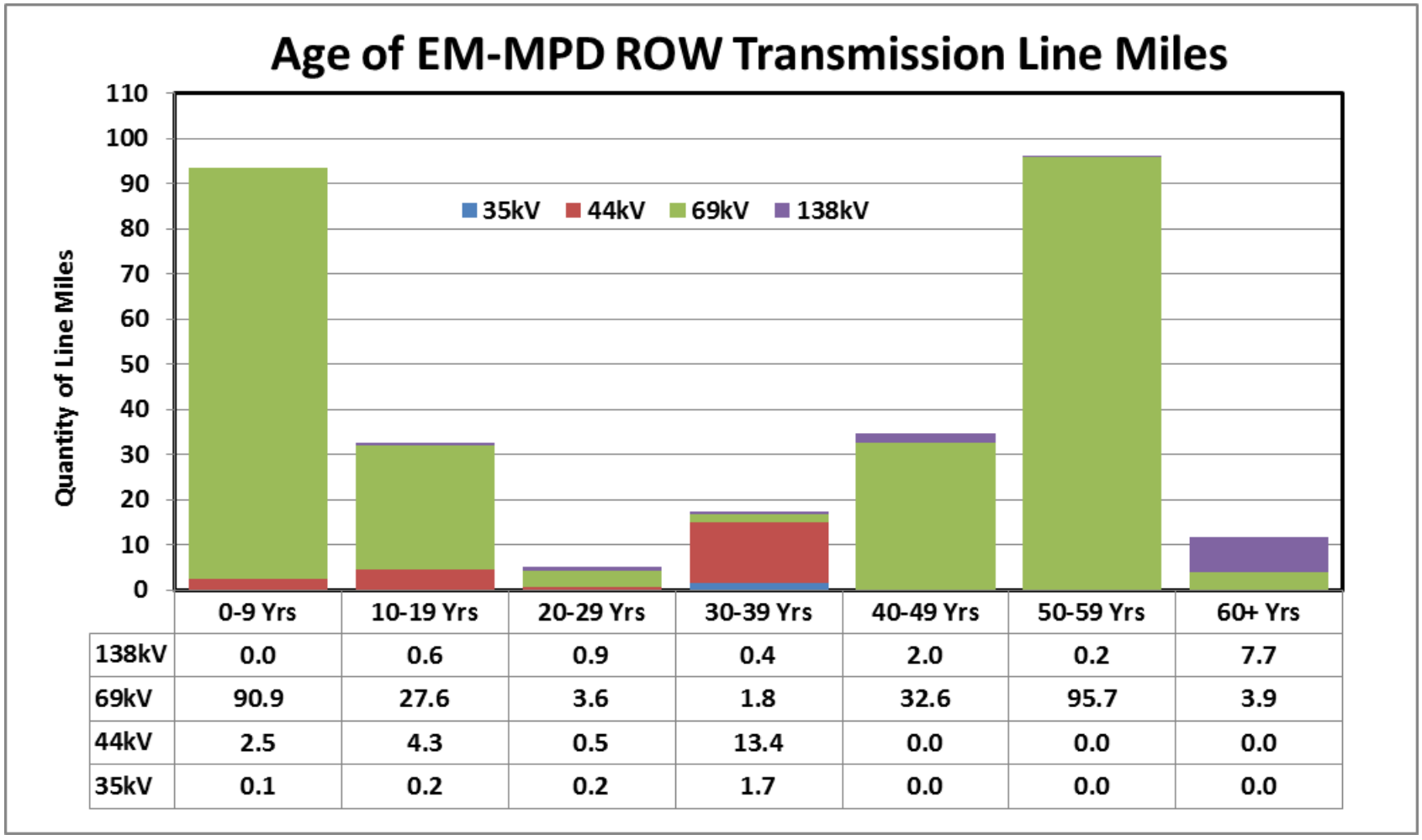
- Welcome and Introductions
- Meeting Purpose and Agenda Review
- Northern System Overview
- System Reliability Report
- Condition Review
- Rebuild Program Progress and Plans
- Five-Year Transmission Plan and MPUC Chapter 330 Filing
- Other Issues
- Regional Topics
- Meeting Close

Northern Maine Transmission System



Emera Maine

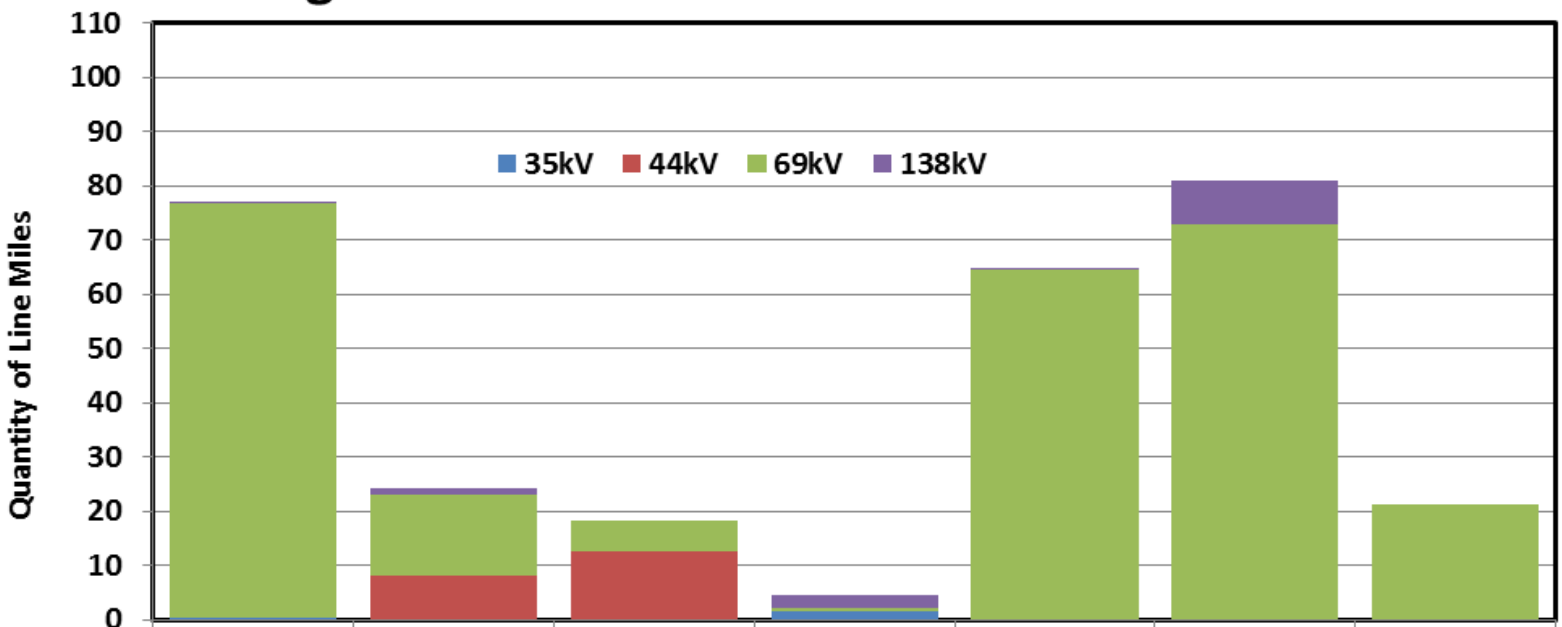
MPD Transmission Line Age



	0-9 Yrs	10-19 Yrs	20-29 Yrs	30-39 Yrs	40-49 Yrs	50-59 Yrs	60+ Yrs
138kV	0.0	0.6	0.9	0.4	2.0	0.2	7.7
69kV	90.9	27.6	3.6	1.8	32.6	95.7	3.9
44kV	2.5	4.3	0.5	13.4	0.0	0.0	0.0
35kV	0.1	0.2	0.2	1.7	0.0	0.0	0.0

Emera Maine

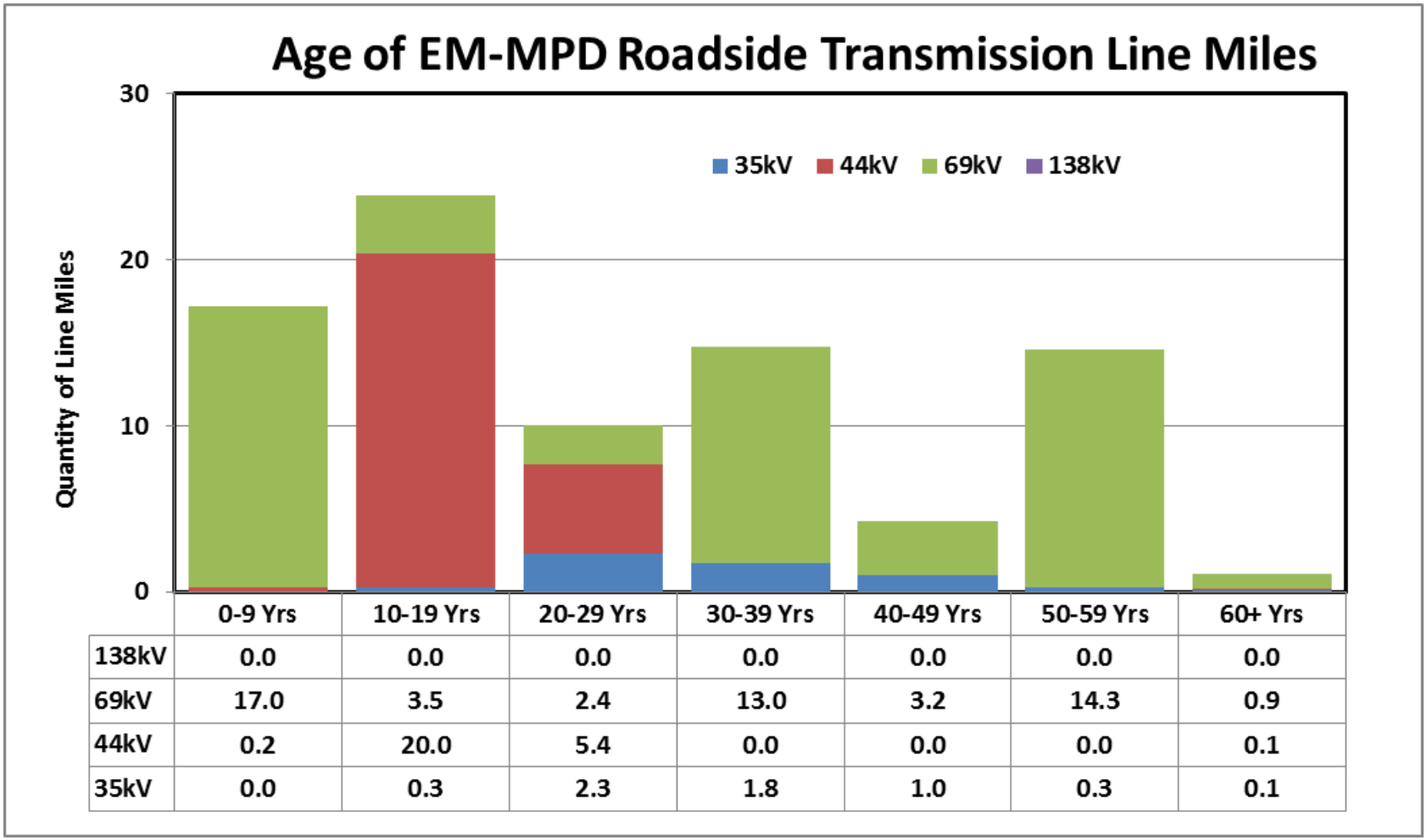
MPD Transmission Line Age (2016)



	0-9 Yrs	10-19 Yrs	20-29 Yrs	30-39 Yrs	40-49 Yrs	50-59 Yrs	60+ Yrs
138kV	0.1	1.3	0.0	2.2	0.2	8.0	0.0
69kV	76.3	14.7	5.8	0.6	64.6	72.9	21.2
44kV	0.1	8.3	12.3	0.0	0.0	0.0	0.0
35kV	0.3	0.0	0.2	1.7	0.0	0.0	0.0

Emera Maine

MPD Transmission Line Age (Roadside)



	0-9 Yrs	10-19 Yrs	20-29 Yrs	30-39 Yrs	40-49 Yrs	50-59 Yrs	60+ Yrs
138kV	0.0	0.0	0.0	0.0	0.0	0.0	0.0
69kV	17.0	3.5	2.4	13.0	3.2	14.3	0.9
44kV	0.2	20.0	5.4	0.0	0.0	0.0	0.1
35kV	0.0	0.3	2.3	1.8	1.0	0.3	0.1

Emera Maine

Measuring Outage Performance

System Average Interruption Frequency Index (SAIFI)

$$SAIFI = \frac{\text{Service Interruptions}}{\text{Customers served}}$$

SAIFI Target = 1.80 events

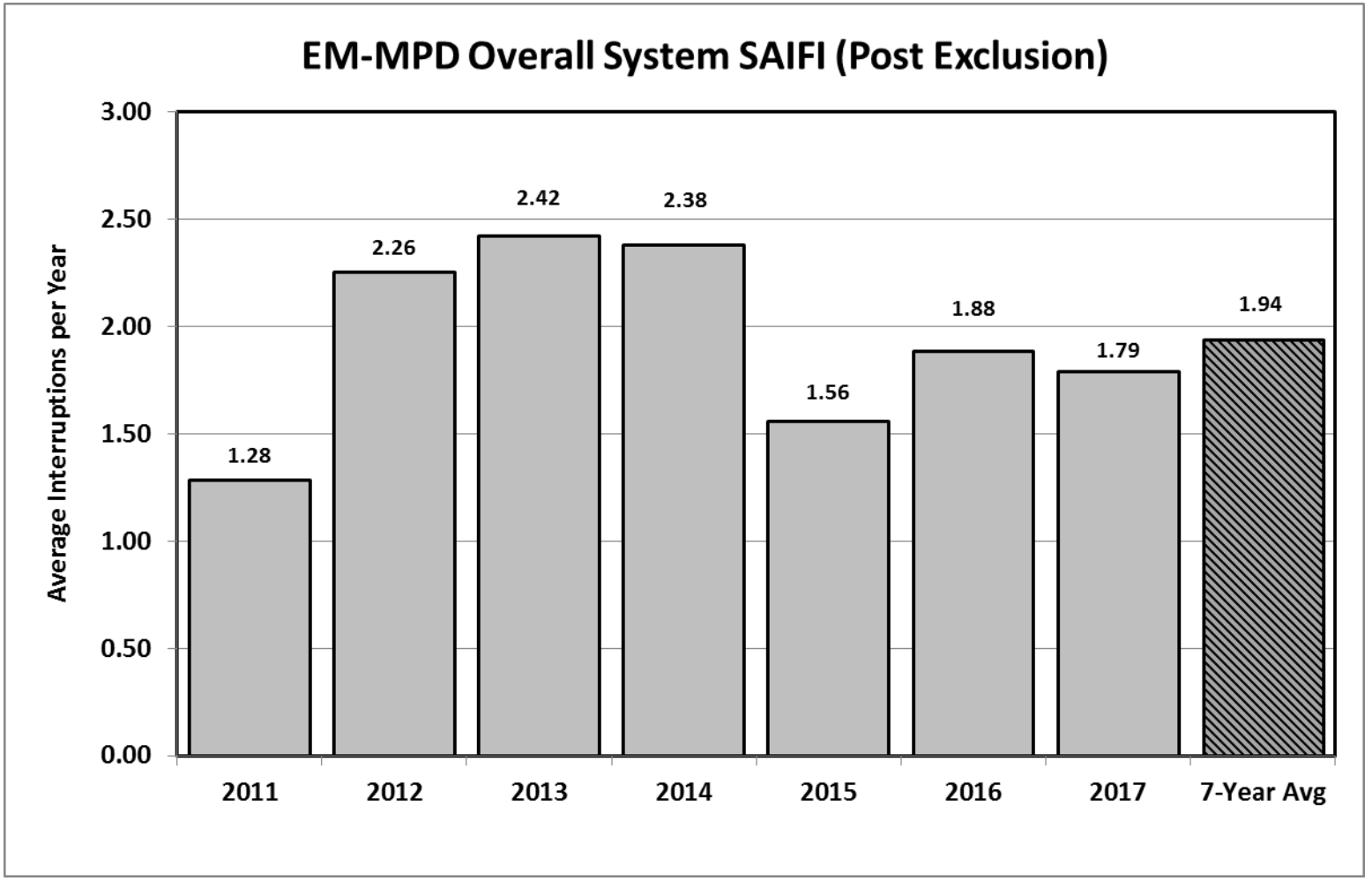
Customer Average Interruption Duration Index (CAIDI)

$$CAIDI = \frac{\text{Hours Service Interruption}}{\text{Service Interruptions}}$$

CAIDI Target = 2.00 hours per Service Interruption

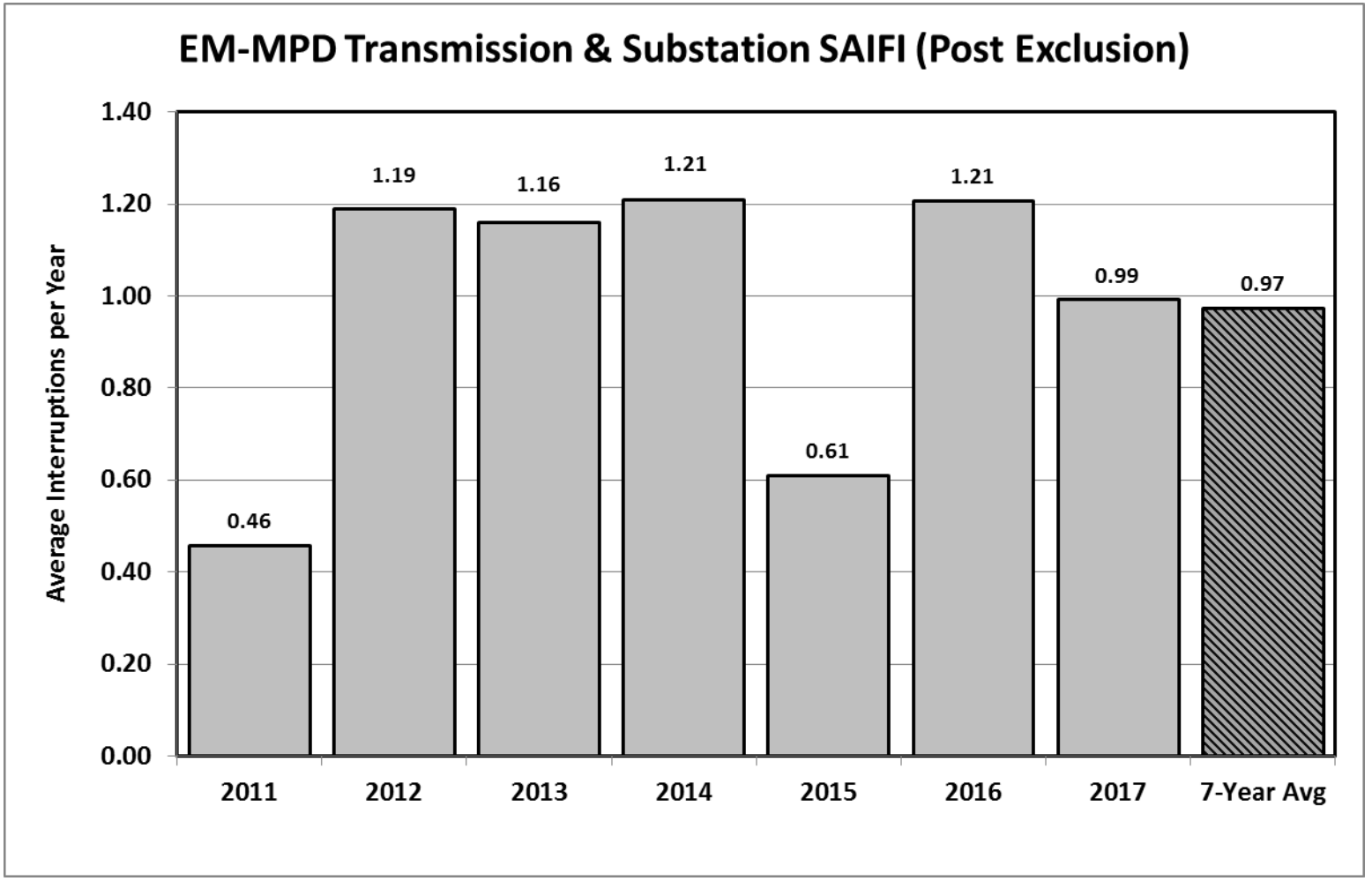
Emera Maine

MPD Reliability - SAIFI



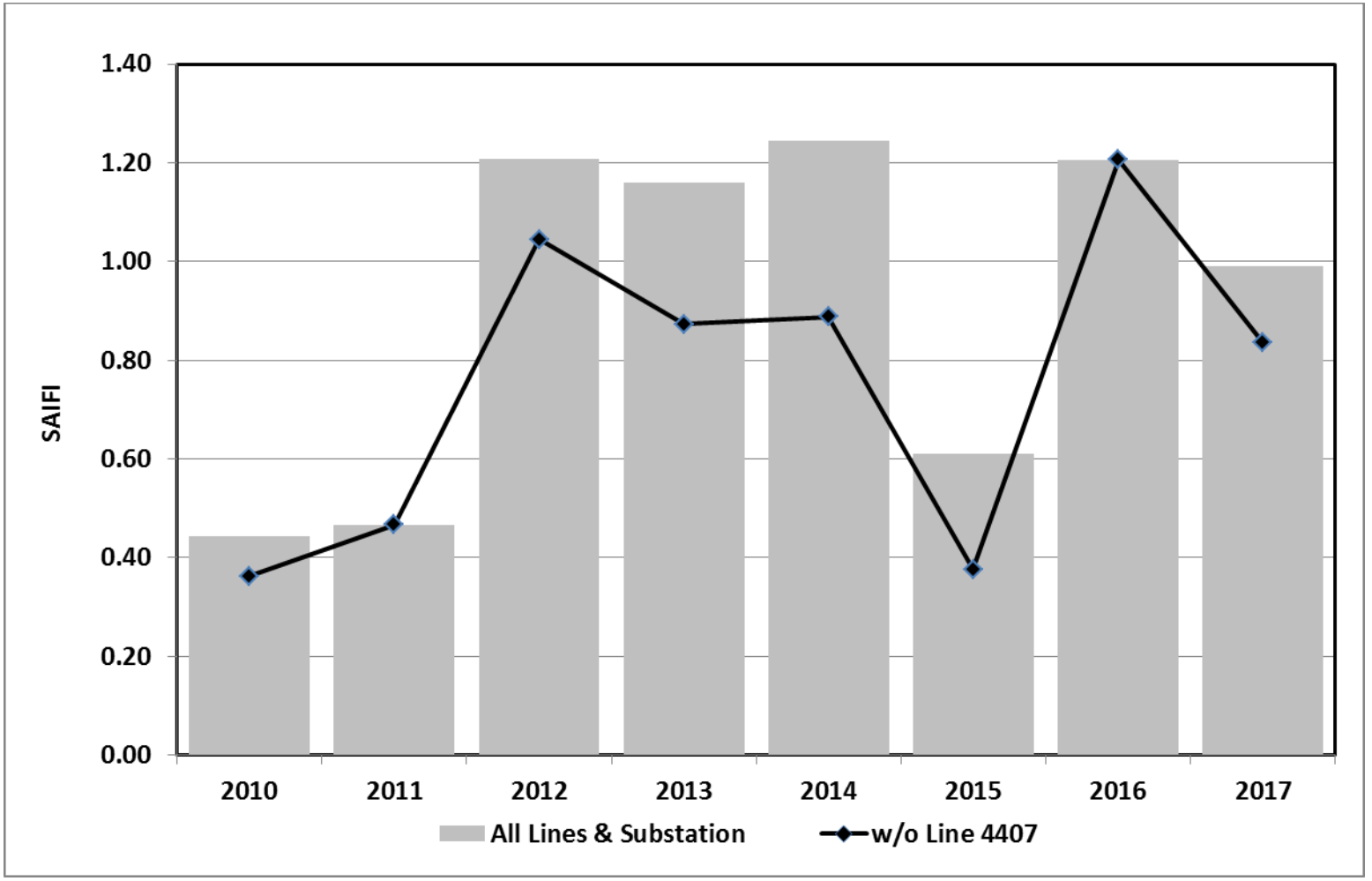
Emera Maine

MPD Reliability – Transmission SAIFI



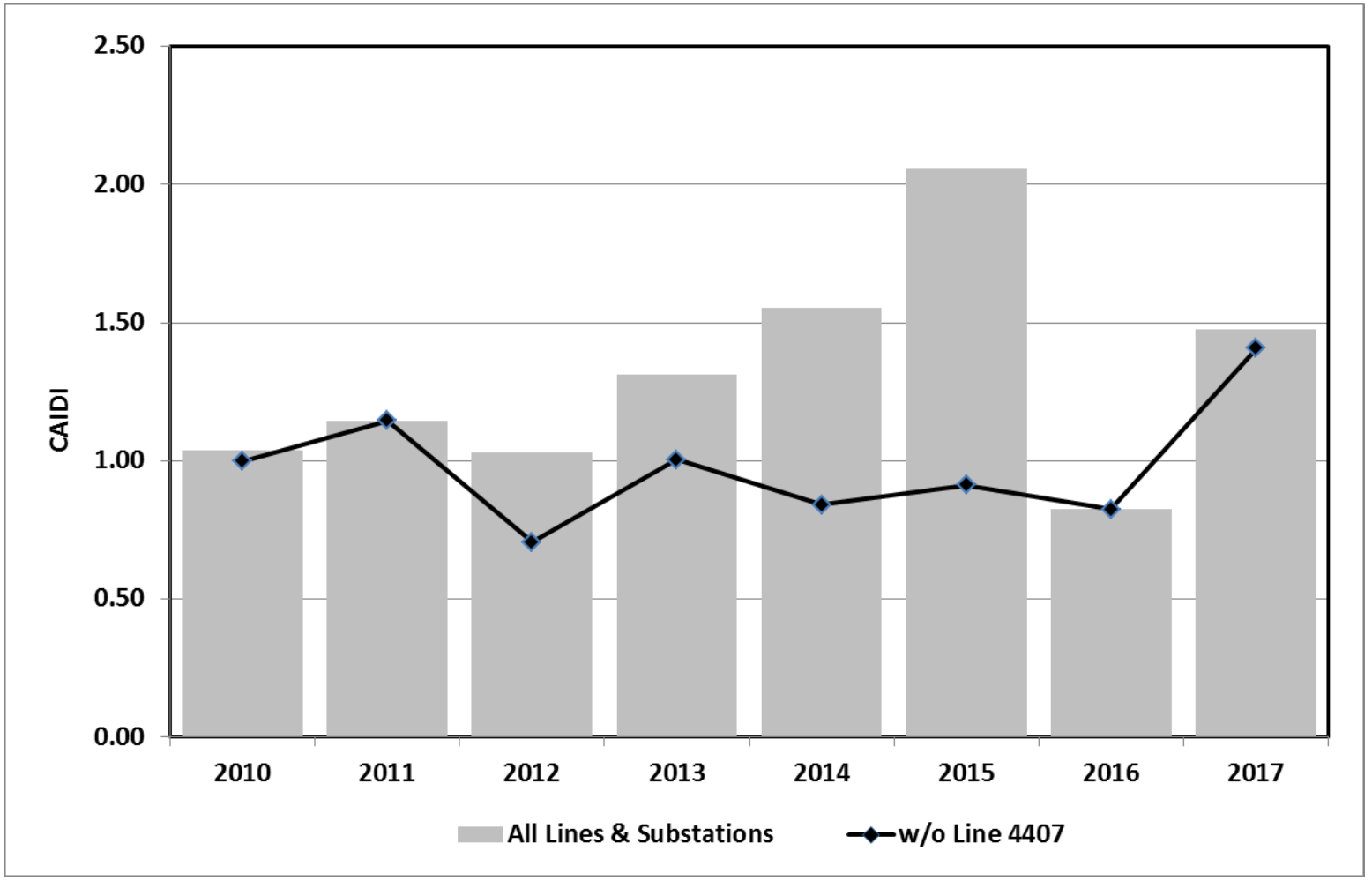
Emera Maine

MDP Transmission/Substation SAIFI



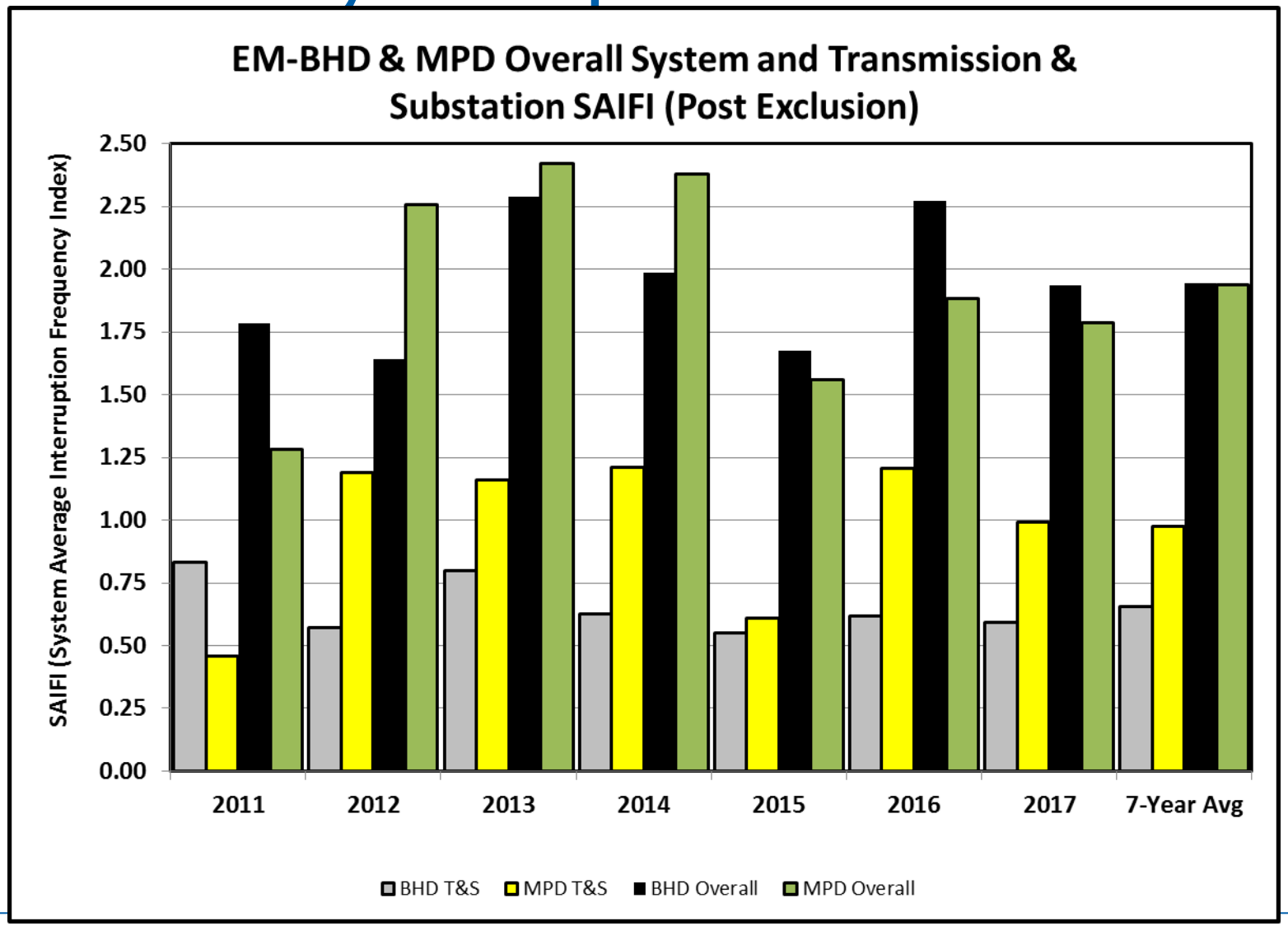
Emera Maine

MPD Transmission/Substation CAIDI



Emera Maine

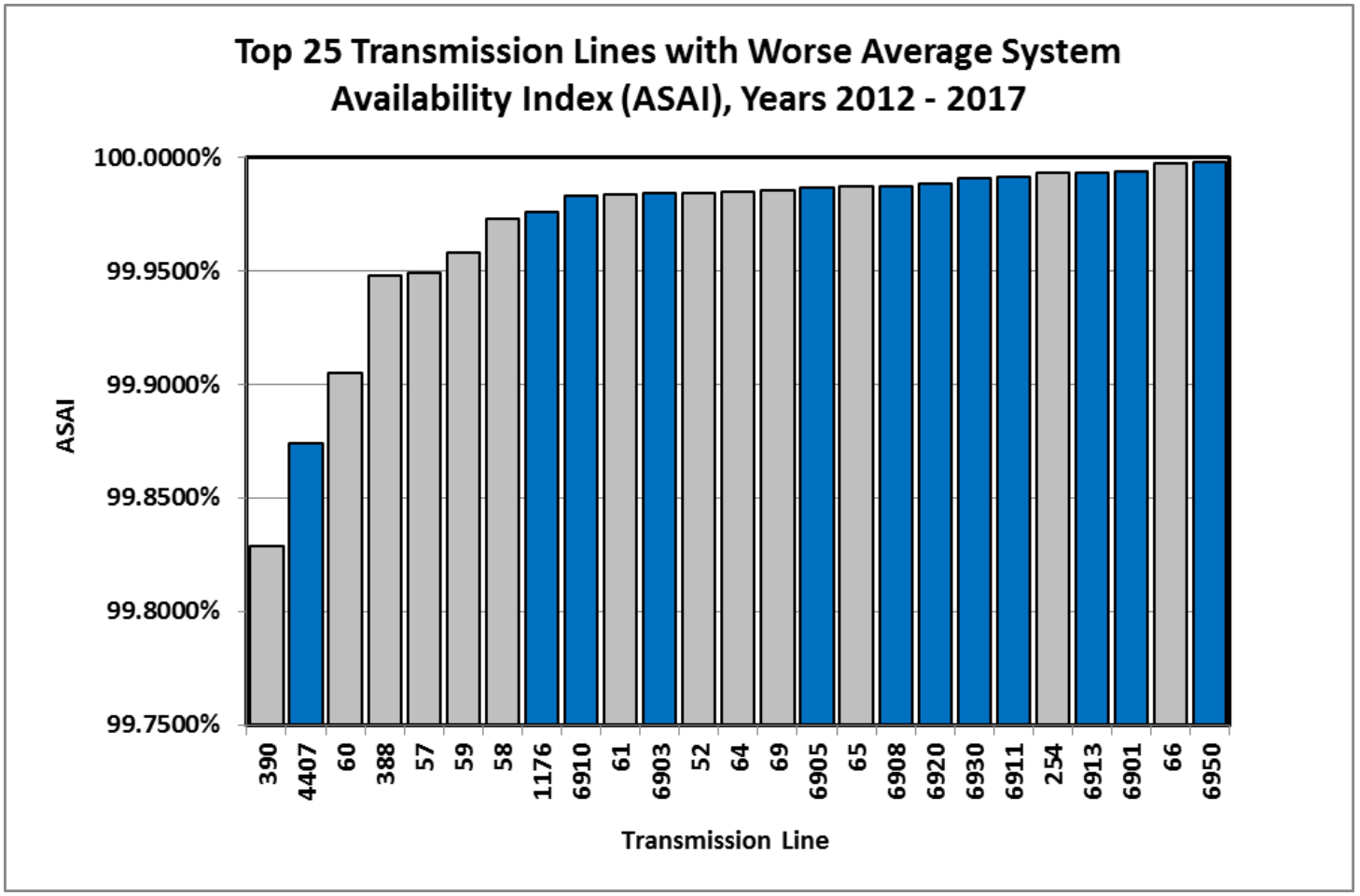
Reliability Comparison



Emera Maine

Emera Maine Transmission Lines

Increasing Order of Reliability



MPD Lines

Emera Maine

Line Inspection Program

Emera Maine Northern Operating Region Transmission Inspection Program	
Inspection Type/Activity	**Frequency**
ROW Visual Foot Patrol	5 Year Cycle
Drive-by Roadside Visual Patrol	6 Year Cycle **
Critical Crossing Visual Patrol	3 Year Cycle
Routine ROW Visual Aerial Patrol	Twice Annually
Emergency ROW Visual Aerial Patrol	As Needed
ROW Thermographic (IR) Inspection	Annual
Roadside Thermographic (IR) Inspection	Annual
Ground-Line ROW Pole Inspection & Treatment	Excavate & Treat every 10 Year for Treatment, Retreat every 5 Years for wood poles with decay
Ground-Line Roadside Pole Inspection	6 Year Cycle
Elevated ROW Inspection	As Needed
Elevated Roadside Inspection	As Needed
Corona Inspection	As Needed

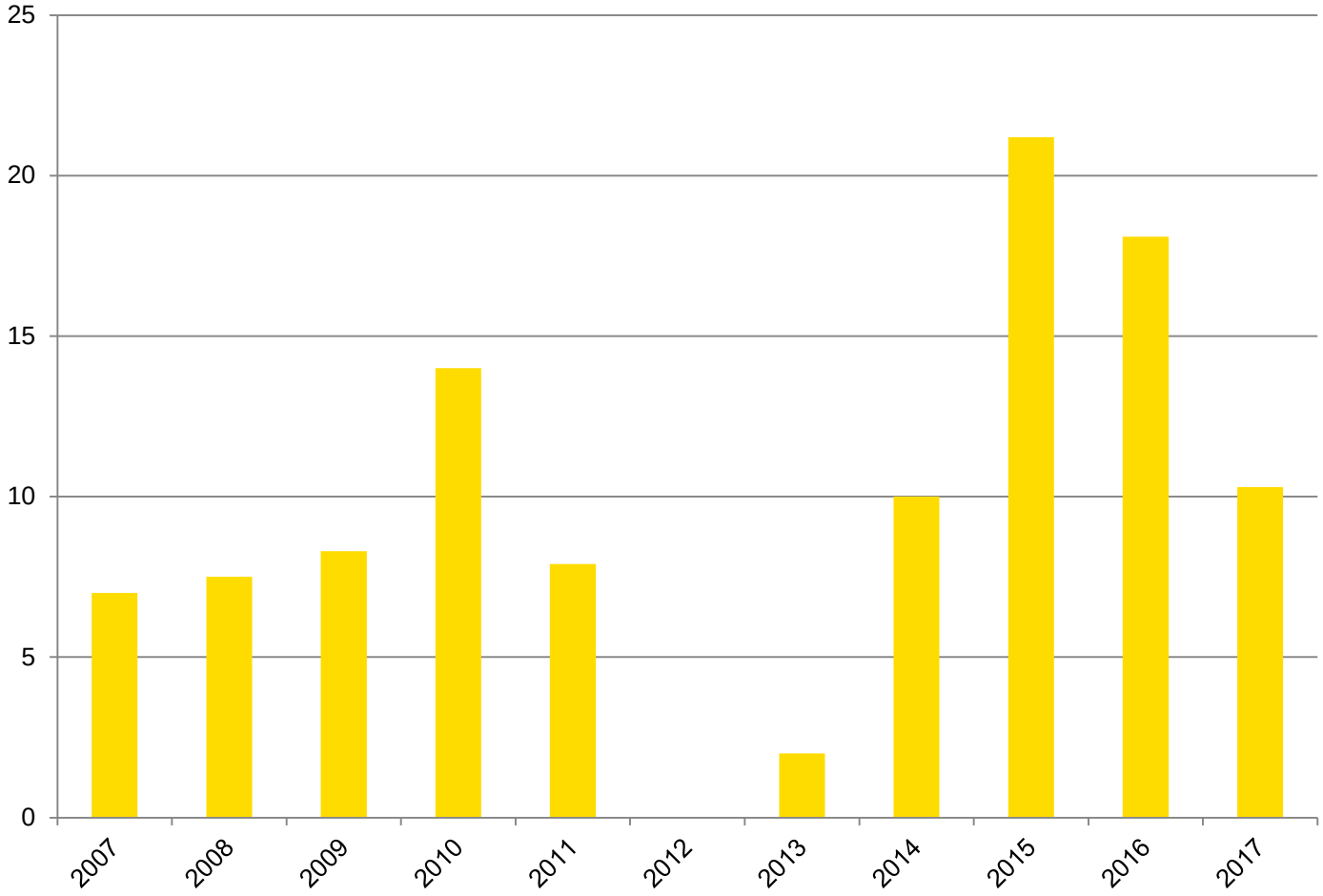
*** Drive-by Roadside Visual Patrol and Ground-Line Roadside Pole Inspection schedules are offset by 3 years. The result is a 3-year inspection frequency for all Roadside transmission assets.

Emera Maine

Transmission Planning Strategy

- Spread out remaining required MPD rebuild plan over 15-20 years (total rebuild program will span nearly 30 years)
- Final plan subject to enhanced inspection findings
- Targeted replacements will be necessary

Emera Maine - MPD Transmission Rebuild History - Mileage



Emera Maine

2017 Completed & Active Projects

Emera Maine - Maine Public District
2017 Plant Additions

Project Name	2017 & Prior Spend	2018 Carryover	In Service Date
Line 6910 Ph III	$4,292,000	$13,000	Dec-17
Line 6913 Mapleton	$178,000	$636,000	June-18
6905/6909 Emergency Repair (River)	$679,000	$335,000	June-18
Line 4407 Ph. II	$1,863,000	n/a	Dec-17

Emera Maine

2018 Projects

- 6913 Rebuild – 0.8 miles (Mapleton)
  - Estimated cost of $814K
- 6905/6909 River Crossing (Emerg. Repair)
  - Final cost of $1.0M
- 6913 ROW and Roadside Rebuilds
  - Estimated cost of $0.95M
- Line 4407 Ph. III Structure replacements
  - Estimated cost of $1.2M

Chapter 330: Adjusted

2018 Chapter 330 Plan					
Year	**Miles**	**Cost Range ($M)**	**Adjusted Miles**	**Adjusted Cost ($M)**	**Comments/Projects**
2018	2.6	$1.6 - 2.4	3.8	$1.6 - 2.4	Added 6913
2019	14	$6.9 - 9.6	14	$6.9 - 9.6	Moved 6903 '18 to '19
2020	8.4	$4.5 - 6.0	8.4	$4.5 - 6.0	Line 6930
2021	11.9	$6.0 - 8.5	11.9	$6.0 - 8.5	Line 3855/1176
2022	23.3	$16.5 - 19.5	10	$7.1 - 8.4	Lines 6930/6950
Total	60.2	$35 - 46	48.1	$26 - 35	
Average	12.0	$ 8.0	9.6	$ 6.2	

2017 Chapter 330 Plan			
Year	**Miles**	**Cost Range ($M)**	**Comments/Projects**
2017	11	$3.0 - 4.5	
2018	9.8	$4.9 - 6.9	
2019	5.8	$2.5 - 3.4	
2020	8.4	$4.5 - 6.0	
2021	11.9	$6.0 - 8.5	
Total	46.9	$21 - 29	
Average	9.4	$ 5.0	

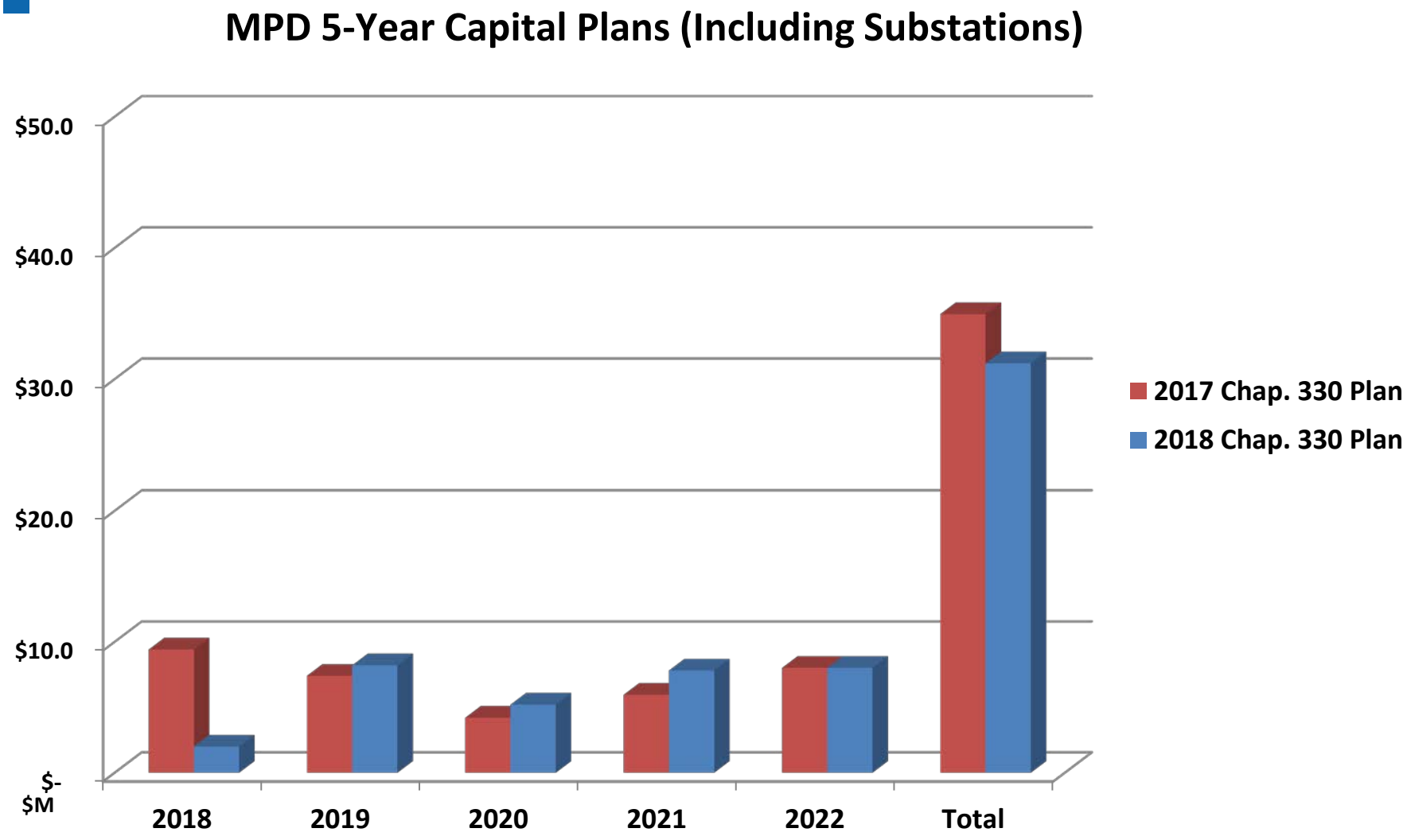
Emera Maine

Year-Over-Year Chapter 330 Filing

		2018	2019	2020	2021	2022	Total
2017 Chapter 330	Projects	6903	6930 6901 Tap 6903 Tap	6930	3855/1176	6930 6950	
	Miles	9.8	5.8	8.4	11.9	10	45.9
	$	$4,900,000	$2,900,000	$4,200,000	$5,950,000	$8,000,000	$26,950,000
2018 Chapter 330	Projects	6913	6930 6903 6901 Tap	6930	3855/1176	6930 6950	
	Miles	3.8	14	8.4	11.9	10	48.1
	$	$2,000,000	$8,200,000	$5,200,000	$7,800,000	$8,000,000	$31,200,000

Emera Maine

MPD Major Capital Comparison - 2018



Emera Maine

Completed Work

Emera Maine

Lines 6905/09 Riverbank Erosion

Emera Maine

6905/6909 River Crossing

Emera Maine

Serious Risk of Structure Loss

Emera Maine

6905/6909 River Crossing

Emera Maine

6905/6909 Before Stabilization

Emera Maine

Lines 6905/09 After Stabilization

Emera Maine

Regional Topics

- Update on Houlton Water Company's plan to build a new line connection with New Brunswick, disconnect from the Northern Maine system and take network service from New Brunswick Power
- Transmission Discount – Financial Analysis
- Other Regional Questions?

Meeting Close

- PAG member questions and comments to:

  steve.sloan@emeramaine.com

  david.norman@emeramaine.com

  (207) 973-2568

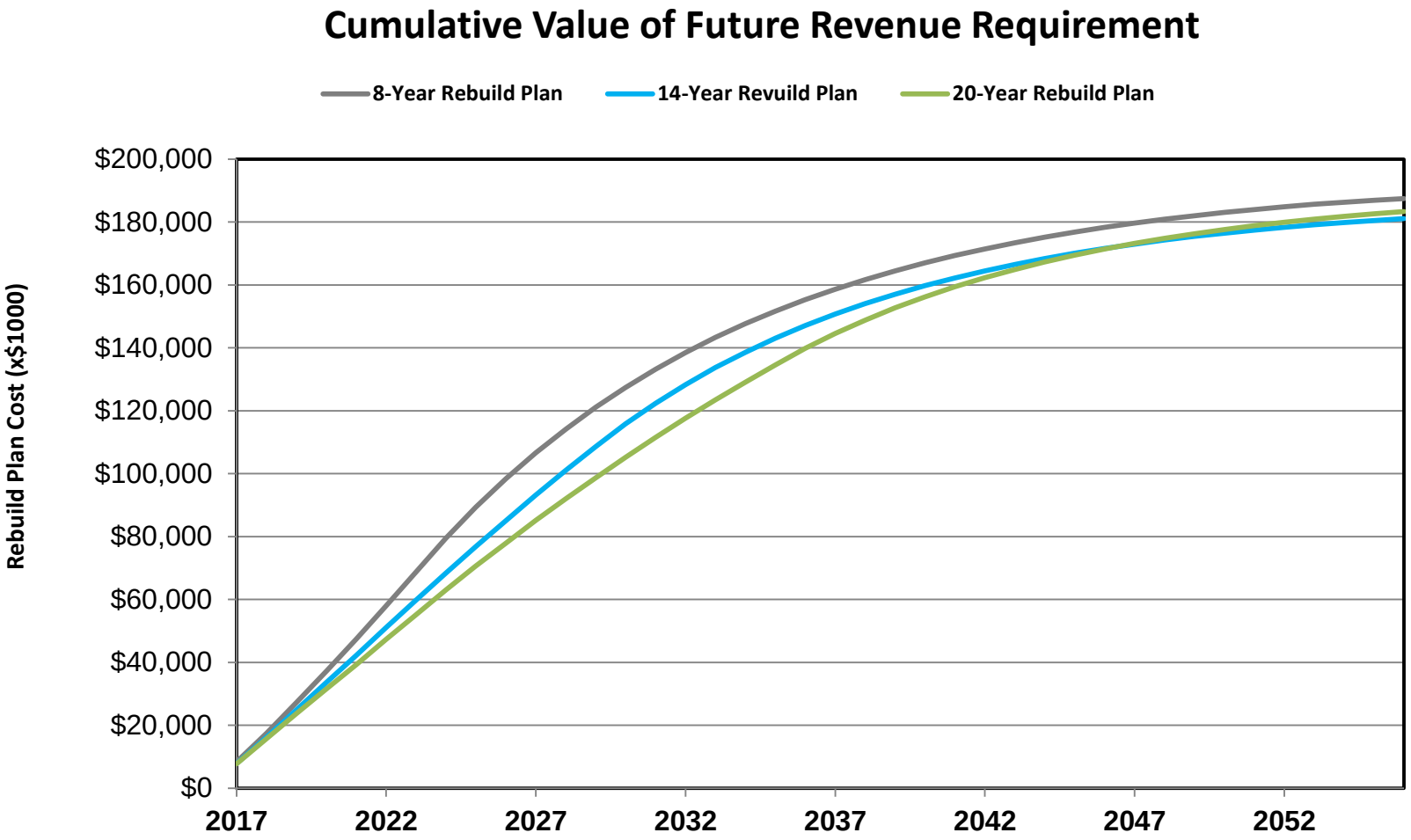
  (207) 973-2708

- Next PAG meeting – 2019

Emera Maine

Appendix

NPV Cumulative Investment



Emera Maine

Year-Over-Year Chapter 330 Filing

		2017	2018	2019	2020	2021	Total
2017 Chapter 330	Projects	6910 6913	6903	6930 6901 Tap 6903 Tap	6930	3855	
	Miles	11	9.8	5.8	8.4	11.9	46.9
	$	$2,940,000	$4,900,000	$2,900,000	$4,200,000	$5,950,000	$20,890,000
2016 Chapter 330	Projects	6910 6913 3855	6903 6930	6905	6905	6909	
	Miles	22.9	12.8	19.2	19.2	17.8	91.9
	$	$8,890,000	$6,400,000	$9,600,000	$9,600,000	$8,900,000	$43,390,000

Emera Maine

Line 4407
Woodpecker Damage

Emera Maine

Line 6910
Wooden Pole and Crossarm Condition

Emera Maine