

CONSULTANT TEAM 2019-2021 GOALS – CURRENT ESTIMATE

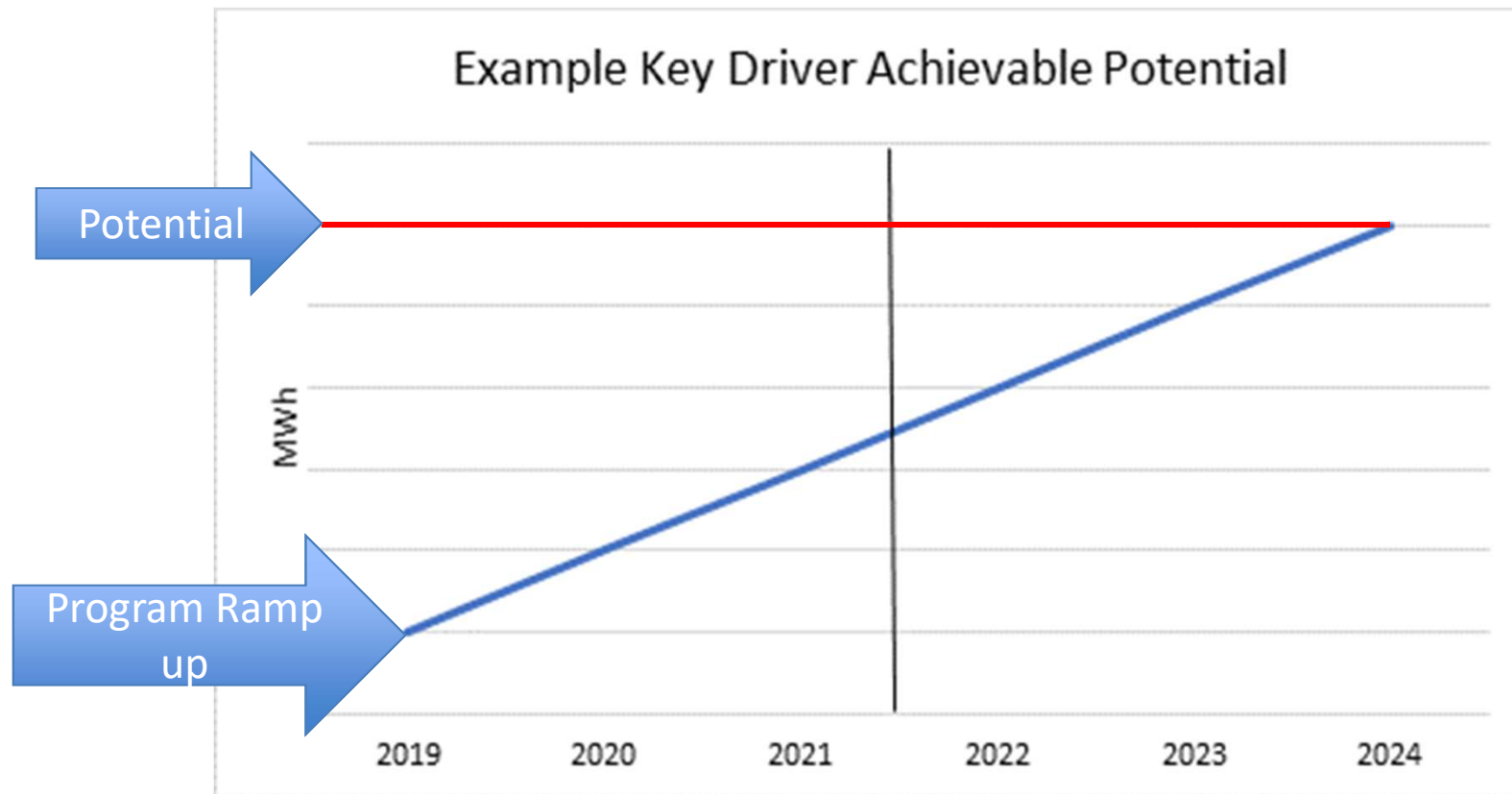
▶ August 29, 2018

INTRODUCTION



- ▶ **Following key drivers process, Consultant Team developed estimate of achievable goals in 2019-2021**
- ▶ **Estimate took into account numerous factors including:**
 - Evaluated 2017 results, which were not available for AoP
 - Revised assumptions from key drivers discussions and information exchange
 - Ramp rates: achieving higher savings will require time to train, educate, roll out new programs
 - Known post-2017 EM&V impacts
 - Savings possible from implementation strategy adjustments
- ▶ **The following slides present Consultant goal estimates and a summary of recent EM&V impacts**

EFFECT OF RAMP RATES ON SAVINGS











IMPACT OF RECENT EM&V IMPACTS



- ▶ **EM&V summary impacts on following slides represent a synthesis of hundreds of different numbers**
- ▶ **We provide an indication of magnitude where results are relatively straightforward way to quantify**
- ▶ **In many cases, there's no way to quantify the magnitude without first understanding additional planning assumptions**






RECENT EM&V IMPACT RESULTS: C&I



Offering/ Measure Category	Summary of Key Changes	Relative Magnitude of Impact
Upstream Lighting	NTGRs have fallen from 90-123% in 2016-2018 to 73-80% in 2019, with some annual declines thereafter	Large 
Upstream Lighting	Install rate has risen roughly 7% higher overall	Large 
Lighting, All	Overall average measure life has probably risen moderately	Medium 
Upstream HVAC	NTGRs have fallen significantly	Medium 
Custom Gas	Realization rates may fall by roughly 5% overall	Medium to Large 
New Construction	Realization rate has fallen substantially	Medium 
Downstream, Most Measures	NTGRs are roughly 5% lower overall	Large 
Multifamily	Multiple impact parameters have improved	Small to Medium 

RECENT EM&V IMPACT RESULTS: RESIDENTIAL



Offering/ Measure Category	Summary of Key Changes	Relative Magnitude of Impact
Upstream Lighting	NTGRs and measure lives have both fallen significantly; continued declines forecasted for 2019-2021	Large 
HES, Non-Lighting	Realization rates are largely unchanged	Small
HES, Lighting	For 2019, NTGR down only slightly but measure life down significantly; further declines 2020-2021	Small to Medium 
Appliance Turn-In	Gross and net unit impacts both down significantly	Medium 
HVAC	Overall NTGRs down modestly, gross unit savings up modestly	Small
WiFi T-Stats	Unit savings may fall by 80% for electric and 70% for gas	Large 
Non-Lighting Retail Products	NTGRs have fallen for many, though not all, measure categories	Small to Medium 

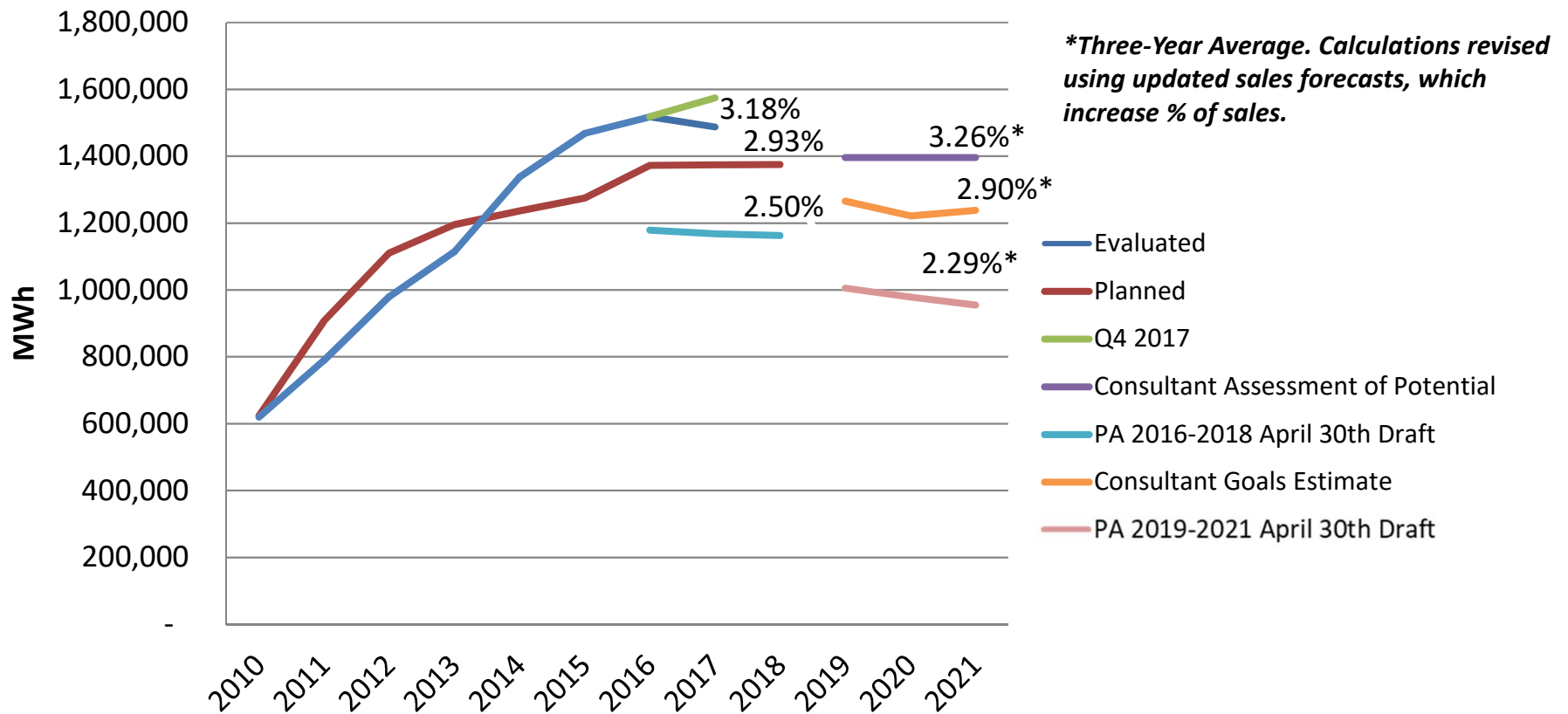
SALES FORECAST IMPACTS

- ▶ The savings as a % of sales from AoP were recalculated using updated PA sales forecasts
- ▶ Also, 2019-2021 electric sales decreasing from 2016-2018 levels while reverse true for gas

	Electric	Gas
AoP Annual 2019-2021 Savings	4,190 GWh	126 Million Therms
Savings as % of sales (original forecast)	3.15%	1.65%
Savings as % of sales (updated forecast)	3.26%	1.65%
Net Impact of revised sales forecasts	+0.11%	-0.00%
Sales forecast compared to 2016-2018	↓	↑
Impact on savings as % of sales	↑	↓

ELECTRIC PROGRAM ANNUAL SAVINGS OVER TIME

Portfolio Annual Electric Savings



CONSULTANT 2019-2021 ELECTRIC PROGRAM ANNUAL SAVINGS GOALS

Annual MWh	2019	2020	2021	Total	Assessment of Potential	PA April 30 th Draft
Residential	445,938	323,285	316,193	1,085,416	1,162,468	935,090
Low Income	39,142	39,142	39,142	117,426	117,426	105,057
C&I	780,408	859,110	882,954	2,522,472	2,908,432	1,898,835
Total	1,265,488	1,221,537	1,238,289	3,725,314	4,188,327	2,938,982

Savings as % of Sales	2019	2020	2021	Total	Assessment of Potential*	PA April 30 th Draft
Residential	3.20%	2.34%	2.31%	2.62%	2.81%	2.26%
Low Income	2.11%	2.13%	2.15%	2.13%	2.13%	1.91%
C&I	2.83%	3.16%	3.31%	3.10%	3.57%	2.33%
Total	2.92%	2.86%	2.94%	2.90%	3.26%	2.29%

*Calculations updated using updated sales forecasts

CONSULTANT 2019-2021 ELECTRIC PROGRAM LIFETIME SAVINGS GOALS

Lifetime MWh	2019	2020	2021	Total	PA April 30 th Draft
Residential	1,898,483	1,177,587	1,080,582	4,156,652	4,820,892
Low Income	379,356	379,356	379,356	1,138,068	1,003,086
C&I	10,025,299	10,933,411	11,355,403	32,314,112	23,133,721
Total	12,303,138	12,490,354	12,815,341	37,608,833	28,957,699

CONSULTANT 2019-2021 ACTIVE DEMAND MANAGEMENT GOALS

ADM Summer Peak MW	Consultant Estimate	PA April 30 th Draft Plan
Residential Thermostats/Direct Load Control	25.5	9.5
Low Income	-	-
C&I Curtailment	140.2	106.6
Storage - BTM	84.3	4.0
Total (w/ storage)	250.0	120.1

CONSULTANT 2019-2021 GAS PROGRAM ANNUAL SAVINGS GOALS

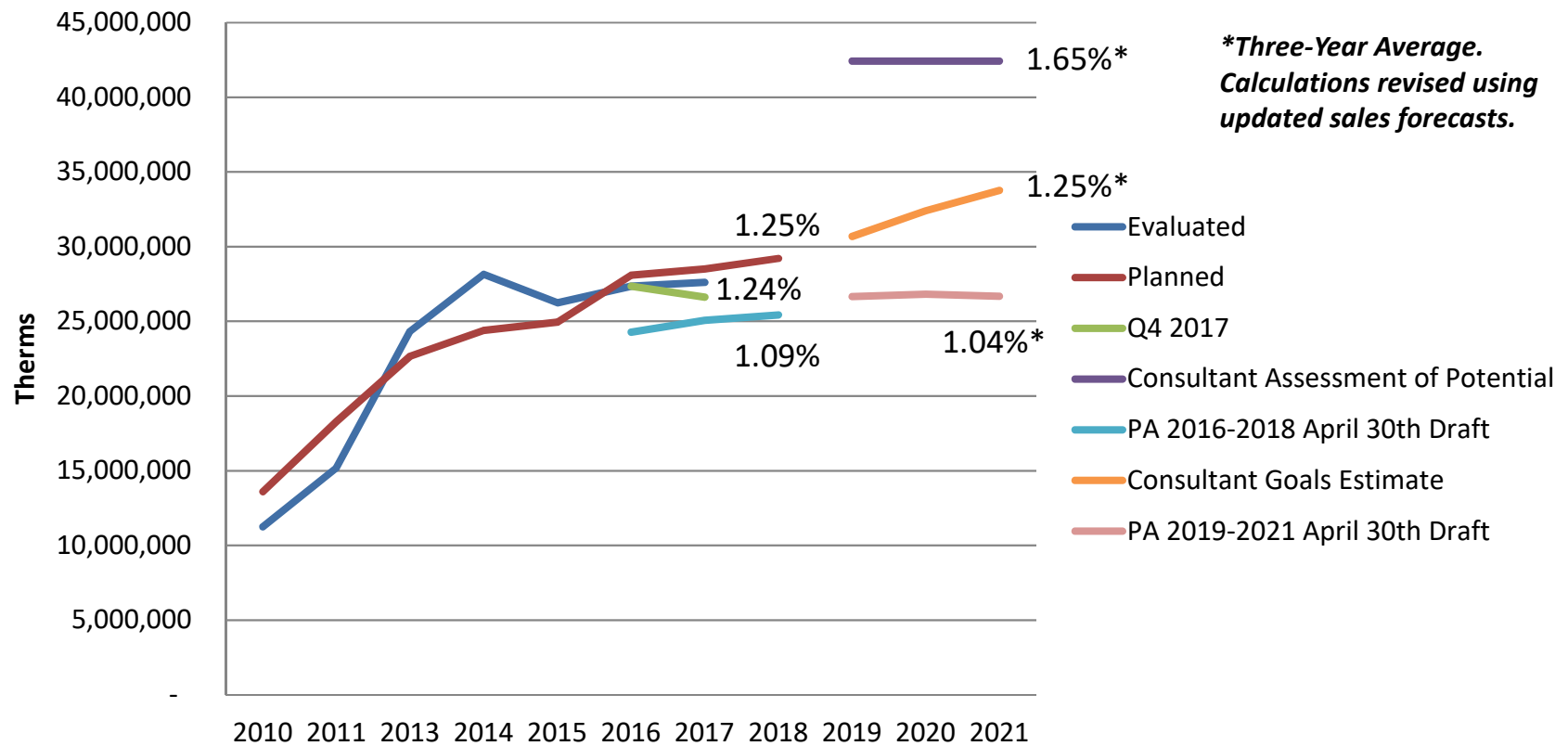
Annual Therms	2019	2020	2021	Total	Assessment of Potential	PA April 30 th Draft
Residential	16,492,319	17,993,431	19,355,950	53,841,700	75,587,050	44,549,544
Low Income	2,477,684	2,477,684	2,477,684	7,433,051	7,433,051	7,076,868
C&I	11,716,061	11,935,246	11,937,622	35,588,928	44,263,209	28,520,920
Total	30,686,063	32,406,360	33,771,255	96,863,679	127,283,310	80,147,332

Savings as % of Sales	2019	2020	2021	Total	Assessment of Potential*	PA April 30 th Draft
Residential	1.43%	1.55%	1.64%	1.54%	2.16%	1.28%
Low Income	1.80%	1.78%	1.76%	1.78%	1.78%	1.70%
C&I	0.93%	0.94%	0.93%	0.93%	1.16%	0.75%
Total	1.20%	1.26%	1.30%	1.25%	1.65%	1.04%

*Calculations updated using updated sales forecasts

GAS PROGRAM ANNUAL SAVINGS OVER TIME

Portfolio Annual Gas Savings











THANK YOU

Questions?





▶ August 29, 2018

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RECENT EM&V IMPACT RESULTS WITH ADDITIONAL NOTES: C&I

Offering/ Measure Category	Summary of Key Changes	Notes	Relative Magnitude of Impact
Upstream Lighting	NTGRs have fallen from over 100% to the range of 90% in 2019 and 70% in 2021	Initial surge of LED spillover found in previous NTGR study appears to have abated	Large 
Upstream Lighting	Install rate has risen by roughly 7 percentage points overall	Implementers' efforts to address install rate problems found in 2017 partially successful	Large 
Lighting, All	Overall average measure life has probably risen moderately	Some measures increasing, some decreasing; overall effect appears to be positive	Medium 
Upstream HVAC	NTGRs have fallen significantly	Study yielded very low NTGR estimates. Assumed NTGRs reflect program changes made immediately in response to study.	Medium 
Custom Gas	Realization rates may fall by roughly 5 percentage points overall	Study nearing completion but will not be done in time for 3-year plan filing	Medium to Large 
New Construction	Realization rate has fallen substantially	EM&V has concluded that the program's baseline assumptions have fallen behind the market	Medium 
Downstream, Most Measures	NTGRs have fallen by roughly 5 percentage points overall	Some categories increasing, some decreasing; overall effect likely to be negative	Large 
Multifamily	Multiple impact parameters have improved	New EM&V study suggests program successfully responded to problems uncovered by 2016 study	Small to Medium 

RECENT EM&V IMPACT RESULTS WITH ADDITIONAL NOTES:RESIDENTIAL

Offering/ Measure Category	Summary of Key Changes	Notes	Relative Magnitude of Impact
Upstream Lighting	NTGRs and measure lives have both fallen significantly; continued declines forecasted for 2019-2021	Trend due to continuing worldwide commercialization of LEDs, and has been widely anticipated and discussed	Large 
HES, Non-Lighting	Realization rates are largely unchanged	New study has produced very similar overall results to the last one (but changes at more granular levels)	Small
HES, Lighting	For 2019, NTGR down only slightly but measure life down significantly; further declines 2020-2021	Differences from upstream lighting stem from program approach of blanketing house with LEDs	Small to Medium 
Appliance Turn-In	Gross and net unit impacts both down significantly	Trend being observed nationwide, and is due to continuing disappearance of inefficient old fridges	Medium 
HVAC	Overall NTGRs down modestly, gross unit savings up modestly	Change due to combination of EM&V results and planned changes in program structure. Differences across measures. Overall effect appears to be limited.	Small
WiFi T-Stats	Unit savings may fall by 80% for electric and 70% for gas	Values still under discussion. Lit review shows highly variable and sometimes disappointing results nationwide. Results are placeholder pending major MA impact evaluation just launching.	Large 
Non-Lighting Retail Products	NTGRs have fallen for many, though not all, measure categories	Change due largely to study that cleaned up some unrealistic 100% NTGR assumptions for minor measures	Small to Medium 