

Appendix 4: Community and Government Measure Analysis Reports

Bath

Community Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Residential Sector

Location of Measure: Bath, Maine

Type of Measure: Energy Efficiency: Buildings

Ten Percent Challenge (30% participation)

Measure Name

Measure Details

Affected Energy Source 1		Affected Energy Source 2 (Optional)	
Electricity		Light Fuel Oil	
		Residential	
Energy Reduction	2,941	Energy Reduction	12,924
Unit	(MMBtu)	Unit	(MMBtu)
Price per Unit	\$29.34	Price per Unit	\$33.01
Ramp-In Factor	100%	Energy Reduction (MMBtu)	15,864
Year Implemented	2010	Emission Reduction (tonnes eCO ₂)	1,314
Implementation Cost	\$0	Savings (\$/year)	\$512,894
		Payback Period (years)	0

The emission reduction from this measure as a percentage of total reductions: 20.5%

NO _x Reduction	SO _x Reduction	CO Reduction	VOC Reduction	PM ₁₀ Reduction
(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
3,918	2,621	1,912	250	1,204

Full Description of Measure

Challenge citizens to increase home energy efficiency and reduce energy use (electricity and heating fuel) by 10%. Assuming heating fuel oil cost of July 2008 average \$4.62/gal and projected average of 10.014 cents/kWh provided by Maine Public Utilities Commission report and assuming 30% participation (3% total reduction). Energy reduction calculations made according to total Residential energy consumption in MMBtu. Light fuel oil accounted for 71.2% of energy consumed by the Residential Sector and electricity accounted for 16.2%, so fuel use and electricity reductions were weighted according to those percentages. Propane use was not accounted for.

This report has been generated for Bath, Maine using STAPPA/ALAPCO and ICLEI's Clean Air and Climate Protection Software developed by Torrie Smith Associates Inc.

Bath

Community Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Residential Sector

Location of Measure: Bath, Maine

Type of Measure: Energy Efficiency: Buildings

Measure Name

Ten Percent Challenge (50% participation)

Measure Details

Affected Energy Source 1
Electricity

Affected Energy Source 2 (Optional)
Light Fuel Oil
Residential

Energy Reduction
Unit

4,901
(MMBtu)

Energy Reduction
Unit

21,540
(MMBtu)

Price per Unit

\$29.34

Price per Unit

\$33.01

Ramp-In Factor

100%

Energy Reduction (MMBtu)

26,441

Year Implemented

2012

Emission Reduction (tonnes eCO₂)

2,190

Implementation Cost

\$0

Savings (\$/year)

\$854,823

Payback Period (years)

0

The emission reduction from this measure as a percentage of total reductions: 34.2%

NOx Reduction
(lbs)
6,530

SOx Reduction
(lbs)
4,368

CO Reduction
(lbs)
3,187

VOC Reduction
(lbs)
417

PM10 Reduction
(lbs)
2,006

Full Description of Measure

Challenge citizens to increase home energy efficiency and reduce energy use (electricity and heating fuel) by 10%. Assuming heating fuel oil cost of July 2008 average \$4.62/gal and projected average of 10.014 cents/kWh provided by Maine Public Utilities Commission report and assuming 50% participation (5% total reduction). Energy reduction calculations made according to total Residential energy consumption in MMBtu. Light fuel oil accounted for 71.2% of energy consumed by the Residential Sector and electricity accounted for 16.2%, so fuel use and electricity reductions were weighted according to those percentages. Propane use was not accounted for.

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Bath

Community Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Commercial Sector

Location of Measure: Bath, Maine

Type of Measure: Energy Efficiency: Buildings

Ten Percent Challenge (30% participation)

Measure Name

Measure Details

Affected Energy Source 1
Electricity

Affected Energy Source 2 (Optional)
Light Fuel Oil
Commercial

Energy Reduction

2,717

Energy Reduction

2,631

Unit

(MMBtu)

Unit

(MMBtu)

Price per Unit

\$29.34

Price per Unit

\$33.01

Ramp-In Factor

100%

Energy Reduction (MMBtu)

5,348

Year Implemented

2010

Emission Reduction (tonnes eCO₂)

516

Implementation Cost

\$0

Savings (\$/year)

\$166,559

Payback Period (years)

0

The emission reduction from this measure as a percentage of total reductions: 8.1%

NO_x Reduction
(lbs)
1,162

SO_x Reduction
(lbs)
2,835

CO Reduction
(lbs)
1,268

VOC Reduction
(lbs)
147

PM₁₀ Reduction
(lbs)
818

Full Description of Measure

Challenge all businesses to increase energy efficiency and reduce energy use (electricity and heating fuel) by 10%. Assuming heating fuel oil cost of July 2008 average \$4.62/gal and projected average of 10.014 cents/kWh provided by Maine Public Utilities Commission report and assuming 30% participation (3% total reduction). Energy reduction calculations made according to total Residential energy consumption in MMBtu. Light fuel oil accounted for 49.2% of energy consumed by the Commercial Sector and electricity accounted for 50.8%, so fuel use and electricity reductions were weighted according to those percentages.

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Community Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Industrial Sector

Location of Measure: Bath, Maine

Type of Measure: Absolute Emissions Reduction

Measure Name

BIW 5% emissions reduction by 2010

Measure Details

Emission Affected

Carbon Dioxide

Emissions Reduction

1,502

0

Unit

(tonnes CO2) Unit

Price per Unit

\$0.00

Price per Unit

\$0.00

Ramp-In Factor

100%

Energy Reduction (MMBtu)

0

Year Implemented

2010

Emission Reduction (tonnes eCO2)

1,502

Implementation Cost

\$0

Savings (\$/year)

\$0

Payback Period (years)

0

The emission reduction from this measure as a percentage of total reductions: 23.5%

NOx Reduction

SOx Reduction

CO Reduction

VOC Reduction

PM10 Reduction

(lbs)

(lbs)

(lbs)

(lbs)

(lbs)

0

0

0

0

0

Full Description of Measure

Bath Iron Works has pledged to reduce its greenhouse gas emissions by 5% from 2007 levels by 2010.

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Community Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Transportation Sector
Type of Measure: Walking/Biking

Location of Measure: Bath, Maine

		Measure Name		
Bath Bike Path/Bike Campaign				
		Measure Details		
Initial Fuel and Vehicle Type		Replacement Fuel and Vehicle Type		
Gasoline		Gasoline		
Passenger Vehicle		Passenger Vehicle		
Usage Before	1,792,651	Usage After	1,703,018	
Unit	(US gal)	Unit	(US gal)	
Price per Unit	\$4.00	Price per Unit	\$4.00	
Ramp-In Factor	100%	Energy Reduction (MMBtu)	11,258	
Year Implemented		Emission Reduction (tonnes eCO ₂)	872	
Implementation Cost	\$0	Savings (\$/year)	\$358,530	
		Payback Period (years)	0	
			<i>The emission reduction from this measure as a percentage of total reductions: 13.6%</i>	
NOx Reduction	SOx Reduction	CO Reduction	VOC Reduction	PM10 Reduction
(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
3,611	264	56,458	5,319	82

Full Description of Measure

Build new bike paths around the city and encourage people to use them for biking to work, into town, etc. Assuming a 5% total reduction in community VMT and \$4 per gallon for gasoline.

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Government Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Buildings Sector

Location of Measure: Bath, Maine

Type of Measure: Energy Efficiency: Buildings

Measure Name

Window Upgrades and Increased Insulation

Measure Details

Affected Energy Source 1

Affected Energy Source 2 (Optional)

Light Fuel Oil
Commercial

Electricity

Energy Reduction

12,041

Energy Reduction

0

Unit

(US gal)

Unit

(kWh)

Price per Unit

\$4.00

Price per Unit

\$0.00

Ramp-In Factor

100%

Energy Reduction (MMBtu)

1,685

Year Implemented

2010

Emission Reduction (tonnes eCO₂)

126

Implementation Cost

\$0

Savings (\$/year)

\$48,163

Payback Period (years)

0

The emission reduction from this measure as a percentage of total reductions: 23.9%

This emission reduction as a percentage of emission reductions required to meet target: 7.9%

NO_x Reduction

SO_x Reduction

CO Reduction

VOC Reduction

PM₁₀ Reduction

(lbs)

(lbs)

(lbs)

(lbs)

(lbs)

447

1,392

90

15

53

Full Description of Measure

Install energy efficient double-paned windows and better insulation for City Hall and other municipal buildings. Assuming 5% reduction in fuel use and 5% reduction in electricity use. Ramp-in schedule starting with 40% in 2010, then 30%, 20%, and 10% in the following years until it is completed in 2013. Assuming (very conseratively) a price of \$3.00 per gallon for heating fuel. Electricity price is based on current price from CMP which will likely increase.

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Government Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Buildings Sector

Location of Measure: Bath, Maine

Type of Measure: Energy Efficiency: Equipment and Lighting

Measure Name

Energy Star Appliance Replacement

Measure Details

Affected Energy Source 1

Affected Energy Source 2 (Optional)

Electricity

Energy Reduction

199,690

Energy Reduction

0

Unit

(kWh)

Unit

Price per Unit

\$.10

Price per Unit

\$.00

Ramp-In Factor

100%

Energy Reduction (MMBtu)

682

Year Implemented

2009

Emission Reduction (tonnes eCO2)

80

Implementation Cost

\$0

Savings (\$/year)

\$19,917

Payback Period (years)

0

The emission reduction from this measure as a percentage of total reductions: 15.1%

This emission reduction as a percentage of emission reductions required to meet target: 5.0%

NOx Reduction

SOx Reduction

CO Reduction

VOC Reduction

PM10 Reduction

(lbs)

(lbs)

(lbs)

(lbs)

(lbs)

117

166

283

31

184

Full Description of Measure

Replace appliances, computers, other equipment with Energy Star rated units when they are due to be replaced. Assuming minimum total energy savings of 10%.

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Government Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Vehicle Fleet Sector

Location of Measure: Bath, Maine

Type of Measure: Increase in Fuel Efficiency

Measure Name

Hybrid vehicles for Police and Fire

Measure Details

Initial Fuel and Vehicle Type

Replacement Fuel and Vehicle Type

Gasoline
Passenger Vehicle

Gasoline
Auto - Sub-Compact/Compact
SULEV

Use Before

13,488

Use After

7,480

Unit

(US gal)

Unit

(US gal)

Price per Unit

\$4.00

Price per Unit

\$4.00

Ramp-In Factor

100%

Energy Reduction (MMBtu)

755

Year Implemented

2010

Emission Reduction (tonnes eCO2)

59

Implementation Cost

\$36,000

Savings (\$/year)

\$24,034

Payback Period (years)

1.5

The emission reduction from this measure as a percentage of total reductions: 11.1%

This emission reduction as a percentage of emission reductions required to meet target: 3.7%

NOx Reduction

SOx Reduction

CO Reduction

VOC Reduction

PM10 Reduction

(lbs)

(lbs)

(lbs)

(lbs)

(lbs)

519

24

6,333

788

1

Full Description of Measure

Replace 12 government vehicles with Ford Escape hybrids. Assuming \$4/gallon of gass and avg. 33 mpg for Escape hybrid.

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Government Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Employee Commute Sector
Type of Measure: Car/Van Pooling

Location of Measure: Bath, Maine

		Measure Name		
Bath Municipal Carpooling				
		Measure Details		
Initial Fuel and Vehicle Type		Replacement Fuel and Vehicle Type		
Gasoline		Gasoline		
Passenger Vehicle		Passenger Vehicle		
Use Before	276,977	Use After	193,884	
Unit	(vehicle-miles)	Unit	(vehicle-miles)	
Price per Unit	\$.22	Price per Unit	\$.22	
Ramp-In Factor	100%	Energy Reduction (MMBtu)	570	
Year Implemented	2010	Emission Reduction (tonnes eCO ₂)	44	
Implementation Cost	\$0	Savings (\$/year)	\$18,162	
		Payback Period (years)	0	
		<i>The emission reduction from this measure as a percentage of total reductions: 8.4%</i>		
		<i>This emission reduction as a percentage of emission reductions required to meet target: 2.8%</i>		
NOx Reduction	SOx Reduction	CO Reduction	VOC Reduction	PM10 Reduction
(lbs)	(lbs)	(lbs)	(lbs)	(lbs)
183	13	2,860	269	4

Full Description of Measure

Carpooling program for Bath City Employees. Assuming that employees carpool with one other person and VMT decreasing by 30% and a conservative gasoline price of \$4 per gallon.

Bath

Government Greenhouse Gas and Air Pollutant Reductions in 2018 Target Year Measures Listing

Streetlights Sector

Location of Measure: Bath, Maine

Type of Measure: Energy Efficiency: Lamp and Ballast

		Measure Name			
LED Replacement					
		Measure Details			
Affected Energy Source					
Electricity					
Energy Reduction	547,788				0
Unit	(kWh)	Unit			
Price per Unit	\$.10	Price per Unit			\$.00
Ramp-In Factor	100%	Energy Reduction (MMBtu)			1,870
Year Implemented	2010	Emission Reduction (tonnes eCO2)			219
Implementation Cost	\$237,250	Savings (\$/year)			\$54,636
		Payback Period (years)			4.3
		<i>The emission reduction from this measure as a percentage of total reductions:</i>			41.5%
		<i>This emission reduction as a percentage of emission reductions required to meet target:</i>			13.7%
NOx Reduction	SOx Reduction	CO Reduction	VOC Reduction	PM10 Reduction	
(lbs)	(lbs)	(lbs)	(lbs)	(lbs)	
320	455	775	85	506	

Full Description of Measure

Replace current street lights with LEDs at a rate of 20% per year. Assuming implementation cost of \$237,250 (\$365/bulb).

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