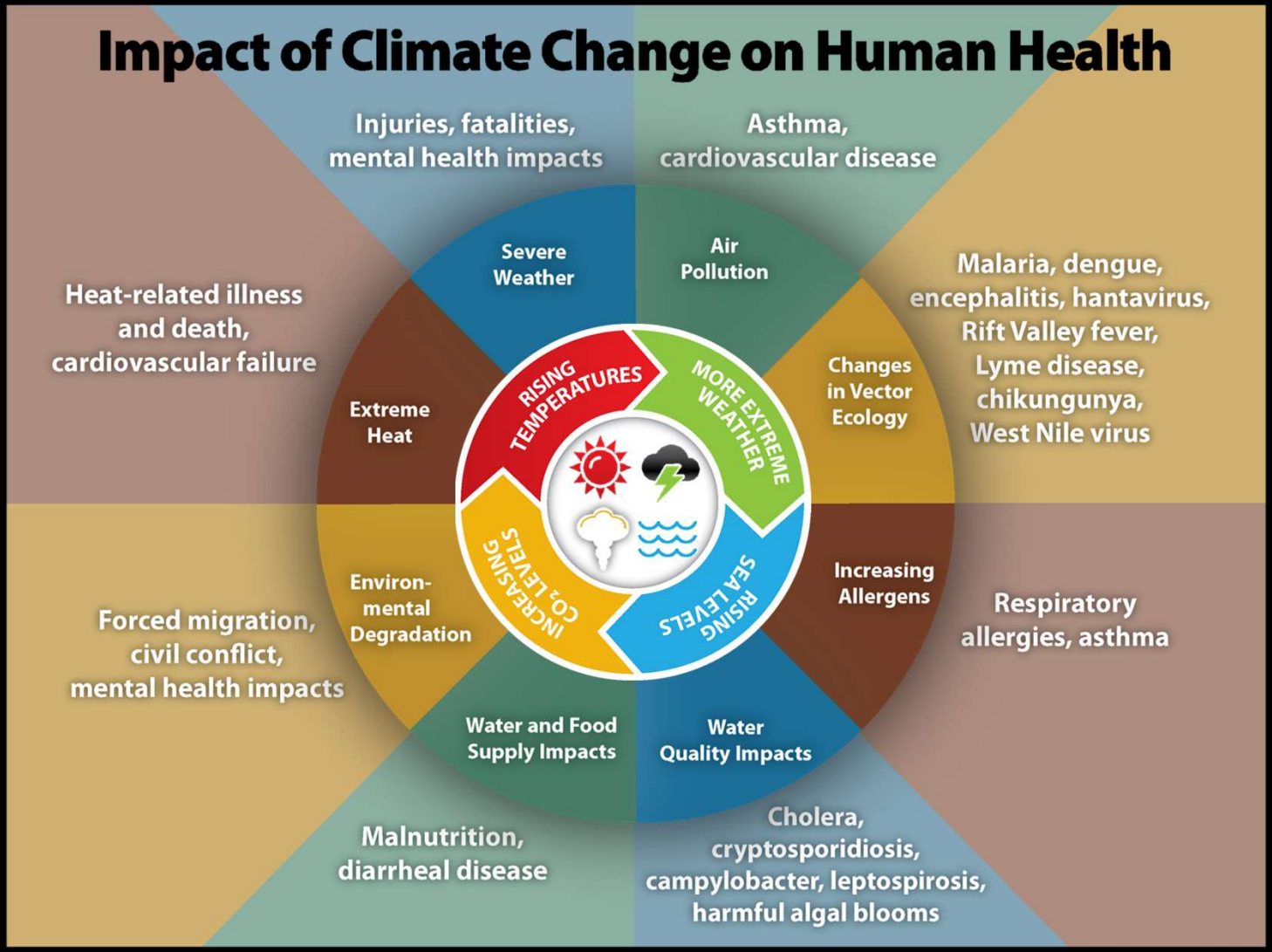
Benton County Greenhouse Gas Inventory 2019 Update

Board of Commissioners

May 5, 2020


Impact of Climate Change on Human Health
Injuries, fatalities, mental health impacts
Asthma, cardiovascular disease
Heat-related illness and death, cardiovascular failure
Malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, West Nile virus
Forced migration, civil conflict, mental health impacts
Respiratory allergies, asthma
Malnutrition, diarrheal disease
Cholera, cryptosporidiosis, campylobacter, leptospirosis, harmful algal blooms
Severe Weather
Air Pollution
Extreme Heat
Changes in Vector Ecology
Environ-mental Degradation
Increasing Allergens
Water and Food Supply Impacts
Water Quality Impacts
RISING TEMPERATURES
MORE EXTREME WEATHER
INCREASING CO2 LEVELS
RISING SEA LEVELS

Briefing Topics

- Greenhouse Gas Emissions Inventory
- Emission Reductions from Renewable Energy Sources
- County Successes from Climate Action Plan
- Carbon Capture from County-Owned Lands
- GHG Reduction Calculator as Analysis Tool

Climate Crisis Goal & Deliverables

Goal:

- Benton County government will reduce its greenhouse gas emissions by 50% from 2010 levels by 2030 and be net-zero by 2050. (Updated by Resolution 2020-004)

Deliverables Established by Resolution 2017-025:

- Track Benton County Government's Monthly Resource Usage
- Calculate GHG Emissions Annually & Present to Commissioners
- Develop & Implement a Climate Action Plan to Achieve Goal
- Publish GHG Emissions Inventory & County Activities via Website

Greenhouse Gas Emissions Inventory

Local Greenhouse Gas Inventory Tool – U.S. EPA

Calculates GHG Emissions from:

- **Natural Gas**
- **Fleet & Fuel**
- **Electricity**
- **Water**
- **Solid Waste**
- **Carbon Sequestration**

- Wastewater
- Employee Commute
- Urban Forestry
- Waste Production

Greenhouse Gas Emissions Inventory

Inventory Sources & Assumptions

Inventory Only From County Public Works Facilities:

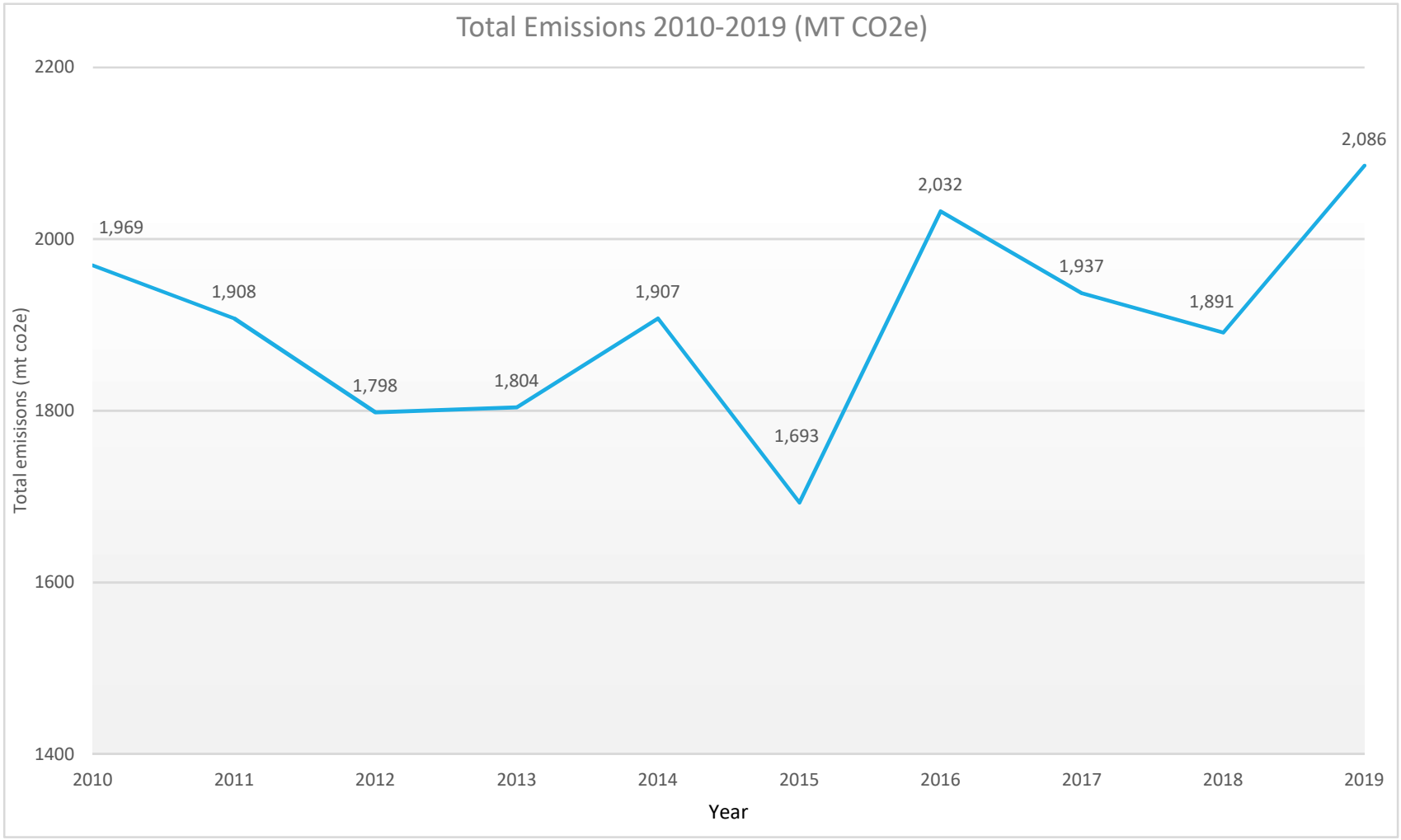
- Electricity
- Fleet Fuel
- Natural Gas
- Water
- Waste (new)

Does Not Include Fairgrounds or Natural Areas & Parks

Assumptions & Issues:

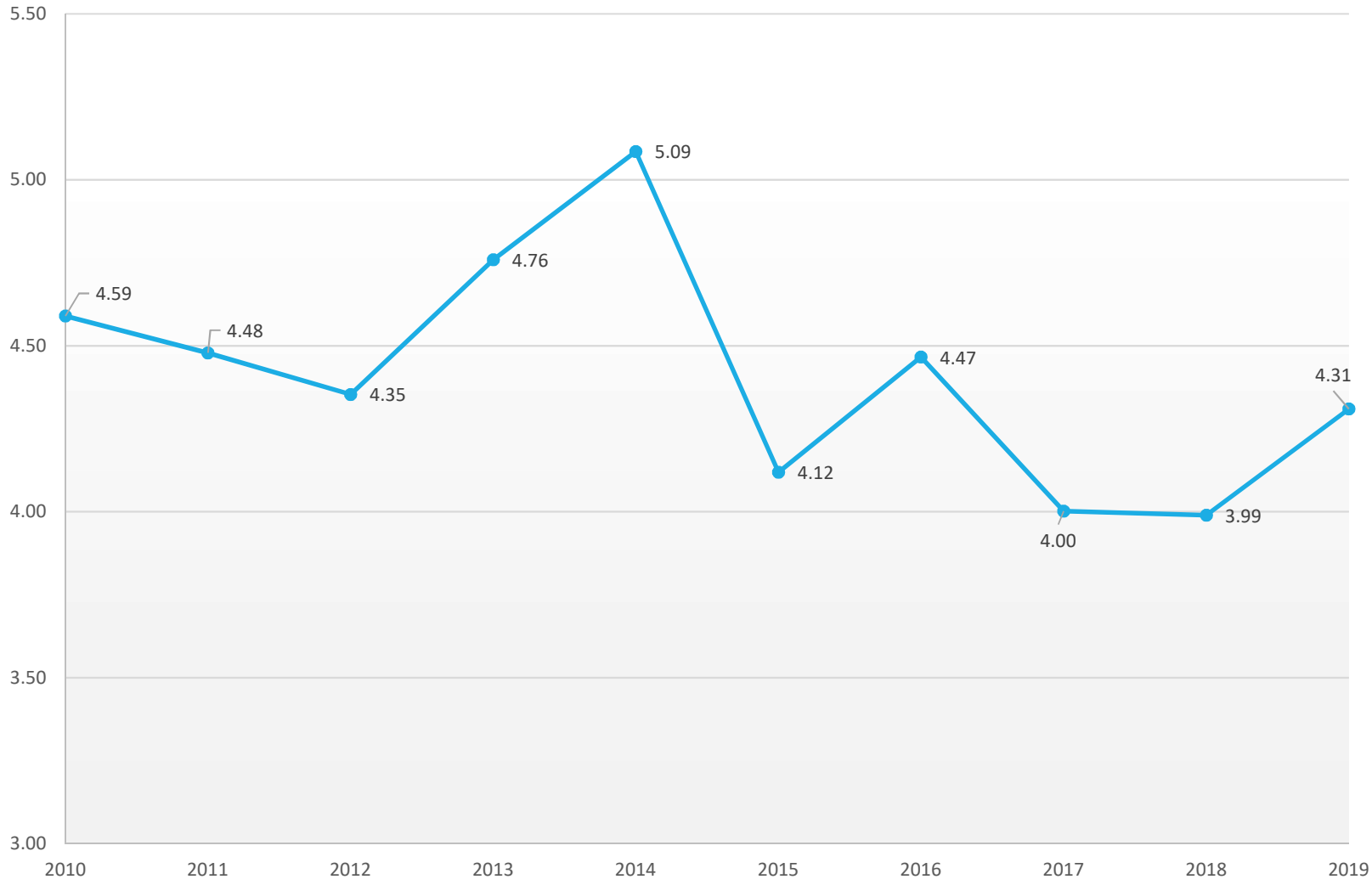
- High Confidence in Data, but Not Absolute
- Bills & Waste Pick-Ups are Not 'Clean': Jan. 1 – Dec. 31
- Fleet & Facilities Change Over Time

Total (Net) GHG Emissions: 2010 – 2019

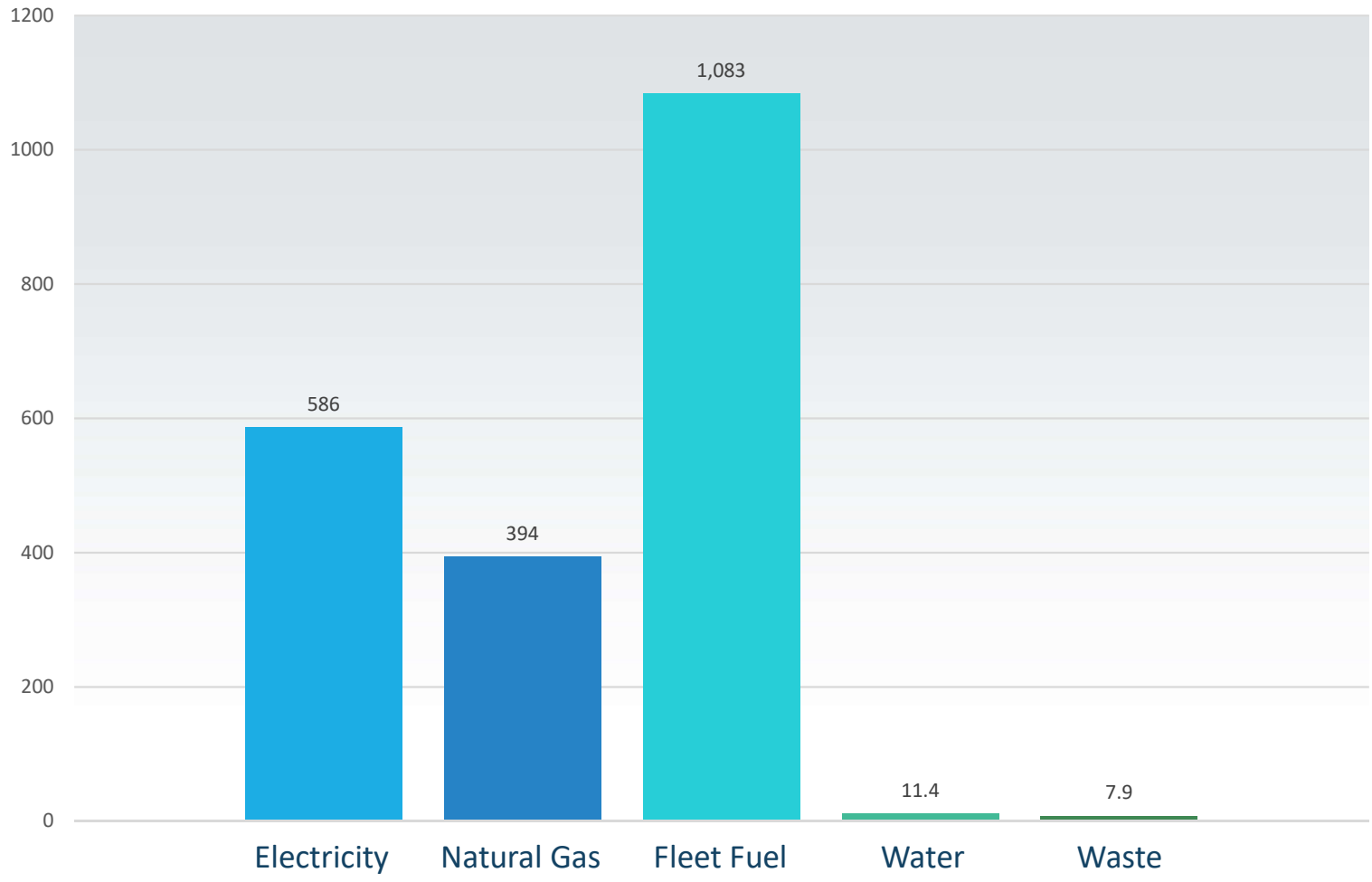


Note: Emissions are net, which is actual emissions minus offsets from purchasing and use of renewable energy. This only affects 2019, which is explained in detail in later slides.

Total GHG Emissions per FTE (MTCO2E)



Total Net Emissions by Source (MTCO2E)



Note: Emissions for Electricity are net. Actual emissions are 608 MTCO2E, but offset from renewables.

Change in GHG Emissions: 2018 – 2019

- Electricity decreased by 5.7%
- Fleet/Fuel increased by 29.2 %
- Natural Gas decreased by 3.4 %
- Water decreased by 22.8%
- Waste decreased by 0.5%





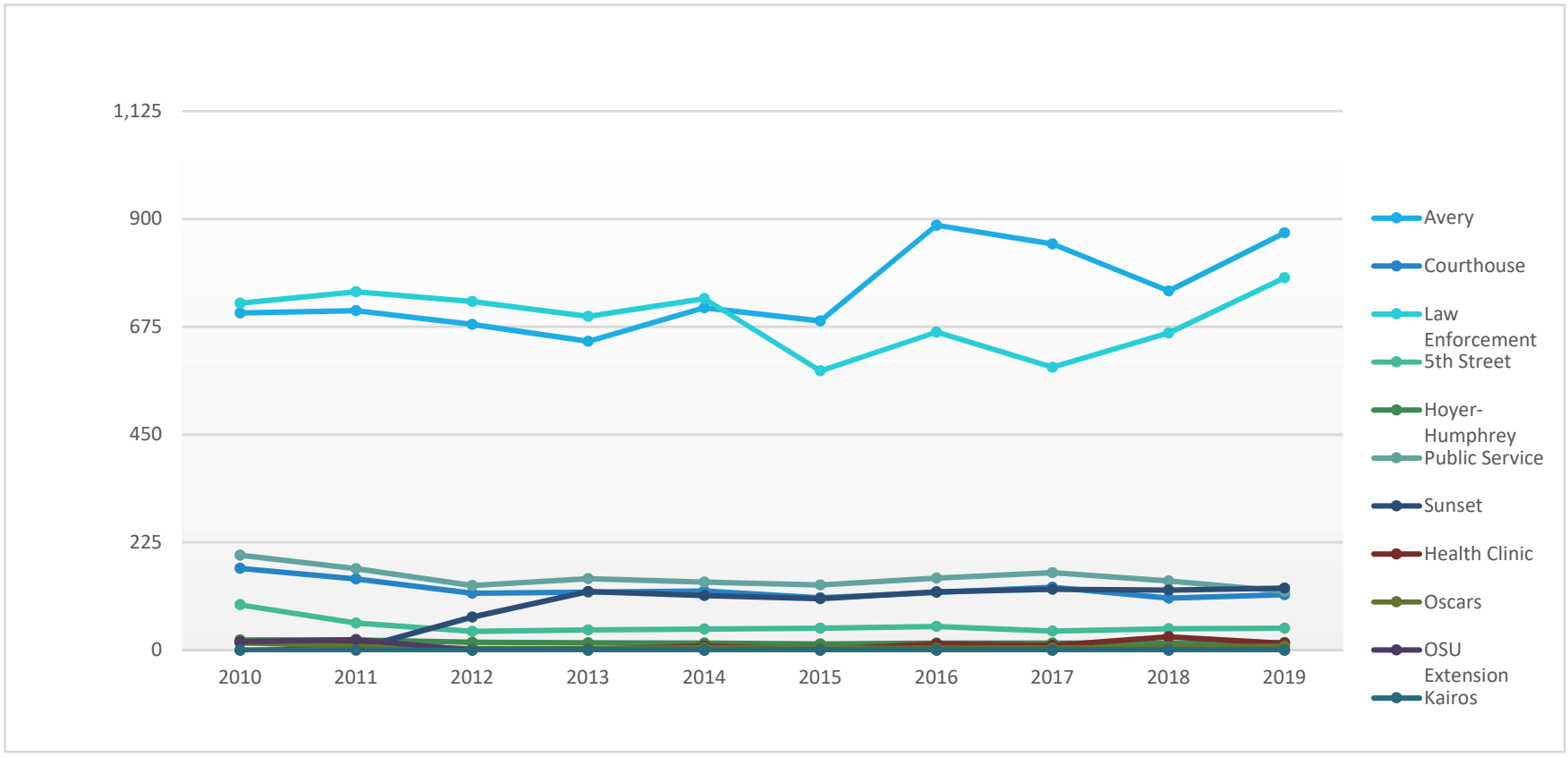
Change in Resource Use: 2018 – 2019

- Electricity decreased by 1.5%
- Fleet/Fuel increased by 20.9 %
- Natural Gas decreased by 3.5 %
- Water decreased by 22.4%
- Waste decreased by 0.5%

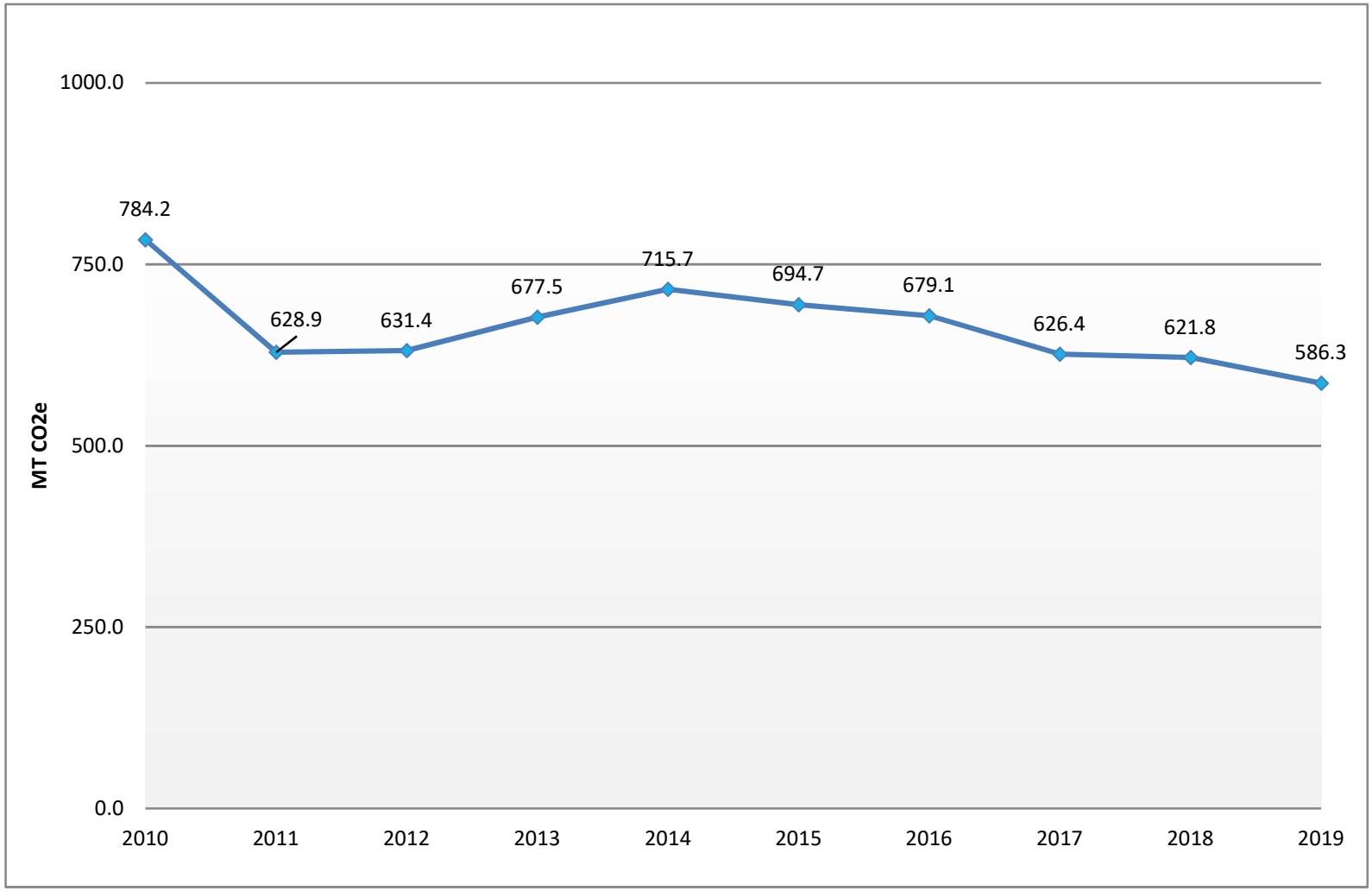




Total GHG Emissions by Location

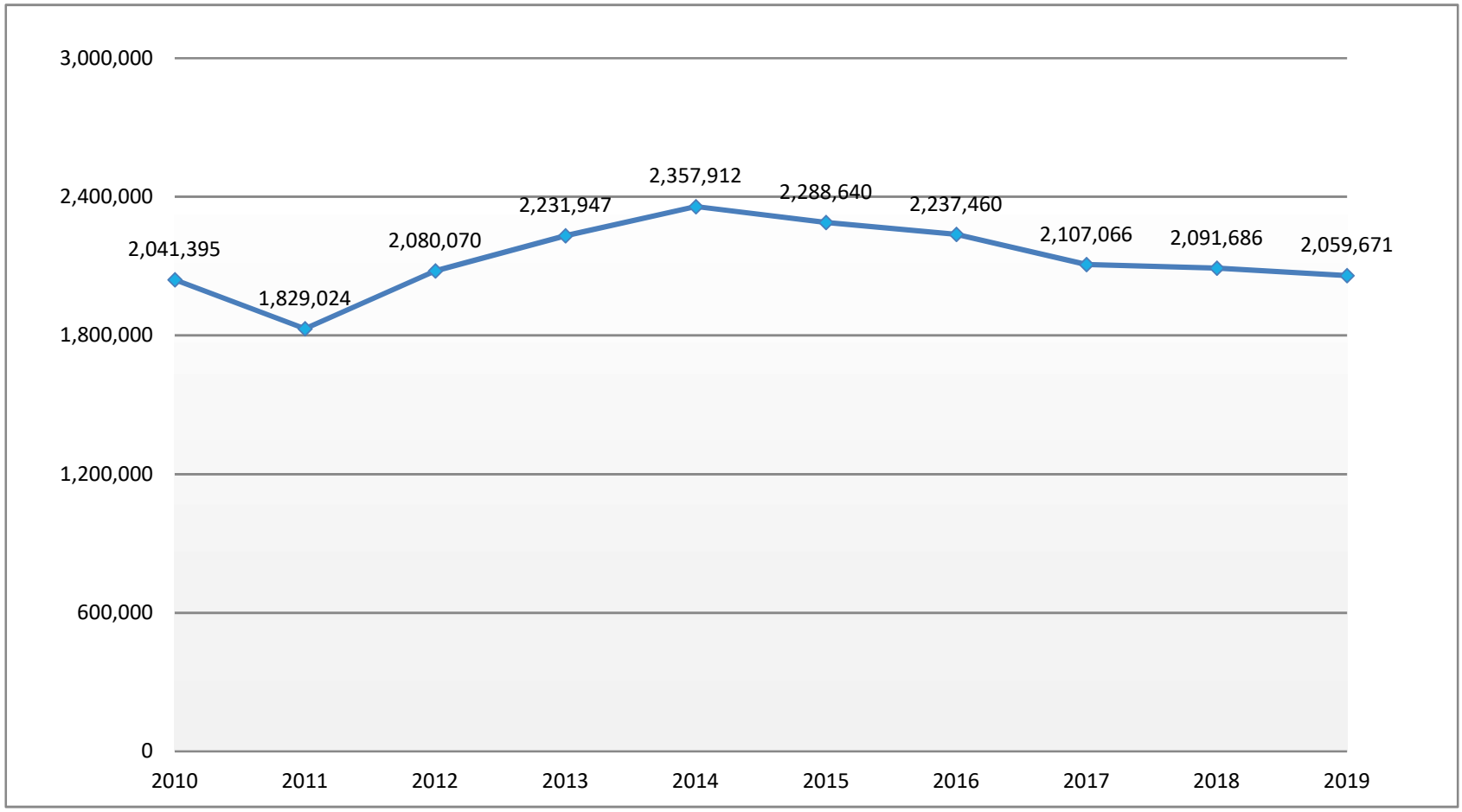


Total Net GHG Emissions from Electricity



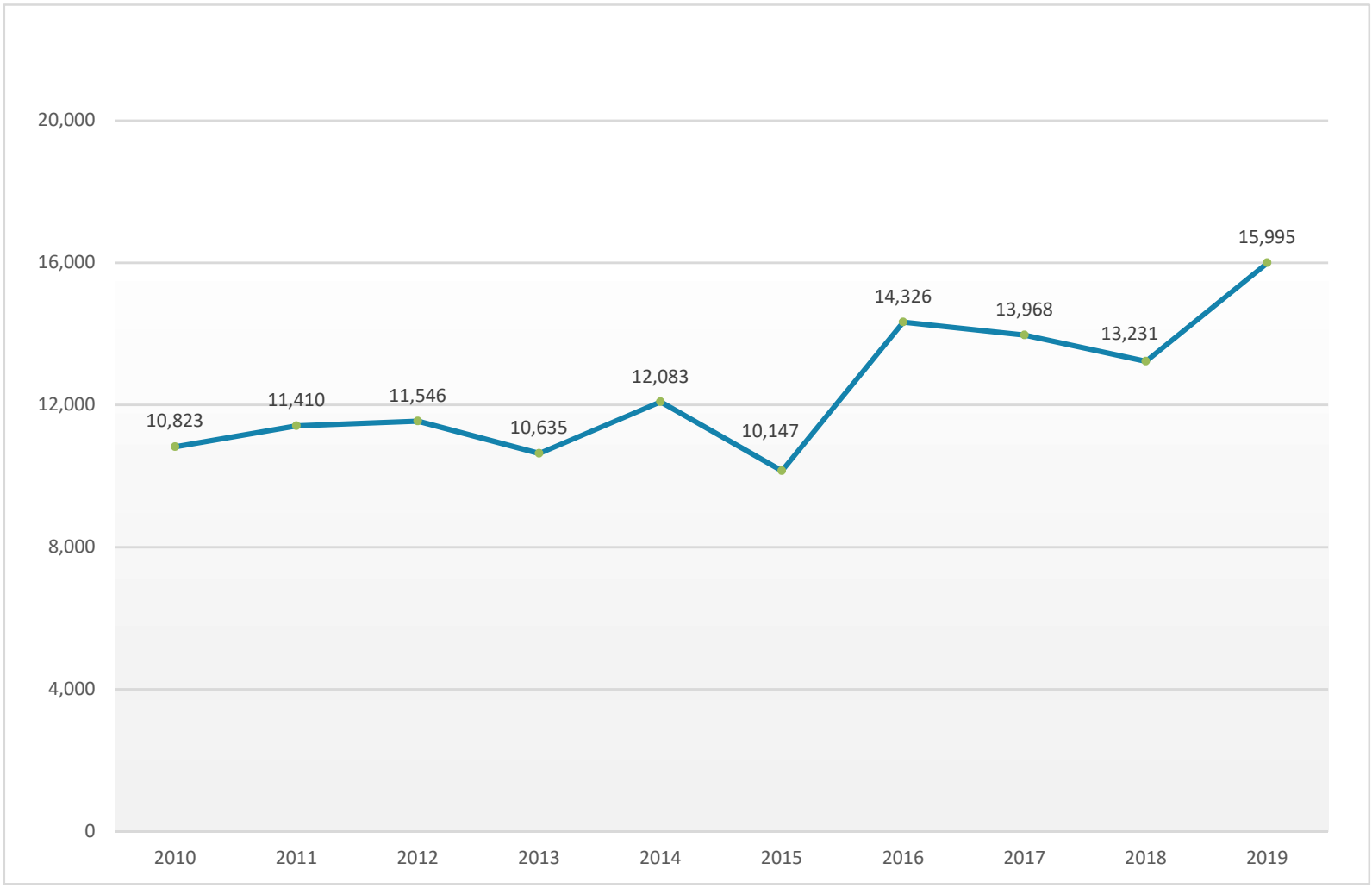
Note: Emissions for Electricity are net. Actual emissions are 608 MTCO2E, but offset from renewables.

Total Electricity Usage (kWh)

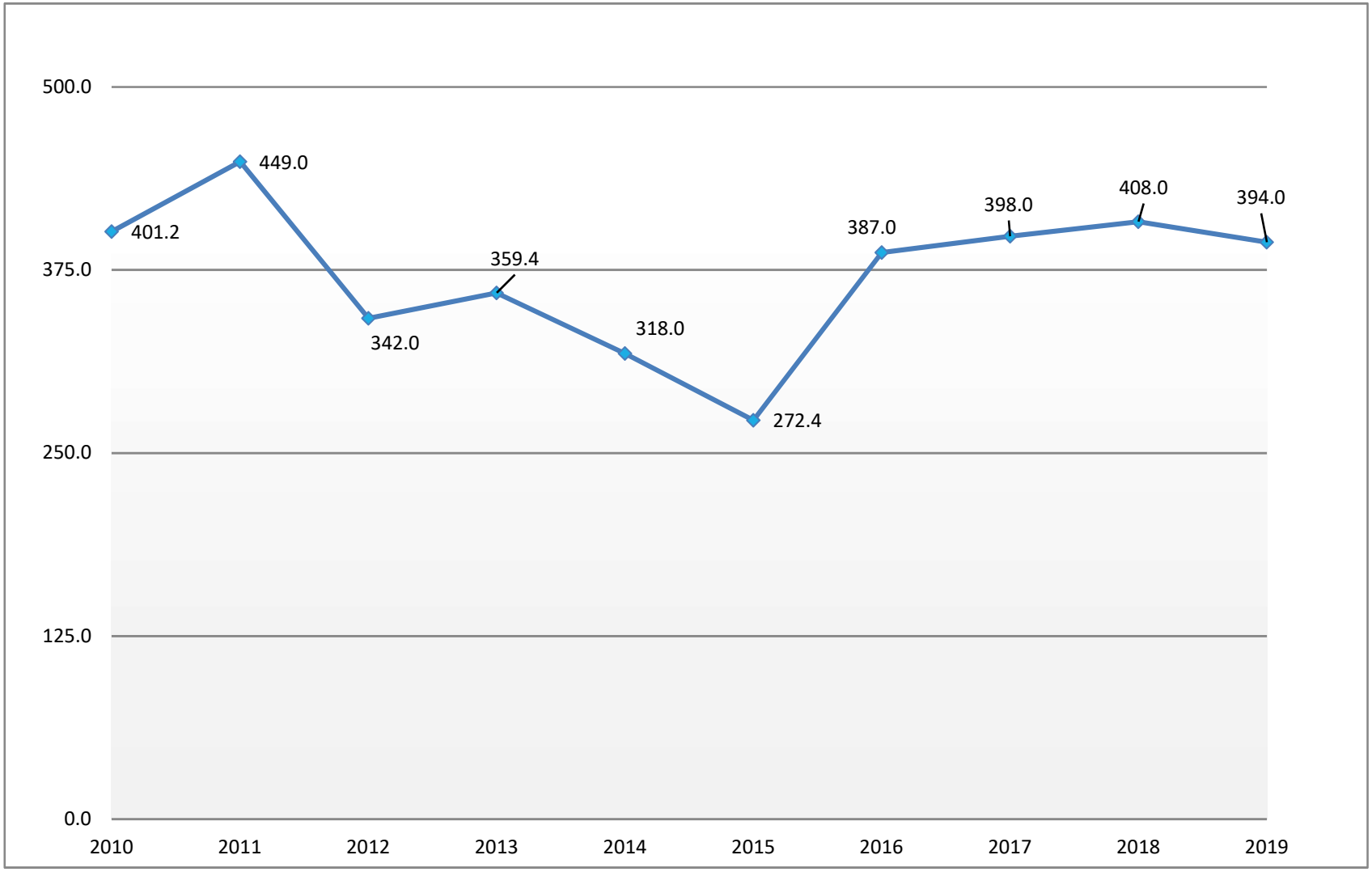


Total GHG Emissions from Fleet & Fuel

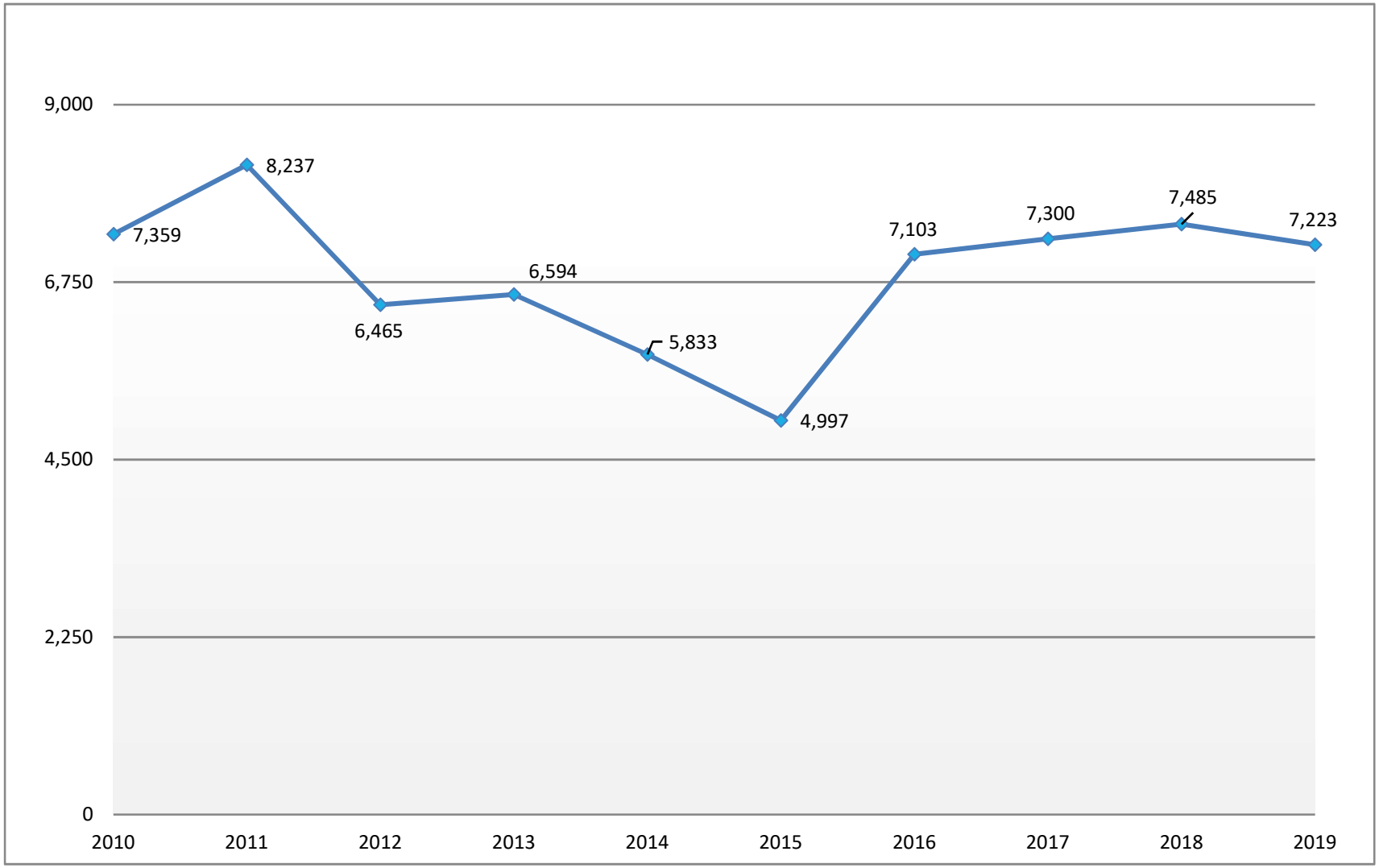
Total Fuel Usage (MMBtu)



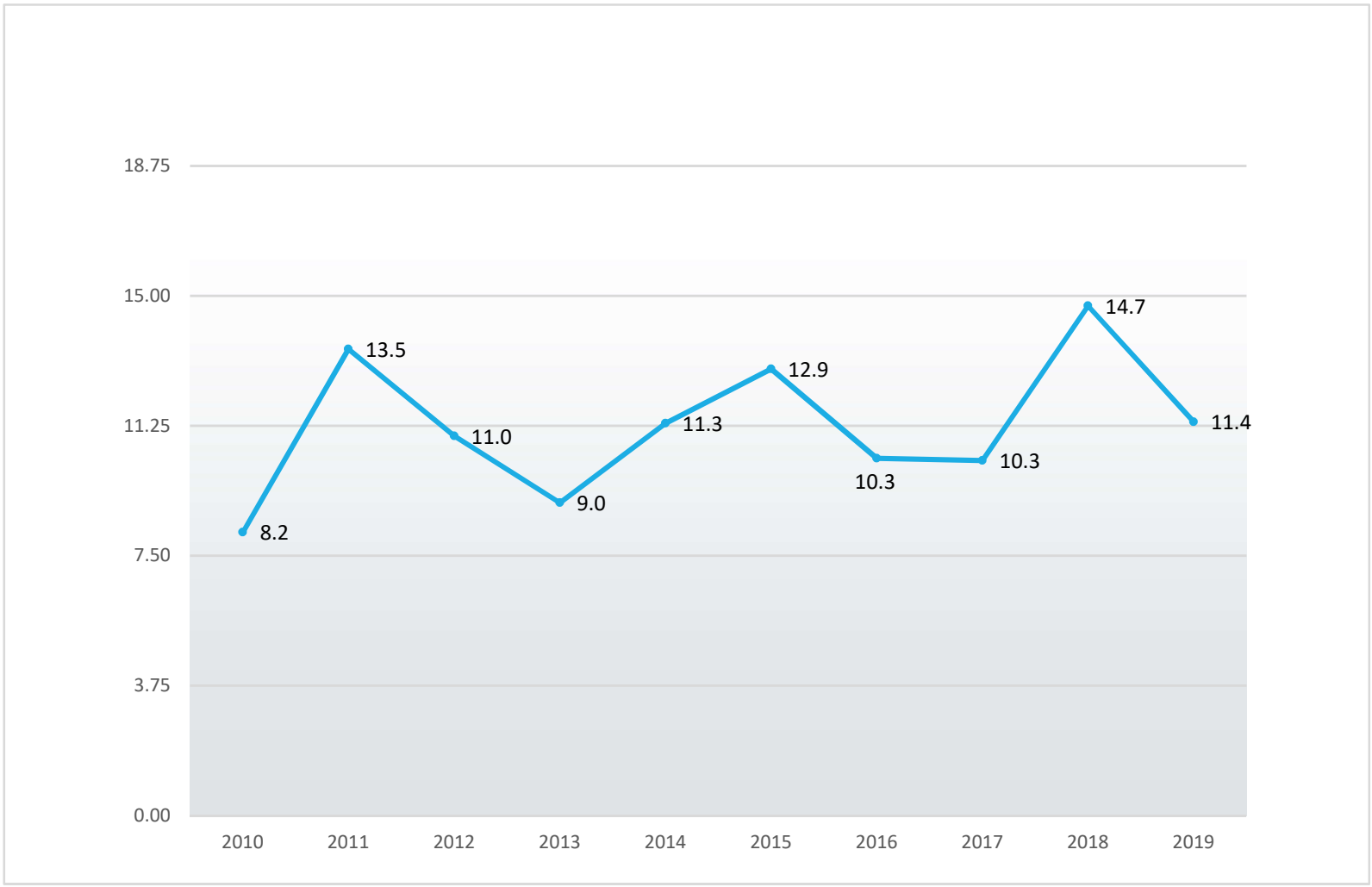
Total GHG Emissions from Natural Gas



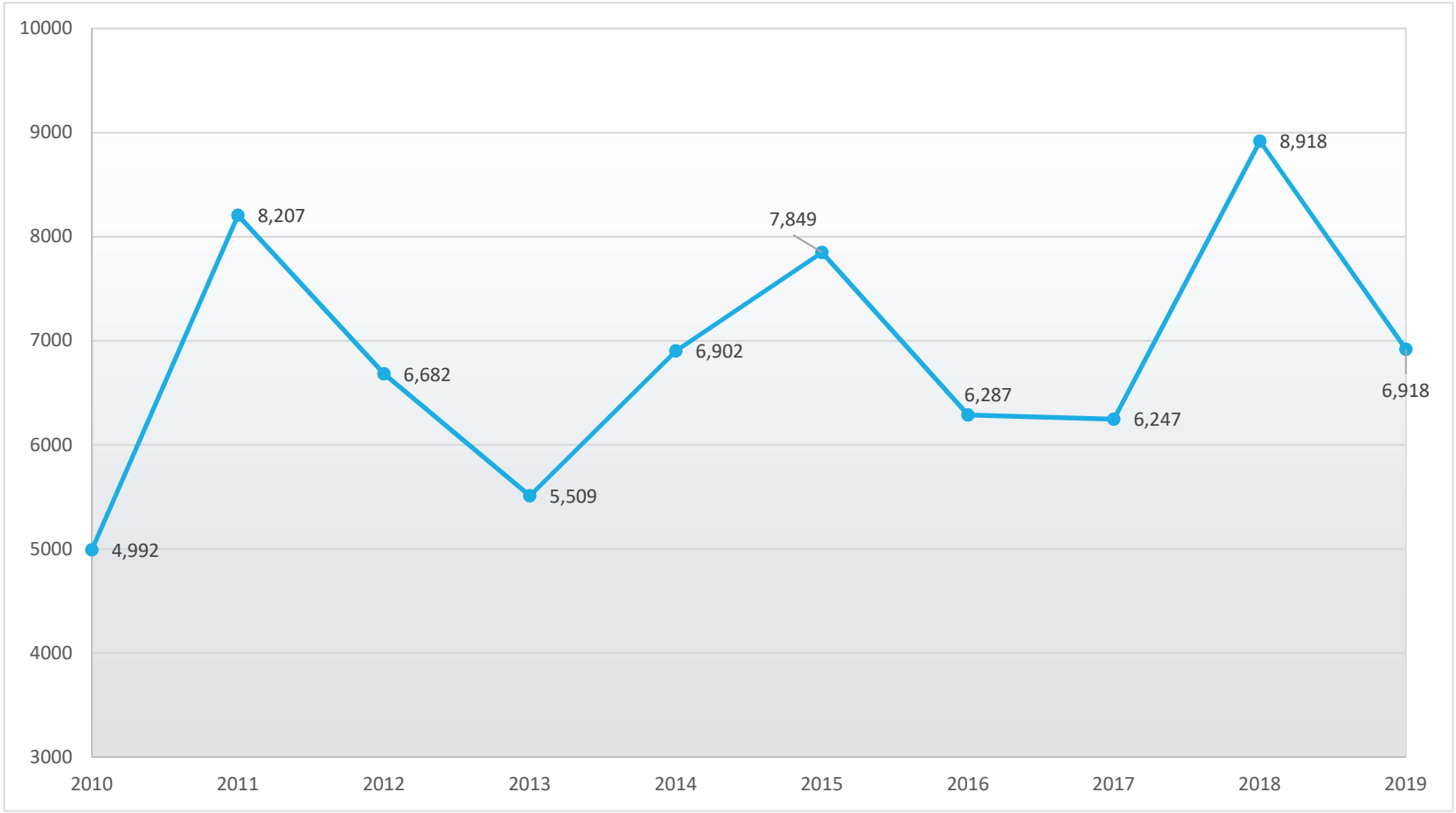
Total Natural Gas Usage (mcf)



Total GHG Emissions from Water

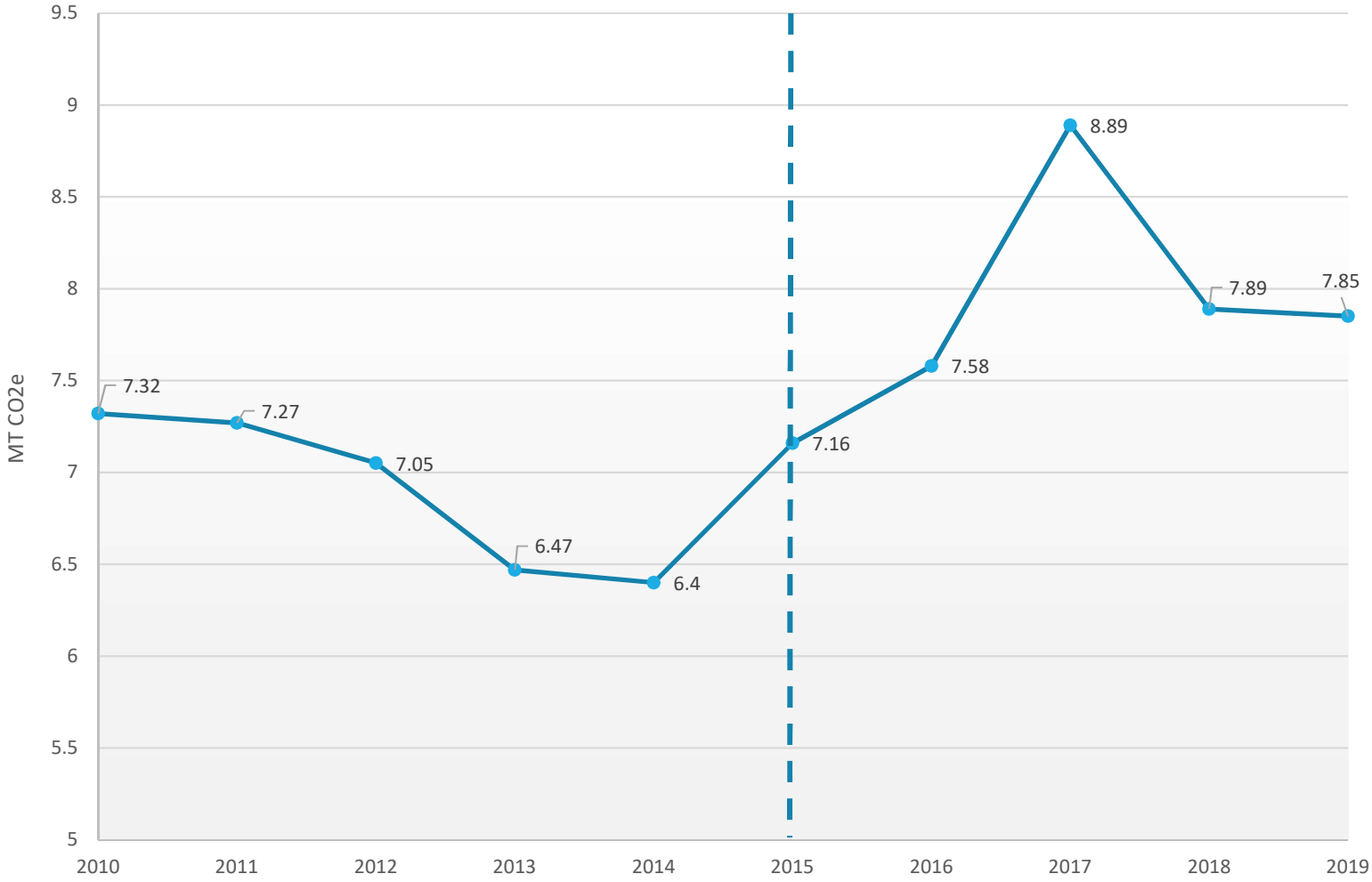


Total Water Usage (per 100 ft^3)



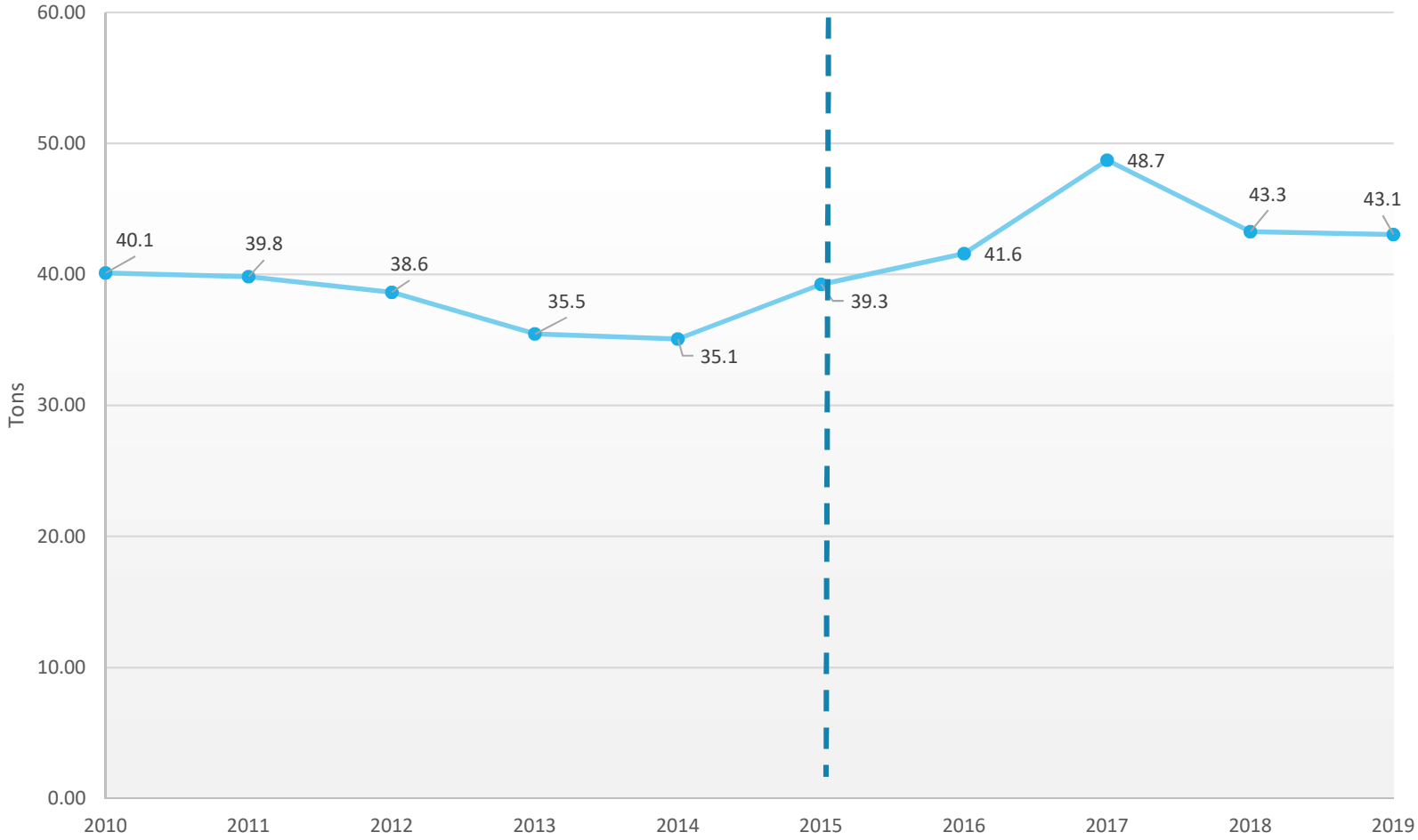
Note: For context, 2019 equals about 5,175,000 gallons.

Total GHG Emissions from Waste



Note: Compactor was installed 2014 (first pick-up was October 1), which captures actual weight. Waste estimates for 2010-2014 were used by calculating 2015 waste usage per FTE, and then extrapolated to 2010.

Total Waste Usage (Tons)



Note: Compactor was installed 2014, (first pick-up was October 1) which captures actual weight. Waste estimates for 2010-2014 were used by calculating 2015 waste usage per FTE, and then extrapolated to 2010.

Renewable Energy: Purchasing Blue Sky

Benton County is a "Champion"

- Purchased 10% of Energy from Renewable Sources (162 blocks)
- 76,100 kWh of Electricity Came from Blue Sky in 2019
- Result is **22.5 MTCO2E Removed**
- Estimated If All Year: 194,900 kWh = 57.6 MTCO2E Removed

Important Update from Pacific Power

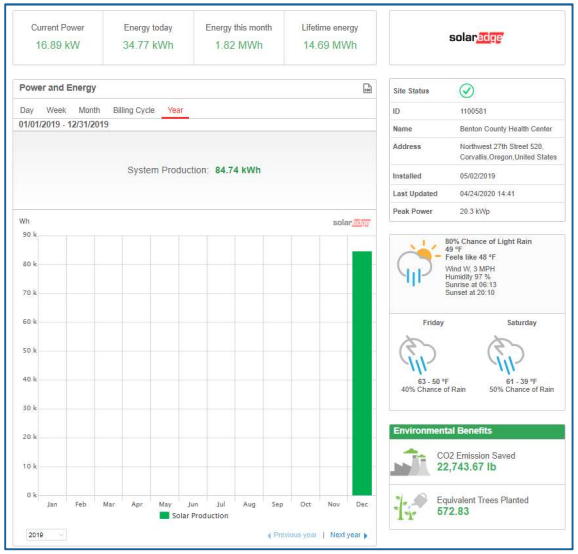
- Blocks Now Doubled as of January 1!
- For 2020: Est. 389,800 = 115.4 MTCO2E

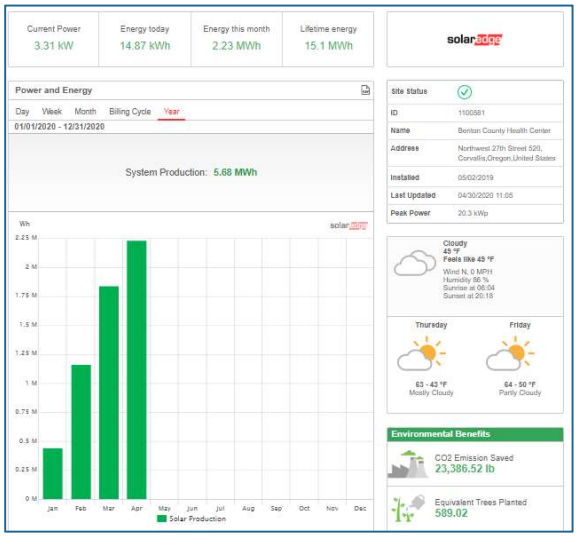
BLUE sky℠ renewable energy

Renewable Energy: PSB Solar Panels

Solar Panels on Health Building (PSB)

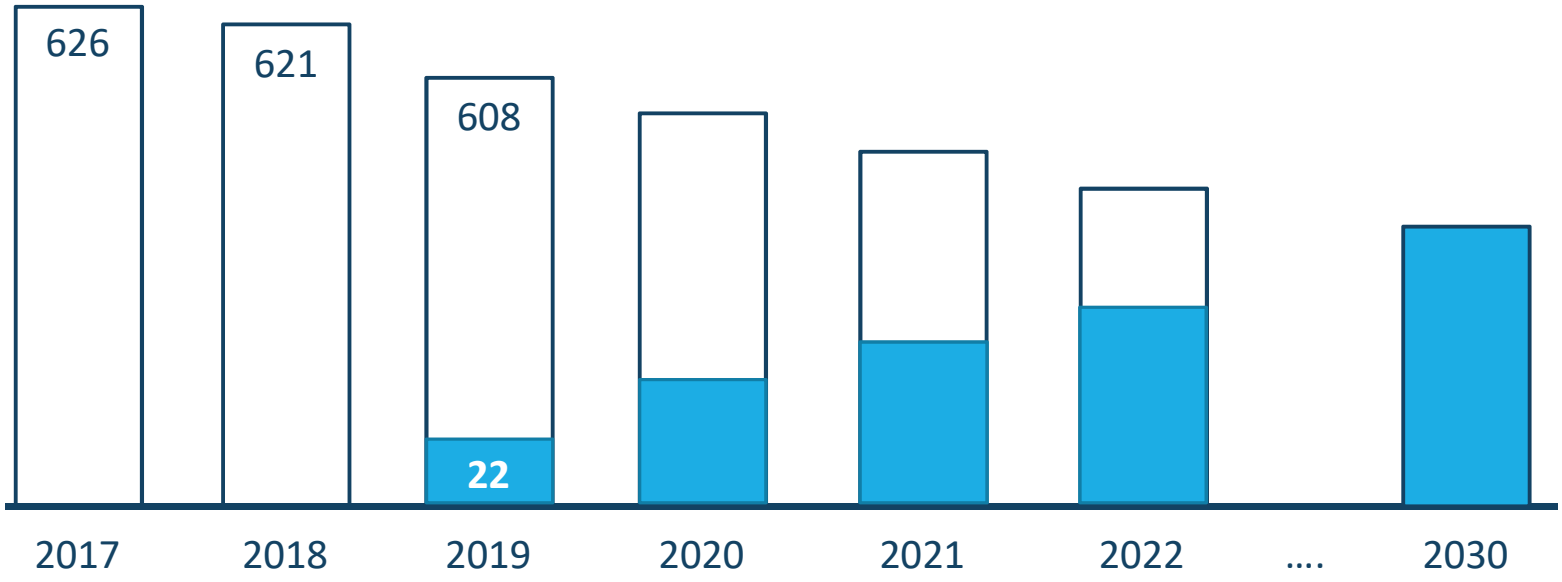
- Solar Panels Installed During 2019 Renovation
- Operational in September, but Not Online Until December – 84.7 kWh Produced that Month
- 2019 GHG Emissions Reduced ≅ 0.03 MTCO2E
- January – April 2020 ≅ 11.7 MTCO2E



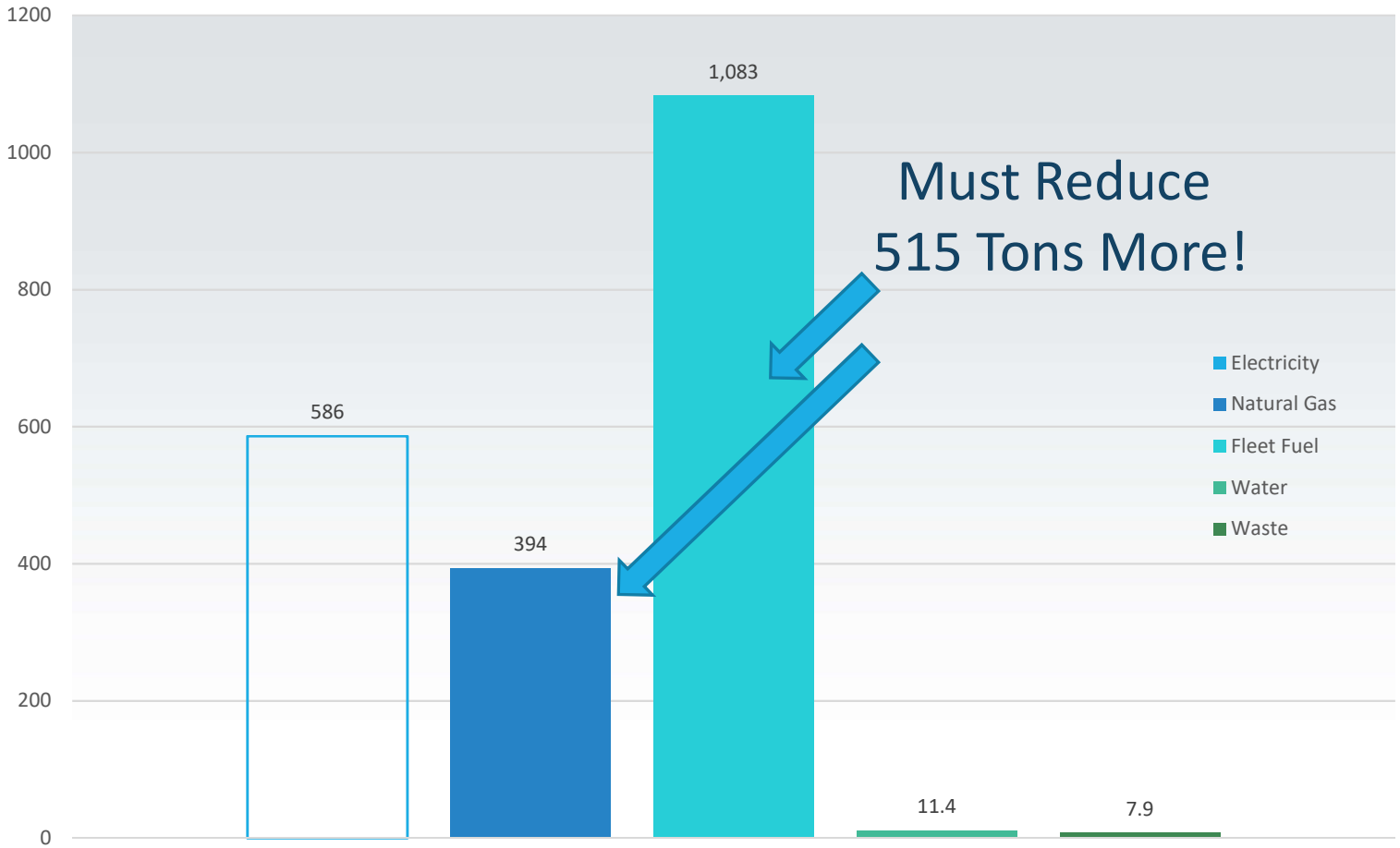


GHG Emissions Savings From Renewables

Source	MTCO2E
Emissions from Electricity:	608
Blue Sky Energy:	- 22
PSB Solar Panels:	- > 1
Total Emissions:	586



Total Emissions by Source – 50% by 2030



2,086	–	586	=	1,500	985
(Total Emissions)		(Elect. Emissions)		(“Off the Grid”)	(2030 Goal)

Alignment of Plans, Focus Areas, Goals

- Climate Action Plan
  - Energy
  - Waste
  - Transportation
  - Water
  - Multi-Scope
- Sustainability Program's Environmental Plan
  - Energy
  - Sustainable Materials Management
  - Workforce Development
  - Transportation
  - Harmful Chemicals
  - Water

Green font above indicates focus area for current biennium

ENERGY

REDUCE ENERGY CONSUMPTION

Goal: Reduce Energy Use by [redacted] by June 30, 2023

Strategy 1: Identify & Establish Energy Reduction Goals at County Facilities/Buildings

Strategy 2: Implement Energy Conservation & Efficiency Techniques to Achieve Goal

TRANSITION TO RENEWABLE ENERGY

Goal: County will generate and/or purchase [redacted] of Electric energy from renewable sources by June 30, 2023

Strategy 1: Install Solar Panels at County Facilities/Buildings

Strategy 2: Install Other Renewable Energy Sources at County Facilities/Buildings

Strategy 3: Purchase Renewable Energy

SUSTAINABLE MATERIALS MANAGEMENT

REDUCE WASTE GENERATION

Goal: Reduce Total Landfilled Waste by [redacted] from 2019 levels by 2023

Strategy 1: Develop Action Plans to Reduce Materials Use

Strategy 2: Reuse Existing Materials throughout Benton County organization

Strategy 3: Establish Sustainable Procurement Guidelines and Recommendations

MAXIMIZE WASTE DIVERSION

Goal: Reduce contamination in all waste streams to no more than [redacted] by weight by 2023.

Strategy 1: Assess contamination in waste streams

Strategy 2: Ensure recycling and composting in all County operational facilities

Strategy 3: Identify and pursue different outlets for difficult to recycle commodities

Strategy 4: Monitor and improve

Note: Blue text highlights direct alignment of Climate Action Plan & Sustainability Program Environmental Plan.

Energy

Reduce Energy Consumption

- Upgraded to LED lighting: parking/exterior lighting at Avery, Sunset, BOC, Fairgrounds and 4500 Research Way; SARS and Surplus sheds at Avery
- Upgraded Boiler Control Systems for Fleet at Avery
- Upgraded Heat Pump Systems at Sunset, HVAC Units at Avery
- Upgraded Indoor Environmental Control System at Law Enforcement Building
- LEED Silver Used as Consideration Standard for 4500 SW Research Way Renovation

Transition to Renewable Energy

- Installed 20.3 kW of Solar Panels on Health Services Building
- Purchased 10% of County Electricity from Blue Sky
- Secured Funding to Install 96.6 kW of Solar Panels on County Buildings
- In Discussion with Oregon Clean Power Cooperative for Lease-to-Buy/Power Purchase Agreement for 4500 SW Research Way

Sustainable Materials Management

Reduce Waste Generation

- Implemented Paper Reduction Initiative
- Update to Miscellaneous Purchasing Policy to Reduce Purchases of Single Use Items
- Developed Sustainable Meeting & Events Checklist
- Online Inventory of Surplus & ReUse
- Installed Hand Dryers in Restrooms at Fairgrounds; Eliminated Paper Towels
- Began Development of Environmentally Preferred Purchasing Guidelines
- Piloted New Janitorial Protocols at Avery and Sunset to Reduce Plastic Bags
- LEED Silver as Consideration Standard for 4500 Research Way Renovation

Maximize Waste Diversion

- Implemented Compost Program at Avery, Sunset, BOC, Jail (staff only), and **Emergency Operations Center**
- Collection of Plastic Film at Avery
- Reuse of Shredded Paper from Sunset and Avery
- Fairgrounds Bottle Drop collections
- Updated Recycling Signage

Transportation

Reduce Emissions from Fuel & Fleet

- Implemented Use of R99 (renewables-based diesel fuel) for Fleet
- Established Fleet Preventative Maintenance Program
- Established Fleet Replacement Program

Alternative Transit

- Launched Teleconferencing via GoTo Meeting
- Installed Trash Compactor at Fairgrounds

Carbon Capture from County-Owned Lands

Disclaimers & Assumptions:

- Estimates are NOT to be considered official carbon sequestration as County-owned lands are not certified
- Accordingly, estimates should NOT be included in 'net-zero' calculation
- Purpose of exercise was to estimate carbon capture of County-owned lands as a reference or lens for policy- & budget-making decisions
- Natural Areas & Parks Department provided acreage & land use cover
- Sustainability Program researched & identified coefficients per land use area to estimate carbon capture; Most conservative figures were used

Carbon Capture from County Lands

Greenhouse Gas Capture from Benton County's Natural Areas & Parks												
											TOTALS	
	Site Name	Forest	CC	Wetland	CC	Grassland	CC	Impervious	CC	Grass/Mow	CC	Acres	CC
			32		15		2		0		0.5		
Natural Areas													
	Beazell	574	18,368	0	0	24	48	20	0	0	0	**618**	**18,416**
	Campbell Boat Landing	0	0	0	0	0	0	1	0	0	0	**1**	**0**
	Fitton Green	279	8,928	0	0	41	82	0	0	0	0	**320**	**9,010**
	Fort Hoskins	44	1,408	1	15	35	70	27	0	0	0	**107**	**1,493**
	Jackson Frazier	0	0	116	1,740	0	0	10	0	0	0	**126**	**1,740**
	Mill Creek Landing	0	0	0	0	0	0	4	0	0	0	**4**	**0**
	Salmonberry Campgrounds	6	192	7	105	0	0	2	0	1	1	**16**	**298**
Parks													
	Adair	6	192	26	390	0	0	36	0	6	3	**74**	**585**
	Anderson Park	0	0	20	300	0	0	1	0	0	0	**21**	**300**
	Bellfountain Park	10	320	0	0	5	10	4	0	1	1	**20**	**331**
	Clemens Park	33	1,056	4	60	0	0	2	0	0	0	**39**	**1,116**
	Hyak	1	32	1	15	0	0	2	0	1	1	**5**	**48**
	Irish Bend	0	0	10	150	0	0	0	0	0	0	**10**	**150**
	North Albany Park	14	448	0	0	0	0	4	0	4	2	**22**	**450**
	North Albany Natural Area	10	320	2	30	0	0	0	0	0	0	**12**	**350**
	TOTALS:	977	31,264	187	2805	105	210	113	0	13	6.5	**1,395**	**34,286**

Approximately 34,286 MTCO2E are Captured

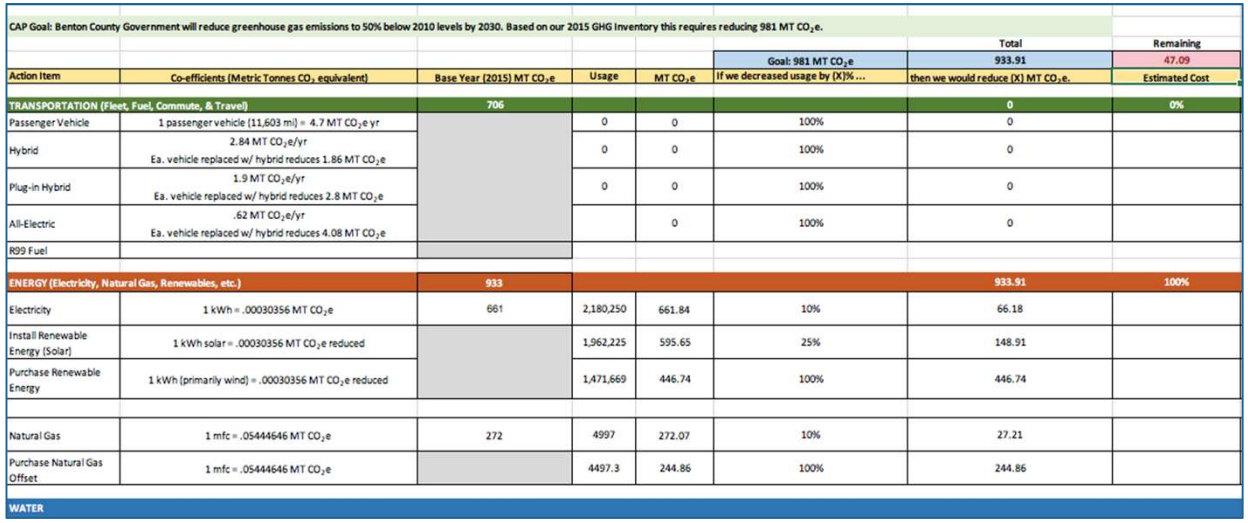
Potential Next Steps:

- Continue to research & capture most appropriate coefficients
- Ground-truth land use designations; Potentially fine tune
- Future consultants could assist in refining estimates

GHG Emissions Analysis Tool

Calculates MTCO2e Reduction Potential Relative to Cost

- Resource Usage Reductions (kWh, fuel, water, gas, waste)
- Solar Panels
- HVAC Systems
- Alternative Fuels
- Hybrid/Electric Vehicle Purchasing
- Renewable Energy Offsets



CAP Goal: Benton County Government will reduce greenhouse gas emissions to 50% below 2010 levels by 2030. Based on our 2015 GHG Inventory this requires reducing 981 MT CO_2e.

						Total	Remaining
					Goal: 981 MT CO_2e	933.91	47.09
Action Item	Co-efficients (Metric Tonnes CO_2 equivalent)	Base Year (2015) MT CO_2e	Usage	MT CO_2e	If we decreased usage by (X)% ...	then we would reduce (X) MT CO_2e.	Estimated Cost
TRANSPORTATION (Fleet, Fuel, Commute, & Travel)		706				0	0%
Passenger Vehicle	1 passenger vehicle (11,603 mi) = 4.7 MT CO_2e yr		0	0	100%	0	
Hybrid	2.84 MT CO_2e/yr Ea. vehicle replaced w/ hybrid reduces 1.86 MT CO_2e		0	0	100%	0	
Plug-in Hybrid	1.9 MT CO_2e/yr Ea. vehicle replaced w/ hybrid reduces 2.8 MT CO_2e		0	0	100%	0	
All-Electric	.62 MT CO_2e/yr Ea. vehicle replaced w/ hybrid reduces 4.08 MT CO_2e			0	100%	0	
R99 Fuel							
ENERGY (Electricity, Natural Gas, Renewables, etc.)		933				933.91	100%
Electricity	1 kWh = .00030356 MT CO_2e	661	2,180,250	661.84	10%	66.18	
Install Renewable Energy (Solar)	1 kWh solar = .00030356 MT CO_2e reduced		1,962,225	595.65	25%	148.91	
Purchase Renewable Energy	1 kWh (primarily wind) = .00030356 MT CO_2e reduced		1,471,669	446.74	100%	446.74	
Natural Gas	1 mfc = .05444646 MT CO_2e	272	4997	272.07	10%	27.21	
Purchase Natural Gas Offset	1 mfc = .05444646 MT CO_2e		4497.3	244.86	100%	244.86	
WATER							

Issues & Opportunities for 2020

- New Facility at 4500 Research Way
  - 1,497,000 kWh (72% of current) ≅ 442 MTCO2E
  - Many Resource Use Reduction Opportunities
- Impacts from COVID-19
- Renewable Purchasing Opportunities
- Solar Panel Installation Opportunities
- Prepare for FY21-23 Budget & Beyond

Questions?