



Climate Change Advisory Committee Meeting

August 24, 2021

Tom Wolf, Governor

Patrick McDonnell, Secretary

Agenda

- **Introduction**
 - Approval of June minutes
- Report on letters received from CCAC
- 2021 GHG Inventory Report presentation
 - 2021 GHG Inventory Report discussion
- Public Comment
- Break
- Dr. Satyapal – Hydrogen Tech. presentation
 - Hydrogen Tech. discussion
- EPO's Clean Energy Program Plan presentation
 - EPO's Clean Energy Program Plan discussion
- New Business
- Next Steps/Next meeting

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CCAC Letters

- 8 CCAC members submitted letters to be appended to the CAP, totaling over 37 pages.
- These letters will be appended to the final 2021 CAP

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Pennsylvania's DRAFT 2021 GHG Inventory Report (2018 Data Year)

Tom Wolf, Governor

Patrick McDonnell, Secretary

GHG Emissions Inventory

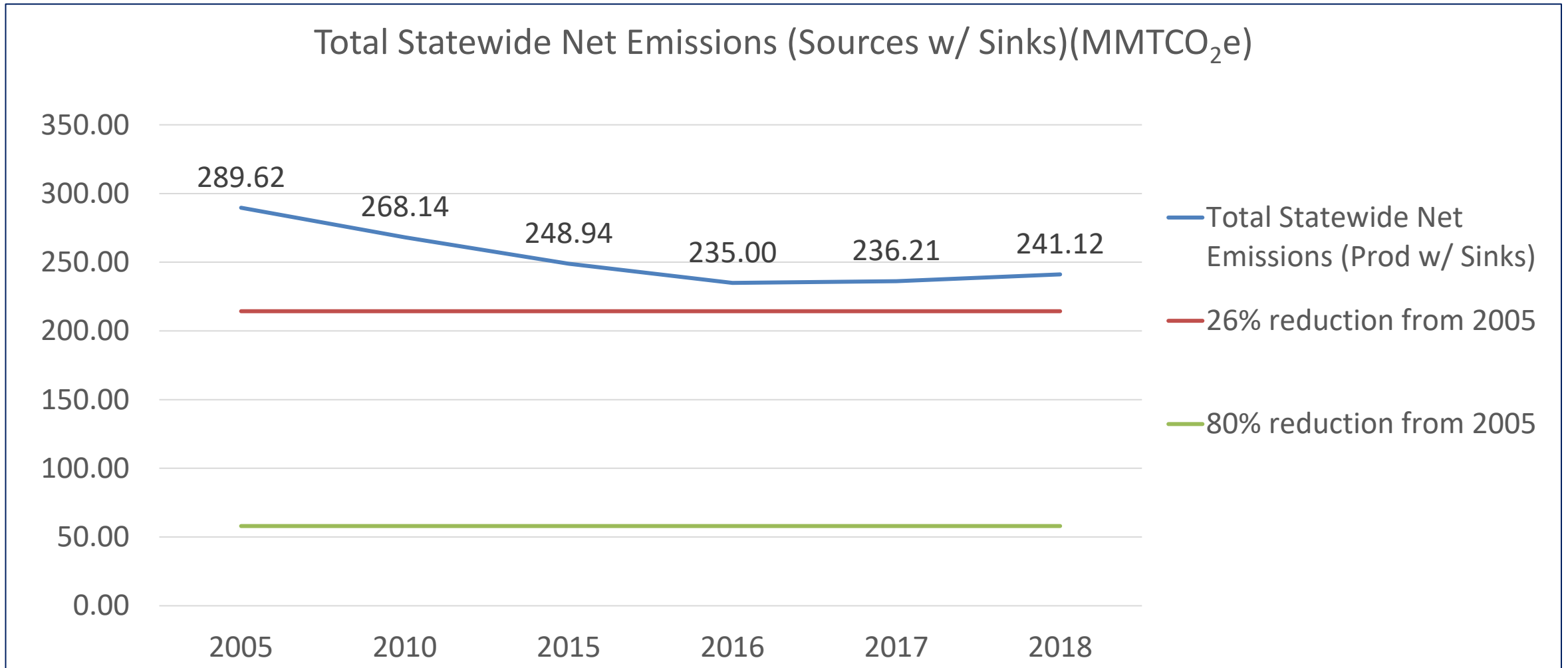
State Inventory Tool (SIT)

- Made available in October 2020, with updates to the tool released in November 2020, August 2021.
- EPA updated all 11 modules with data through 2018.

GHG Emissions Inventory

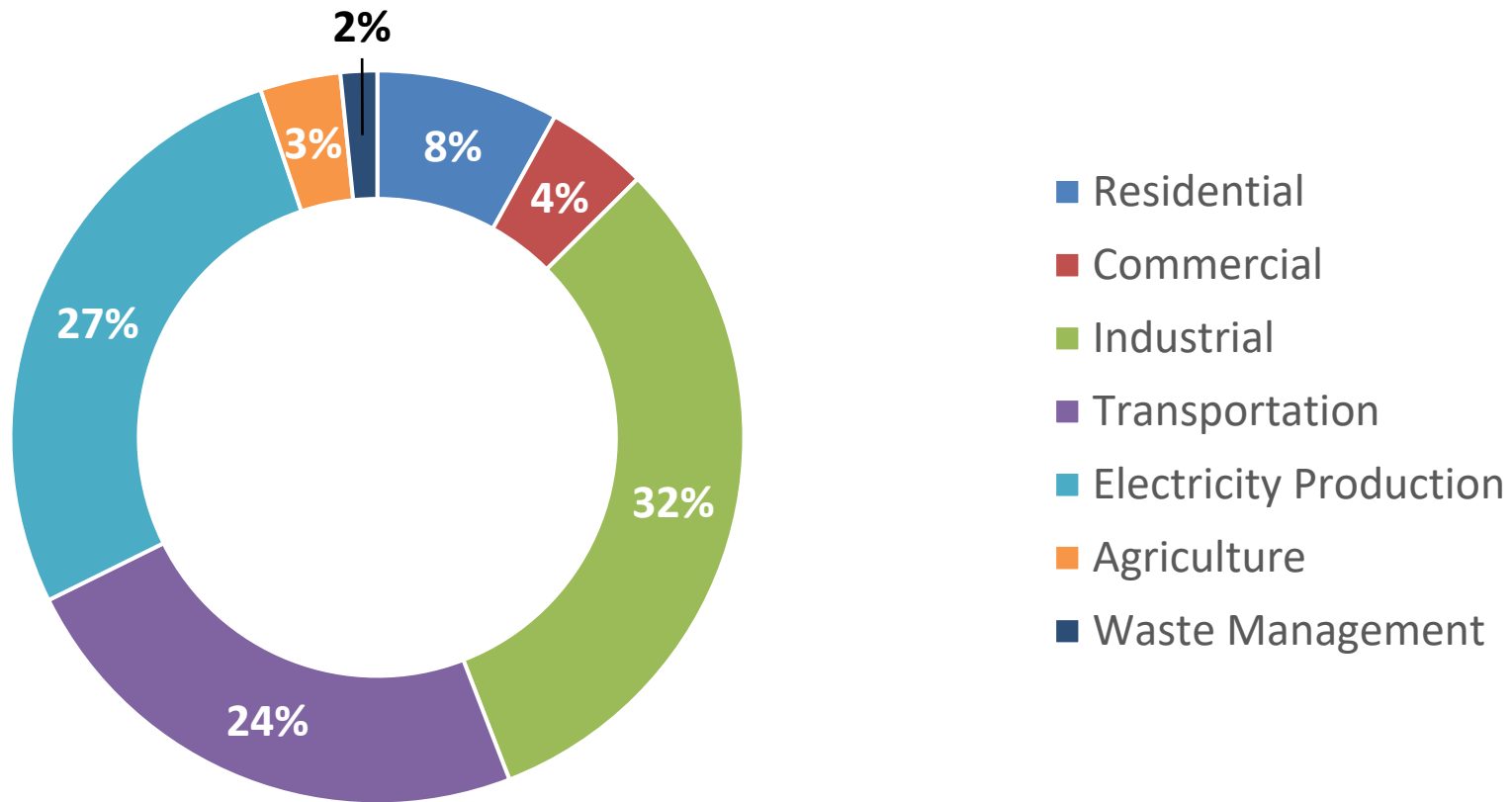
- 2018 data shows a net emissions increase from 2017. This is the second consecutive year with a GHG increase.
- Emissions increases occurred in the Residential, Commercial, Industrial, and Agricultural sectors.
- Emissions decreases occurred in the Transportation and Electricity Production sectors.
- The Waste Management sector saw no significant change in emissions.
- There was a decrease in CO₂ sequestered in the LULUCF sector in 2018 compared to 2017.

GHG Emissions Inventory



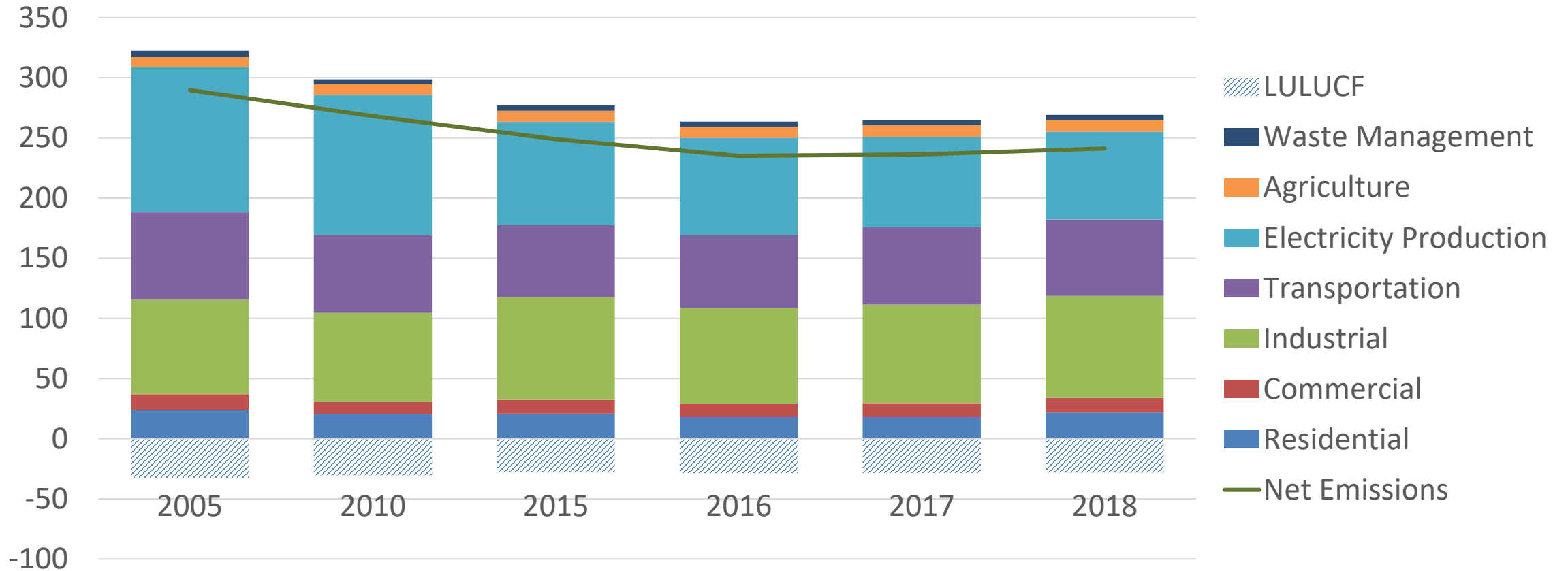
GHG Emissions Inventory

Pennsylvania 2018 GHG Emissions
% of Total by Sector



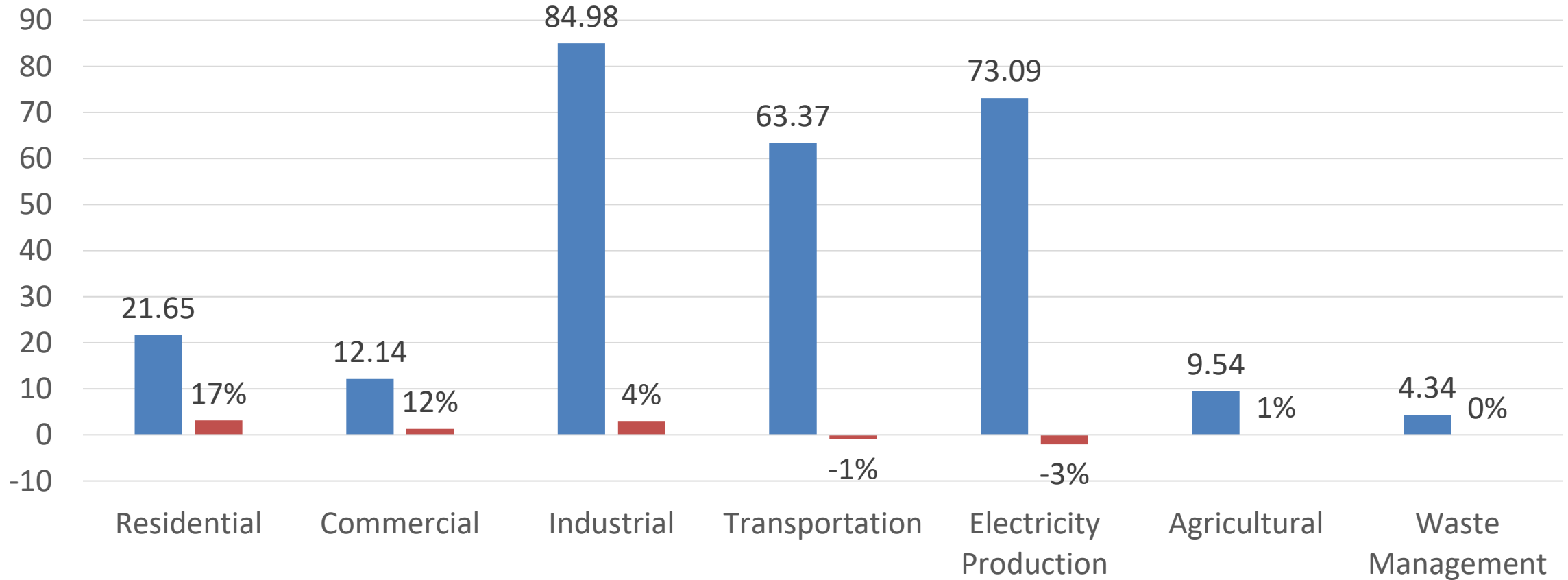
GHG Emissions Inventory

GHG Emissions (MMT_{CO₂e}) by Sector



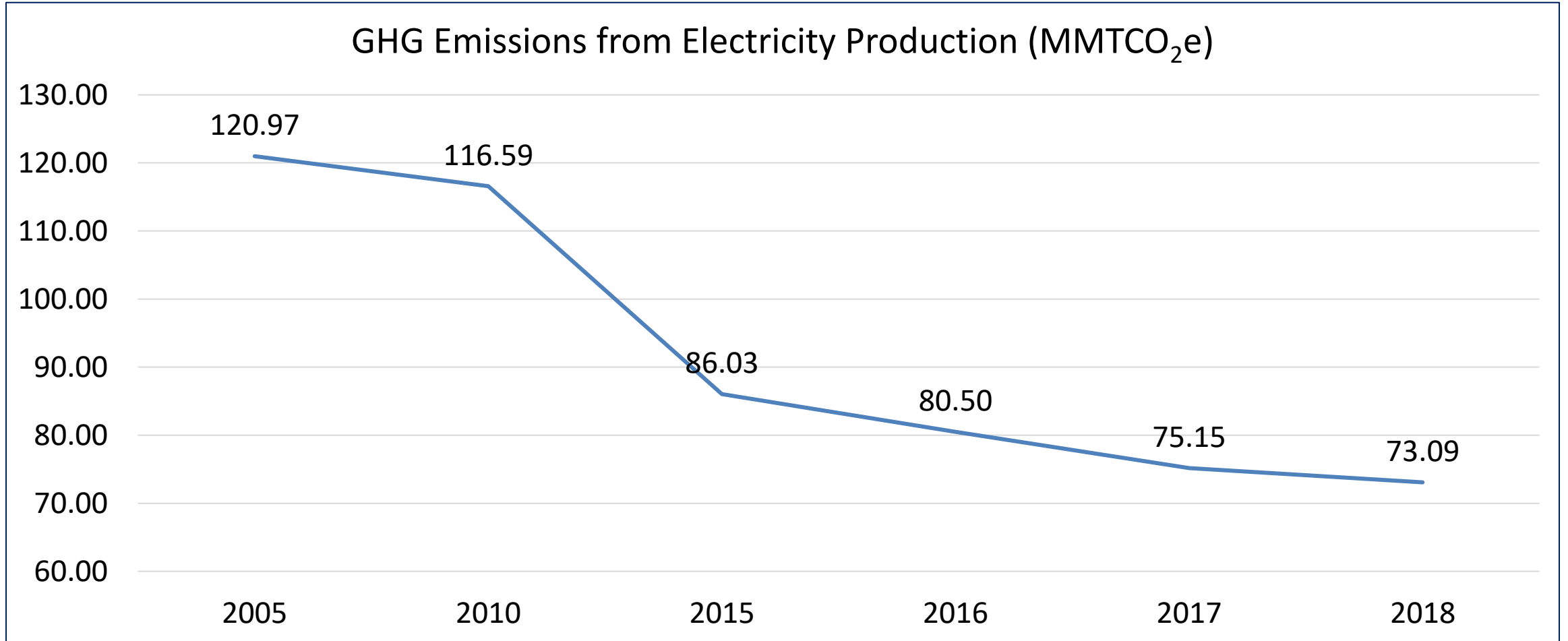
GHG Emissions Inventory

2018 GHG Emissions By Sector (MMT_{CO₂e})



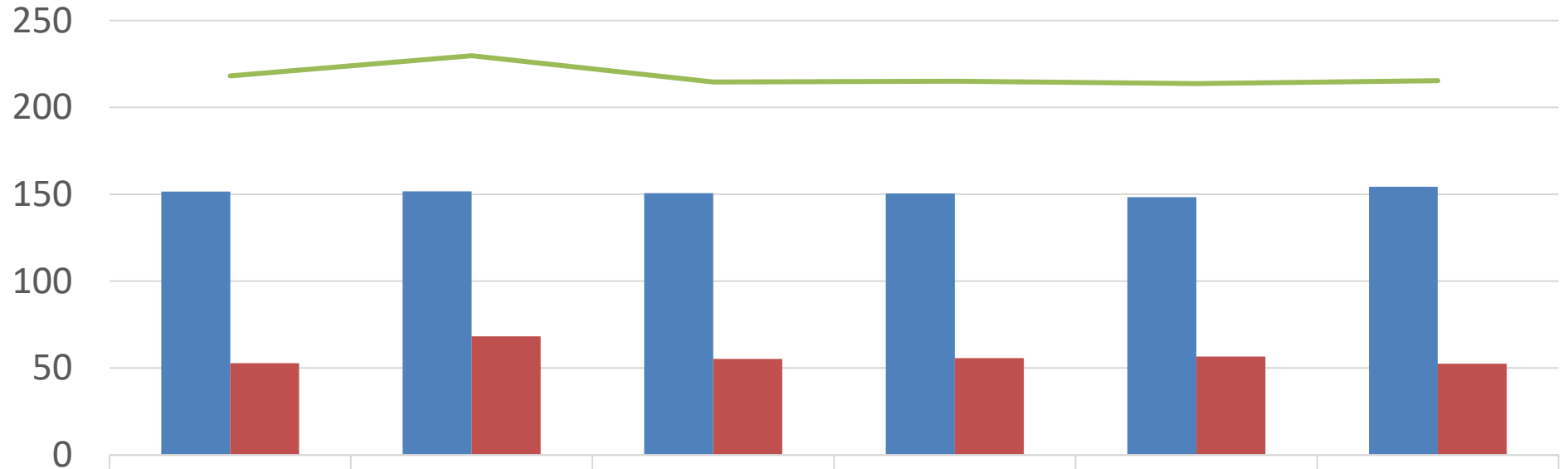
■ 2018 ■ Change from 2017

Electricity Production



Electricity Production

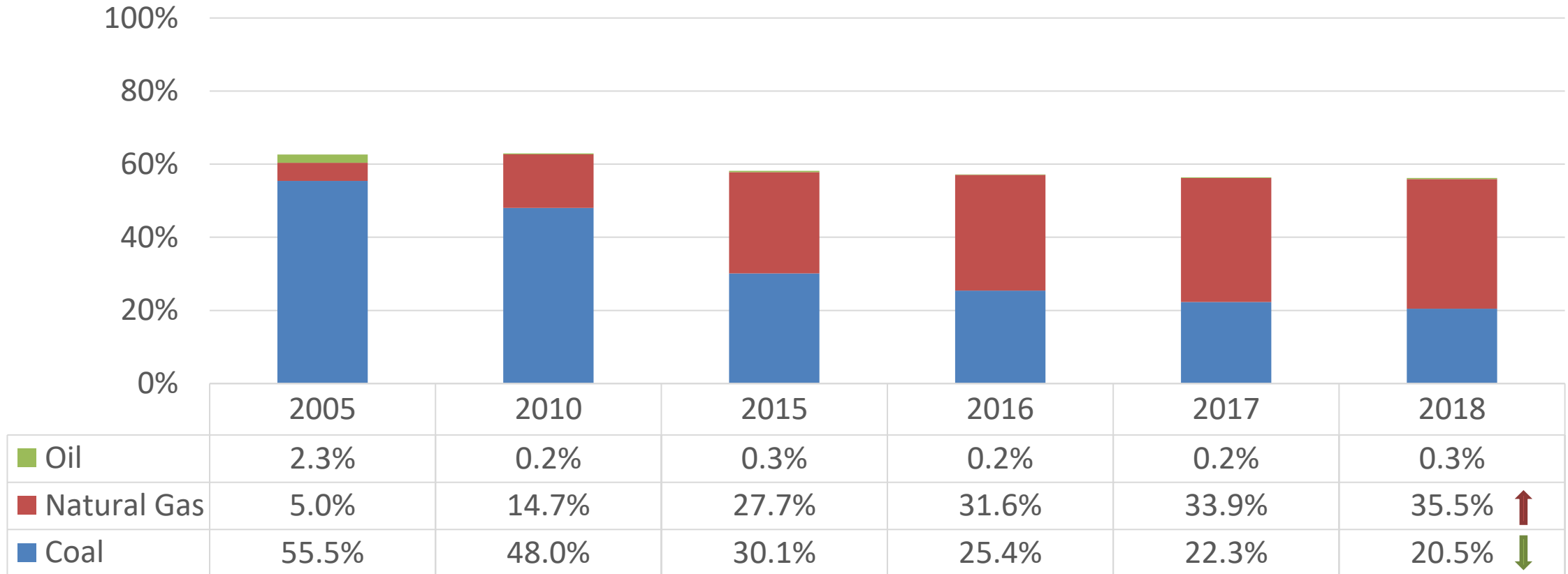
Total Electricity Generated, Consumed, and Exported (TWh)



	2005	2010	2015	2016	2017	2018
Electricity Consumed	151.56	151.74	150.67	150.53	148.33	154.36 ↑
Electricity Exported	52.87	68.26	55.21	55.73	56.61	52.57 ↓
Electricity Generated	218.09	229.75	214.57	215.07	213.64	215.39 ↑

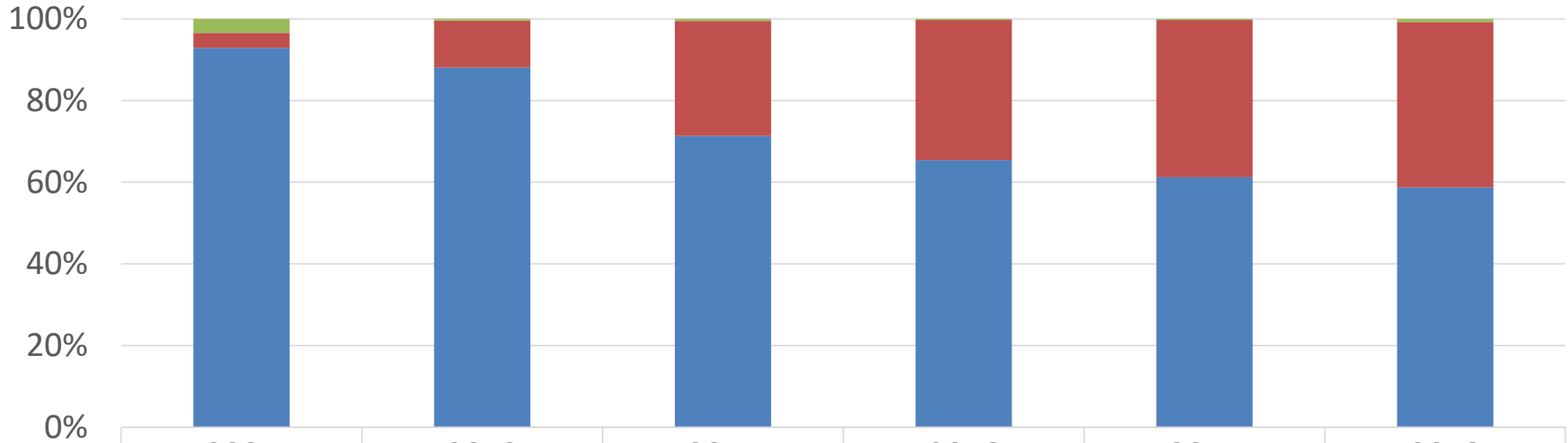
Electricity Production

Percent Electricity Production By Fuel Type



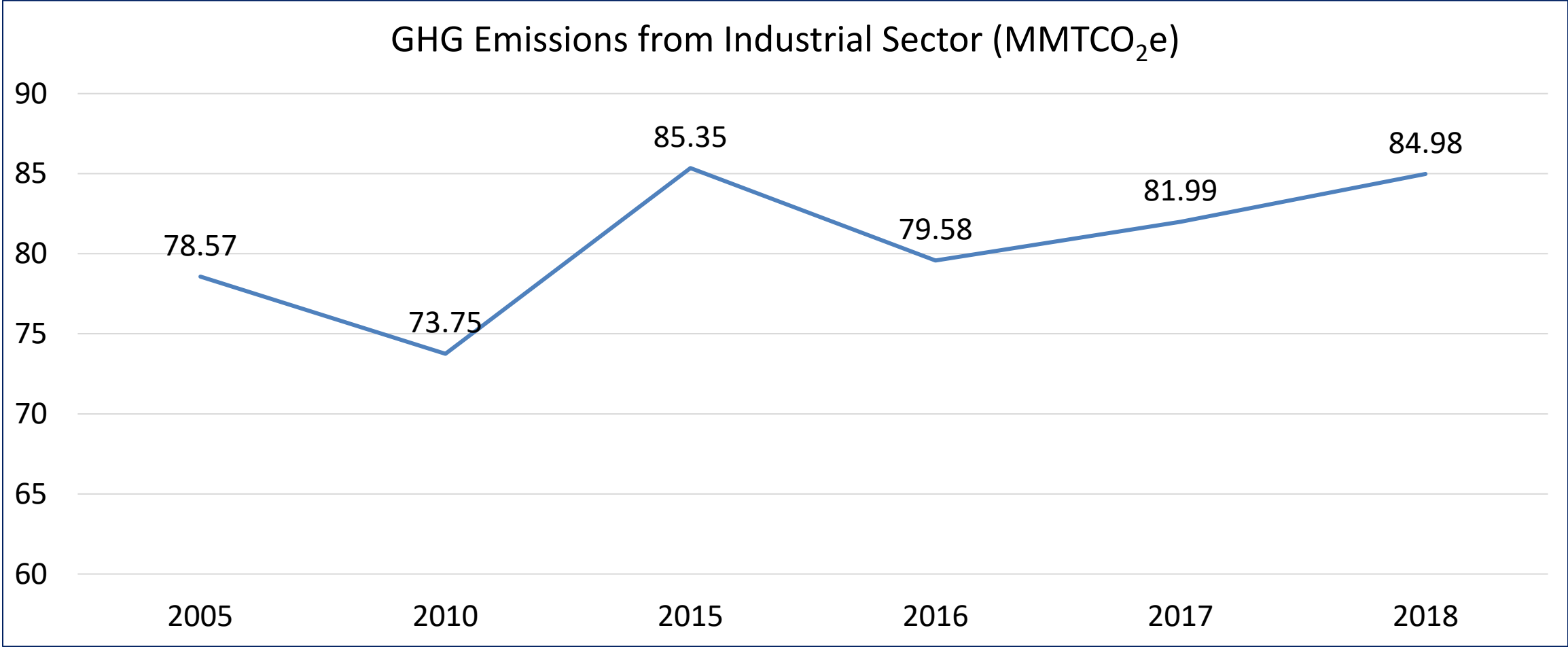
Electricity Production

GHG Emissions from Electricity Production Sector by Source
(% of Total)



	2005	2010	2015	2016	2017	2018
Oil	3.5%	0.4%	0.5%	0.3%	0.3%	0.8%
Natural Gas	3.7%	11.5%	28.1%	34.3%	38.5%	40.5% ↑
Coal	92.9%	88.1%	71.3%	65.4%	61.2%	58.7% ↓

Industrial Sector



Industrial Sector

GHG Emissions from Industrial Sector by Source (% of Total)

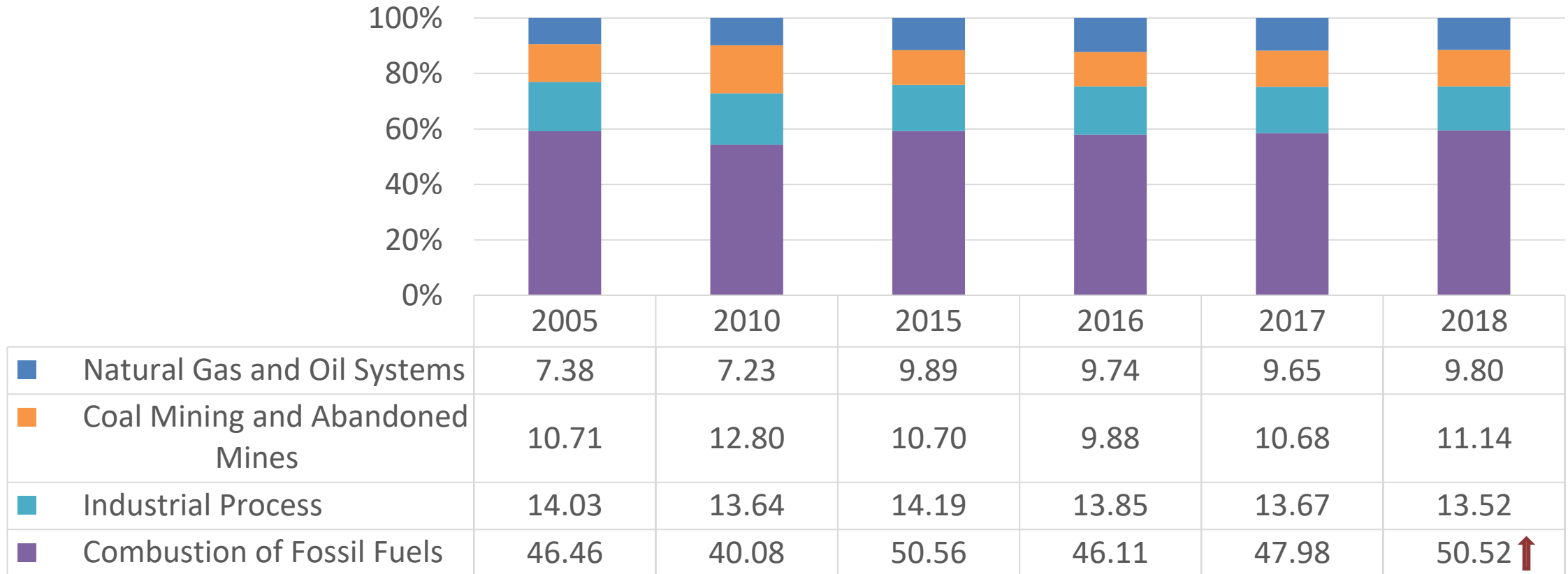
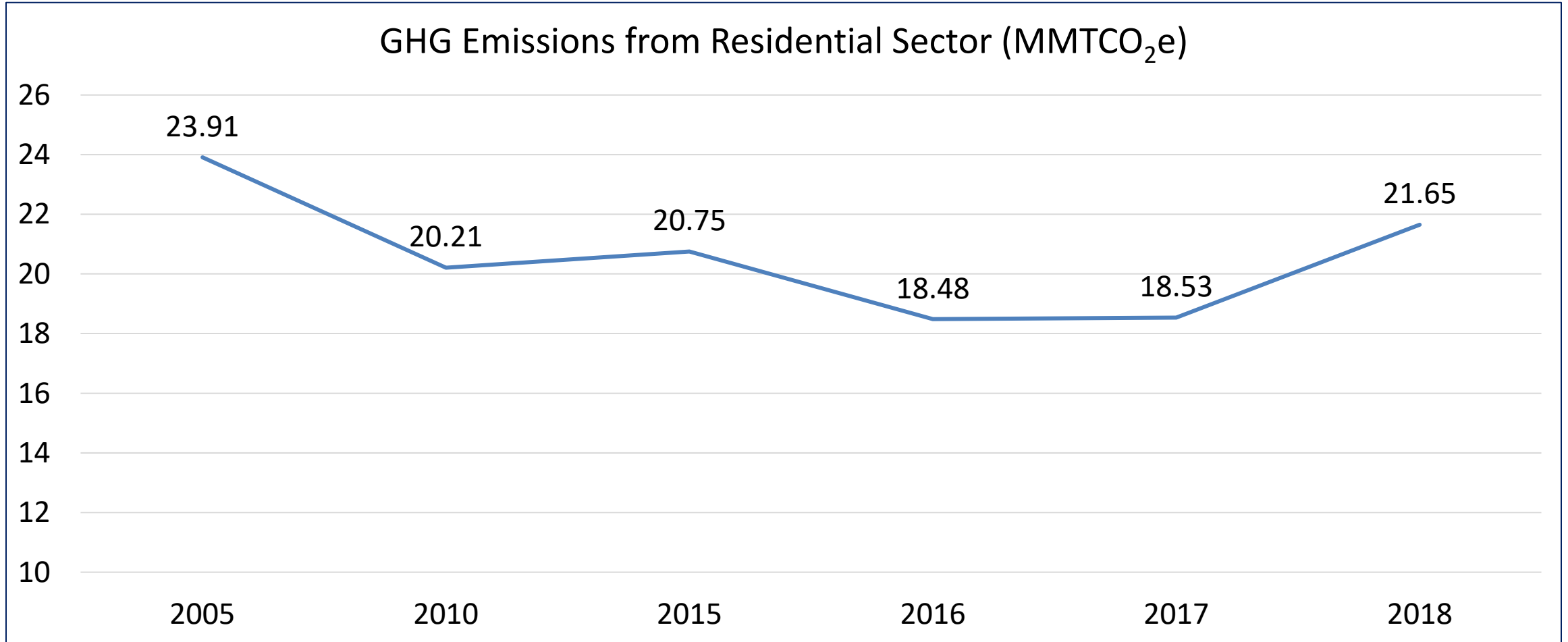


Table values presented in MMTCO₂e

Residential Sector



Residential Sector

Residential Emissions by Fuel Type (% of Total)

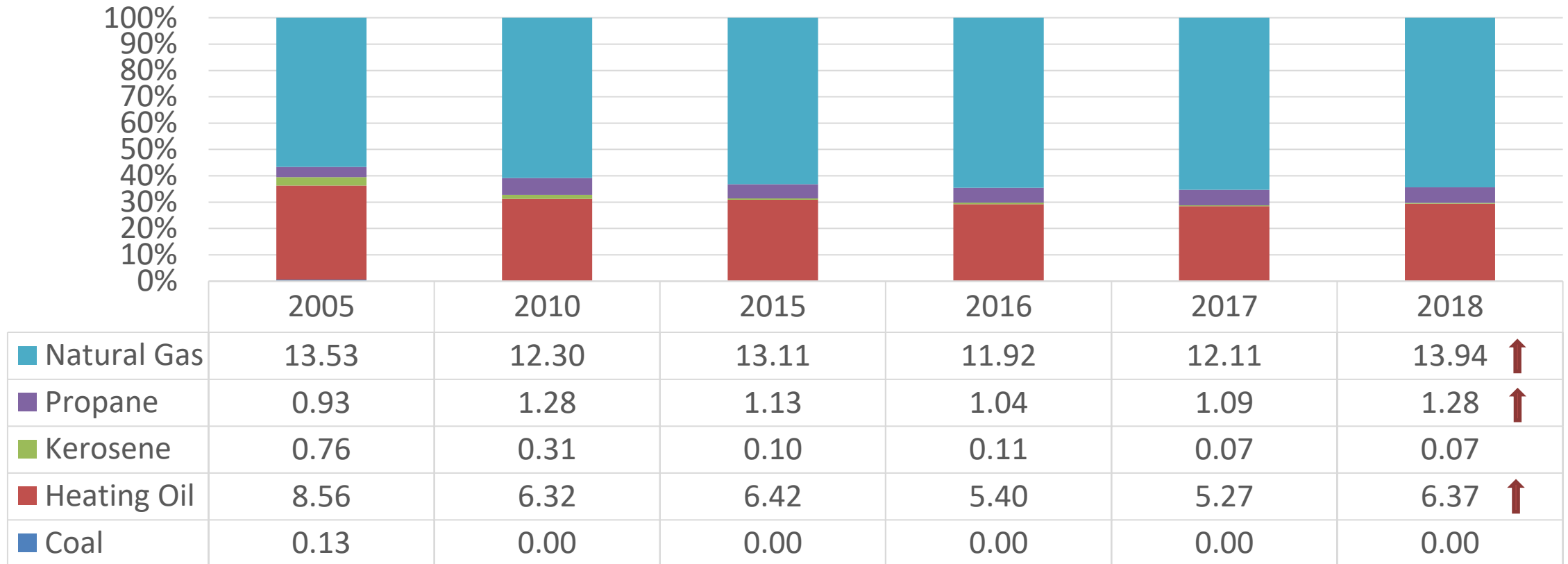
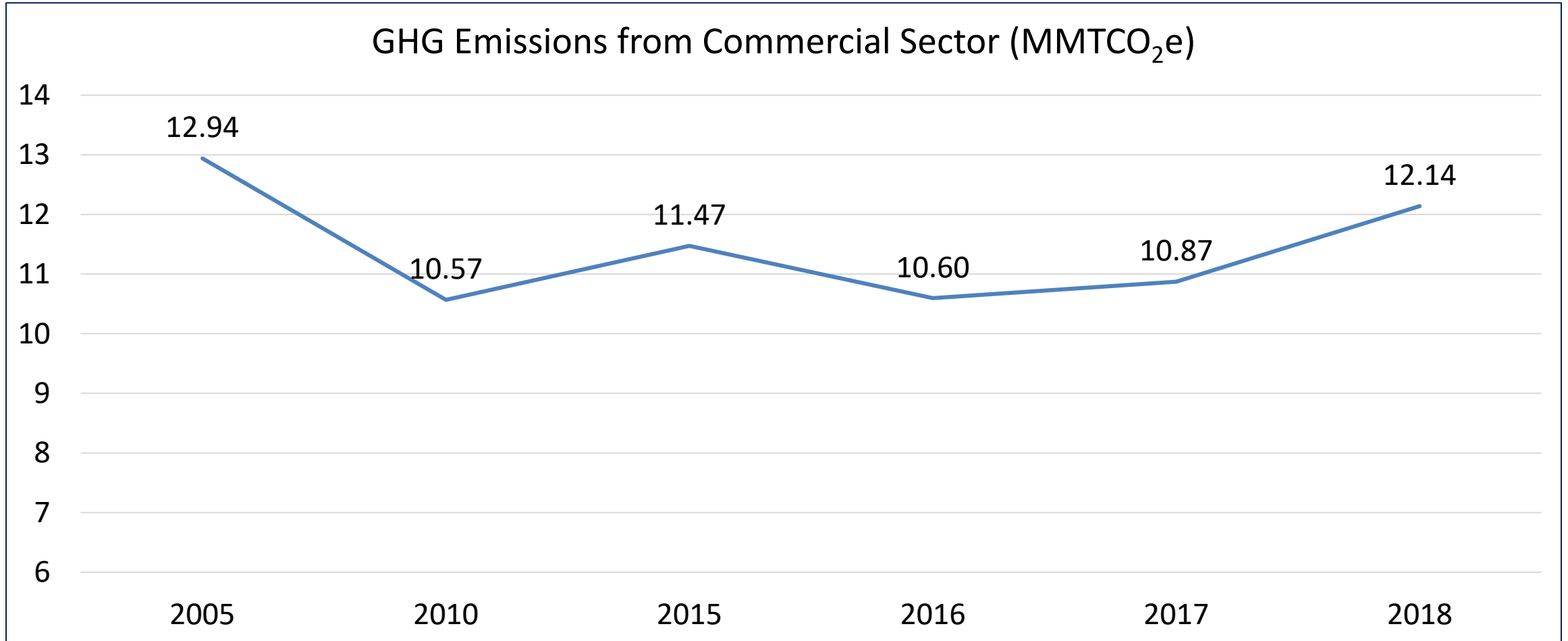


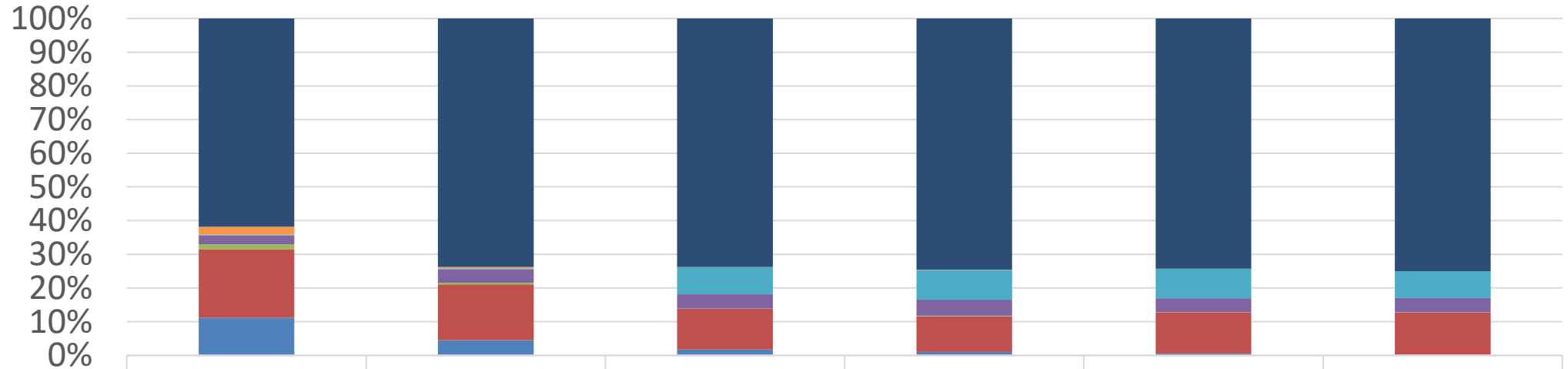
Table values presented in MMTCO₂e

Commercial Sector



Commercial Sector

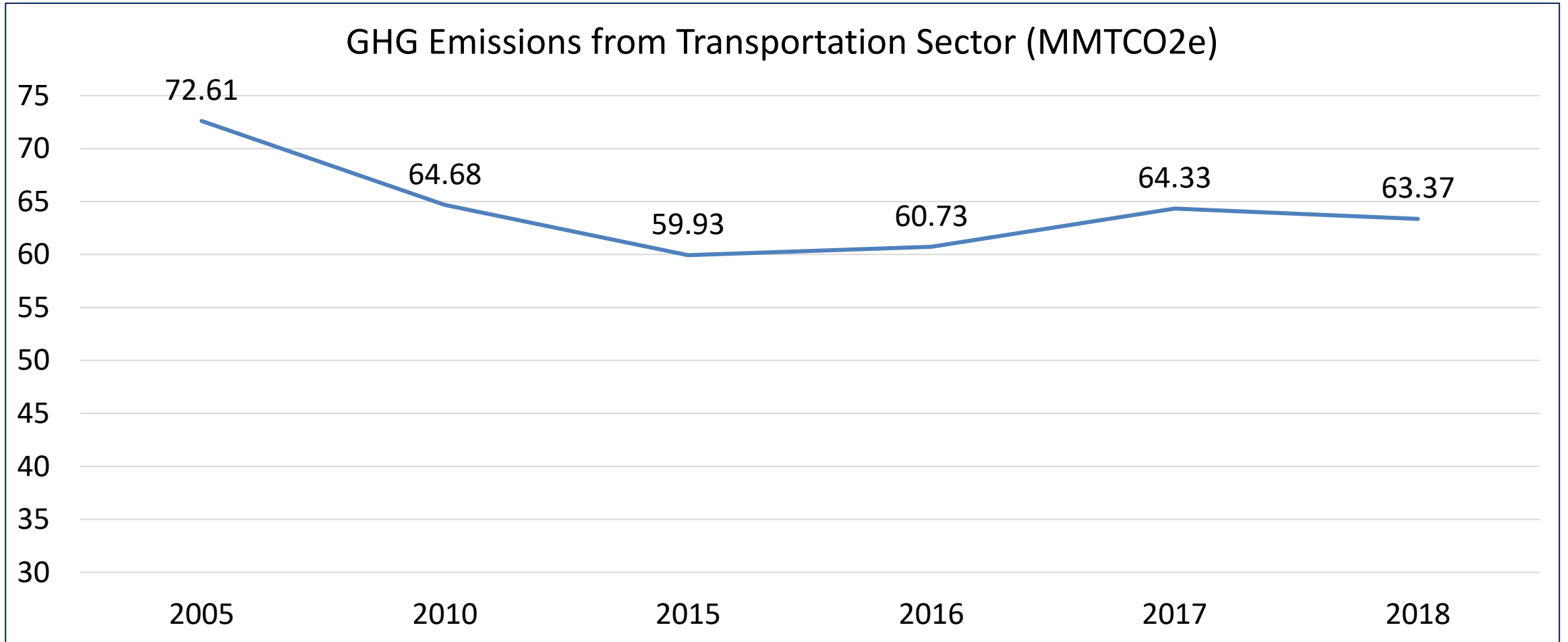
Commercial Emissions by Fuel Type (% of Total)



	2005	2010	2015	2016	2017	2018
■ Natural Gas	8.00	7.79	8.46	7.90	8.08	9.11 ↑
■ Residual Fuel	0.30	0.04	0.00	0.01	0.00	0.00
■ Motor Gasoline	0.03	0.03	0.93	0.94	0.95	0.97
■ Propane	0.34	0.42	0.48	0.50	0.45	0.52
■ Kerosene	0.19	0.06	0.01	0.02	0.01	0.01
■ Heating Fuel	2.64	1.75	1.39	1.13	1.32	1.50 ↑
■ Coal	1.44	0.47	0.20	0.10	0.06	0.04

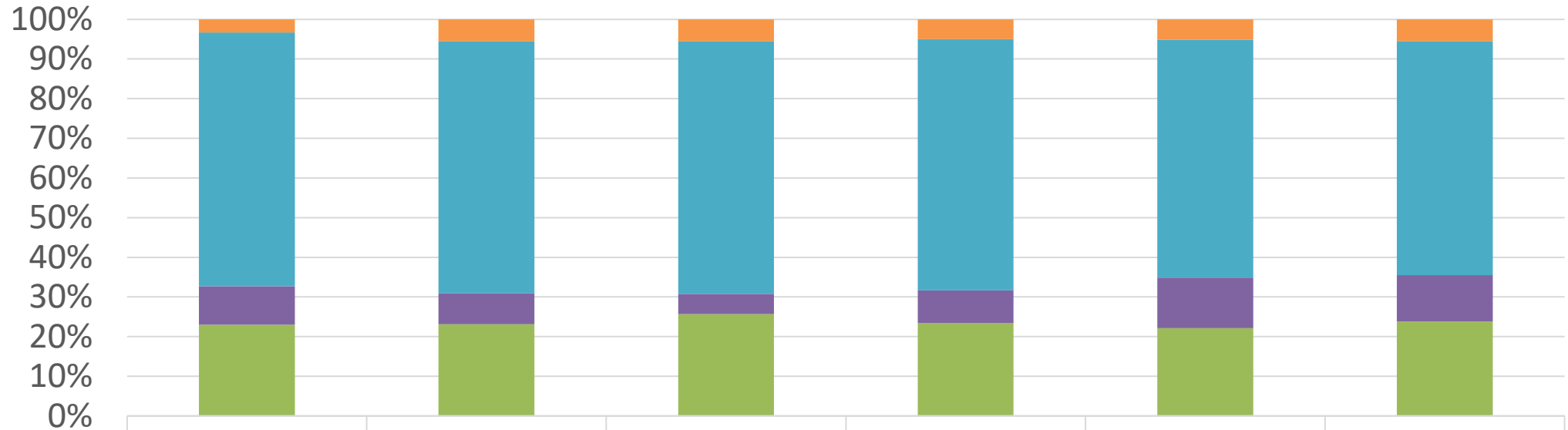
Table values presented in MMTCO₂e

Transportation Sector



Transportation Sector

Transportation Emissions by Fuel Type (% of Total)



	2005	2010	2015	2016	2017	2018
■ Natural Gas	32,312	49,517	45,700	42,547	46,188	48,850 ↑
■ Motor Gasoline	628,121	571,588	532,669	535,957	539,177	522,404 ↓
■ Jet Fuel	95,404	70,572	42,599	69,246	114,692	103,656 ↓
■ Diesel	225,678	208,177	214,410	198,257	198,552	210,825 ↑

Waste Management Sector

GHG Emissions from Waste Management Sector (% of Total)

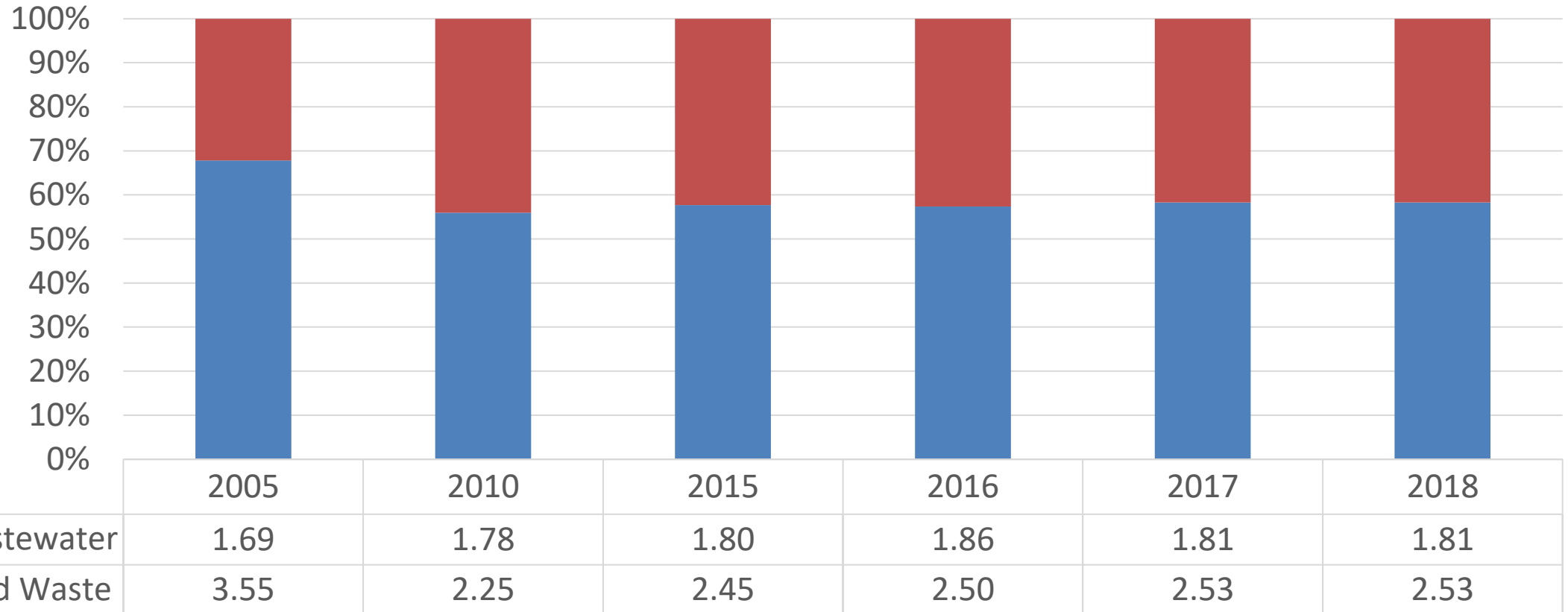


Table values presented in MMTCO₂e

Agricultural Sector

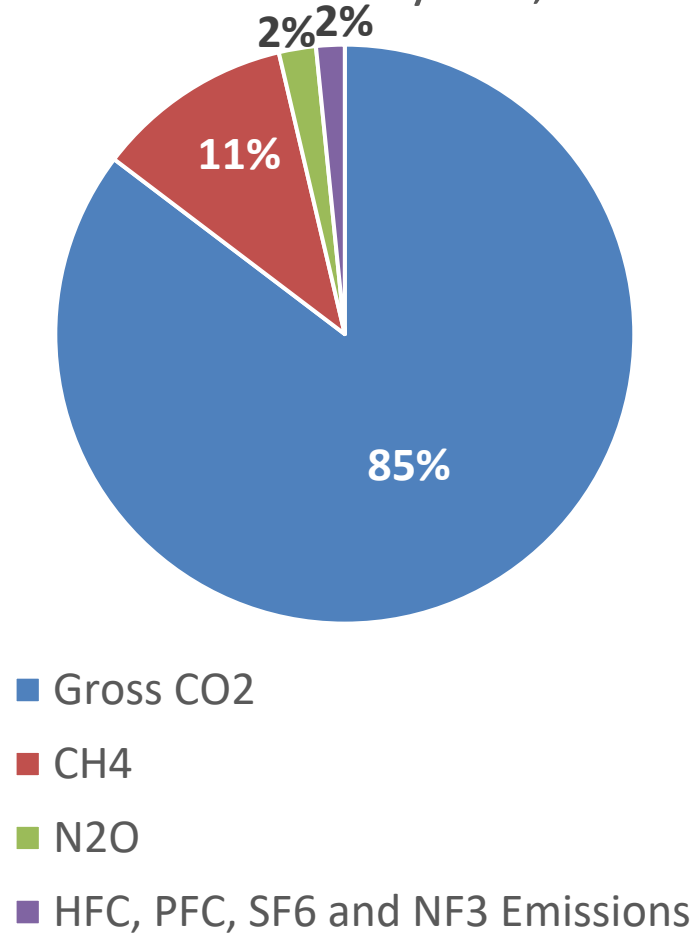
GHG Emissions from Agricultural Sector by Source (% of Total)



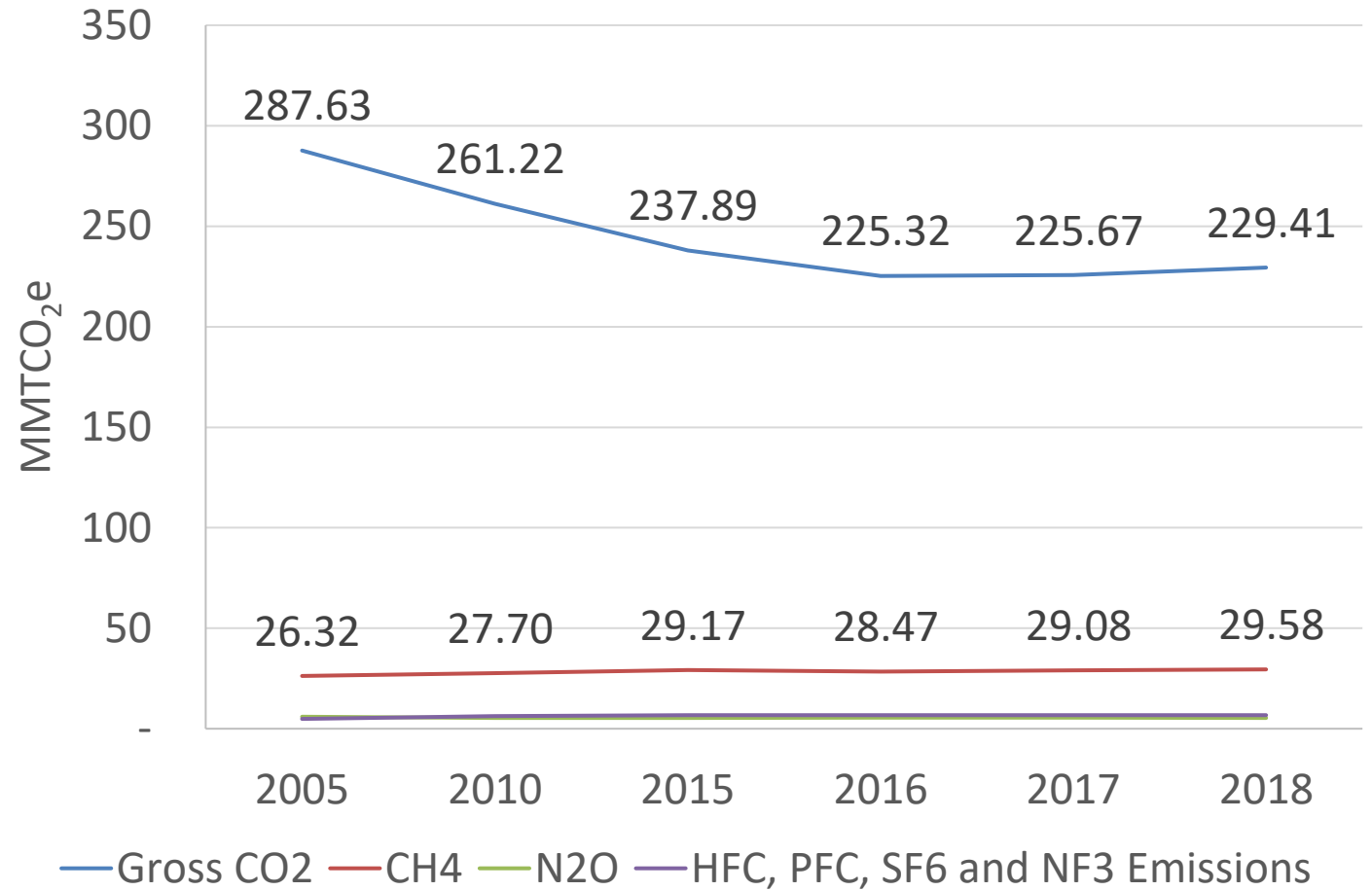
Table values presented in MMTCO₂e

Summary by Gas

GHG Emissions by Gas, 2018



GHG Emissions by Gas, 2005-2018





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Energy Programs Office

Questions?



Public Comment (15 min)



Break

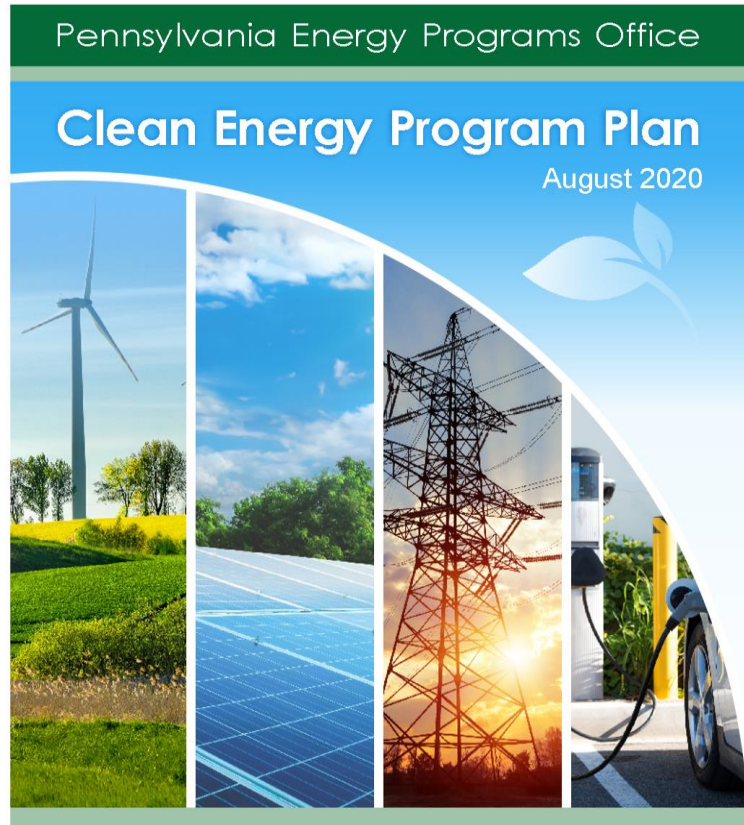
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Clean Energy Program Plan



- Summarizes the Energy Programs Office's energy-related plans, supporting policies, and programs;
- Recommends new clean energy actions to be taken over the next several years;
- Explores approaches that may be taken to anticipate future events and mitigate disruptions to ensure energy resilience and security.
- Guides EPO toward achieving ambitious long-term clean energy goals while fulfilling our obligations to support energy conservation and efficiency, advance clean energy technologies, and ensure energy security and resilience.



7200-BK-DEP5299 8/2020 G2445-AUG2020



Clean Energy Program Plan

Collaborative Effort with our Partners:

In addition to DEP, EPO and our Consultants:

- Offices and agencies within the Pennsylvania government,
 - DCED, PAPUC, Dept of Ag.
- Non-Governmental Organizations,
- Regional planning commissions,
- Energy policy consultants,
- Higher education institutions,
- Technology experts,
- Utilities, and
- Advocacy organizations.

Clean Energy Program Plan

Includes: EPO's Purpose and Mission

Who We Are and What We do

- History and Function
- Clean Energy Leadership
- Partnerships with Other Agencies, Networks and Programs
- Energy Assurance and Climate Obligations
- Key Programs

EPO Five Focus Areas

- Energy conservation and efficiency
- Advanced energy technologies
- Energy security and resilience
- Climate change mitigation and adaptation
- Education and outreach

Clean Energy Program Plan

Includes: Near-Term Planning Suggestions and Tools

Recommendations for Short-Term Program Actions or Initiatives

- Actions that will develop a pathway to achieving long-term Commonwealth climate and energy goals while providing residents and businesses with clean, reliable energy.
- Focus on both expanding or enhancing existing programs; and developing new programs

Guiding Principles and Best Practices for EPO Planning and Programming

- Enhance collaboration between government and stakeholders.
- Enhance the marketing of programs and communication of results.
- Integrate energy assurance and resilience in planning efforts.
- Consider the needs of vulnerable communities and the effects of actions on equity, access, and inclusion.

Clean Energy Program Plan

Includes: Suggestions on Measurement and Evaluation

To Ensure Programs are on Track and are Delivering Expected Results:

- Conduct program assessments periodically to assess progress over the program duration
- Develop and deploy a program tracker to provide a comprehensive overview of ongoing efforts
- Reconfirm Program metrics – examples provided in report
 - Funds invested in clean energy programs.
 - Number of business or people trained.
 - Website hits or downloads on specific resources or training materials.
 - Number of new clean energy projects implemented across the state, or total installed new capacity.
 - Number of communities directly benefitting from EPO-funded programs, and varied characteristics of those communities to ensure equity.

Clean Energy Program Plan

Includes: Forward Looking Priorities

Technology Areas for Trend Tracking

- Carbon capture utilization and sequestration (CCUS)
- Offshore wind and Energy Storage
- Disruptive digital technologies
- Small and large distributed energy resources
- Alternative fuels
- Transportation innovations

A Focus on Energy Resilience

- An overarching priority for EPO's programs both today and into the future is to maintain and enhance preparedness to respond to and assist in recovery from disruptive events that affect Pennsylvania's energy systems.

Clean Energy Program Plan

An Emphasis on Equity

- The effects of climate change are growing and the burdens of climate change are not equally distributed.
- Communities that are especially vulnerable or underrepresented often suffer the most, and climate change impacts can exacerbate existing social inequalities.
 - Access to clean, affordable energy is a key strategy to address both concerns.
- EPO should increase its work with the DEP Environmental Justice Office and other agencies to create programs to benefit vulnerable communities and consider the needs and concerns of these communities

Clean Energy Program Plan

Includes: Guidance on Ensuring Success

- Strive to identify and recognize the potential for technology to both solve problems and enhance business practices in the energy marketplace to achieve EPO's mission
- Look to anticipate needs and implement adjustments to programs to leverage technologies and services with the potential to have the largest effect either by broad implementation or via transformational breakthroughs in technology.
- Dedicate staff time and efforts to focus on planning and building relationships with a broad set of stakeholders of differing perspectives.
- Seek regular input from stakeholders to keep program implementers up to date on what is happening around the Commonwealth and how technology, program, and project implementation is changing.

Clean Energy Program Plan

Project Recommendations:

	Renewable Energy	Energy Efficiency	Transportation	Energy Workforce	Climate and Energy
Recommended Programs	+ Support the Deployment of Agricultural Renewable Energy	+ Support and Grow Commercial and Industrial Energy Benchmarking	+ Explore Low-Carbon Transportation Options with PENNDOT	↻ Expand E4 by Providing Resources to assist Changing Workforces	+ Local Government Pooled Procurement of Energy Services
	+ Solar Guidance for Local Government	+ Provide Outreach to Wastewater Treatment Plant (WWTP) Operators on Energy	↻ Modernize the Alternative Fuels Incentive Grant Program		+ Create a Green Bank for Energy Efficiency and Renewable Energy
	+ Support Community Solar Efforts				↻ Expand Climate Planning Efforts with Local Governments

Clean Energy Program Plan

Progress on Recommendations:

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Clean Energy Program Plan

EPO will endeavor to develop and deliver the recommended program actions contained in the report and retain a future focus in order to achieve success in achieving both short and long-term energy and environmental goals.

- Collaborating with other agencies and organizations
- Considering equity, access, and inclusion and the needs of and effects on vulnerable communities
- Ensuring effective marketing of programs and results
- Conducting program impact assessments
- Creating and using a program tracker
- Integrating energy assurance and resilience in planning efforts



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Energy Programs Office

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Next Meeting

2021 Regular Meeting Dates:

- ~~Tuesday February 23~~
- ~~Tuesday April 27~~
- ~~Tuesday June 22~~
- ~~Tuesday August 24~~
- **Tuesday October 26**
- Tuesday December 14