

Colorado's Greenhouse Gas Inventory

2018 Update
including Projections to 2020 & 2030



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of Public Health
and Environment

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Overview

- Process To Develop Inventory
- Layout of the Document
- Results
- Next Steps

Process To Develop Inventory

- Top-down approach
- Detailed description of the methodology used
- State Inventory Tool (SIT) – model used
 - Links major national data bases to calculation schemes
 - Has consistency with other states
 - Follows the international GHG protocol the U.S. agreed to follow for the national inventory
 - Allows for customization of emission factors and activity assumptions
 - Was updated by EPA in 2013 to improve the process using latest assumptions

Process To Develop Inventory

- Draft relies solely on SIT Model default values
- SIT Model allows customization to either better reflect Colorado's emissions or test alternative scenarios
- As a general rule inventory presents data as organized by model, but limited reorganization done to provide a more cohesive sector based analysis of GHG emissions in Colorado

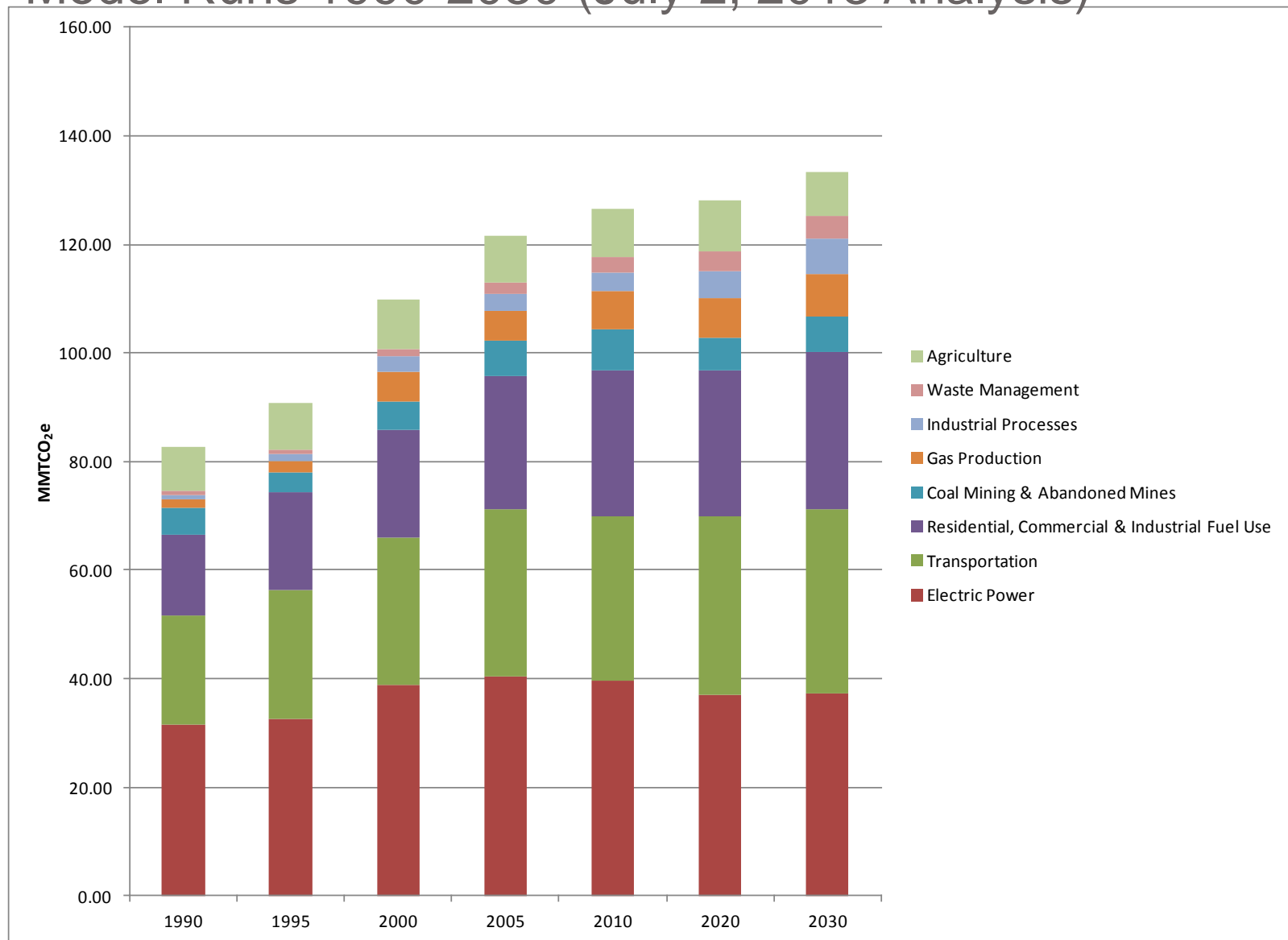
Layout of the Document

- Executive Summary
- Synthesis Chapter
 - Summarizes the results from entire model for the period from 1990-2010
- Projection Chapter
 - Summarizes the results from the projection module (2010-2030)
- Individual Chapters for Each Sector

Sectors

- Electrical Power
- Residential, Commercial, Industrial (RCI) Fuel Use
- Industrial Processes
- Coal Mining and Abandoned Mines
- Gas Production
- Agriculture
- Waste Management
- Land Use and Forestry

Summary of Colorado GHG Emissions by emission sector SIT Model Runs 1990-2030 (July 2, 2013 Analysis)



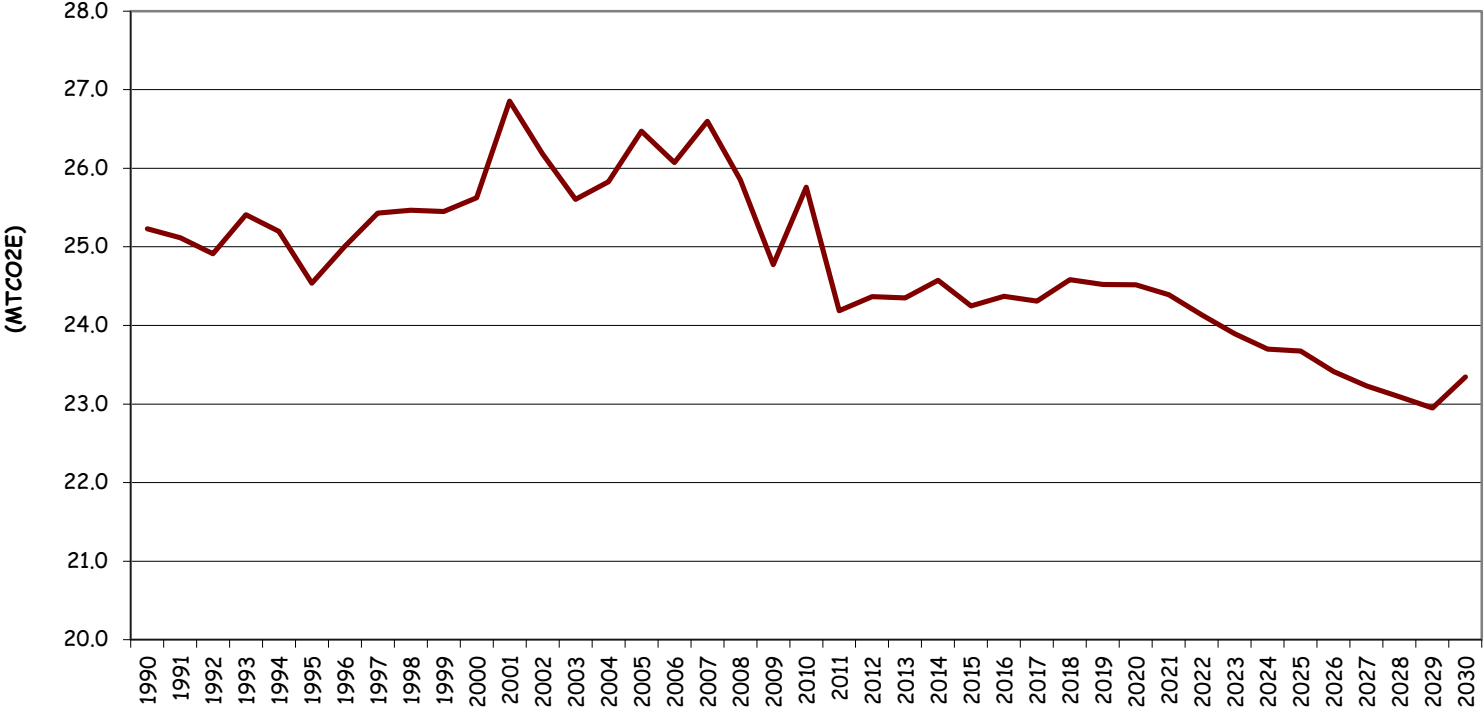
Summary of Colorado GHG Emissions by emission sector SIT Model Runs 1990-2030 (July 2, 2013 Analysis)

	1990	1995	2000	2005	2010	2020	2030
Electric Power	31.43	32.66	38.83	40.29	39.53	37.06	37.36
Transportation	20.11	23.73	27.02	30.88	30.47	32.95	33.71
Residential, Commercial & Industrial Fuel Use	15.01	17.87	19.96	24.50	26.81	26.77	29.10
Coal Mining & Abandoned Mines	4.81	3.73	5.32	6.61	7.54	5.96	6.60
Gas Production	1.72	2.00	5.39	5.47	6.98	7.47	7.89
Industrial Processes	0.72	1.41	2.94	3.16	3.58	4.89	6.28
Waste Management	0.81	0.80	1.29	1.97	2.62	3.73	4.20
Agriculture	8.14	8.44	9.14	8.77	9.04	9.24	8.25
Grand Total	82.74	90.65	109.88	121.65	126.57	128.06	133.38
Electricity Consumption	N/A	N/A	38.75	43.55	48.32	62.12	70.04
Land Use & Forestry	-11.64	-10.53	-10.96	-10.97	-8.99	N/A	N/A

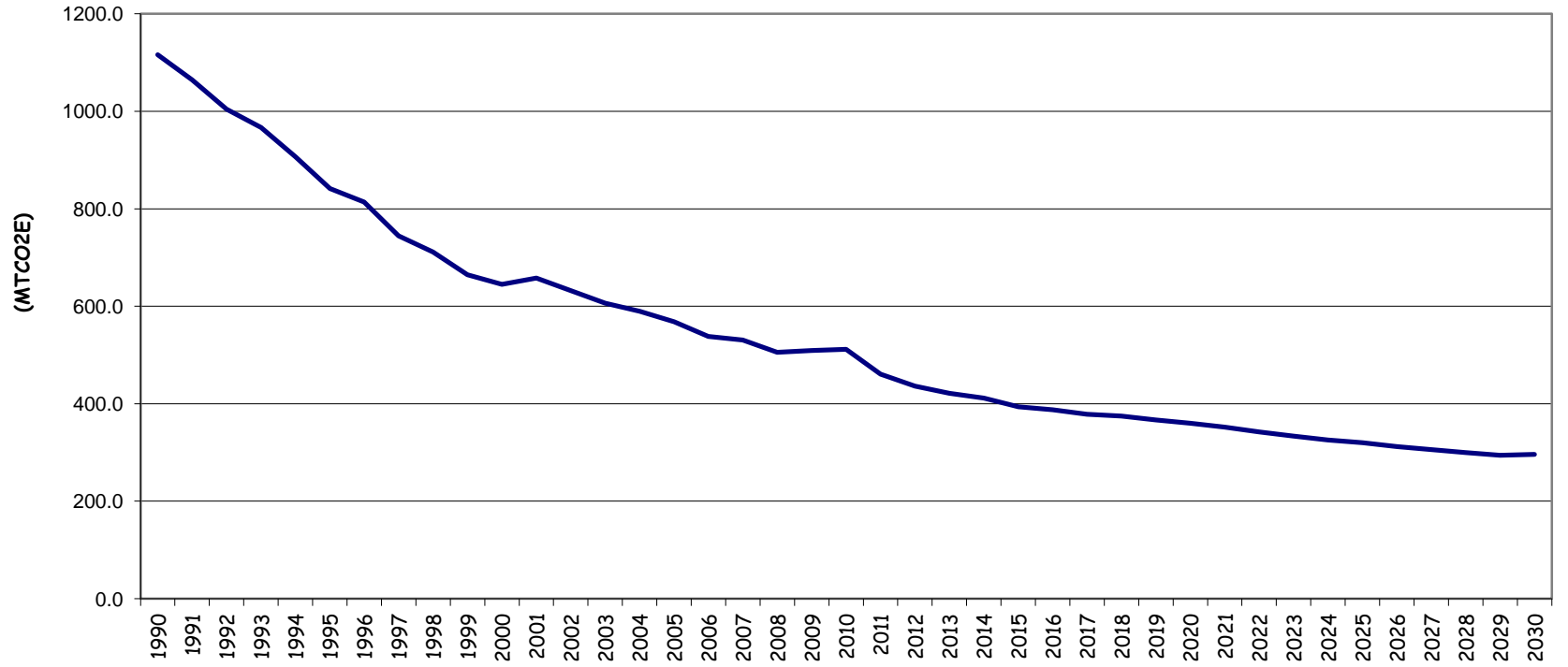
Summary of Past and Projected GHG Emissions by Gas in Colorado (MMT_{CO₂e})

	1990	1995	2000	2005	2010	2020	2030
CO₂							
CO ₂ from Fossil Fuel Combustion	65.33	72.68	84.17	94.38	95.99	96.44	99.78
Industrial Processes	0.36	0.64	1.47	1.33	1.44	1.64	2.05
Waste Combustion and Landfills	0.11	0.16	0.17	0.20	0.20	0.26	0.30
Total Emissions	65.8	73.48	85.81	95.91	97.63	98.34	102.13
CH₄							
Stationary Combustion	0.08	0.08	0.09	0.09	0.09	0.04	0.04
Mobile Combustion	0.09	0.1	0.08	0.06	0.04	0.03	0.03
Coal Mining & Abandoned Mines	4.81	3.73	5.32	6.61	7.54	5.96	6.6
Natural Gas and Oil Systems	1.72	2	5.39	5.47	6.98	7.47	7.89
Enteric Fermentation	3.87	4.32	4.61	4.52	4.95	5.33	4.64
Manure Management	0.38	0.51	0.71	0.75	0.87	0.75	0.77
Rice Cultivation	-	-	-	-	-	-	-
Burning of Agricultural Crop Waste	0.009	0.009	0.009	0.009	0.012	0.004	0.004
Waste Combustion and Landfills	0.61	0.53	0.94	1.58	2.19	2.83	3.18
Wastewater	0.26	0.3	0.35	0.36	0.39	0.46	0.53
Total Emissions	11.83	11.58	17.50	19.45	23.06	22.87	23.68
N₂O							
Stationary Combustion	0.17	0.18	0.21	0.21	0.21	0.19	0.19
Mobile Combustion	0.87	1.22	1.26	0.92	0.48	0.33	0.31
Industrial Processes	-	-	-	-	-	-	-
Manure Management	0.43	0.48	0.57	0.53	0.51	0.53	0.48
Agricultural Soil Management	3.45	3.12	3.24	2.96	2.68	2.63	2.35
Burning of Agricultural Crop Waste	0.003	0.003	0.003	0.003	0.004	0.002	0.002
Waste Combustion and Landfills	0.01	0.01	0.01	0.01	0.01	0.01	0
Wastewater	0.09	0.11	0.13	0.14	0.15	0.18	0.22
Total Emissions	5.02	5.12	5.42	4.77	4.04	3.87	3.55
HFC ,PFC ,and SF₆							
Industrial Processes	0.72	0.77	1.47	1.83	2.14	3.25	4.23
GRAND TOTAL	83.37	90.95	110.20	121.96	126.88	128.34	133.60
Electricity Consumption Emissions (CO₂ Eq.)	27.73	31.81	38.75	43.55	48.32	62.12	70.04
LULUCF	-11.64	-10.53	-10.96	-10.97	-8.99	N/A	N/A

Gross GHG Emissions Per Capita, 1990-2030



Gross GHG Emissions per GSP, 1990-2030



Next Steps

- Accepting Comments on the Draft Inventory until March 15, 2014
 - Posted on the APCD's website
 - E-mail comments to Theresa.Takushi@state.co.us
- Determine if any modifications need to be made
- Make edits as appropriate
- Issue a final document

Sectors That May be Tailored to Colorado Based on Comments Received

- Electrical Power
- Transportation
- Oil and Gas
- Coal
- Population
- Methane Emission Factor

Comments Received

- Electrical Power
 - Energy Production vs Consumption
 - Reflect Colorado Regulations – Clean Air Clean Jobs, Regional Haze, Renewable Portfolio Standards
- Transportation
 - Moves Vs Mobile 6

Comments Received

- Oil and Gas
 - Transmission and distribution
 - Projections
- Coal
 - More reflective of actual production

Comments Received

- Population
 - Census Data vs State Demographer's Office
- Methane Emission Factor

Questions?
