

GHG Rules, Statewide GHG Inventories, & AFOLU Sector.

January 30, 2018

Clean Air Branch



Healthy Communities, Healthy Islands, Healthy People

Carbon Farming Task Force

Introduction

- The GHG Rules are required by Hawaii Act 234, 2007.
- Sets statewide greenhouse gas emissions limit to equal or below 1990 levels by 2020 (13.66 million metric tons per year of CO₂e, excluding aviation and international bunker fuel emissions and includes carbon sinks).
- DOH has a contractor compiling statewide GHG emissions inventories to track progress in meeting statewide GHG Limit.
- The Agriculture, Forestry, and other Land Uses (AFOLU) sector consists of both sources and sinks of GHG emissions.



HAR 11-60.1-204(k)

- DOH must conduct annual reports evaluating progress in achieving the statewide GHG emissions limit.
- These progress reports will be posted on the Clean Air Branch website.

<http://health.hawaii.gov/cab/>



ICF Incorporated, L.L.C.

Experience:

- 25 years supporting preparation of EPA's inventory of U.S. GHG emissions and sinks.
- State and local GHG inventory reports.

IPCC-Intergovernmental Panel on Climate Change is a scientific & intergovernmental body under the United Nations dedicated to providing world with an objective, scientific view of climate change.

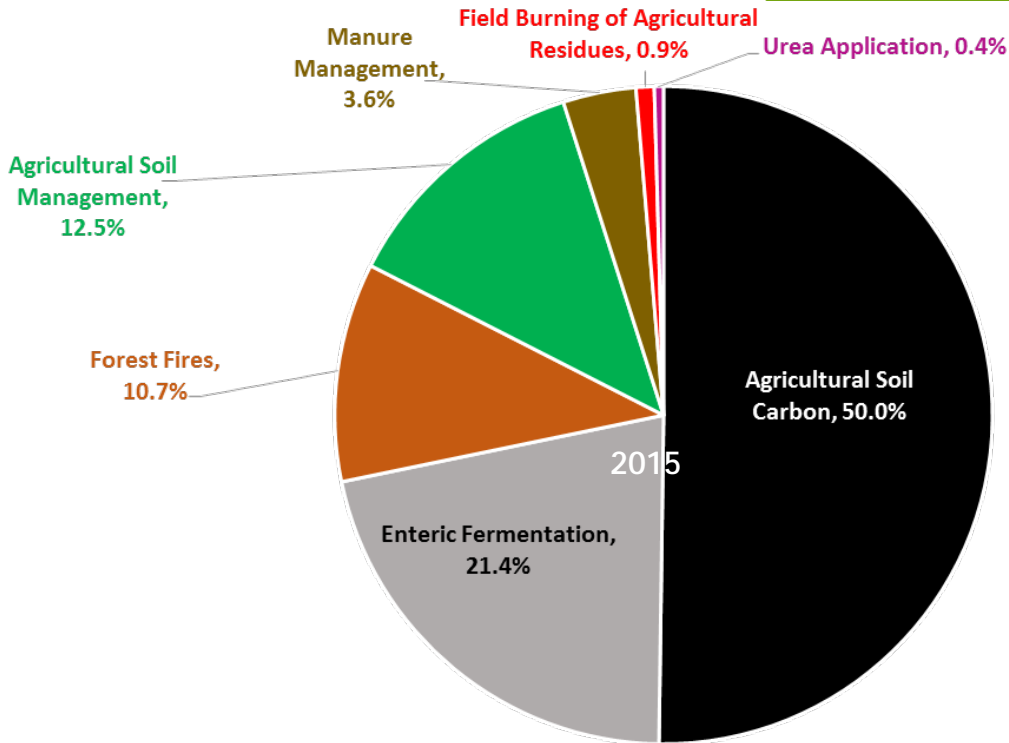


ICF Incorporated, L.L.C.

- Provide three annual reports with:
 - 1) Updated statewide GHG emissions for prior inventories (1990, 2007, & 2010);
 - 2) Compile new 2015, 2016, and 2017 statewide GHG inventories; and
 - 3) GHG projections for 2020 and 2025.



2015 AFOLU Sources

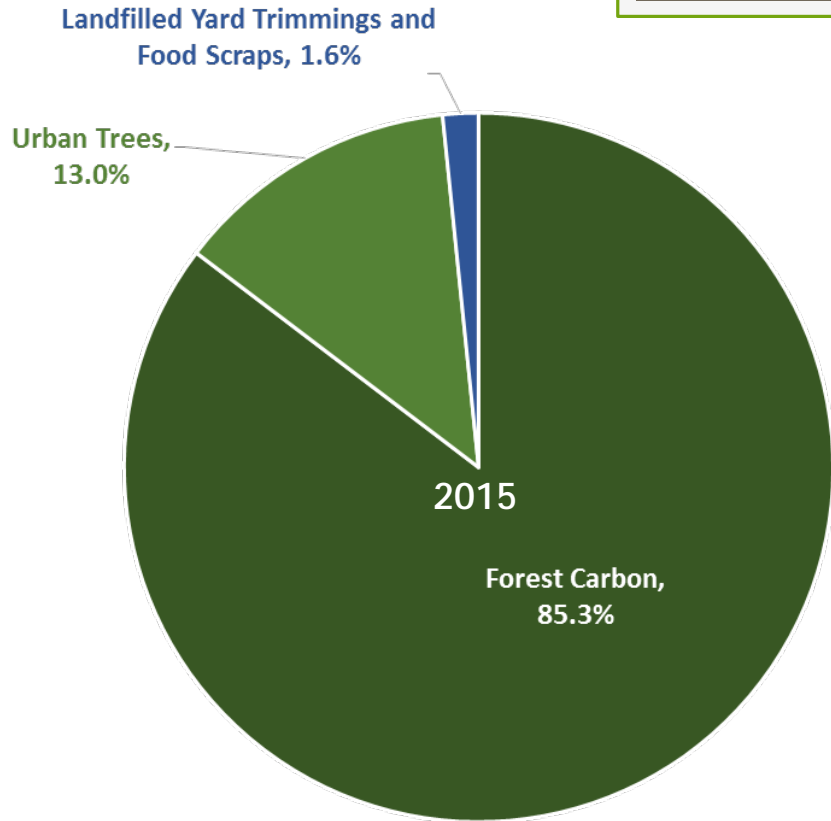


Largest sources are agricultural soil carbon followed by enteric fermentation, agricultural soil management, and forest fires.

AFOLU Sector Sources (2015)	Percent Contribution	MMTCO ₂ e
Agricultural Soil Carbon	50.0%	0.56
Enteric Fermentation	21.4%	0.24
Agricultural Soil Management	12.5%	0.14
Forest Fires	10.7%	0.12
Manure Management	3.6%	0.04
Field Burning of Agricultural Residues	0.9%	0.01
Urea Application	0.4%	0.005
	Total ----->	1.12

MMT=Million Metric Tons
CO₂e=Carbon Dioxide Equivalent Emissions

2015 AFOLU Sinks



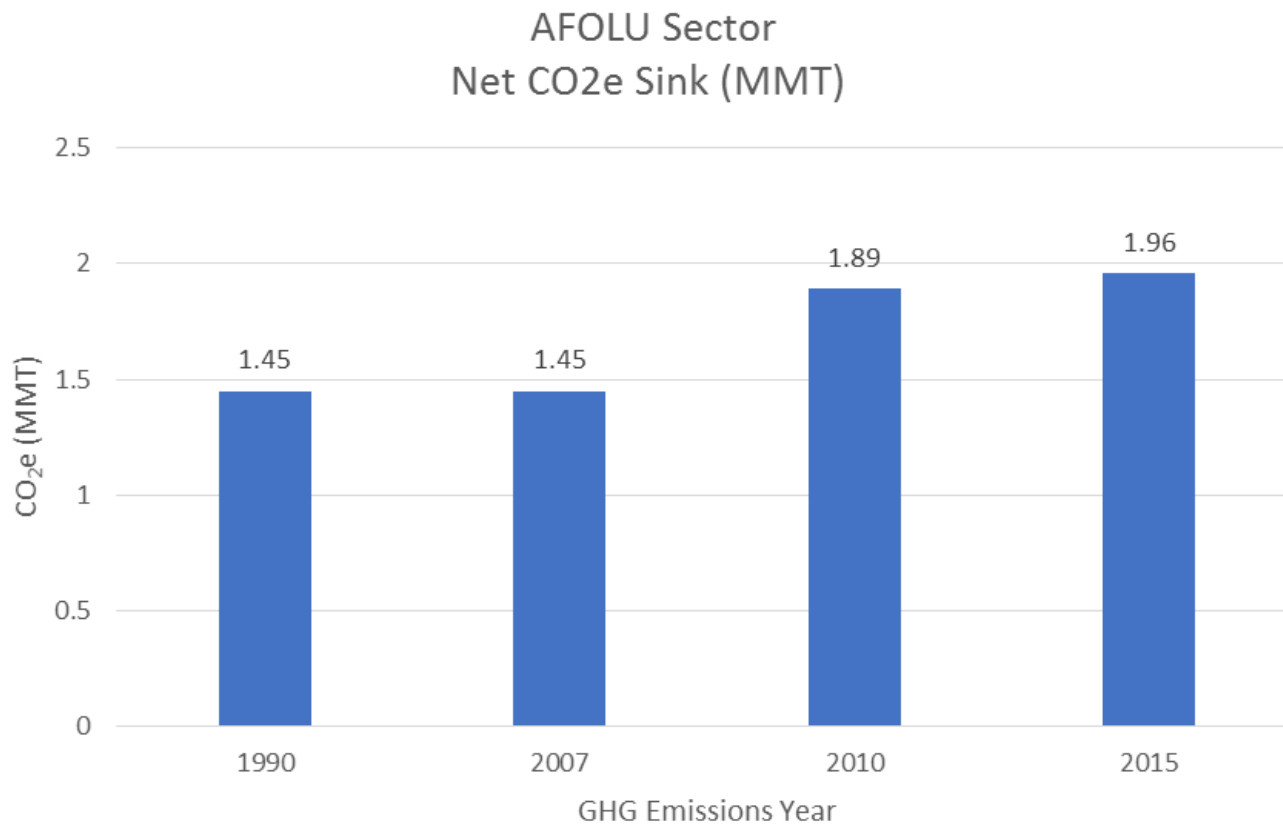
Largest sink is forest carbon followed by urban trees and landfilled yard trimmings and food scraps.

AFOLU Sector Sinks (2015)	Percent Contriubution	MMT _{CO₂e}
Forest Carbon	85.3%	2.62
Urban Trees	13.0%	0.40
Landfilled Yard Trimmings and Food Scraps	1.6%	0.05
	Total ----->	3.07

MMT=Million Metric Tons
 CO₂e=Carbon Dioxide Equivalent Emissions

AFOLU Net Sink (1990 – 2015)

- Net sink from AFOLU has increased in 2015 from the net sink in 1990.
- Increase in net sink attributed mostly to decrease in forest fires.



Where's GHG Inventory Work Now?

- DBEDT, DOT, and DOH are providing data to ICF for compiling statewide GHG emission inventories.
- Initial annual report from ICF is expected second half of 2018.
- Annual report will be reviewed by DOH and other state and county agencies prior to finalizing.



Conclusions

- Statewide GHG emission inventories will be used to track progress in achieving statewide GHG reduction goals.
- Forest carbon accounts for the largest share of sinks to offset statewide GHG emissions.

Thank You

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New AFOLU Estimates (preliminary)

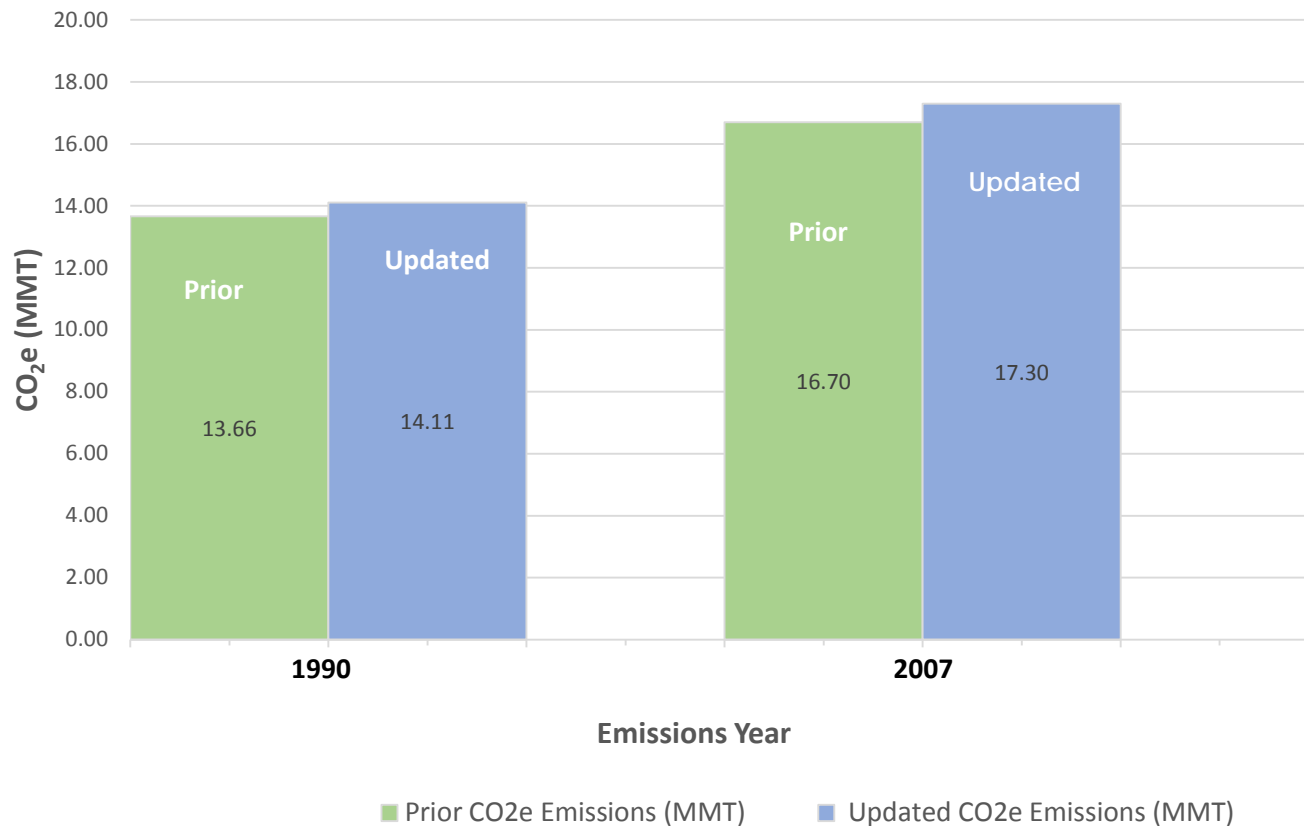
Category	1990	2007	2010	2015
Agriculture	0.66	0.51	0.47	0.42
Enteric Fermentation	0.32	0.29	0.27	0.24
Manure Management	0.15	0.05	0.04	0.04
Agricultural Soil Management	0.17	0.16	0.15	0.14
Field Burning of Agricultural Residues	0.03	0.01	0.01	0.01
Urea Application	+	+	+	+
Land Use, Land-Use Change, and Forestry	(2.11)	(1.96)	(2.36)	(2.39)
Agricultural Soil Carbon	0.57	0.48	0.53	0.56
Forest Fires	0.38	0.61	0.20	0.12
Landfilled Yard Trimmings and Food Scraps	(0.12)	(0.04)	(0.05)	(0.05)
Urban Trees	(0.28)	(0.37)	(0.38)	(0.40)
Forest Carbon	(2.66)	(2.64)	(2.66)	(2.62)
Total (Sources)	1.61	1.60	1.20	1.11
Total (Sinks)	(3.06)	(3.05)	(3.09)	(3.07)
AFOLU Net Total	(1.45)	(1.45)	(1.89)	(1.96)

+ Does not exceed 0.005 MMT CO₂ Eq.

Notes: Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

Update Prior Statewide GHG Inventories

Prior and Updated Statewide GHG Inventories (1990 & 2007)
(Excluding Aviation and International Bunker Fuel Emissions and Including Carbon Sinks)



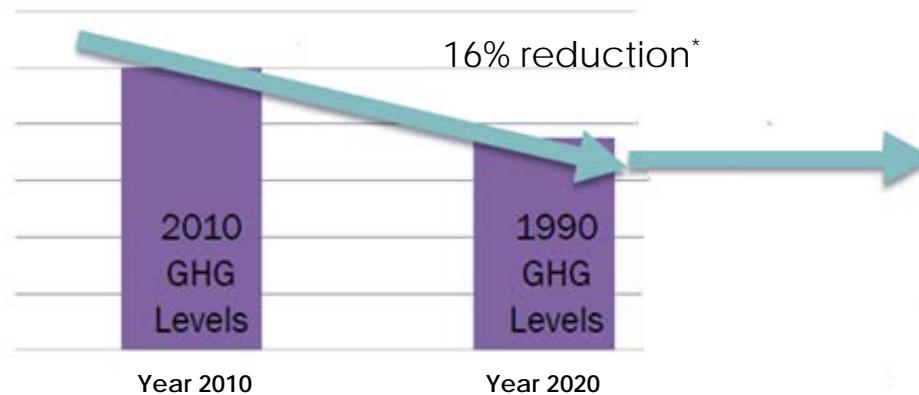
Changes include updated:
GWPs;
Fuel consumption data; and
GHG emission factors.
MMT= Million Metric Tons



Backup Slide

- To help meet goal – GHG emission cap specified for stationary sources.
- Potential CO₂e emissions threshold of 100,000 tons/year.
- Cap is set at 16% below facility's baseline emission level unless alternate cap is approved if 16% reduction cannot be achieved.
- Use 2010 or as baseline or alternate approved baseline emission level for establishing the cap.

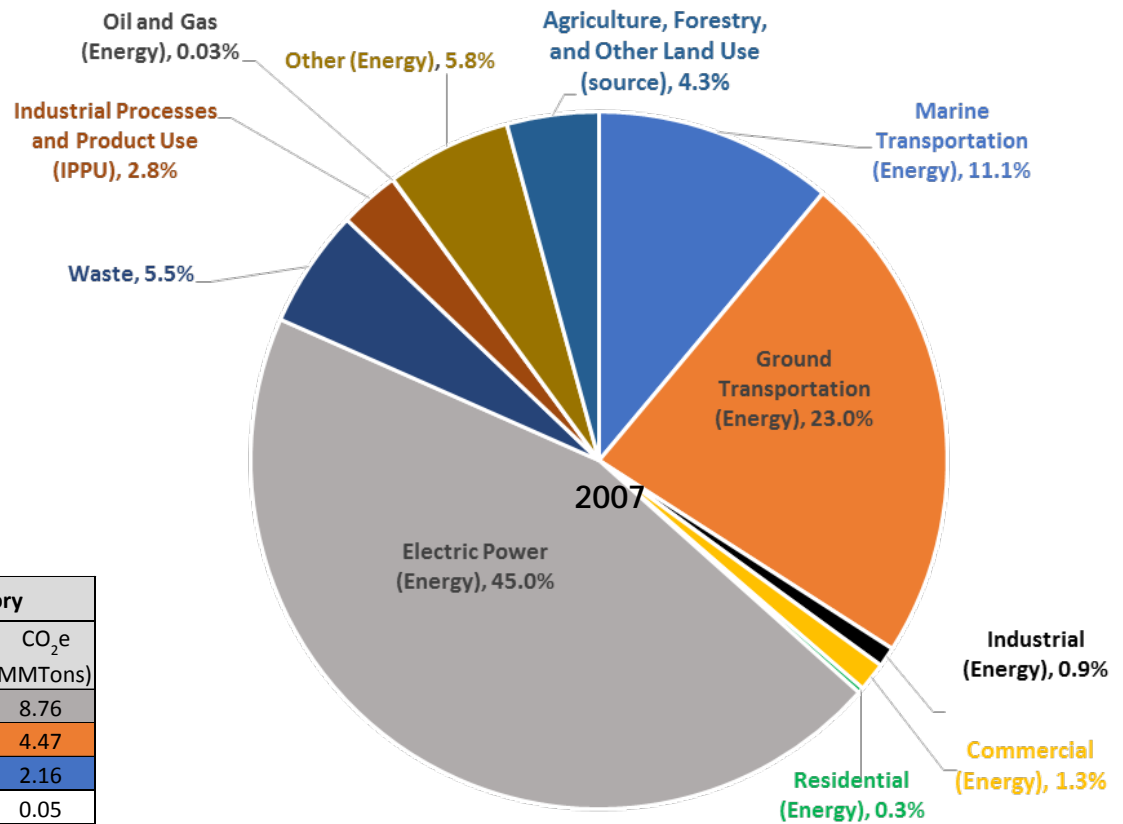
Statewide Stationary Source GHG Emission Levels



* 13.2% + Factor of Safety = 16% Reduction



Backup Slide



Prior 2007 Statewide GHG Emissions Inventory	
Sector/Category	CO ₂ e (MMTons)
Electric Power (Energy)	8.76
Ground Transportation (Energy)	4.47
Marine Transportation (Energy)	2.16
Residential (Energy)	0.05
Commercial (Energy)	0.26
Industrial (Energy)	0.18
Oil and Gas (Energy)	> 0.01
Other (Energy)	1.13
Waste	1.07
Industrial Processes and Product Use (IPPU)	0.54
Agriculture, Forestry and Other Land Use (source)	0.83
Agriculture, Forestry and Other Land Use (sink)	-2.75
Total →	16.70

Hawaii Administrative Rules, Chapter 11-60.1 Subchapter 11



	Threshold
Requires reductions from Hawaii's largest "existing" emitters (18)	$\geq 100,000$ CO ₂ e tons/year (biogenic and non-biogenic emissions)

Affects mainly electric power producers, refineries, and large commercial operations

*Excludes municipal waste combustion operations
Excludes municipal solid waste landfills with controls*

Represents about 88% of Hawaii's stationary source GHG emissions

