



CalRecycle/CARB
Waste Management Sector Plan Workshops

RECYCLING, REUSE AND REMANUFACTURING
(June 18, 2013 draft)

Supportive written copies prepared by Edgar & Associates, Inc. provided during the June 18, 2013 CalRecycle/CARB Waste Management Sector Plan Workshops.

Section 11.A – Collection – *Discuss fleet emissions and Carbon Negative Fleets*

The solid waste and recycling industry as a system – including greenhouse gas (GHG) emissions from collection and processing, and not including landfilling, - typically emit 90% of their GHG from collection considered as Scope 1 direct emissions, and 10% of their GHGs as Scope 2 indirect emissions from processing the material.

Today in California, there are over 15,000 refuse and recycling collection vehicles in California, with over 2,000 plus collection vehicles running on CNG, or about 13% of the fleet. The South Coast Air Quality Management District (SCAQMD) adopted Rule 1193 requiring the use of CNG vehicles for all new refuse and recycling contracts, and a five-year phase-in for current contracts. SCAQMD reports that today there are over 1,850 CNG vehicles in the district, with a projected 4,500 CNG vehicles by 2020. Using CNG fuel reduces GHG by 22% per truck compared to diesel.

With a dramatic transition underway from diesel to CNG vehicles, there will be a demand for renewable CNG (RNG). Using RNG from biomethane has been declared to be carbon negative where you could have a carbon negative fleet.

Section 11.B – Processing – *Discuss relation to the 75% Plan and determine Programs Tons and GHG Avoidance per each Program*

Since the 75% Recycling Plan was released, we have commented on the need to determine the tonnage amount and GHG reductions by the type of Program. The AB 32 Scoping plan adopted measures by Program type as listed on the next page, and the 5-Year Scoping Plan update and The 75% Recycling Plan should also list tonnage amounts by Program type.

AB 32 Scoping Plan - Methane Capture and High Recycling/Zero Waste - (MMTCO2E in 2020)

Measure No.	Measure Description	MMTCO2E Reductions
RW-1	Landfill Methane Control (Discrete Early Action)	1
RW-2	Additional Reductions in Landfill Methane <ul style="list-style-type: none"> • Increase the Efficiency of Landfill Methane Capture 	TBD
RW-3	High Recycling/Zero Waste <ul style="list-style-type: none"> • Mandatory Commercial Recycling • Increase Production and Markets for Organics Products • Anaerobic Digestion • Extended Producer Responsibility • Environmentally Preferable Purchasing 	5 2 2 TBD TBD
	Total	10

CalRecycle determine that the number of jobs that could be created by for the 75% Recycling Plan to be 100,000 for 22 million tons of material listed by material types. We have commented that those numbers should be translated to Program Types with the GHG avoidance calculated. Edgar & Associates has done that – copied below.

**Calculate Avoided Greenhouse Gases Emissions
Potentially Avoided by Recycling in California by 2020**

22 Million Tons of Recyclables			Avoided Recycling Emission Factors (MTCO ₂ e/ton)	Avoided Landfill Emission Factors (MTCO ₂ e/ton)	Avoided Recycling Emissions ⁵ (MTCO ₂ e)X 1,000	Avoided Landfill Emissions ⁷ (MTCO ₂ e) X 1,000
Material Type	Material Composition Share %	Material Tons X 1,000				
Paper - MCR	15%	3,300	4.1	0.088	13,530.0	289.7
Glass - MCR	1%	220	0.2		44.0	
Metal - MCR	4%	880	5.15		4,532.0	
Plastics - MCR	9%	1,980	1.2		2,376.0	
Green Waste Compost	10%	2,200	0.16	0.195	352.0	427.9
Food – AD/compost	13%	2,860	0.16	0.250	457.6	715.3
<u>Other Organics –</u>						
Yard Waste Compost	4.5%	990	0.16	0.195	158.4	192.6
Biomass Energy	4.5%	990	0.21	0.047	207.9	46.1
Lumber (biomass energy)	12%	2,640	0.21	0.047	554.4	123.0
<u>Other Inerts</u>						
Base Rock	16%	3,520	0.0079		27.8	
<u>Other –</u>						
Carpet	2.8%	620	2.37		1,468.8	
Dry Wall	1.8%	400	0.03		12.5	
Textiles	2.3%	500	-			
Bulky Items	1.8%	400	-			
Asphalt Roofing	2.3%	500	0.09		45.5	
Totals	100%	22,000			23,766.9	1,794.6
					25,561.5 MTCO₂e	

The Technical Paper should determine the Program tonnage and the GHG avoidance for that type of program for the following Program listed below:

- Mandated Commercial Recycling
- Anaerobic Digestion
- Composting
- Lumber to Energy
- Carpet Recycling

	AB 939 Current Accounting Statute	AB 341 Proposed 75% Recycling Plan
PPD to 2020	4.4 PPD in 2012 To 3.1 PPD by 2020.	5.4 PPD in 2011 to 2.7 PPD in 2020
Total Tons by 2020	9 million tons diverted	22 million tons recycled
New Jobs	40,000 jobs	100,000 jobs
GHG avoided	10 million tons GHG avoided	25 million tons GHG avoided
Statewide Programs Estimates		
Mandatory Commercial Recycling	1.5 million tons diverted 13,000 jobs 5 million tons GHG avoided 20 MRF processing lines	8.25 million tons recycled 71,500 jobs 21 million tons GHG avoided 110 MRF processing lines
Anaerobic Digestion	3.5 million tons diverted 7,500 jobs 2.9 million tons GHG avoided 34 million diesel gallon equivalents of renewable CNG	3.5 million tons recycled 7,500 jobs 2.0 million tons GHG avoided 34 million diesel gallon equivalents of renewable CNG
Composting	1.0 million tons diverted 2,170 jobs 0.7 million tons GHG avoided	3.65 million tons recycled 8,000 jobs 0.4 million tons GHG avoided
Lumber	2.2 million tons diverted 14,200 jobs 0.5 million tons GHG avoided 160 MW	3.0 million tons recycled 19,00 jobs 0.6 million tons GHG avoided 225 MW
Carpet	0.6 million tons diverted 4,000 jobs 1.4 million tons GHG avoided	0.6 million tons recycled 4,000 jobs 1.4 million tons GHG avoided

V. Challenges to Meeting Goals

A. Short-Term

GHG emission reduction quantifications can be performed using default emission reduction factors in the Federal EPA WARM model on an interim basis. This should not deter CalRecycle/CARB from determine GHG avoidance.

B. Long-Term

The need to develop a sustainable low-carbon waste management system needs to include the fleet collection and processing facilities, where the fleet can move to CNG and reduce GHG emission by 22% per truck, and could eventual be carbon negative by making their own fuel using the anaerobic digestion process. Processing facilities are adding solar and carbon-neutral biomass gasification facilities.