Beyond Waste

A Regulatory and Market Report by Edgar & Associates, Inc. April 2013

Recycling and composting policies to date have helped to create over 125,000 jobs in the State of California. Depending how you calculate the current landfill diversion rate or the proposed recycling rate, increasing recycling and composting by 2020 will add over 40,000 to 110,000 new jobs and avoid between 10 and 32 million tons of greenhouse gas emissions. With the passage of AB 341 in 2011, CalRecycle will be submitting a report to the Legislature on or before January 1, 2014 that provides strategies to achieve the state's policy goal that not less than 75% of solid waste generated be source reduced, recycled, or composted by 2020, with CalRecycle proposing to change the measurement methodology from a landfill diversion rate calculation to a recycling rate formula. In parallel to the CalRecycle 75% Recycling Plan preparation, the California Air Resources Board will adopt a five-year update to the AB 32 Scoping Plan that will review the progress made on the 100 adopted measures to reduce greenhouse gases, and devise new strategies or increasing existing strategies to further reduce greenhouse gases by 2020, where "waste" is one of the top three targeted programs. With CalRecycle and CARB having one eye on 2020 and the other eye on waste, each agency will be adopting transformative reports later this year. With waste reduction being the centerpiece of the AB 32 Scoping Plan update, with the production of renewable energy and carbon negative fuel from organic waste, now would be the time to appreciate the avoided greenhouse gas reduction benefits and potential job creation by diverting or recycling 75% by 2020. However, the public process has stalled out over the last 6 months and it is unclear if the final report to the Legislature will have passed through the robust public review that was originally proposed or incorporate missing items that have been brought to their attention, leaving the AB 32 Scoping Plan five year update as the trump card over the 75% Recycling Plan.

The California Integrated Waste Management Act of 1989 (AB 939) was an ambitious state mandate in 1989, with 50% of solid waste needing to be diverted from landfills by the year 2000. California had proclaimed victory over AB 939 in 2005 with a landfill diversion rate of 52%, with an eye on making zero waste happen. California has proudly achieved a 65% landfill diversion rate in 2011. In May 2012, CalRecycle released the discussion paper, ***"California's New Goal: 75% Recycling"***. The paper was a bold initiative to frame-up strategies that will be sent to the Legislature recommending statutory and regulatory changes to implement the desired strategies. With their report due in 2014, any legislative changes or regulatory activity derived during this process, and that could be successfully adopted, would probably not start until

2016, leaving just 4 years to meet the 2020 goals. CalRecycle wanted to move California into a new era that redefines what "recycling" means in California. Today's 65% landfill diversion rate would translate into a 49% proposed recycling rate. Landfill-based landfill diversion, such as alternative daily cover and beneficial reuse, would no longer count as landfill diversion. Landfill-based landfill diversion would not be considered recycling and would no longer be a paradox.

The new paradigm of recycling accounting instead of landfill diversion would lower the disposal indicator from 3.1 pounds per person per day (PPD) to just 2.7 PPD, and would count 6.6 million tons of what was landfill diversion as disposal, making the 75% goal more ominous. A comparison of the current AB 939 framework and the proposed AB 341 system is highlighted below, and if even legislatively possible, would not be in place until 2016. Instead of diverting another 9 million tons by 2020, the new paradigm would require that 19 million tons would need to be recycled or composted by 2020. In suggesting these bold plans, CalRecycle should be determining the avoided greenhouse gas benefits and job creation as part of the 75% Recycling Plan, where The Edgar Institute has projected that 40,000 to 110,000 new jobs can be created and between 10 to 32 million tons of greenhouse gas emissions would be avoided.

AB 939	AB 341
Jurisdictions	Statewide
50% Mandate	75% Goal
Currently at 65% Landfill Diversion	Would be 49% Recycling today
Landfill Diversion Accounting includes use of materials in a landfill and transformation	Recycling Accounting
Base Generation (2003-2006) 4 –year peak used in SB 1016 at 12.6 PPD	Base Generation (1990-2010) 20-year average at 10.7 PPD
9 million tons of additional diversion to reach 75% landfill diversion rate	19 million tons of recycling to reach 75% recycling rate
40,000 new jobs created	110,000 new jobs created
10 million tons of GHG avoided	32 million tons of GHG avoided
160 MW to 225 MW of bioenergy and 34 million DGE of renewable CNG	

The May 2012 Discussion Paper presented a snapshot in time and summarized programs that are currently being implemented, as well as potential new ways to tackle problematic waste streams. CalRecycle organized the existing efforts and new ideas into a series of "focus areas" with a dedicated Web page: http://www.calrecycle.ca.gov/75percent/. Each focused area is listed below and can be tracked with a click, and will be closely followed over the next 8 months. CalRecycle requested comments on ideas that may have been missed. Even before the CalRecycle Discussion Paper was released in May 2012, The Edgar Institute in their January 2012 Beyond Waste article calculated and submitted to CalRecycle that the 75% landfill diversion rate could translate into 40,000 new jobs, avoid 10 million metric tons of greenhouse gases, and divert 9 more million tons of waste, and provided that information again to CalRecycle after the release of the Discussion Paper. With the proposed change from landfill

diversion to recycling, The Edgar Institute has now calculated that the 75% recycling rate could translate into 110,000 new jobs, avoid 32 million metric tons of greenhouse gases, and recycle 19 more million tons of waste.

California's 75 Percent Initiative: Defining the Future http://www.calrecycle.ca.gov/75percent/.	
Focus Area 1: Increase Recycling Infrastructure	**Focus Area 7**: Other Materials
Focus Area 2: Organics	**Focus Area 8**: Governance/Funding
Focus Area 3: Increase Commercial Recycling	**Focus Area 9**: Source Reduction
Focus Area 4: Establish Extended Producer Responsibility	**Focus Area 10**: The Other 25 Percent
Focus Area 5: Reform Beverage Container Program.	**Focus Area 11:** Measurement
Focus Area 6: Increase Procurement/Demand	

It was also conveyed to CalRecycle that lumber to renewable energy should be highlighted since lumber is the second most prevalent waste type disposed. In 2008, 14.5% of landfill disposal was lumber, with about 5.7 million tons buried. Lumber is currently bundled under "inerts" in the charts within the Discussion Paper without a focused plan. Lumber is not inert, it is potential energy. Lumber to biomass energy should be specifically mentioned and be tied to the Governor's BioEnergy Action Plan to promote distributed green energy from the conversion of wood chips where 160 MW to 225 MW could be generated.

In determining job creation, a recent report from the Institute for Local Self Reliance was utilized with a general statewide program approach to determine material recycling tonnages referencing applicable state policies. The Institute for Local Self Reliance developed a set of job production estimates for 11 recycling and processing business categories that were used in their report, where so many jobs are created for each 1,000 tons of material type handled for collection, processing, manufacturing, landfilling, and incinerating. For every ton landfilled or burned, there are 20 new jobs created by recycling, or 5 new jobs by composting, and where manufacturing can add between 30 to 100 new jobs for each ton diverted, as summarized in the table below:

	DIVERTED WASTE				DISPOSED WASTE		
Material Type	**Collection**	**Processing**	**Manufacturing**	**Reuse**	**Collection**	**Landfill**	**Incineration**
	Jobs per 1,000 tons handled				**Jobs per 1,000 tons handled**		
Paper	**1.67 jobs per 1,000 tons**	**2.0 jobs per 1,000 tons**	**4.16**	**N/A**	**0.56 jobs per 1,000 tons**	**0.10 jobs per 1,000 tons**	**0.10 jobs per 1,000 tons**
Glass			**7.85**	**7.35**			
Ferrous			**4.12**	**20.00**			
Aluminum			**17.63**	**20.00**			
Plastics			**10.30**	**20.00**			
Rubber			**9.24**	**7.35**			
Textiles			**2.50**	**7.35**			
Wood			**2.80**	**2.80**			
Food		**0.50**	**0.50**	**N/A**			
Yard			**0.50**	**N/A**			

The AB 32 Scoping Plan adopted over 100 measures, and in the waste and recycling sector the adopted measures included mandatory commercial recycling, anaerobic digestion, and composting and extended producer responsibility. The key features of the AB 32 Scoping Plan included increasing renewable energy and producing low carbon fuels, where the recycling sector can provide wood chips from lumber for renewable energy and biomethane from anaerobic digestion to produce carbon negative fuel. The statewide tonnage amount needed to be diverted or recycled for each program is estimated below and converted to potential new job creation, GHG avoidance and energy production.

	AB 939 Current Accounting Statute	AB 341 Proposed 75% Recycling Plan
Total Tons by 2020	9 million tons diverted	19 million tons recycled
New Jobs	40,000 jobs	110,000 jobs
GHG avoided	10 million tons GHG avoided	32 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 25 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 2.9 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 2.4 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

<u>Commercial Recycling</u> – 1.5 million tons of traditional recyclables (AB 939) would need to increase to 8.25 million tons (AB 341). CalRecycle, with HF&H Consultants, prepared a study to determine the tonnage and costs to reduce 5 million metric tons of carbon dioxide equivalent (MMTCO2e) by 2020, where 1.5 million tons of dry commercial recyclables would need to be recycled and will require 20 more commercial processing lines at material recovery facilities handling 20 tons per hour, 16 hours per day, 310 days per year, with a 30% residual rate. With 1.67 collection jobs, 2.00 processing jobs and an average of 5.00 manufacturing jobs per 1,000 tons, the 1.5 million tons could result in over 13,000 new jobs.

In order to reach the new proposed paradigm of recycling, mandated commercial recycling would need to increase by over 5 fold to recycle 8.25 million tons by 2020. Over one-third of the commercial waste that was disposed of in 2010 would need to be processed and recycled, which will require 110 more commercial processing lines at material recovery facilities handling

20 tons per hour, 16 hours per day, 310 days per year, with a 30% residual rate. With 1.67 collection jobs, 2.00 processing jobs and an average of 5.00 manufacturing jobs per 1,000 tons, the 8.25 million tons of recycling could result in over 71,500 new jobs.

Anaerobic Digestion – 1.5 million tons of Food Waste and 2.0 million tons of Green Waste to total 3.5 million tons (AB 939 and AB 341): CalRecycle released the Final Program EIR for Anaerobic Digestion (AD) Facilities where it was assumed that there will need to be 70 AD facilities processing 50,000 tons (or 200 tons per day) of solid waste by 2020 to achieve state goals, which would divert about 3.5 million tons per year of organic material. Assuming a ratio of 40% food waste to 60% green waste in a dry fermentation process, 1.5 million tons of food waste would be recovered in 2020. Just one-third of the food waste disposed of in 2010 would need to be diverted and processed over the next 10 years. From ADC to AD, about 2 million tons of green waste ADC that does not count as disposal in 2010 could be re-directed to AD to bulk up the food waste. With 1.67 collection jobs, 0.50 processing jobs per 1,000 tons, the 3.5 million tons could result in over 7,500 new jobs.

Composting – 1.0 million tons of Green Waste (AB 939) would need to increase to 3.65 million tons of green waste and food waste (AB 341). : CalRecycle released the Organic Road Map where it was assumed that there will need to be 28 more composting facilities processing 500 tons per day. About 3.65 million tons per year of organics would need to be composted by 2020 to achieve strategic goals. Using a very conservative one million tons of green waste, or about one-half of the green waste disposed of in 2010, and not counting green waste ADC, would need to be composted over the next 10 years. With 1.67 collection jobs, 0.5 processing jobs per 1,000 tons, the 1.0 million tons could result in over 2,170 new jobs.

Composting all of 3.65 million tons per year of green waste and food waste by 2020 mentioned in the Organic Road Map will achieve the planned strategic goals. With 1.67 collection jobs, 0.5 processing jobs per 1,000 tons, the 3.65 million tons could result in 8,000 new jobs.

Lumber to Renewable Energy – 2.2 million tons of Wood Chips (AB 939) would need to increase to 3.0 million tons (AB 341): The BioEnergy Action Plan, coupled with new laws to accelerate the Renewable Portfolio Standard from 20% to 33% renewable by 2020, plans on developing 1,500 MW of green power from biomass by 2020. This potential market expansion could divert all of the estimated 4.4 million tons of lumber that was disposed of in 2010. Assuming a modest 50% recovery rate of what is still being disposed; 2.2 million tons of wood chips could be diverted and generate 160 MW of distributed renewable energy. With 1.67 collection jobs, 2.0 processing jobs and 2.8 manufacturing jobs per 1,000 tons, the 2.2 million tons could result in over 14,200 new jobs.

Increasing the recovery rate to 67% of what is still being disposed; 3.0 million tons of wood chips could be recycled and generate 225 MW of distributed renewable energy. With 1.67 collection jobs, 2.0 processing jobs and 2.8 manufacturing jobs per 1,000 tons, the 2.2 million tons could result in over 19,000 new jobs.

<u>Carpet Recycling</u> – 0.6 million tons (AB 939 and AB 341): AB 2398 (Perez, 2010) was the first extended producer responsibility bill (EPR) bill in the nation. Recycling just 50% of the carpet that was disposed in 2010 (or about 600,000 tons), the amount of GHGs avoided could be 1.4 million metric tons. With 1.67 collection jobs, 2.0 processing jobs and 2.5 manufacturing jobs per 1,000 tons, the 600,000 tons could result in almost 4,000 new jobs.

California is striving to achieve a statewide 75% landfill diversion goal by 2020, and have achieved a 65% diversion rate in 2011, and an estimated 67% diversion rate in 2012 (based on preliminary calculations by The Edgar Institute). The Discussion Paper by CalRecycle on the 75% Recycling Plan proposes to change the landfill diversion accounting system to a recycling rate, where the 65% landfill diversion would translate to a 49% recycling rate. Whereas this has been promoted as a more honest approach, the robust public process and the program evaluation on how to achieve that statewide goal has not materialized. Key issues that were missing that would link the program effectiveness to greenhouse gas avoidance; job creation and lumber to bioenergy have been ignored. The general public, industry, local government, and state agencies are all striving to do more, recycle more, and reduce greenhouse gases, while facing limited resources and competing issues. CalRecycle should assist these stakeholders in developing strategies, determining programs, and calculating statewide tonnages in a public review process to accommodate both the current landfill diversion methodology in statute, and the proposed recycling rate formulas in print. Sending the 75% Recycling Plan directly to the Legislature, and not reporting on The 75% Recycling Plan on a monthly basis during the CalRecycle public meeting is not the robust approach that was promised. CalRecycle is abdicating their leadership role, leaving the AB 32 Scoping Plan five year update as the trump card over the 75% Recycling Plan and allowing the California Air Resources Board to control the future of organics. At this point, AB 323 (Chesbro) could be positioned to provide the leadership that the 75% Recycling Plan has not and retain the legislative and regulatory authority under CalRecycle, instead of having the regulatory authority slip away to CARB under their current AB 32 legislative authority.

The opinions expressed in Beyond Waste are those of Edgar & Associates and do not necessarily represent the policies or views of CRRC or its members.