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# CONNECTING THE DOTS

Recycling, Climate and Economic Development



# Introduction

California has a statewide goal to recycle 75 percent of the waste that is generated annually by 2020. More recycling means a demand for more recycling infrastructure – facilities that separate, recover process and use recycled materials. This recycling infrastructure will be needed, either here in California, in other states or abroad. In California, this translates into new or expanded facilities – both for processing recyclables and for manufacturing that uses recycled content.

When this infrastructure is built in California, near to the source of the source materials, the increase in diversion translates into reductions in greenhouse gasses and potential economic development, job growth and wealth retention opportunities for California’s communities.

## California’s Commitment to Recycling

Californians have been recycling for well over fifty years. In 1989, organized recycling took a leap forward when California enacted “The California Integrated Waste Management Act of 1989” (commonly referred to as “AB 939”). AB 939 required cities and counties to develop programs and policies to divert 25 percent of solid waste from landfills by 1995 and 50 percent (or the maximum amount feasible) by 2000. Another law (referred to as AB 341) enacted in 2011 requires most business and apartment owners/managers to recycle, and requires cities and counties to educate businesses about the recycling requirements. The law also established a new statewide recycling goal of 75 percent by 2020. A third law (referred to as AB 1826) enacted in 2014 requires most business and apartment owners/managers to separate their food scraps and yard trimmings from their trash so that they can be processed for reuse.

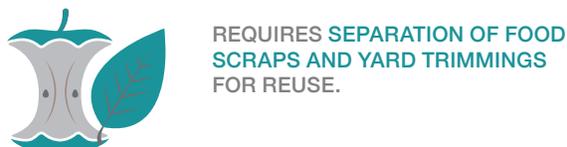
### AB 939 (Enacted 1989)



### AB 341 (Enacted 2011)



### AB1826 (Enacted 2014)



The California Department of Resources Recycling and Recovery (commonly referred to as CalRecycle), the state agency that oversees waste management and recycling, estimates that 80 million tons of solid waste will be generated annually in California by 2020. In 2010 the state had a recycling rate equivalent of 49 percent of total solid waste generated. To meet the 75 percent statewide recycling goal by 2020, CalRecycle estimates that more than 20 million tons of recyclables will need to be diverted from landfills annually. This includes about one-third organic waste, plus traditional recyclable materials (glass, plastic, paper).

To accommodate this increase in diversion from landfills, more recycling infrastructure – facilities that separate, recover, process and use recycled materials – will be needed, either here in California, in other states or abroad. In California, this increase in diversion from landfills translates into opportunities for new or expanded facilities – both recycling processing facilities and manufacturing facilities that use recycled content. It also translates into potential economic development, job growth and wealth retention opportunities.

## Using Recycled Content in Manufacturing

Many companies manufacture products that use recyclable materials instead of virgin materials. Examples include rigid plastic, plastic film, bottles, cans, boxes and paper products. Factories in California that produce these products must meet the same land use, air and water quality requirements, and environmental review as other manufacturing facilities. These factories help California meet statewide recycling goals by providing markets for recycled materials that otherwise would be landfilled or shipped out of state. They also help reduce state and local greenhouse gas emissions because recycled materials use less energy than needed to produce virgin materials.

## What is California's Capacity to Handle Recycled Materials?

Significant quantities of glass, metals and paper, and increasing amounts of the plastics that are collected in California remain in California for remanufacturing or inclusion in new products. However, large quantities of these materials, especially plastics, certain metals and fibers, leave California for further processing in other states or countries. These materials are remanufactured in China, numerous Pacific Rim countries, Europe, Brazil, Mexico and other US states.



**50%**  
OF THAT WASTE  
IS RECYCLED



**MOST WASTE  
LEAVES CALIFORNIA**  
AND IS SENT TO OTHER  
COUNTRIES FOR FURTHER  
PROCESSING

California will need adequate material recovery facilities and processing infrastructure to accommodate significant increases in collection and initial sorting of recyclable materials. However, according to the 2013 study commissioned by CalRecycle, California does *not have* adequate manufacturing capacity for taking the recycled materials and turning them into final products unless existing facilities can be expanded and new facilities sited in California. CalRecycle observes that “California processors currently have the capacity to handle most of the recovered commodities. However, manufacturers in the state may have little excess capacity at present to turn additional materials...into new products.”

The challenge remains to increase California's in-state capacity, including processing for organics and manufacturing that includes recycled materials, in ways that meet environmental quality standards while at the same time increasing jobs and local economic vitality.

## China's Green Fence Policy

The challenges of exporting recyclable materials to other countries are illustrated by China's “Operation Green Fence” policy, enacted February 2013. Initially, Operation Green Fence strictly enforced China's regulations on importing contaminated recyclable materials, including metallic, plastic, textiles, rubber and recovered paper materials. It had an adverse impact on the global market for recycled materials and highlighted the challenges of relying on exporting recyclable materials for processing. When recycled materials are kept locally for processing and manufacturing, the flow of materials isn't interrupted by barriers imposed by other countries.

## Recycling and Economic Development

Numerous studies have documented the economic development and job creation connection to recycling. This includes job creation in the collection, processing and manufacturing sectors. Achieving California's 75 percent recycling goal is estimated to generate about 59,000 jobs total in the collection and processing sectors and about 50,000 jobs total in the manufacturing sector.

These jobs, however, are dependent in part on keeping the recyclable materials in the state. Similarly, the new jobs rely upon building new recycling and manufacturing infrastructure in California to collect, process and then use in manufacturing the more than 20 million tons of additional recyclable materials expected to be produced.

### Recycling Employees



OVER  
**85,000**  
CALIFORNIANS

### Recycling Establishments

**OVER 5,300**  
RECYCLING AND REUSE  
ESTABLISHMENTS DO  
BUSINESS IN CALIFORNIA



### Recycling Generates

ALMOST...



**\$4** BILLION IN  
TAXABLE INCOME



**\$5** BILLION IN  
TAXABLE SALES



**\$10** BILLION IN  
NEW PRODUCTS &  
SERVICES.

### Recycling is...

**BIG BUSINESS...**  
COMPARABLE TO OTHER LARGE  
INDUSTRIES IN CALIFORNIA. IT IS  
AS LARGE AS THE MOVIE AND  
VIDEO INDUSTRY.



Confounding the opportunity for increased job creation, however, is the fact that much of the recovered recyclable material collected in California currently leaves the state, thus reducing economic development and job growth opportunities. The solution to the situation becomes clear when one considers that in many cases, recyclable materials are generated and collected in California, shipped and processed overseas, turned into products with recycled content, shipped back to California and purchased by California consumers. At each stage, value is added to the final product. Keeping the middle steps of this process within California captures the added value, supporting job creation and economic development in California communities.

## Another Economic Development Tool: Recycling Market Development Zones

Recycling Market Development Zones (RMDZs) combine recycling with economic development. The 36 RMDZs in California cover about 88,000 square miles or 54 percent of California. They provide support for businesses in numerous ways.

Businesses that use recycled materials to manufacture their products and want to locate within a zone may be eligible to receive low interest loans. Local agencies may offer streamlined permitting, and/or other financial incentives to businesses interesting in locating in a zone.

Each zone has an administrator to provide technical assistance. Between 1993 and 2013 the RMDZ offered almost \$150 million in low interest loans to help businesses that locate in a zone. More information on Recycling Market Development Zones is available at: [www.calrecycle.ca.gov/RMDZ/](http://www.calrecycle.ca.gov/RMDZ/).

## Recycling and Reducing Greenhouse Gas Emissions

Although the initial goals of AB 939 were to conserve natural resources, reduce pollution and extend the life of landfills, in the last few years, the importance of recycling has taken on another dimension. California's landmark climate change law, the Global Warming Solutions Act of 2006 (sometimes known by its legislative identity, AB 32) establishes policy to reduce the amount of greenhouse gas emissions in California to 1990 levels by the year 2020.

Keeping recyclable materials, especially organic materials, out of landfills is an important part of meeting California's AB 32 greenhouse emission reduction goals (as well as local greenhouse gas reduction goals). This is because methane, a strong greenhouse gas pollutant, is produced from the decomposition of organic materials in landfills.

Turning recycled materials into useful products also reduces greenhouse gas emissions produced "upstream" (or earlier in the lifecycle of a material). This includes, for example, greenhouse gas emissions from energy used to extract virgin resources, to process those resources into usable materials or to transport products.

The AB 32 Scoping Plan, the policy roadmap that guides California's implementation of AB 32, identifies the need to increase recycling, composting and reuse of waste materials as a way of meeting greenhouse gas emissions reductions from the solid waste sector. The 2014 update to the Scoping Plan suggests that 20-30 million metric tons of greenhouse gas emission reductions will result from reaching the 75 percent statewide recycling goal required in AB 341.

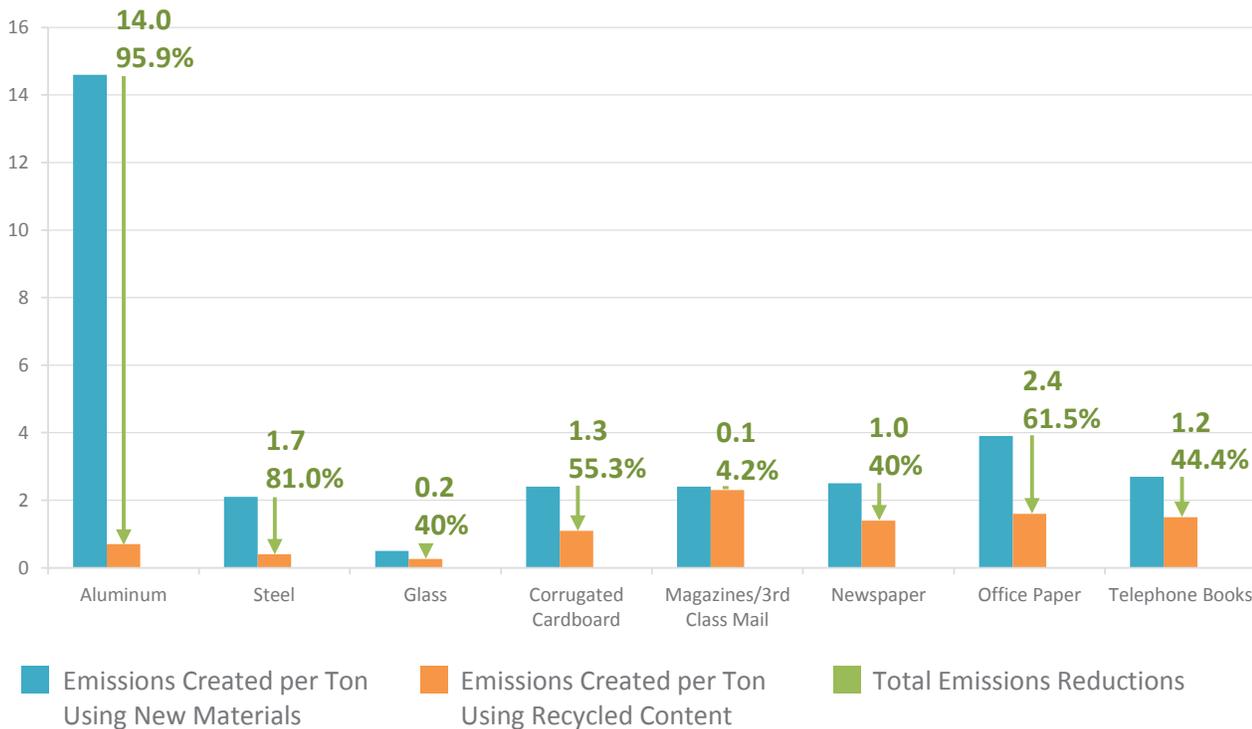
The Scoping Plan also points out that as more materials are diverted and recovered from landfill disposal, the markets for recycled, reused and remanufactured materials must grow. The Scoping Plan also helps “connect the dots” between recycling, reducing greenhouse gas emissions and economic development at both the state and local levels.

Since recycling uses less energy than extracting and processing raw materials, making new products from materials that have already been used (and thus recycled) can save energy and reduce greenhouse gas emissions. Similarly, when products are made using recycled materials, they embody less energy than the same products made with virgin materials. The table below shows how much one ton of recycled material can reduce greenhouse gas emissions.

“To achieve these goals [achieving the 75 percent recycling and greenhouse gas reduction goals] California must take greater ownership and responsibility for the waste generated within its borders. Shipping of waste, even recyclable products, to other states or nations is not a viable, long-term environmentally appropriate waste management practice for California. Further, exporting waste denies California the economic opportunity of significant job growth that would result if these materials were processed and remanufactured in California. While California cannot control exports, implementing the principle of owning our waste will allow California to develop new, state-of-the-art waste management facilities/ systems which can be emulated by other states and nations.

AB 32 Scoping Plan Update, page 76.

## Greenhouse Gas Emissions per Ton

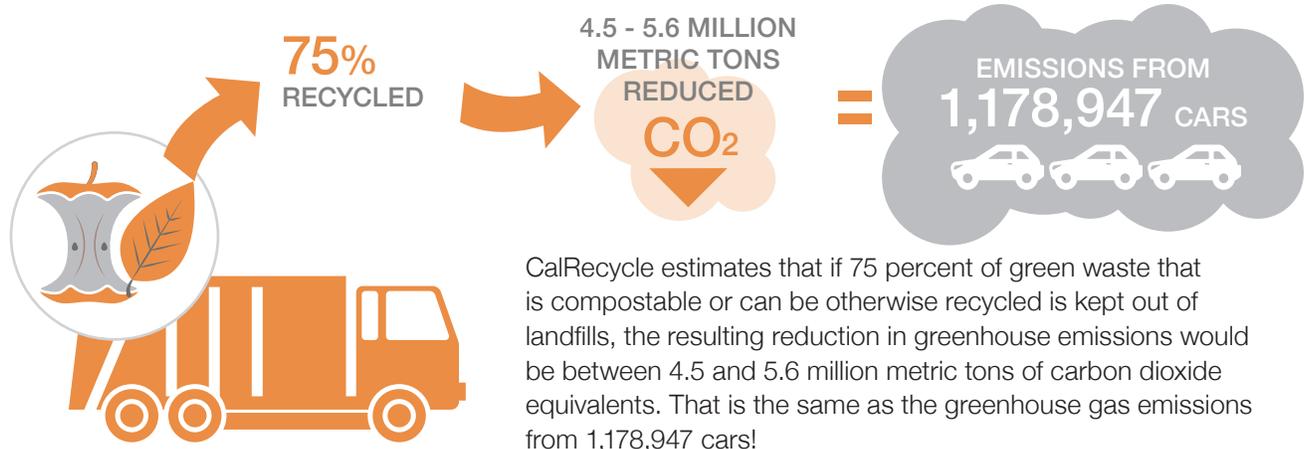


Keeping recyclable organic materials out of landfills reduces potential emissions of methane, a powerful and short-lived greenhouse gas, from landfills, but reuse of organic materials involves distinctly different processes than manufacturing with recycled materials like glass, plastic, metal and paper. Most organic materials processed for reuse are turned into either compost or energy. The choice of what is produced, and how, can have strong economic effects.

Using compost for agricultural or landscaping purposes reduces water use, prevents soil erosion, avoids chemical fertilizer use and further reduces greenhouse gas impacts. Organic materials diverted from landfills to anaerobic digestion facilities can reduce greenhouse gas impacts by reducing disposal rate of organics and the creation of biogas for electricity and transportation fuel. Processing recyclable materials closer to where they are generated also reduces greenhouse gas emissions through lower emissions from transportation.

## Organic Materials

In this document, organic waste or materials generally refers to food scraps and green waste. These are materials that can be diverted from the waste stream and processed through composting, anaerobic digestion or other similar processes. CalRecycle defines organic materials as materials that come from organisms that were once alive, or derived from or produced through the biological activity of a living thing.



CalRecycle estimates that if 75 percent of green waste that is compostable or can be otherwise recycled is kept out of landfills, the resulting reduction in greenhouse emissions would be between 4.5 and 5.6 million metric tons of carbon dioxide equivalents. That is the same as the greenhouse gas emissions from 1,178,947 cars!

## Conclusion

To accommodate the anticipated increase in recyclable materials collected in California, CalRecycle estimates that more recycling infrastructure – facilities that separate, recover, process and use recycled materials – will be needed, either here in California, in other states or abroad. In California, this translates into new or expanded facilities – both recycling processing facilities and manufacturing facilities that use recycled content. By planning these facilities within the state, California’s communities can keep the job creation, economic development and climate benefits here for our residents.

## Resources to Learn More

- AB 32 Updated Scoping Plan, Air Resources Board. May 2014. <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>
- Waste Management Working Papers for Updated AB 32 Scoping Plan. September 2013. Prepared by CalRecycle. [http://www.arb.ca.gov/cc/scopingplan/2013\\_update/waste.pdf](http://www.arb.ca.gov/cc/scopingplan/2013_update/waste.pdf)
  - Overview of Waste Management Sector
  - Recycling, Reuse, and Remanufacturing
  - Composting and Anaerobic Digestion
  - Biomass Conversion
  - Landfilling of Waste
  - Municipal Solid Waste Thermal Technologies
- AB 341's 75 Percent Goal and Potential New Recycling Jobs in California by 2020. CalRecycle. July 2013. <http://www.calrecycle.ca.gov/publications/Documents/1463%5C20131463.pdf>
- From Waste to Jobs: What Achieving 75 Percent Recycling Means for California. Natural Resources Defense Council. March 2014. <http://www.nrdc.org/recycling/files/green-jobs-ca-recycling-report.pdf>
- CalRecycle Business Assistance Website: [www.calrecycle.ca.gov/Business/default.htm](http://www.calrecycle.ca.gov/Business/default.htm)
- Climate Change and Waste. U.S. Environmental Protection Agency. [www.epa.gov/climatechange/climate-change-waste/](http://www.epa.gov/climatechange/climate-change-waste/)

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The Institute gratefully acknowledges the following individual who reviewed this document and offered their comments prior to publication:

- Christopher Bria, Senior Environmental Scientist, CalRecycle
- John Davis, Administrator, Mojave Desert and Mountain Recycling Authority
- Evan Edgar, Edgar & Associates, Inc
- Howard Levenson, Deputy Director, CalRecycle
- Cara Morgan, Environmental Program Manager, CalRecycle
- Mandy Rose, Director, San Benito County Integrated Waste Management
- Chris Stephens, Director, Resource Management Agency, County of Ventura



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Prepared as part of CalRecycle contract number DRR12063, Total Contract Amount \$200,000, pursuant to Government Code Section 7550.