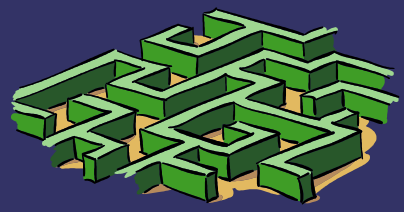
Towards a California Green Industrial Approach

Zoneworks
February 2 and 3, 2011

John Davis
High Desert RMDZ Administrator



September 2008

California long term ENERGY EFFICIENCY STRATEGIC PLAN

ACHIEVING **MAXIMUM ENERGY SAVINGS** IN CALIFORNIA FOR 2009 AND BEYOND

California Public Utilities Commission

www.CaliforniaEnergyEfficiency.com

4. INDUSTRIAL SECTOR

4.1 VISION

California industry will be vibrant, profitable and exceed national benchmarks for energy efficiency and resource management.

4.2 PROFILE

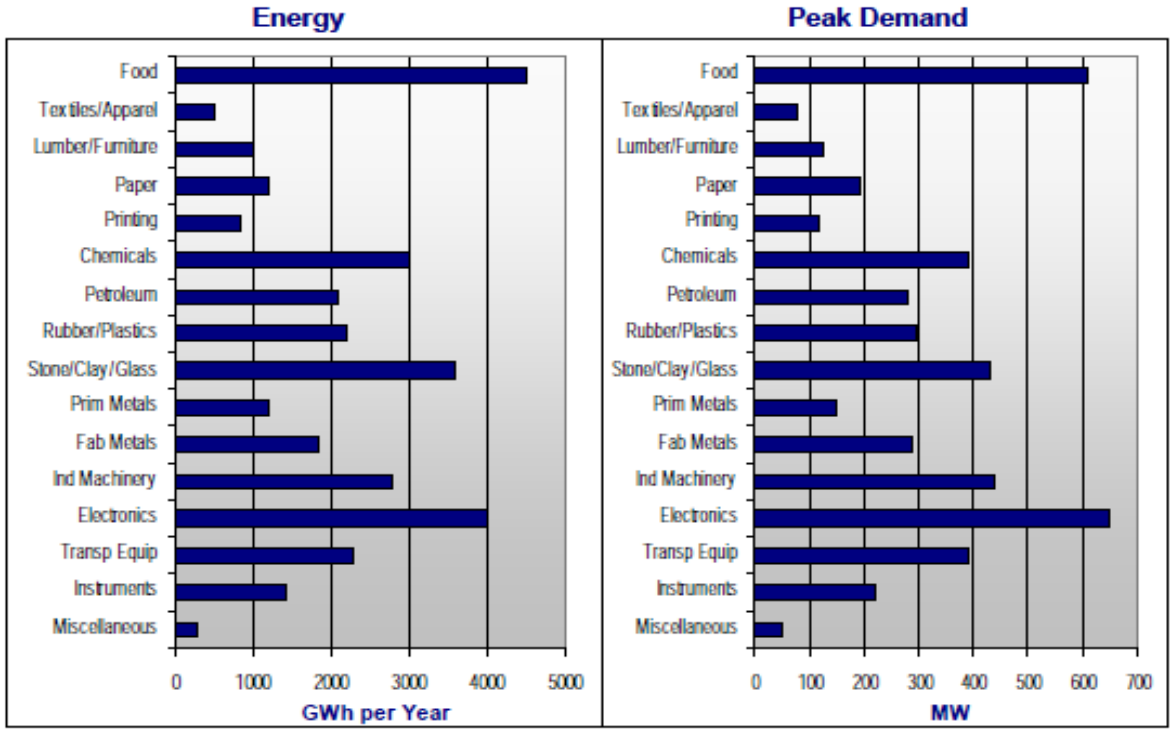
California's industrial sector is both a major driver of California's economy and a major consumer of energy:

Contribution of the Industrial Sector	(% of total in CA)
Electricity use	16
Natural gas use[45]	33
Energy use[46]	22
End use CO2 emissions[47]	20

The treatment, distribution, and use of water in California's industrial sector contributes an additional 3 percent of California's electricity use and 14 percent of its non-power plant natural gas.[48]

Energy consumption in the industrial sector is distributed across a variety of distinct industries and processes. As shown below, the largest industrial users of electricity in California are food processing

Industrial Electricty Usage by Industry Type, 2003–Overall



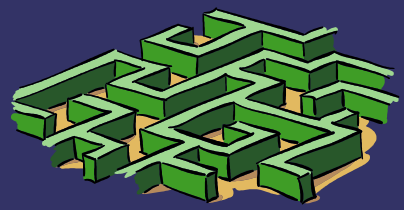
and electronics, although a number of other sectors have also reached significant use levels.

CA Long Term Energy Efficiency

GOAL

1. Support California industry's adoption of energy efficiency by integrating energy efficiency savings with achievement of GHG goals and other resource management objectives.

By 2012, the goals, program designs and funding of industrial resource management programs are fully coordinated.



CA Long Term Energy Efficiency

Goal 1: Integration with Other Resource Strategies

Strategy 1-1: Develop coordinated energy and resource management program for California's industrial sector, to enhance use of energy efficiency

Non-CPUC Partners
CARB
CEC
State Agencies for water, *solid waste*, and toxic substances
Utilities
Industry Reps.

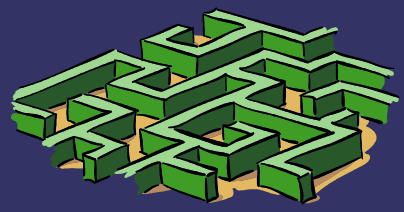
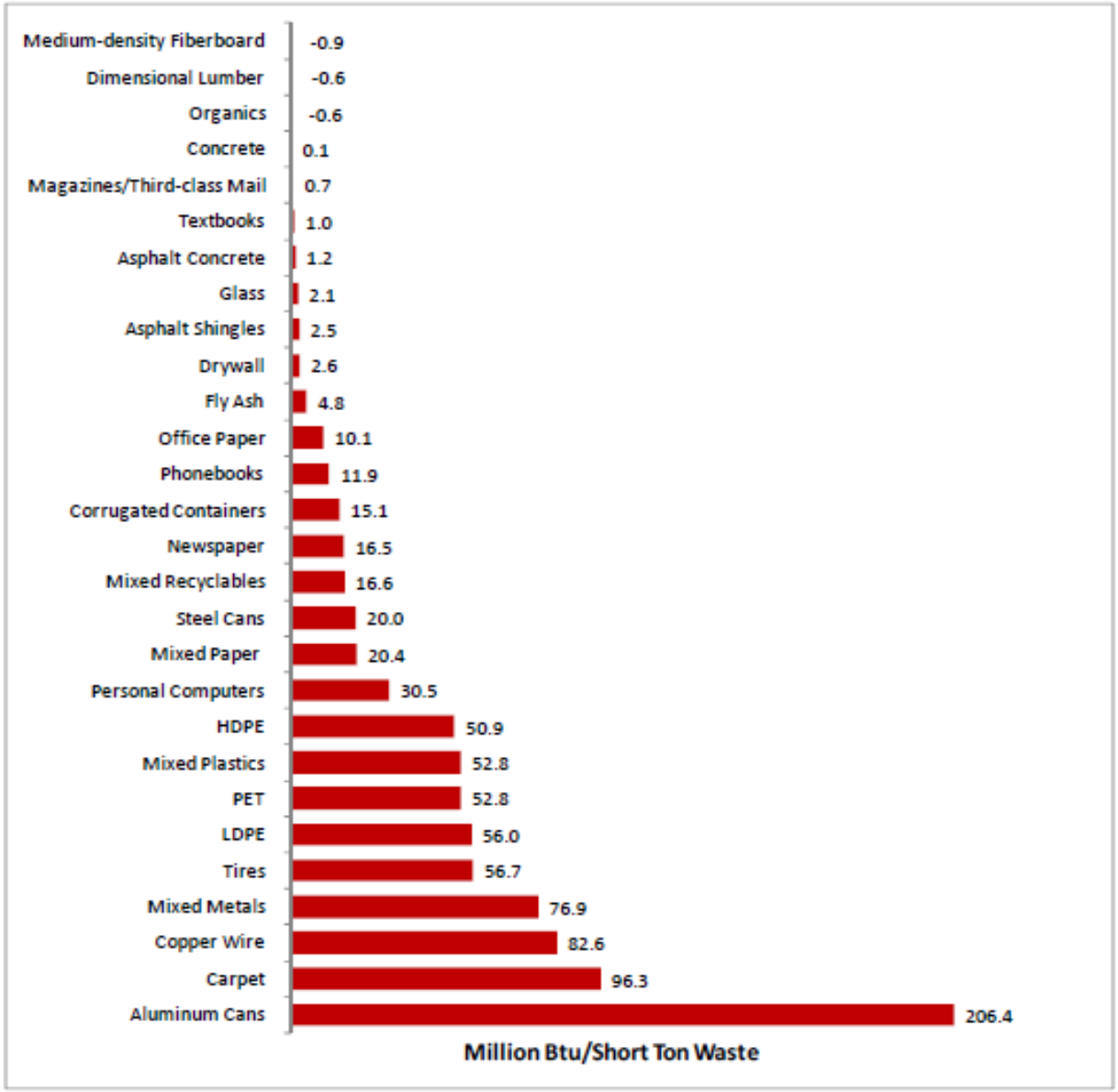


Exhibit 1: Energy Savings per Short Ton of Recycled Material (Relative to Landfilling)



Note: Positive numbers indicate energy savings from recycling; negative numbers indicate that additional energy is required, compared to landfilling.

Exhibit 4: Recycling GHG Benefits Attributable to Energy Savings (Relative to Landfilling)

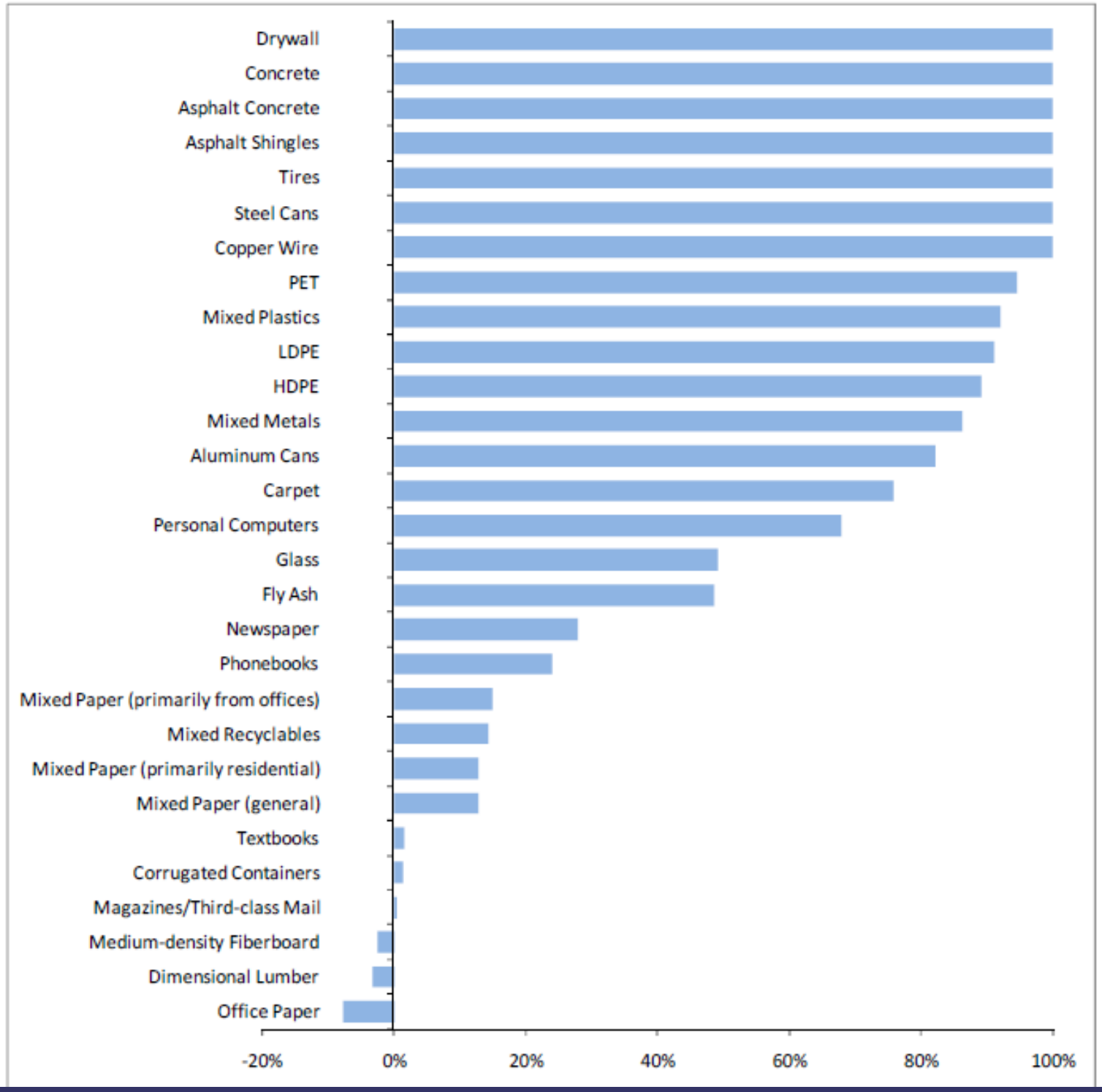
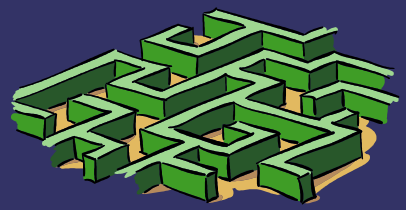


Exhibit 6: Energy Impacts for Source Reduction (Million Btu/Ton of Material Source Reduced)

(a)	(b) Raw Materials Acquisition and Manufacturing Process Energy		(c) Raw Materials Acquisition and Manufacturing Transport Energy		(d) Net Energy (d = b + c)	
Material/Product	Displace Current Mix of Virgin and Recycled Inputs	Displace Virgin Inputs	Displace Current Mix of Virgin and Recycled Inputs	Displace Virgin Inputs	Displace Current Mix of Virgin and Recycled Inputs	Displace Virgin Inputs
Aluminum Cans	−121.85	−231.42	−4.37	−7.50	−126.22	−238.92
Steel Cans	−26.04	−31.58	−4.79	−4.95	−30.82	−36.53
Copper Wire	−121.45	−122.52	−0.90	−0.81	−122.34	−123.33
Glass	−5.99	−6.49	−0.94	−0.99	−6.93	−7.49
HDPE	−63.19	−69.75	−0.57	−0.56	−63.76	−70.31
LDPE	−73.43	−76.32	−0.56	−0.56	−74.00	−76.88
PET	−70.19	−72.23	−0.56	−0.56	−70.75	−72.79
Corrugated Containers	−20.45	−25.13	−1.56	−1.74	−22.01	−26.86
Magazines/Third-class Mail	−32.95	−32.99	−0.27	−0.27	−33.22	−33.26
Newspaper	−35.80	−39.92	−0.66	−0.76	−36.45	−40.69
Office Paper	−36.32	−37.01	−0.27	−0.27	−36.59	−37.28
Phonebooks	−39.61	−39.61	−0.59	−0.59	−40.19	−40.19
Textbooks	−35.01	−35.07	−0.59	−0.59	−35.59	−35.66
Dimensional Lumber	−2.53	−2.53	−1.00	−1.00	−3.53	−3.53
Medium-density Fiberboard	−10.18	−10.18	−1.43	−1.43	−11.61	−11.61
Food Scraps	NA	NA	NA	NA	NA	NA
Yard Trimmings	NA	NA	NA	NA	NA	NA
Grass	NA	NA	NA	NA	NA	NA
Leaves	NA	NA	NA	NA	NA	NA
Branches	NA	NA	NA	NA	NA	NA
Mixed Paper						
Mixed Paper (general)	NA	NA	NA	NA	NA	NA
Mixed Paper (primarily residential)	NA	NA	NA	NA	NA	NA
Mixed Paper (primarily from offices)	NA	NA	NA	NA	NA	NA
Mixed Metals	NA	NA	NA	NA	NA	NA
Mixed Plastics	NA	NA	NA	NA	NA	NA
Mixed Recyclables	NA	NA	NA	NA	NA	NA
Mixed Organics	NA	NA	NA	NA	NA	NA
Mixed MSW	NA	NA	NA	NA	NA	NA
Carpet	−89.70	−89.70	−1.36	−1.36	−91.06	−91.06
Personal Computers	−951.71	−951.71	−5.03	−5.03	−956.74	−956.74
Clay Bricks	−5.10	−5.10	−0.03	−0.03	−5.13	−5.13
Concrete	NA	−0.05	NA	−0.19	NA	−0.24
Fly Ash	NA	−4.77	NA	−0.10	NA	−4.87
Tires	−71.14	−73.79	−0.49	−0.46	−71.63	−74.25
Asphalt Concrete	−0.95	−0.95	−0.73	−0.73	−1.68	−1.68
Asphalt Shingles	−2.19	−2.19	−0.99	−0.99	−3.18	−3.18
Drywall	−3.08	−3.08	−0.51	−0.51	−3.59	−3.59
Fiberglass Insulation	−3.97	−4.74	−0.80	−0.86	−4.77	−5.60
Vinyl Flooring	−9.60	−9.60	−1.12	−1.12	−10.72	−10.72
Wood Flooring	−13.14	−13.14	−1.34	−1.34	−14.48	−14.48

Note: Negative numbers = Energy savings.
NA = Not applicable.



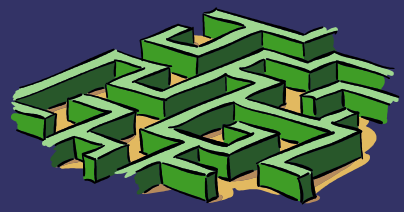
Differences in Emissions Between Recycled and Virgin Plastics Manufacture Measured in MTCO2E

Product/Material	100% Virgin Inputs			100% Recycling Inputs			Difference Between Recycling and Virgin Manufacture		
	Process Energy	Trans-port Energy	Process Non-Energy	Process Energy	Trans-port Energy	Process Non-Energy	Process Energy	Trans-port Energy	Process Non-Energy
HDPE	1.72	0.04	0.19	0.13	0.05	--	-1.59	.01	-0.19
LDPE	2.10	0.04	0.19	0.13	0.05	--	-1.97	.01	-0.19
PET	1.98	0.04	0.11	0.13	0.05	--	-1.85	.01	-0.19

Climate Change Scoping Plan
AB 32

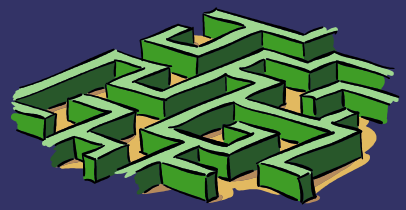
15. Recycling and Waste
Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.

Re-introducing recyclables with intrinsic energy value back into the manufacturing process reduces greenhouse gas emissions from multiple phases of product production including extraction of raw materials, preprocessing and manufacturing.



AB 32 Incentives

CIWMB will explore the use of incentives for all Recycling and Waste Management measures, including for commercial recycling and for local jurisdictions to encourage the collection of residentially and commercially-generated food scraps for composting and in-vessel anaerobic digestion.



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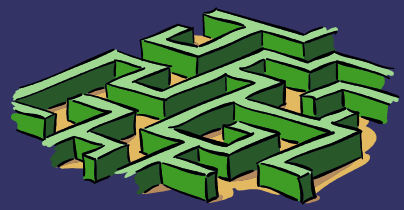
Revenues may be generated from the implementation of various proposed components of the Scoping Plan, including by the use of auctions within a cap-and-trade system or through the imposition of more targeted measures, such as a public goods charge on water. These revenues could be used to support AB 32 requirements for greenhouse gas emissions reductions and associated socio-economic considerations.



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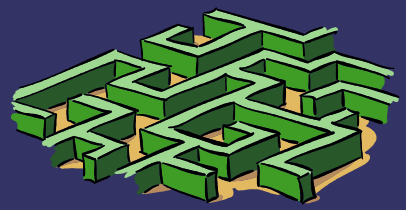
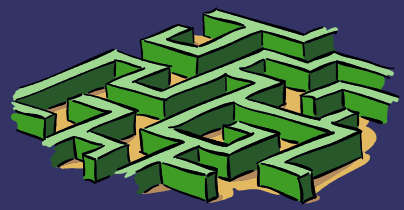
Funding of incentives for local governments could also be used to increase recycling, composting, and to generating renewable energy from anaerobic digestion.



Climate Action Reserve

The Climate Action Reserve is a national offsets program working to ensure integrity, transparency and financial value in the U.S. carbon market. It does this by establishing regulatory-quality standards for the development, quantification and verification of greenhouse gas (GHG) emissions reduction projects in North America; issuing carbon offset credits known as Climate Reserve Tonnes (CRT) generated from such projects; and tracking the transaction of credits over time in a transparent, publicly-accessible system. Adherence to the Reserve's high standards ensures that emissions reductions associated with projects are real, permanent and additional, thereby instilling confidence in the environmental benefit, credibility and efficiency of the U.S. carbon market.



CLIMATE ACTION RESERVE

Organic Waste Digestion Project Protocol

Avoiding Methane Emissions from Anaerobic Digestion of Food Waste and/or Agro-Industrial Wastewater

Version 1.0

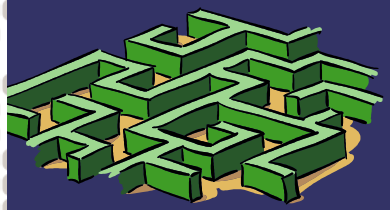
October 7, 2009

CLIMATE ACTION RESERVE

Version 1.0 | June 30, 2010

Organic Waste Composting

Project Protocol



zanker™ | rethink. reinvent. renew.

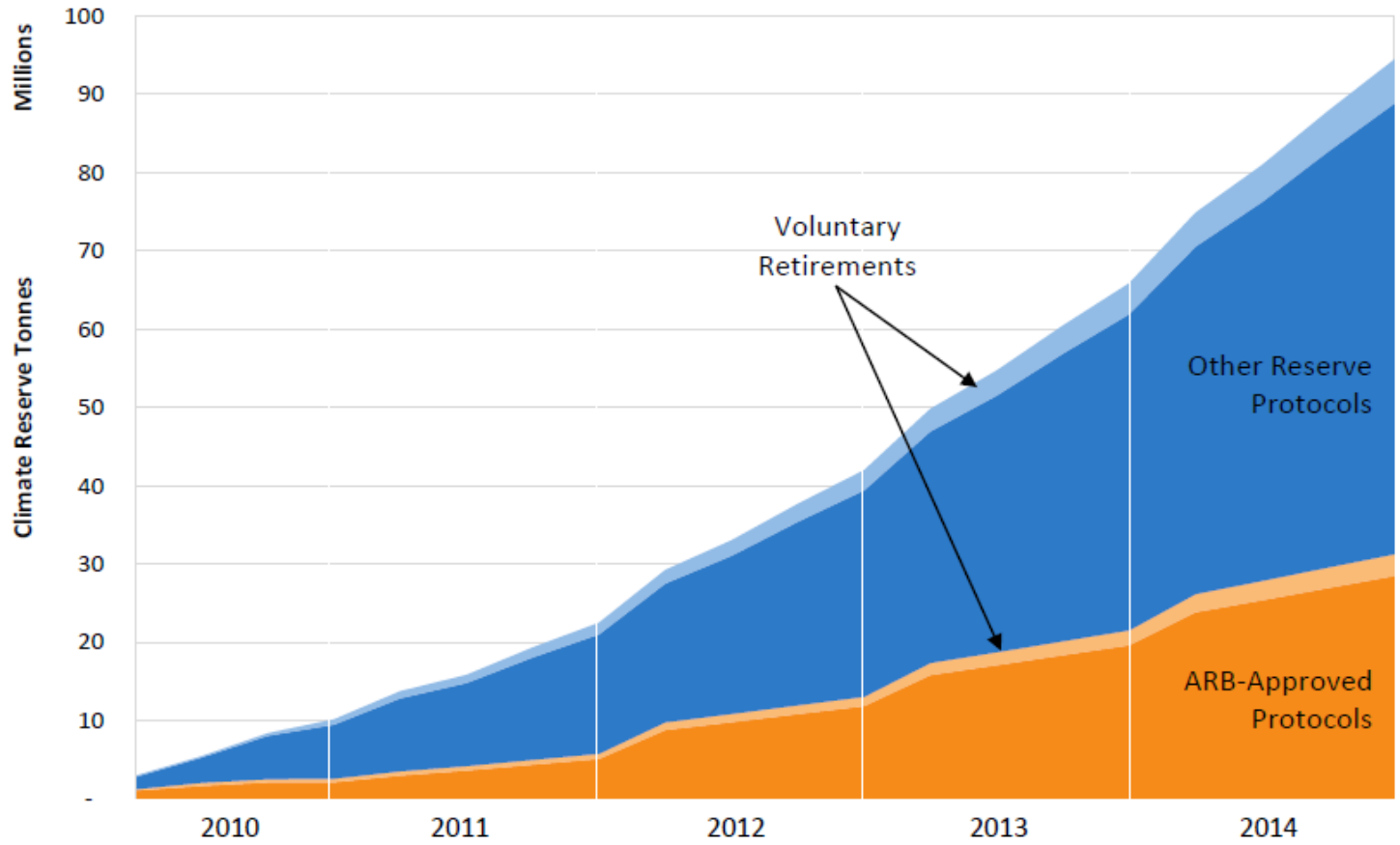
Nation's First Carbon Offset Project for Composting Listed entertainment

Zanker Road Resource Management, one of the nation's leading recycling and composting firms, has listed the first composting greenhouse gas (GHG) offset project, "Z-Best Food Waste Composting," with the Climate Action Reserve (Reserve).

This is a landmark event for composters across the nation who will have the ability to sell carbon credits (CRTs) which create economic incentives and cost effective development of processing infrastructure as more and more food waste is collected from residents and businesses. The City of San Jose provides the majority of the organic waste that is processed through Zanker's facility, and John Stufflebean, Director of the City's Environmental Services Department explains that "this project is a reflection of the leadership and innovation we see in the area, and helps to meet San Jose's Green Vision goals of zero waste to landfills, reduction of GHG, and green job creation."

Projections of Future CRT Issuance

November 5, 2010



This chart illustrates estimated projections for cumulative Climate Reserve Tonne® (CRT) issuance through 2014. The orange area represents an estimate of CRTs to be generated under the four project protocols (Forest, Urban Forest, Livestock, and US Ozone Depleting Substances) to be adopted for compliance use by the California Air Resources Board, including both currently-submitted projects and projected future projects. The blue area represents an estimate of CRTs to be generated under the remaining project protocols, including both currently-submitted projects and projected future projects. The lighter areas at the top of each segment represent CRTs that are retired as voluntary emissions offsets, outside of the compliance program. Note that actual issuances may vary widely depending on a range of factors, including political and economic. The estimated projections do not represent official statements by the Climate Action Reserve.

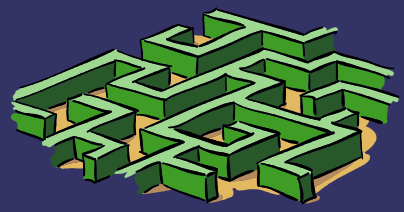
News release regarding the proposed California greenhouse gas emissions trading program: link.

Industrial Roadmap to 2020

Resource Recovery and Utilization. This is a technological pathway built on industrial ecology, wherein a community of producers and consumers perform in a closed system.

Fossil energy is conserved and/or energy is obtained from non‑GhG sources; *materials are reused or recycled.* Through technological advances, the raw materials and resources needed for manufacturing can be obtained by designing products for ease of disassembly and reuse.

Oregon Global Warming Commission



California Roadmap