Diverting Biomass from the Waste Stream

California Energy Commission Workshop

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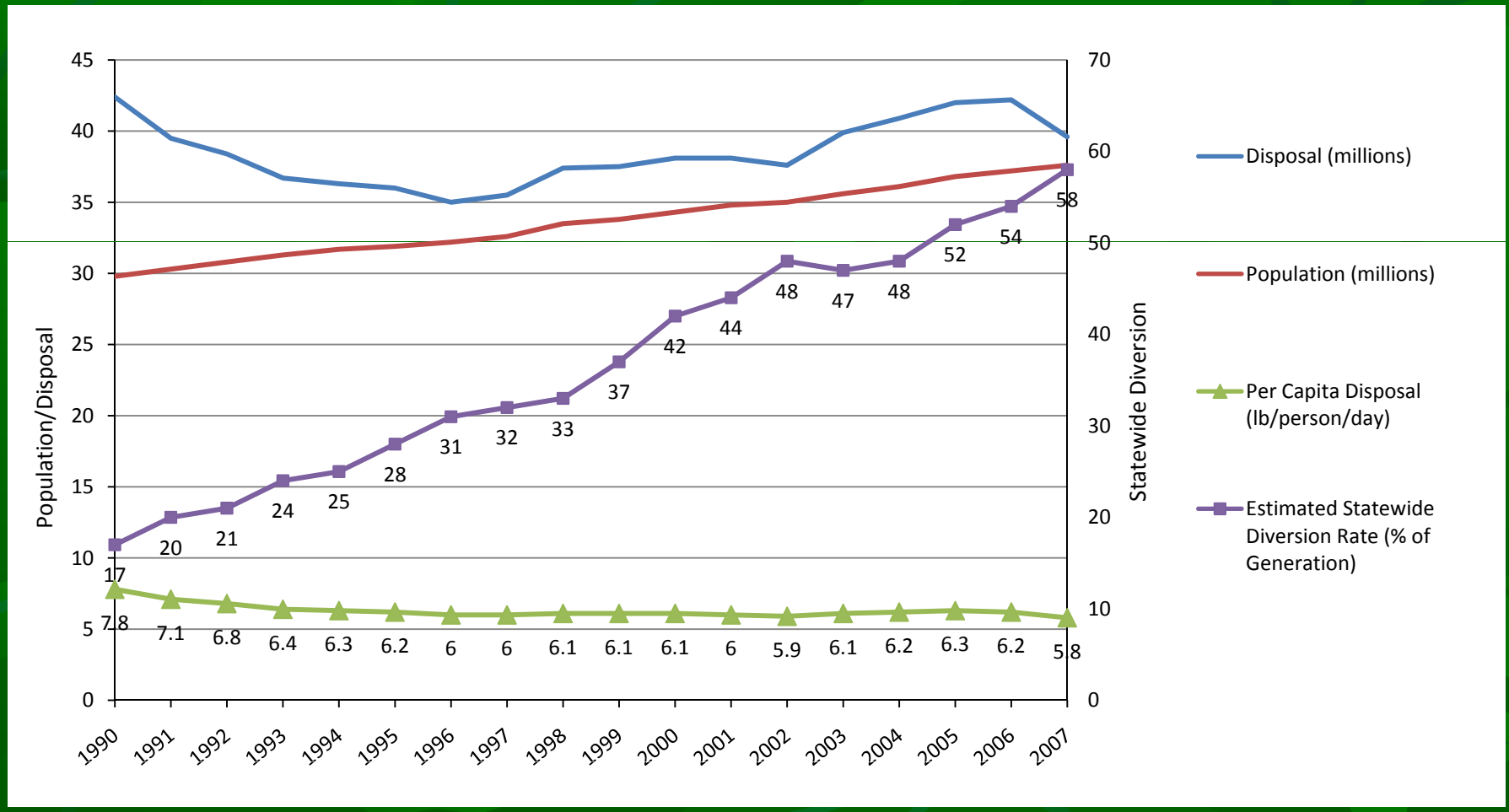
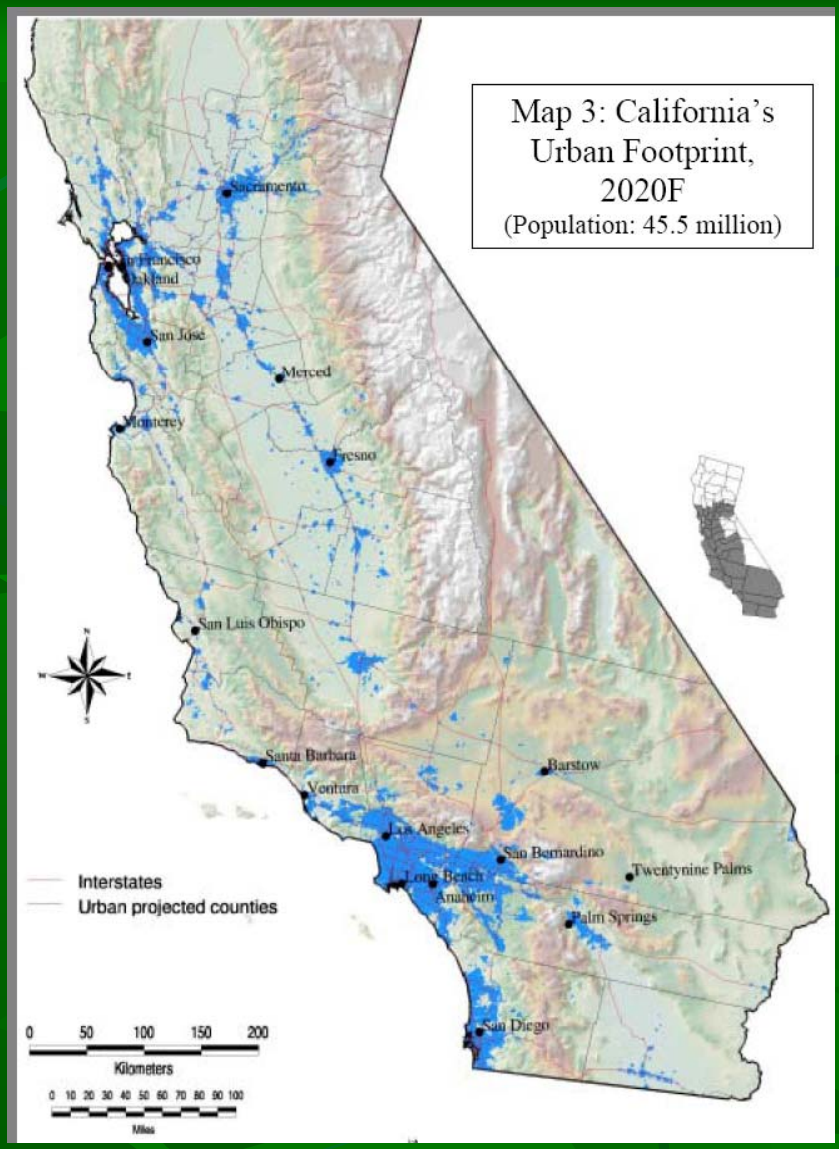
Integrated Waste Management Board

Statewide Policy Drivers

- Integrated Waste Management Act
- Strategic Directive 2 - Vision
- Strategic Directive 6.1 - Organics
- Strategic Directive 8.4 - Regulations
- Strategic Directive 9.0 - Research

Disposal Vs Diversion





Source: Landis, 2004

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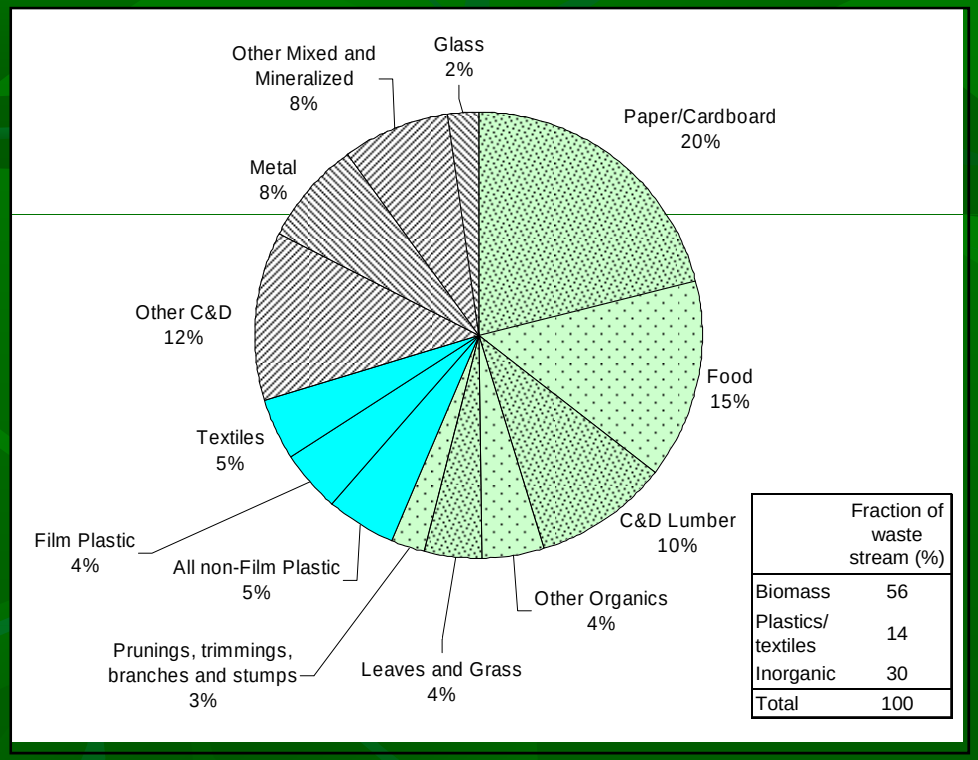
Waste Characterization in California



	Fraction of waste stream (%)
Biomass	56
Plastics/ textiles	14
Inorganic	30
Total	100

- 42 million tons disposed in 2005
- 23 to 25 million tons biological in origin
- 5.7 tons plastic and textiles

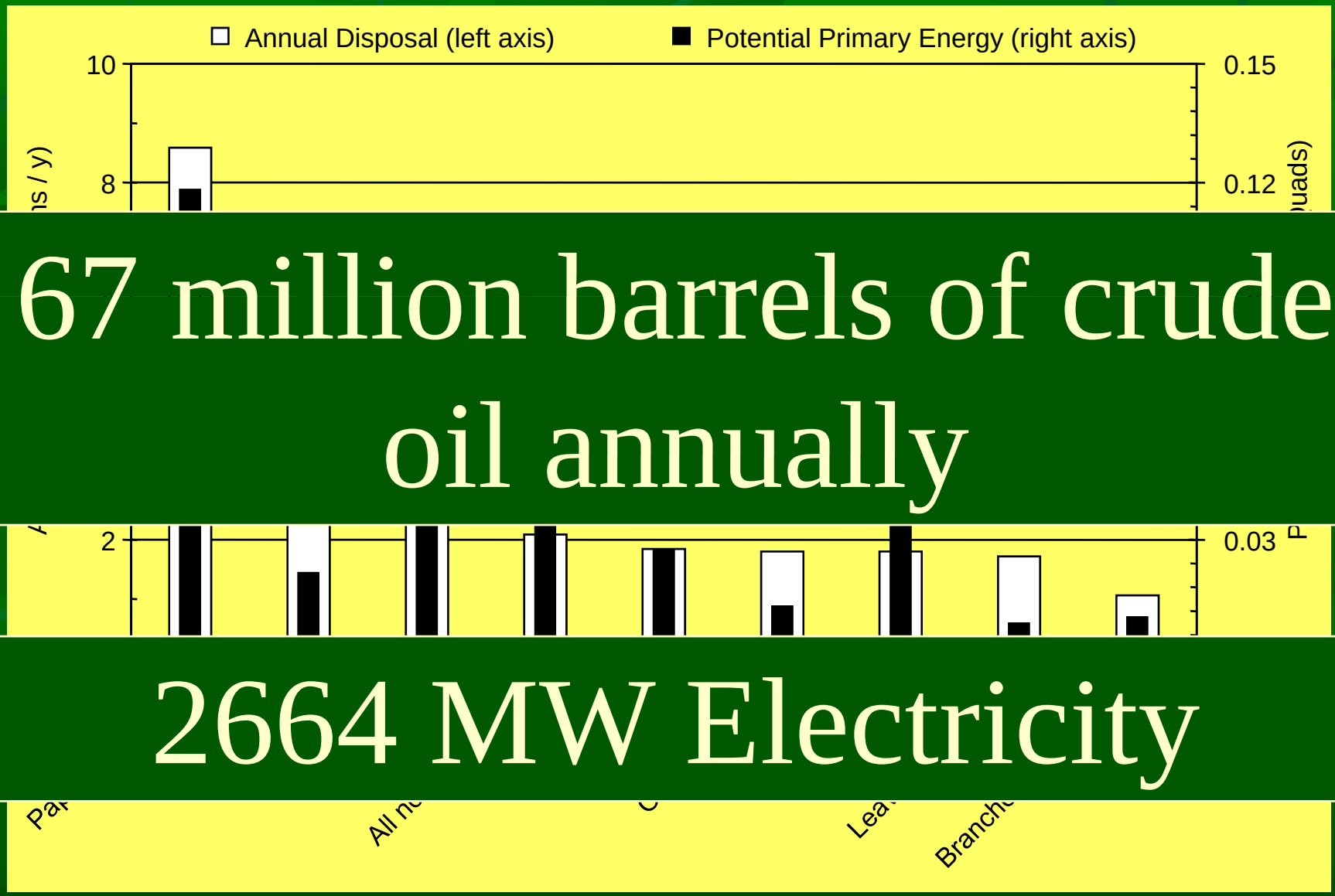
Energy Potential

Table 1 California annual disposed waste characterization (wet basis) and potential energy. *

	Landfilled[a] 2004 (million tons)	wt % of Total	Moisture[b] (%wb)	Landfilled (million dry tons)	Ash / mineral matter (million tons)	HHV[b] (BTU/dry lb)	Chemical Energy			Electricity Potential[d]		
							Potential (PJ)[c]	Equivalent barrels of oil (millions)	Fraction of total (%)	(MWe)	(GWh y-1)	(rank)
Paper/Cardboard	8.6	19.7	10	7.7	0.5	7650	125	20.2	30	791	6928	1
Food	6.0	13.7	70	1.8	0.3	6000	23	3.7	6	204	1790	6
C&D Lumber	3.9	9.0	12	3.5	0.2	6450	14	2.3	3	384	771	8
Prunings, trimmings, branches, stumps and green ADC [e]	3.7	8.4	40	2.2	0.1	8175	9	1.5	2	240	371	9
Other Organics	1.8	4.1	4	1.7	0.1	3800	38	6.1	9	88	2105	5
Leaves and Grass	1.7	3.9	60	0.7	0.2	8300	61	9.8	15	42	3365	3
Biomass Components of MSW Total [e]	**25.7**	**59.0**		**17.6**	**1.3**		**269**	**43.6**	**65.1**	**1750**	**15,330**	
All non-Film Plastic	2.1	4.8	0.2	2.1	0.0	9475	42	6.8	10	264	2313	4
Film Plastic	1.8	4.1	0.2	1.8	0.1	19400	73	11.9	18	466	4083	2
Textiles	1.8	4.2	10	1.7	0.1	8325	29	4.7	7	184	1614	7
Non-Biomass Organic Components of MSW Total	**5.7**	**13.2**		**5.5**	**0.22**		**144**	**23.4**	**34.9**	**914**	**8011**	
Other C&D	4.9	11.3		4.9	4.9	-	-	-	-	-	-	
Metal	3.1	7.2		3.1	3.1	-	-	-	-	-	-	
Other Mixed and Mineralized	3.1	7.1		3.1	3.1	-	-	-	-	-	-	
Glass	0.9	2.2		0.9	0.9	-	-	-	-	-	-	
Inorganic Components of MSW Total	**12.1**	**27.8**		**12.1**	**12.1**	**0**	-	-	-	-	-	
Totals [e]	**43.5**	**100**	**19**	**35.2**	**13.7**	**(ave.) 5300**	**413**	**67**	**100**	**2664**	**23,341**	

Source: Rob Williams, California Biomass Collaborative

Waste Distribution (Mass/Energy)



67 million barrels of crude oil annually

2664 MW Electricity

CIWMB Organics Policy Roadmap

- Organics Summit & BioFuels Forum held in 2007
- Organics Roadmap Developed
  - 6 Key Area Issues:
    - Alternative Daily Cover Policy
    - Economic Incentives and Disincentives
    - Siting and Capacity Development
    - Regulatory and Permitting Constraints
    - Research, Product Standards & Technology Evaluation
    - Education and Procurement

Strategic Directive 6.1

Reduce Amount of Organics in Waste Stream by 50% by 2020.

Economic Incentives & Disincentives

- Need to coordinate with other agencies to create effective incentives and disincentives that address core issues identified by stakeholders.
- Plan to hold workshops in 2009 to collect additional stakeholder input and recommendations

Siting & Capacity Development

- On-line Survey & Interviews to Identify Siting Barriers & Solutions
- Siting Workshops April 2008
  - Coordination with Air & Water Regulatory Agencies
  - Web-based Info Clearinghouse
  - Legislation for Diversion Capacity
- Current & Needed Infrastructure Survey

Strategic Directive 8.4

Enforcement/Permitting

1. Regulations are grounded in the best available science
2. Address changing market conditions
3. Take advantage of developing technologies.

Strategic Directive 9

Research/Development of Technology

1. Develop a focused process to coordinate research activities
2. Encourage the development of alternative energy and bio-fuels.
3. Play an active role in the Bio-Energy Inter-Agency Working Group.
4. Actively participate in Climate Action Team

CIWMB Activities

- Lifecycle/Economic Analysis of Organics
- Biofuels from Post-MRF Residuals Contract
- UC Davis Two-Stage Anaerobic Digestion Project
- Low Carbon Fuel Standard
- Feed-In Tariff
- Programmatic EIR – Anaerobic Digestion

Challenges

- Product vs. Process
- Statutory Updates
- Regulatory Updates

Opportunities

- Plenty of feedstock
- Jurisdictions moving forward
- Federal Stimulus Funds

Thank-You!