



Materials, Waste and Climate: Oregon's "Roadmap to 2020" and the Evolution of GHG Inventories

Prepared for the Association of Oregon Recyclers

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Roadmap to 2020: Scope of “Materials Management”

“**Materials Management** refers to how we manage material resources as they flow through the economy, from extraction or harvest of materials and food, production and transport of goods, *reuse of materials, and recycling, composting, and disposal.*”

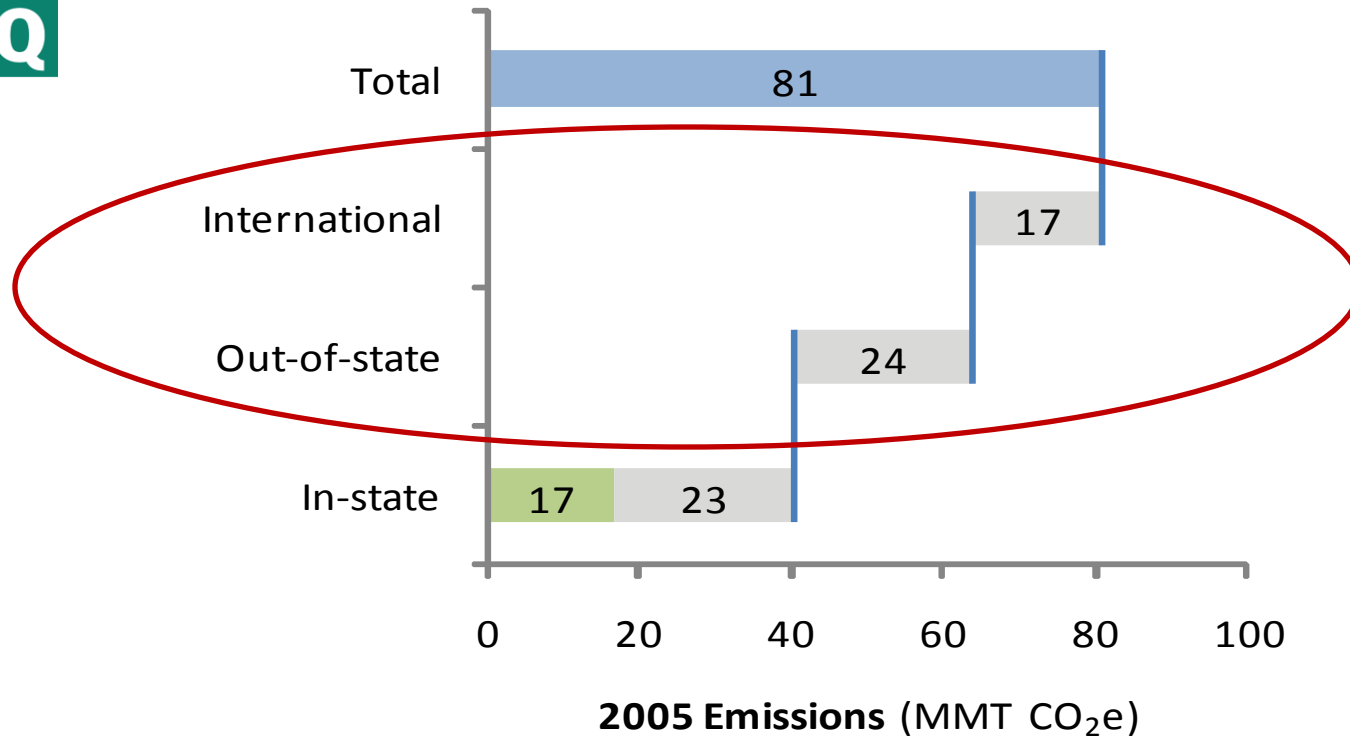


Roadmap to 2020: Scope of “Materials Management” (continued)

- A life-cycle view of materials *used* in Oregon, regardless of location of production
 - Some overlap with other Committees (industry, agriculture, etc.)
 - But not focused on in-state producers (or exports)
- Unique emissions (not addressed by other Committees): upstream emissions of imported goods (and upstream benefits of exported recyclables)
 - Not in Oregon’s traditional GHG inventory
 - Pragmatic approach (thanks Angus!)



Location of Oregon's Consumption-Based Emissions (DRAFT – Will Change!)

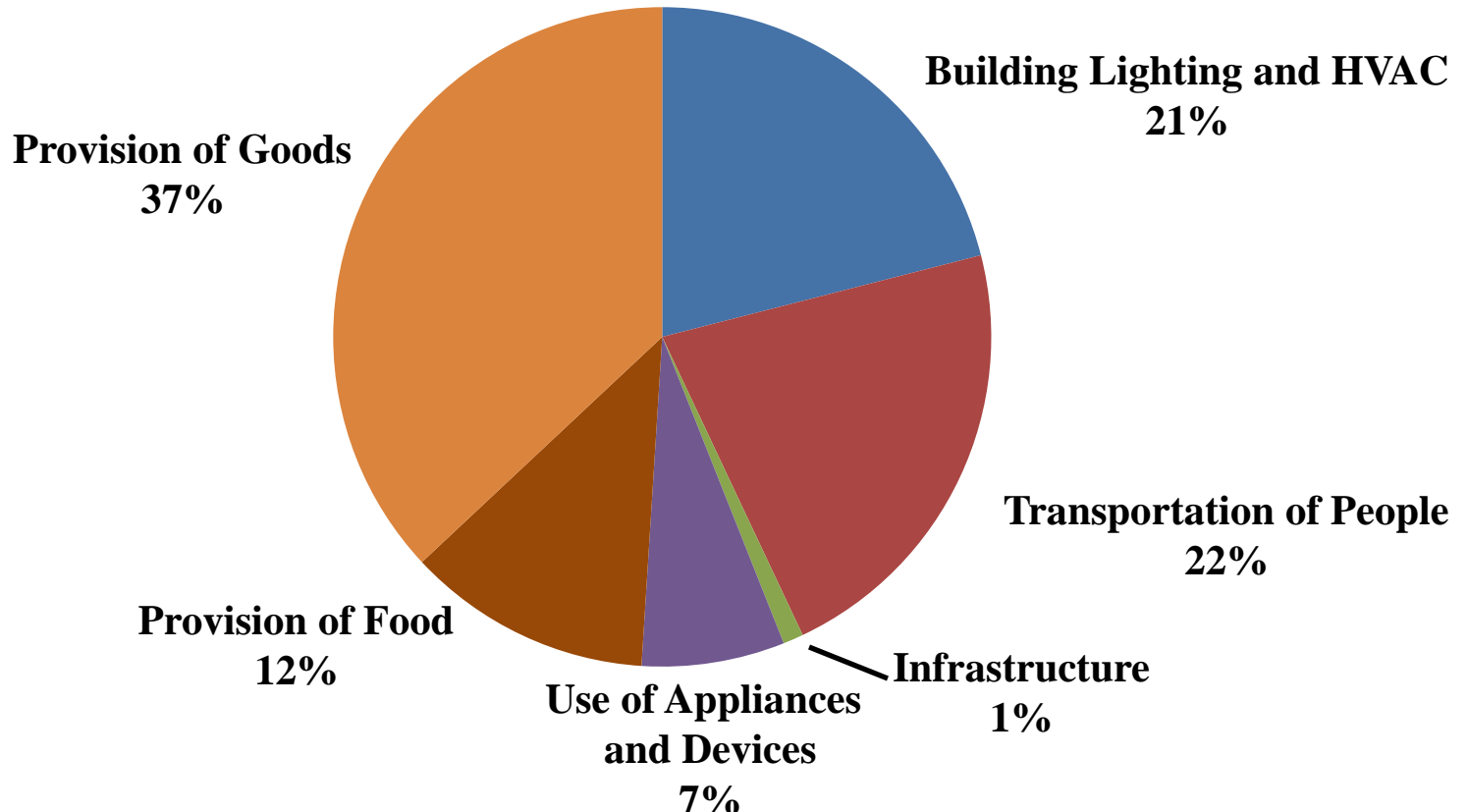


■ = Pre-purchase emissions

■ = Fuel used directly by consumers plus disposal



Systems-Based U.S. Emissions Inventory, Geographic Emissions *Adjusted for Imports and Exports* (2006)



Source: Joshua Stolaroff/Product Policy Institute (2009), based on EPA (2009) and Weber & Matthews (2007)



Roadmap to 2020 – Materials Management What's In It?

- Vision (2050)
- Recommendations
 - “Key Actions for 2020” (9)
 - “Tier Two Recommendations” (29)
- Available (as revised) at <http://www.keeporegoncool.org/content/roadmap-2020>



Key Actions

1. Advocate for a carbon price signal across the life cycle of materials
 - Emissions cap and/or carbon tax
 - Should include imports
2. Develop a consumption-based GHG inventory
 - Consider including consumption-based accounting in future State inventories
 - Additional research as needed into product categories identified as having high emissions, emissions intensity



More Key Actions

3. Develop easy-to-use life cycle metrics for different food types
4. Carbon footprinting, labeling of products
 - Standards, incentives, and/or mandates
5. Focus product stewardship “upstream”
 - Upstream emissions and/or design choices
6. Higher standards for new buildings: “net zero” plus offset for materials



And More Key Actions

7. Consumer information, outreach, education
8. Reduce waste of food
9. Conduct research on three issues involving discards:
 - Highest/best use for organic wastes
 - GHG footprint of conversion technologies (e.g., pyrolysis)
 - Guidelines, recommendations for waste-to-energy



Some Tier 2 Recommendations

- Carbon-based metrics for measuring recycling
- Reduce MRF losses
- Expand product stewardship (downstream), include GHGs as product selection criteria
- Expand bottle bill
- Increase funding for recycling outreach
- Require garbage/recycling service parity
- Develop compost markets
- Mandatory food waste collection opportunities
- Feed-in-tariff for anaerobic digestion
- Landfill changes (covers, gas collection)



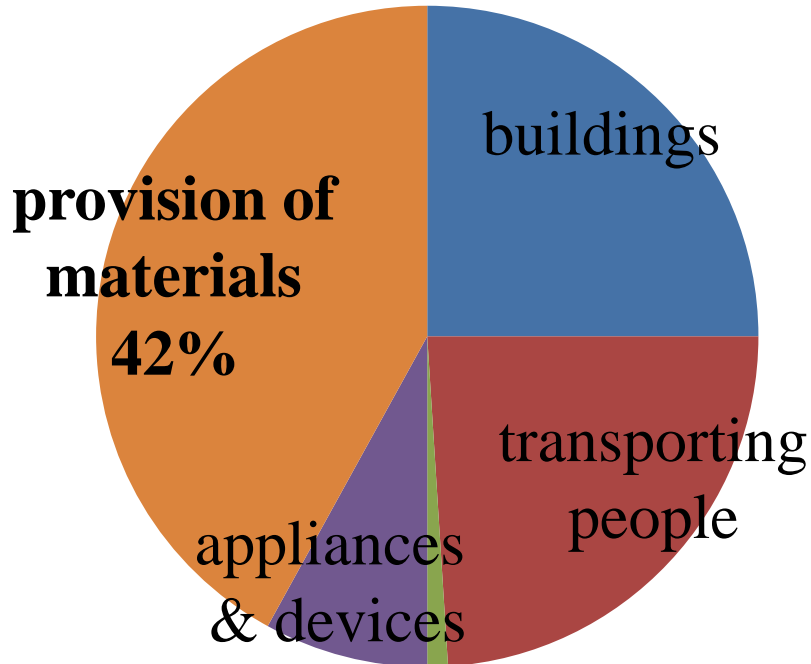
Some More Tier 2 Recommendations:

- Achieve prevention/recovery goals
- Shift focus in solid waste planning to materials management
- Include cost of GHG emissions in policy decisions (internalize externalities)
- Low-carbon government purchasing
- “Do not mail” registry
- Reduce single-use bags
- Carbon footprint score for buildings, including materials
- Incentives for low-carbon building materials
- Change code: larger homes must be more efficient
- Expand salvage of building materials

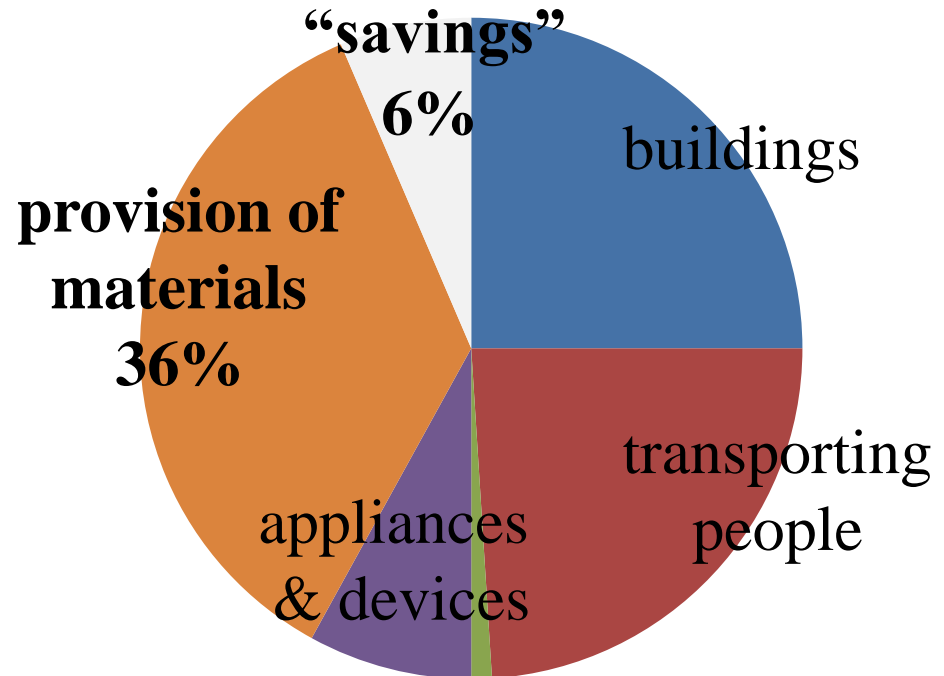


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The importance . . . and limitations . . . of waste recovery (recycling, composting)



2006 U.S. GHG inventory
with 32% recovery
(MSW)

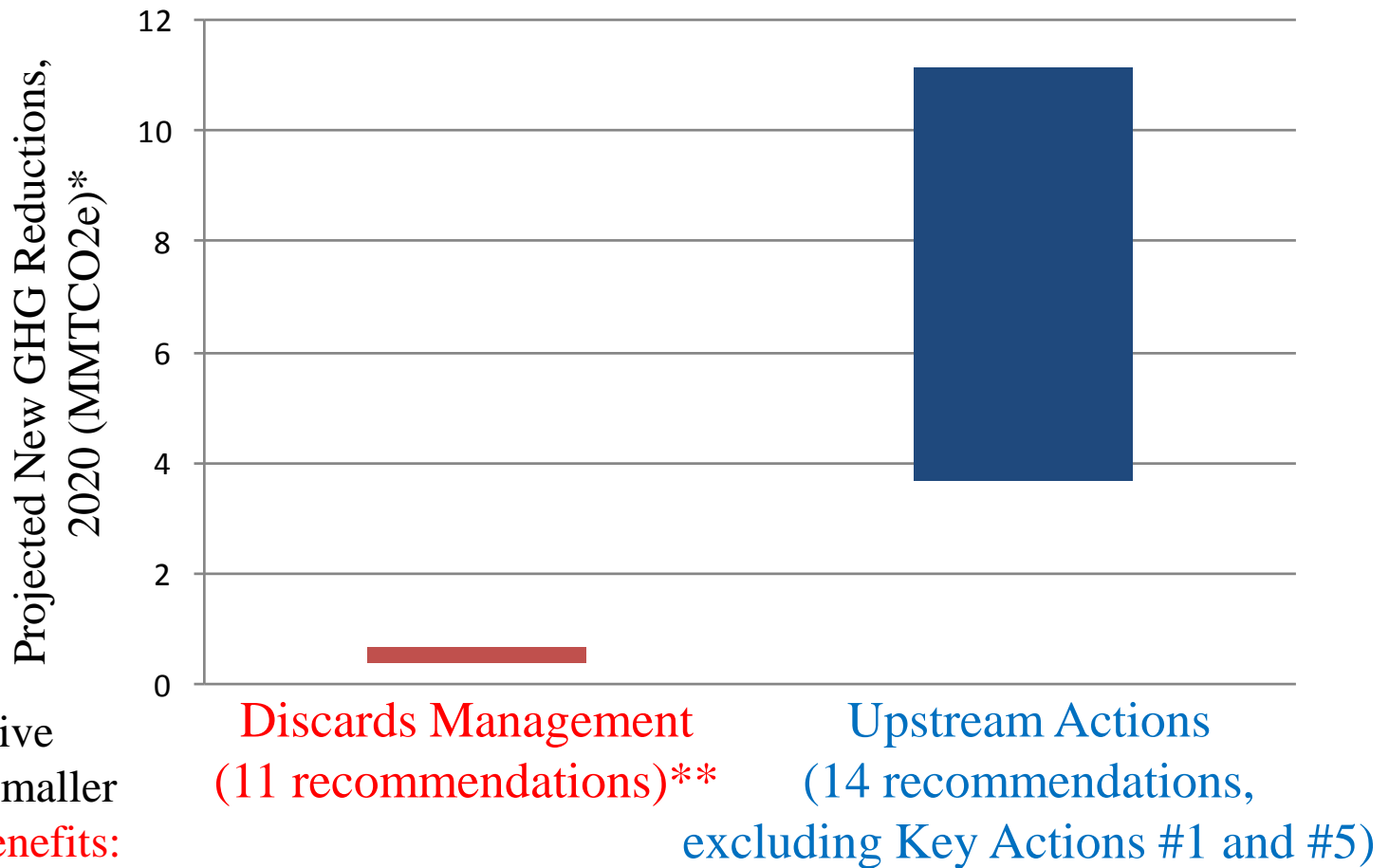


2006 U.S. GHG inventory with
very high recovery rate
(~95% MSW + >70% C&D) 12



Roadmap to 2020:

“Discards Management” and “Upstream Actions”

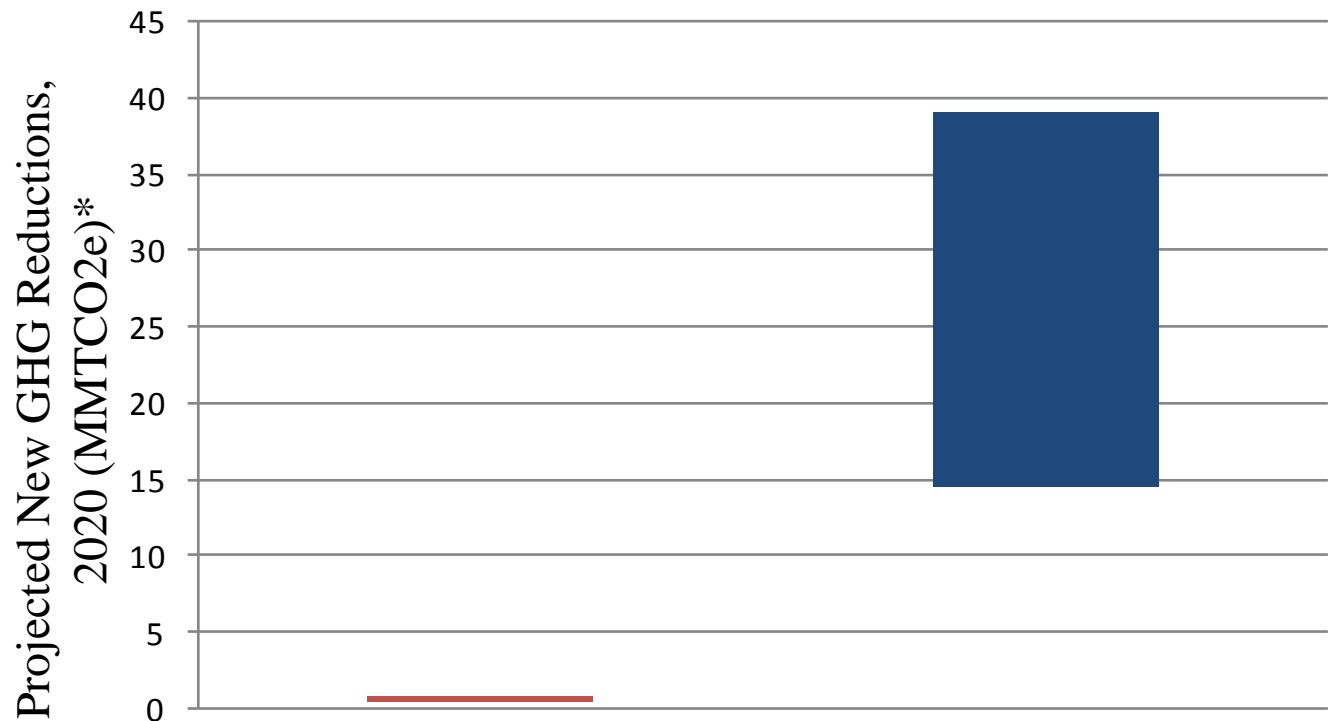


*Additive; cumulative reductions will be smaller
**2009 recovery benefits: 2.8 MMT CO₂e



Roadmap to 2020:

“Discards Management” and “Upstream Actions”



Discards Management
(11 recommendations)**

Upstream Actions
(16 recommendations)

*Additive; cumulative reductions will be smaller

**2009 recovery benefits:
2.8 MMT CO2e



Community-Scale Greenhouse Gas Inventories: Why Do They Matter?

- Common uses of community inventories:
 - Identify how the community contributes to emissions
 - Support GHG reduction planning (scenario analysis)
 - Establish a baseline and reduction goals
 - Measure change relative to the baseline
 - Communicate all of the above to policy-makers and the general public

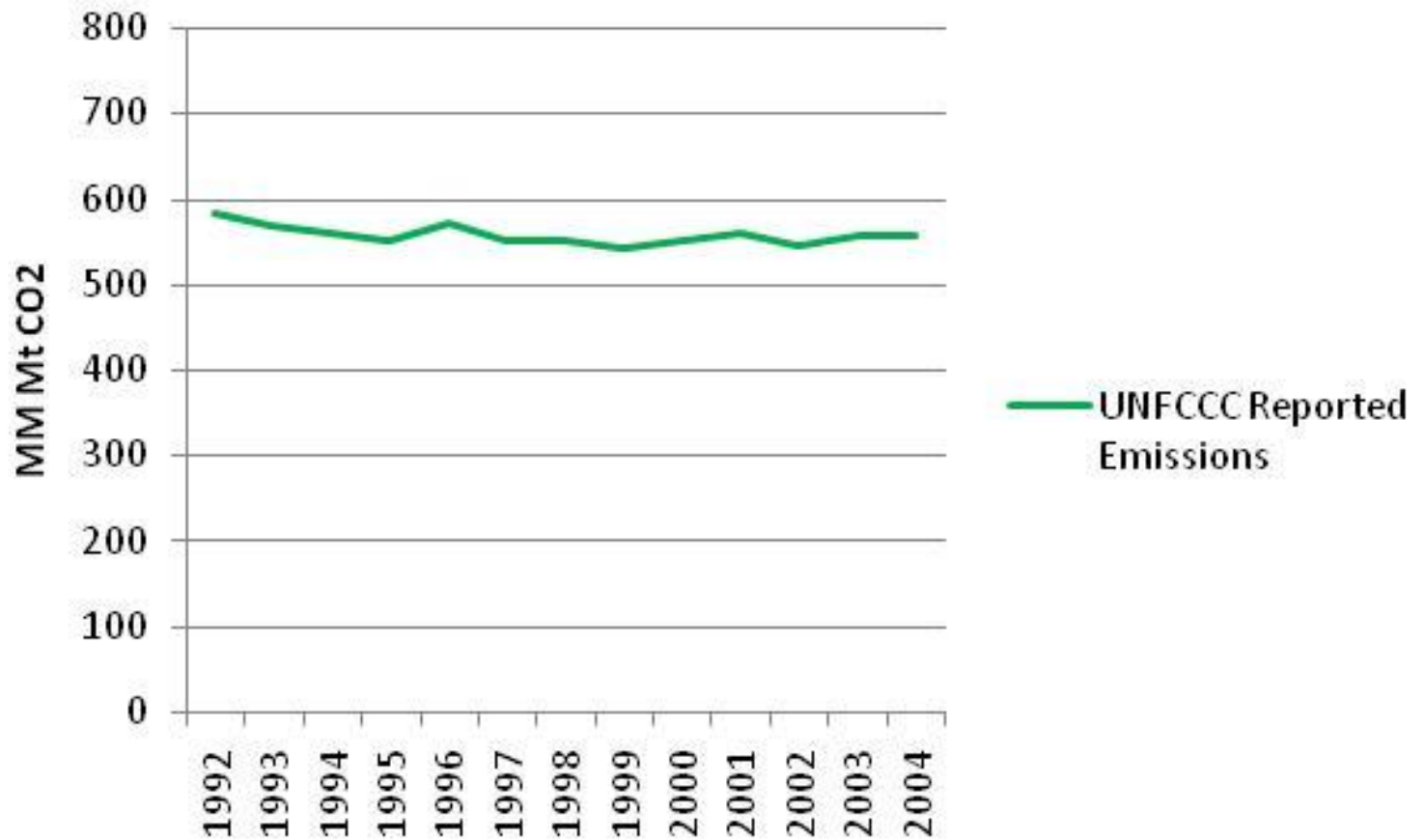


Conventional GHG Inventories (Community Scale)

- “In-boundary” emissions + electricity use + community-generated waste
- Limitations:
 - Provide an incomplete perspective of how communities contribute to emissions . . .
 - . . . and by extension, opportunities to reduce emissions
 - Appear to penalize local production, reward outsourcing (“leakage”)
 - May lead to sub-optimal decisions
 - May provide misleading signals of change over time

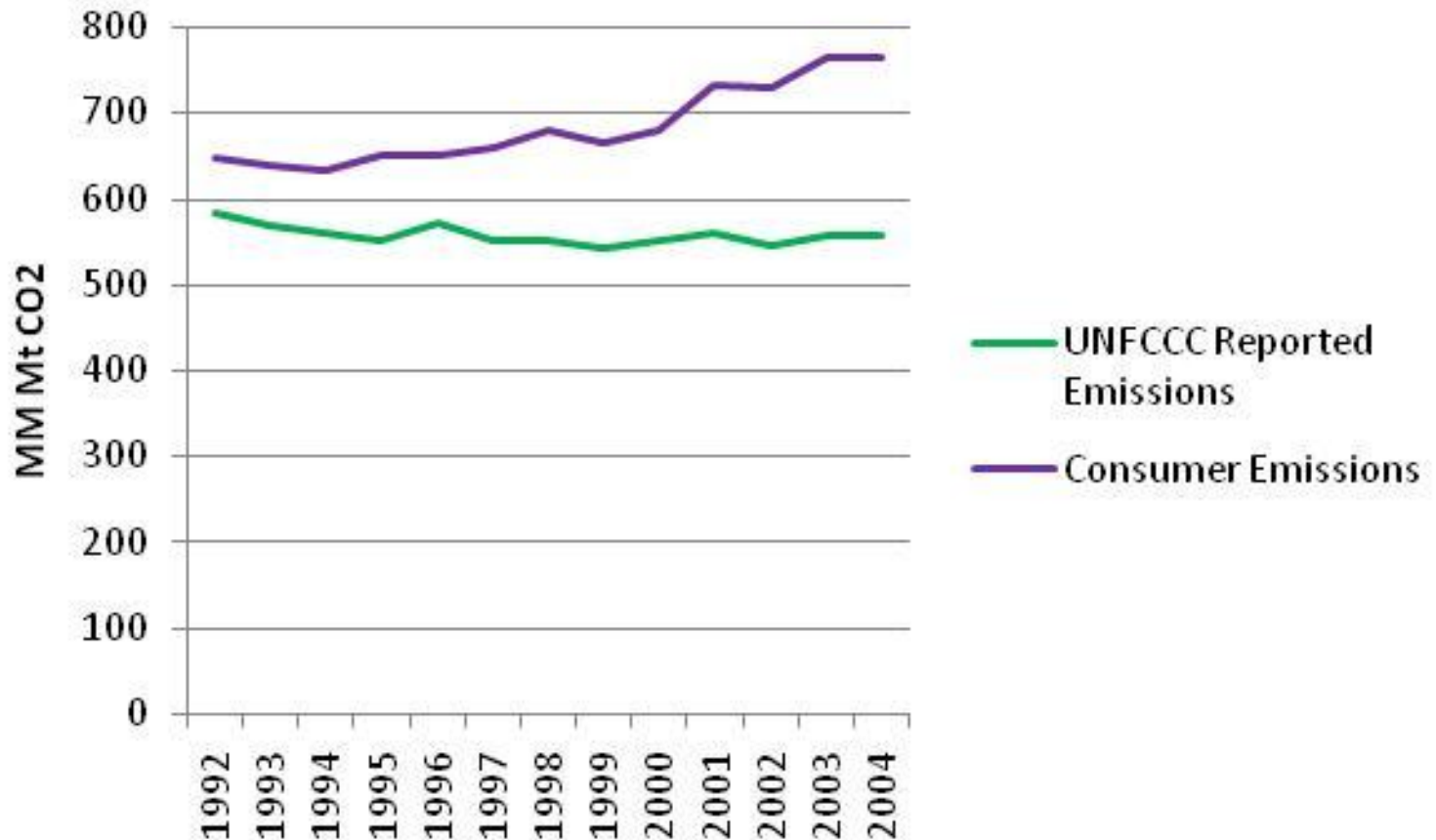


United Kingdom Greenhouse Gas Emissions – Conventional Accounting





United Kingdom Greenhouse Gas Emissions – A More Complete Picture





ICLEI Community Inventory Protocol

- A project of ICLEI-Local Governments for Sustainability USA
 - ICLEI: a membership association of local governments committed to advancing climate protection and sustainable development
 - 600 members in US, 1100 worldwide
 - Developer of software tools (CACCP, CAPPAs) to help local governments conduct inventories, develop climate action plans
- Draft protocol expected late summer (?)
- DEQ on project Steering Committee, Life Cycle Technical Advisory Committee



DEQ

ICLEI Community Inventory Protocol: What to Expect?



- Multiple approaches:
 - Basic standard
 - Local government focus area standard
 - Community impact standard
 - Consumption standard
- Separate “accounting” and “reporting”
- Recycling?
- Materials?



West Coast Climate and Materials Management Forum

- Local government toolkit:
 - Home page (<http://captopoolkit.wikispaces.com/>)
 - Background and motivation
 - GHG inventories
 - Setting targets
 - Climate action plans
 - Measuring results
 - Resources
 - Glossary

- Discussion
- Recent Changes
- Manage Wiki
- Search
- Home Page
- Background & Motivation
- Greenhouse Gas Inventories
- Setting Targets
- Climate Protection Actions
- Measuring Results
- Resources
- Glossary
- Acknowledgements
- We Want to Hear from You

Our Purpose - Reducing Greenhouse Gases through Materials Management

Materials Management strategies reduce greenhouse gas (GHG) emissions associated with waste, materials and products through a lifecycle and systems approach. These emissions contributed 42% to the U.S. greenhouse gas inventory in 2006.

This wiki is a materials management toolkit of:

- Climate Protection Actions
- Example Climate Action Plans
- New approaches to GHG Inventories
- Measurement Tools
- Links to resources
- And more...see links at left

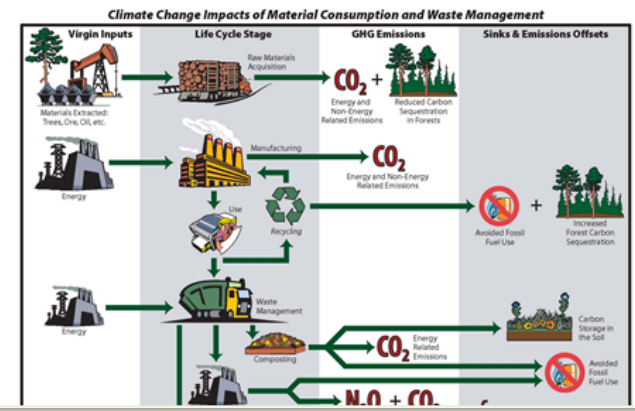
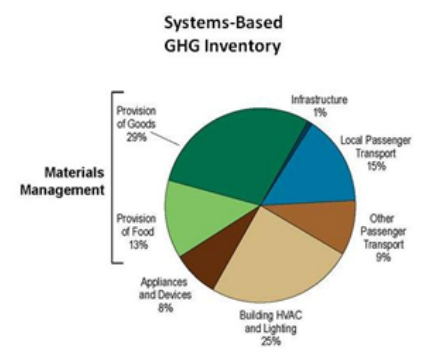
Help us improve this toolkit with your feedback and let us know what materials management approaches you are adding to your Climate Action Plan.

Who Should Use This Toolkit

- State and Local Government Climate Change Staff
- Recycling, Composting and Solid Waste Professionals
- Sustainability and Pollution Prevention Coordinators
- Climate Action Plan Coordinators
- Greenhouse Gas Inventory Staff
- Public Outreach Staff

Click here for [How to Use This Toolkit](#)

This toolkit is a product of the West Coast Climate and Materials Management Forum. The





Oregon Consumption-Based Emissions Inventory (CBEI)

- An estimate of the emissions, everywhere in the world, associated with consumption in Oregon.
- “Consumption” = economic “final demand”
 - The root cause (in economic terms) of emissions





Why CBEI?

- Consumption-based accounting, when coupled with the conventional greenhouse gas inventory, can:
 - provide more comprehensive information on how Oregon contributes to climate change, and
 - provide information that can be used to identify and evaluate actions to reduce greenhouse gases.
- Consumption-based accounting shines new light on material use, but is not the same as a “materials-centric inventory”
 - Exports not included
 - CBEI also adds upstream emissions of fuels, electricity, services



What Will CBEI Tell Us?

- Life-cycle emissions for ~500 commodities (goods and services) consumed in Oregon
 - Emissions by life cycle stage
 - Emissions by region (Oregon, other US, foreign)
 - Emissions by type of consumer (household, government, investment)
- How consumption-based emissions compare with in-state emissions
- Emissions intensities (emissions per \$)
 - Relative emissions intensities by region

Caveat: Precision decreases as one moves from “all consumption” to individual commodities



Potential Applications of CBEI

- Inform efforts involving waste prevention, “sustainable consumption”, product stewardship, government procurement
- Inform and support GHG analyses and actions in government, business and industry
- Include in a future GHG “inventory framework” for Oregon
- Inform policymakers regarding changes in emissions over time, policy options



Thank You!

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