

Disclaimer

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WARM Thoughts

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Using WARM

- Planning Tool
 - West Coast Climate Group
 - California Resource Recovery Association
 - Mojave Desert and Mountain Recycling Authority
- Calculate GHG impacts
 - Avoided emissions
 - Direct reduction
- Emissions Reporting (Scope 1 and 3)
- Not inventory precise
- Not cap and trade emission measure

Understanding WARM

- July 2009 Survey (CRRA , CIWMB)
- 23 responses by July 8
- Never used WARM (39% of respondents)
 - Not aware of the model (50%)
 - Not important or useful (37.5%)
 - Want to learn more (12.5%)

Understanding WARM

Used WARM Previously (61% of respondents)

- What questions would you like answered?
 1. Can WARM reflect impacts of alternative methods, such as anaerobic digestion or alternative daily cover?
 2. Why does WARM include landfill carbon sequestration?
 3. Can WARM be used to calculate solid waste emissions in an inventory?

Understanding WARM

4. Why doesn't WARM include composting impacts like soil sequestration, reduced water consumption and upstream chemical manufacturing?
5. What is the difference if methane emissions are calculated over the atmospheric life (21 years) rather than standardized to CO₂ life (100 years)?
6. Can WARM be used to estimate GHG savings from waste management alternatives?

Improving WARM

- Rate potential changes to WARM
 - Important
 - Not Important
 - No Opinion

Improving WARM

- Important
 1. Add construction and demolition materials
 2. Create WARM version compatible with widely used greenhouse gas inventory models
 3. Expand compost impacts to use and alternatives manufacturing
 4. Link WARM to community planning tools
 5. Calculate methane emissions on actual atmospheric life
 5. Present WARM results in summary narrative (include definitions, dispositions, impacts at stages)

Improving WARM

- Not Important
 1. Consolidate categories when factors are the same
 2. Change output format to all one orientation, either portrait or landscape
 3. Include other waste to energy options
- No Opinion
 1. Allow more options for landfill variations
 2. Remove landfill carbon sequestration
 3. Allow differing options for compost operations

WARM Thoughts

- Common Sense
- Decision Tool
- Compatibility
- Updating
- Directed Research
- New Generation Models

WARM Thoughts: Common Sense

- Land filled organic materials create methane
- Engineered capture is the same thinking that got us here
- Avoiding methane is wiser
- Why are we creating methane?
- Anthrogenicizing biogenic material

WARM Thoughts: Decision Tool

- Composting food has substantial GHG reduction over land filling
- Composting mixed organics (food and yard debris) has lesser benefit
- Composting grass alone is the same as mixed organics
- A food composting alone strategy is not a viable operation

WARM Thoughts: Compatibility

- WARM carbon in landfills is “long-term” stored
- No IPCC definition for long-term except “not completely decomposed”
- ICLEI’s GHG Emissions Analysis Protocol does not include landfill carbon storage
- California Air Resources Board Local Government Operations Protocol does not include landfill carbon storage

WARM Thoughts: Updating

- Methane global warming potential is 21 in WARM
- IPCC Assessment 4 changed the potential to 25
- Methane's real short-term impact is 72
- “a tonne of methane emitted today will exert more annual warming than a tonne of CO₂ *emitted today until 2075*. Not until the year 7300 will the cumulative warming exerted by the two become equal. It is truly carbon on steroids.” Kirk Smith, *New Scientist*, June 27, 2009

WARM Thoughts: Directed Research

- Compost use has been shown to increase soil water retention; moister soil gives a number of ancillary benefits, including reduced energy used for pumping water
- Addressing the possible GHG emission reductions achievable by applying compost instead of chemical fertilizers, fungicides, and pesticides was beyond the scope of WARM.
- Manufacturing those agricultural products requires energy. To the extent that compost may replace or reduce the need for these substances, composting may result in reduced energy-related GHG emissions

WARM Thoughts: New Generation Models

- Lead the way in changing assumptions for immediate benefit – methane's half-life is 8.5 years
- Enhance WARM's planning capabilities by linking with widely-used protocols
- Remove the perverse incentive to landfill organic materials, creating methane, and sequester carbon
- Promote a research agenda to verify composting's upstream benefits
- Introduce more processing options, especially composting, to guide decisions