

Governor's Modernizing Recycling Working Group

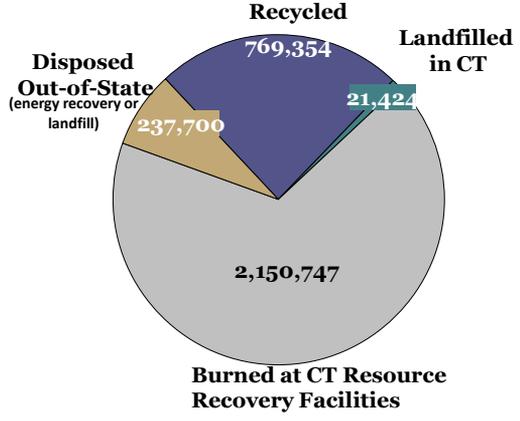
Waste Transformation

DSM's Findings and Draft Recommendations
November 13, 2012

Key Findings

CT is a Leader in Environmental Outcomes and Recovery Rates, in the US and Globally

Reported CT Municipal Solid Waste Disposed and Recycled (Tons, FY 2010)



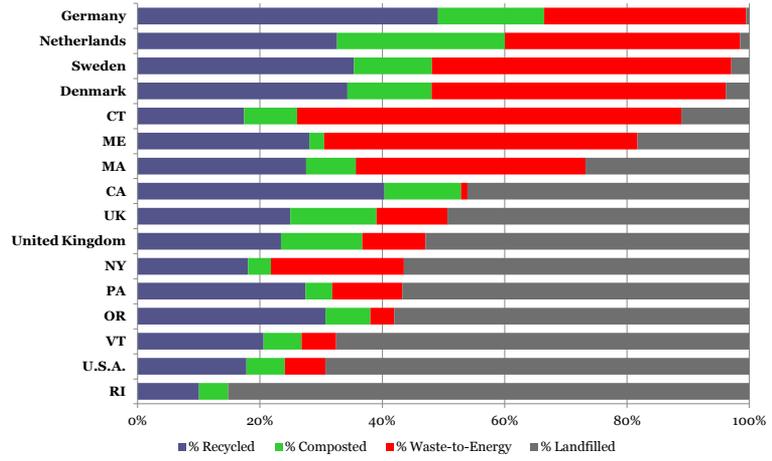
• CT is close to Zero Landfill of municipal solid waste – a goal of a number of corporations and some governments

www.ct.gov/deep/lib/deep/reduce_reuse_recycle/data/average_state_msw_statistics_fy2010.pdf

Sustainability Comparison

(Ranked by total % recycled, composted or sent to WTE facilities)

Sustainable Waste Management Ladder
(2008 data from Earth Engineering Center, Columbia University)

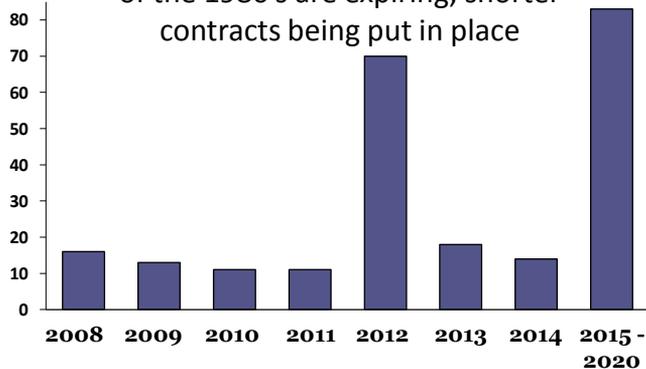


CT is a Leader Today In Part Due to Decisions About System Architecture Made 35 years ago

- Development of sufficient RRF capacity to be self-sufficient
- Creation of CRRA with ability to borrow at low cost with implicit State guarantee
- Flow control through contracts assured predictable flow
- Implementation of avoided cost energy rates to keep tipping fees competitive
- Transfer of future ownership of most RRF's to private companies to reduce public borrowing costs (except Mid –CT and later, ECRRA in Lisbon)

CT is Facing a Watershed Moment Allowing the State to Rethink Waste Management System

Long term municipal disposal contracts* of the 1980's are expiring; shorter contracts being put in place



* Includes contracts between a municipality and a solid waste company; a RRF; a RRF through a regional resource recovery authority, regional operating committee, etc.; 117 municipalities responded to this question in 2008; updated as additional information available

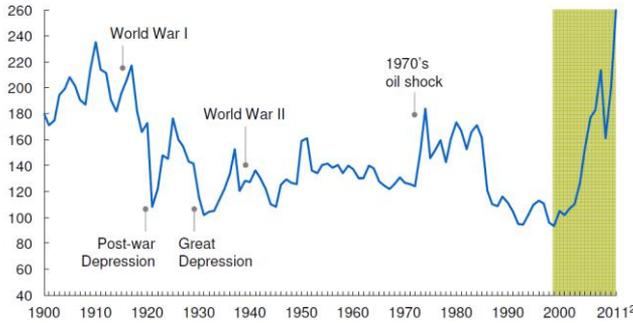
- Expiring power purchase agreements for RRF's between now and 2020 will affect tipping fees as RRF's compete with electricity produced from low cost natural gas

- Closure of RRF's with delivery of waste to out of state RRF's or landfills will increase CT's GHG emissions

Fortunately, as Electricity Prices Have Declined, Commodity Prices for Materials in the Waste Stream Have Been Increasing

Commodity prices have increased sharply since 2000, erasing all the declines of the 20th century

McKinsey Commodity Price Index (years 1999–2001 = 100)¹



¹ Based on arithmetic average of 4 commodity sub-indices of food, non-food agricultural items, metals and energy.
² 2011 prices based on average of first eight months of 2011.

Economic expansion in the developing world means increasing rates of consumption of ALL commodities

Over the next 25 years 3.3 billion consumers will be entering the global market

- Connecticut has an opportunity to capture the value in the commodities currently burned to create new jobs here in Connecticut, and to attract new industries to use these commodities
- But it will take new approaches and investment



Jobs through Recycling

Roughly **3,000 jobs** in the recycling supply chain and another **2,100 indirect and induced jobs** currently contribute **\$240 million in payroll** and **\$60 million in tax revenue** to the CT economy.

	Employment (jobs)	Payroll (\$1,000's)	Business Taxes (\$1,000's)
Direct Impacts			
<i>Direct Impacts</i>			
Collection	1,268	\$54,892	
Processing/Wholesaling	1,429	\$67,998	
Composting	257	\$9,658	
Subtotal, Direct:	2,955	\$132,548	\$43,380
<i>Indirect Impacts</i>	796	\$44,300	\$4,950
Induced Impacts	1,372	\$61,800	\$12,110
Total Direct, Indirect and Induced Impacts:	5,122	\$238,648	\$60,440

Source: CT Economic Resource Center

Source: DSM modeling of collection jobs based on 2010 and 2011 tonnages and 2010 County Business Patterns

Recycling Reliant Industries Have Even Greater Impacts



While CT has not conducted a Recycling Economic study, if CT is similar to other states where recent studies have been conducted, industries reliant on recovered feedstock (paper, wood, glass, plastics) *may be* responsible for another **5100 direct jobs**, and 6,600 indirect and induced jobs.

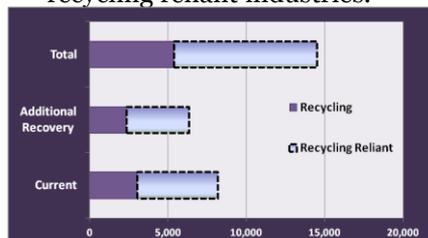
Connecticut's Recycling Economy

Recycling Jobs Potential:

- In total, recycling and recycling reliant industries *may directly employ 8,200* in CT with a payroll of **\$326 million**.
- These direct jobs and payroll are estimated to contribute another **8,800** indirect and induced jobs in CT.
- Determining exactly which industries in CT seek recycled feedstock and which might be attracted to CT are a reason to do a complete Recycling Economic Information Study.

For Example:

- Moving from a 24% materials recovery rate to a 42% rate could **directly create another 2300** recycling jobs as well as support and grow even more jobs in recycling reliant industries.



State Solid Waste Management Plan Vision

- Transform system to one based on resource management:
 - Product Stewardship: **Shared responsibility** for the production, use and end-of-life management and materials
 - Shift to **recognizing the value of raw materials** (i.e., not 'waste') to ensure sustainable materials management
 - **Systems approach**, zero waste principles

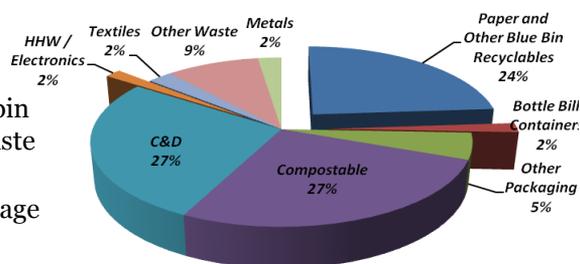
Immediate Opportunities for Increased Materials Recovery

Forty-eight (48%) of blue bin materials remain in the waste stream

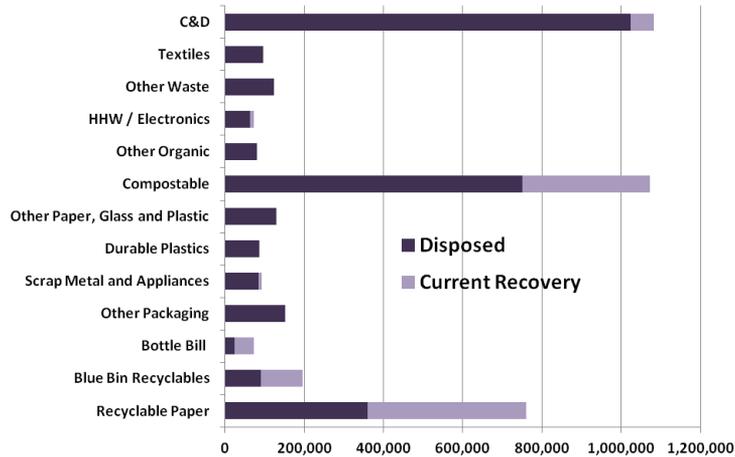
Forty-three (43%) of beverage containers are not being recovered

Paper and packaging make up 31% of what is left in the waste stream

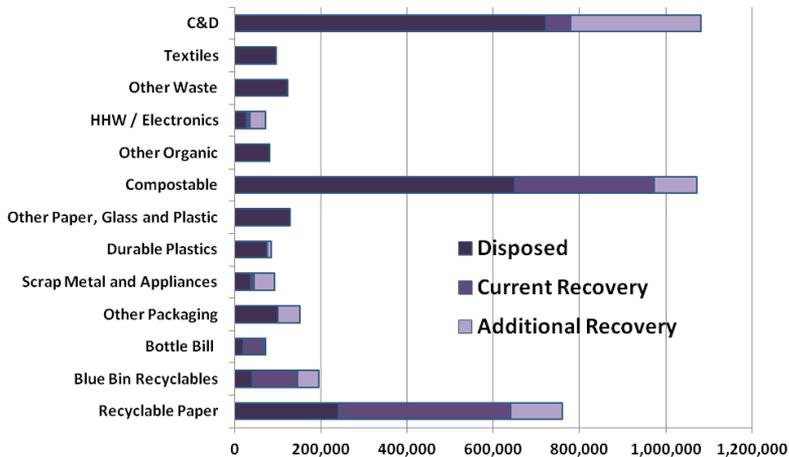
There are large opportunities to recover organics and C&D materials



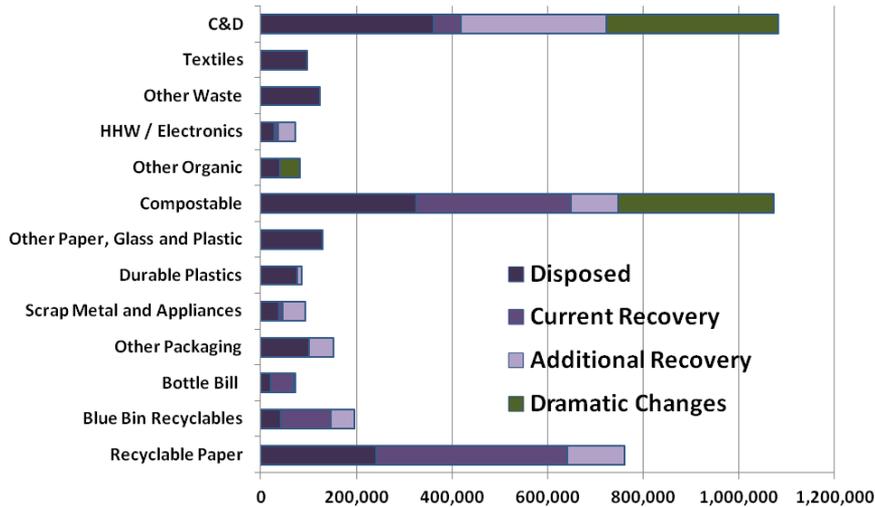
Current Recovery About 24% (MSW and C&D)



Potentially Achievable Recovery Could Result in Rate of 42%



Dramatic Changes Needed to Push Rate to 60%



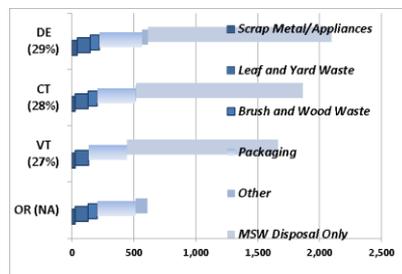
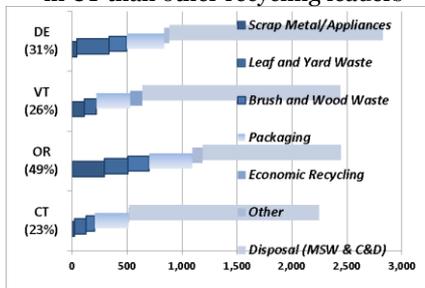
Benchmarking Against Other States

Performance can be measured in more than one way

- Low recycling rate doesn't mean poor performance – material recovery rates more accurate measure of progress
- Per capita disposal may be lower in CT than other recycling leaders

Adjusting for differences in metrics and climate:

- Limiting scrap metal recovery to appliances (and packaging) is more representative
- Brush and yard waste generation varies depending on climate and changes organics potential



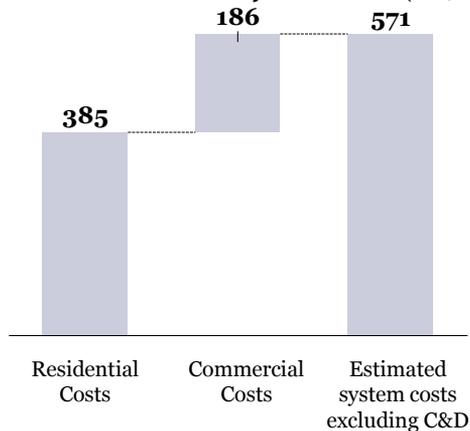
Challenges

The State Faces Several Challenges that will Need to be Addressed

1. Current costs of materials collection and management reflect fragmentation and duplication within system and varying responsibilities
2. Economic signals to increase recycling are often missing resulting in too many valuable materials being wasted
3. Local market demand for recyclable materials does not reflect the availability of supply
4. Declining revenue from electricity sales are shifting the economics for resource recovery facilities
5. Closure of landfills has resulted in lack of capacity for material which cannot be burned or recovered
6. Historical siting and environmental justice issues pose challenges for business development and community acceptance
7. Significant data gaps and quality concerns prevents complete materials flow analysis and hinders capacity planning and market development
8. Stakeholders find the regulatory and enforcement environment complex and costly

Costs of Materials Collection and Management Reflect Fragmentation and Duplication Within System and Varying Responsibilities

Estimated Annual System Costs (in \$1,000,000)



Major cost drivers include:

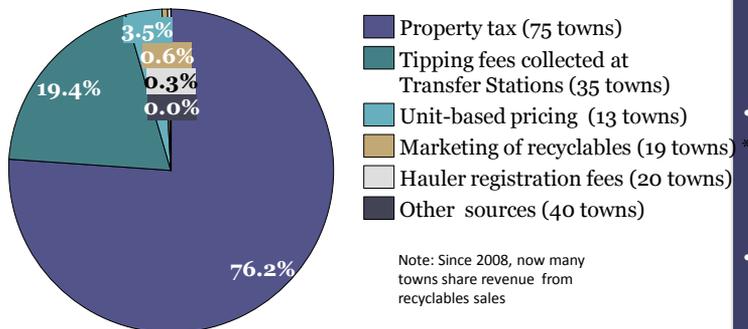
- Collection costs
- Fragmentation/ duplication driven by 169 municipalities
- There may be too many transfer stations, not optimally located

Fragmentation Without Clear Authority and Responsibility for Implementation

- Under current statute CRRA is responsible for implementation of operational aspect of the State Plan Solid Waste Management System
- Yet CRRA does not receive state funding, relying solely on revenues from operation of its facilities
- All 169 municipalities can choose which facilities to use, hindering ability to plan operational needs of municipalities on statewide basis.
 - It is expected that within the next several years only between 55 and 70 municipalities out of 169 may use CRRA facilities.
- Some responsibility for implementing the State Plan falls on municipalities
 - But not all municipalities have the resources, designated responsibility, or authority to do so

Economic Signals Are Missing Resulting in Valuable Materials Being Wasted

Revenue Sources Used to Cover Residential Waste and Recycling-related Costs in CT(1)



(1) Based on responses from CT DEEP Municipal Survey 2008-2010. 113 municipalities (out of the 161 surveys received) responded to this question. Multiple responses allowed.

- No price signals to drive lower disposal and higher recycling means lost opportunity for value extraction
- Some citizens are subsidizing the costs of others
- Businesses are subsidizing costs of residential collection

Local Market Demand for Recyclable Materials Does Not Reflect the Availability of Supply

- Existing DAS and DOT procurements are underutilized as a market driver
- Export market demand for recyclables often driven by economic factors in importing countries including poor environmental and safety regulations, low cost labor, and state subsidization of capital
- Attracting additional manufacturing capacity to CT will require a better understanding of pressures facing current recycling reliant industries in CT

Data Gaps and Quality Prevents Comprehensive Materials Flow Analysis and Hinders Capacity Planning and Market Development

- Currently DEEP collects large amounts of data non-electronically from municipalities and facility operators, with some data gaps due to non-reporters and non-compliance
- There is also duplication of effort with reporting to State and to municipalities
- This places a burden on those reporting the data and on DEEP to manage, quality control, and analyze

The Right Decisions Over the Next Several Years Can Continue Connecticut's Role as a Global Leader in Waste and Materials Management While Generating New Jobs

- Resolution of energy rates for RRF facilities allowing the RRFs to remain competitive
- Decoupling of residential waste management costs from property taxes
- Smart investments in expanded materials recovery
- Development of additional capacity to use recovered materials in Connecticut's recycling reliant industries

In-State Landfill Capacity May Not Be Essential But Would Contribute to Self-Sufficiency

- If a continued goal going forward is self-sufficiency then creative solutions to maintaining in-state landfill capacity for certain waste streams will be necessary
- Some waste streams - such as RRF ash residue, contaminated soil not otherwise able to be reused, catch basin pumping, street sweeping debris, and other special wastes - will continue to require landfill capacity

Infrastructure Costs

- Moving to a 60 percent materials recovery rate is estimated to require capital investments of between \$170 and \$370 million
 - \$90 million for C&D processing
 - \$75 million for composting
 - As much as \$280 million for AD facilities

Proposed Recommendations

Systems Architecture

- There is a need to define a new Systems Architecture to aggressively move to new levels of materials recovery
- It will require similar long term thinking as was exhibited 35 years ago
- We propose coming back to this later today

Funding Investments for a Sustainable Materials Economy Through Generator Responsibility Mechanisms

- De-couple payment of waste and recycling collection and disposal from property taxes by either mandating or incentivizing unit based pricing for all household waste
- Develop a broad based product stewardship approach with an extended producer responsibility fund to jump start the necessary infrastructure
 - Consider adoption of a broad based transaction fee which covers all materials
- Consider creating or expanding an infrastructure development bank to leverage private financing of materials recovery and energy recovery facilities
- Update solid waste assessment fee to apply to all non-recycled materials

Decrease System Costs and Eliminate Fragmentation and Duplication

- Assess municipalities' interest in continuing involvement in collection
 - Implement state licensing of all haulers
 - Consider moving to regional authority responsibility for managing waste
- Reduce system costs by organizing collection in areas of multiple subscription routes
- Decrease contracting authorities to streamline implementation of new facilities
 - Move from municipal contracts to regional authority contracts

The Groundwork Has Been Laid for Regional Aggregation, but More Work Needs to be Done



Mid-Connecticut Project

- Waste processing facility, refuse-derived fuel, trash-to-energy plant, recyclables processing facilities, and CRRA Trash Museum in Hartford
- Transfer stations in Essex, Ellington, Torrington and Waterbury
- Canaan, Durham, Lyme, Old Lyme, Middlefield and Toland deliver trash but not recyclables. Residents may take advantage of Mid-Connecticut Project electronics recycling collections.

Southwest Division

- CRRA contracts for towns to deliver trash to mass-burn trash-to-energy plant in Bridgeport
- Recycling processing center and Garbage Museum in Stratford
- Greenwich, East Haven deliver recyclables but not trash; Bethany delivers trash but not recyclables

Southeast Project

- Mass-burn trash-to-energy facility in Preston

Northwestern towns jointly contract for transportation and disposal of trash and recyclables.

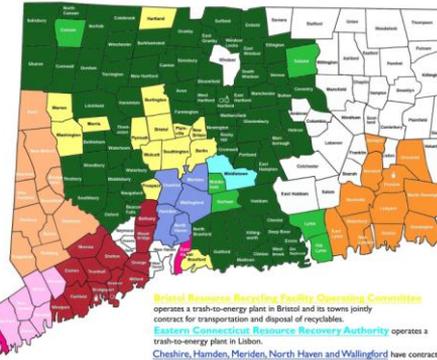
Housatonic Resources Recovery Authority operates a recycling processing center in Danbury and its towns jointly contract for transportation and disposal of trash.

Bristol Resource Recycling Facility Operating Committee

operates a trash-to-energy plant in Bristol and its towns jointly contract for transportation and disposal of recyclables.

Eastern Connecticut Resource Recovery Authority operates a trash-to-energy plant in Lisbon.

Cheshire, Hamden, Meriden, North Haven and Wallingford have contracts to deliver waste to Covanta's Wallingford trash-to-energy plant.



Maintaining Competitive Disposal Rates will Require a Creative Way to Address Energy Revenue Volatility

- Find a way to price electricity from RRF's which allow them to receive above market energy revenues in the short run
- In addition, the current solid waste assessment fee which is only assessed on tonnage delivered to RRFs should be expanded to a fee on all non-recycled waste
 - But solid waste assessment fees on disposal will prove inadequate to fund infrastructure as disposal quantities decrease

Promote Diversification of Materials and Energy Recovery Investments and Infrastructure

- Continue to encourage a diverse range of facility types and ownerships to assure that the best solutions survive and that technological or financial failures do not saddle the state with subsidization of sunk costs
 - New technologies for capturing energy from waste are as yet technologically and financially unproven in the U.S.
- Build on the regional authorities and the significant private sector knowledge and investments going forward

Stimulate Market Development through Innovative Approaches and Investments

- Identify and cultivate recycling development zones and resource recovery industrial parks
- Develop regional markets for key materials focused on CT as a job driver
- Encourage and reposition DECD to create incentives to attract, retain, and develop recycling reliant businesses
- Improve data reporting of recovered materials to identify quantity and value of available recovered materials
- Conduct Recycling Economic Information Study to identify and quantify recycling and recycling reliant industries in CT and their economic impact

The State Can Also Act as a Driver to Increase Demand for Materials

- Increase demand by updating CTDOT requirements for incorporating a certain percentage of recycled materials into its total materials usage each year
 - Compost, plastics, asphalt shingles, glass cullet
- Encourage CT DECD to coordinate the needs of recycling reliant industries identified from the REI study with the materials available from processing facilities
- Provide funding to develop new markets and new recycling reliant facilities in CT
 - Infrastructure development bank

Create Incentives to Expand Materials Supply Through Investment and Permitting

- Consider renewing tax incentives for private sector investments (e.g., renew the provision to exempt certain processing equipment from property taxes)
- Expand the number of C&D processing facilities to move from an estimated 30% to close to 100% processing of C&D
 - Construction of the Plainfield biomass facility and potential permitting of the Montville biomass facility will provide significant new demand for wood waste from C&D processing facilities
- Continue to streamline the permitting process and regulatory environment, per the State Solid Waste Management Plan
- Invest in organics processing capacity (animal feeding, composting, and anaerobic digestion) to build infrastructure to implement mandatory recycling of commercial organics

Improve Management of Certain Difficult Waste Streams

- Improve opportunities for reuse and recycling of special wastes
 - Expand beneficial use approval processes
- Consider Re-Purposing One or More Closed Landfills
 - Mining of old landfills to recover metals and cover materials is being carried out throughout the U.S.
 - One LF in CT is currently being mined for materials used in organics recycling facility
- State should identify closed landfills that could be mined, lined, and opened for special wastes
 - This can become critical during natural disasters for disaster debris types that can't be separated and recycled and will instead require disposal

Measuring performance will require smarter data collection and management

- Enact legislation to authorize state licensing of haulers
 - Alternately, require registration at a statewide level rather than municipal level
- Require web-based reporting from current reporters and entities not currently reporting
 - Consider adopting reporting requirement for all generators, processors and brokers of recyclables
 - All generators sending recyclables to in-state processors are only required to report where they are delivering materials
- Restore stakeholder group (Solid Waste Management Advisory Committee (SWAC) Data Subcommittee) to simplify current reporting requirements
 - Investigate reducing the frequency of reporting
 - Eliminate duplicative reporting
- Synchronize data reporting with performance based analysis
- Standardize data definitions and collection with other states to encourage materials flow

Establish Clear Program Responsibilities and Accountability for Implementing the State Solid Waste Management Plan

- DEEP should clearly identify points of accountability, and report on performance metrics to assure implementation of the State Solid Waste Management Plan is carried out over time
- The existing regional authorities may be logical entities to implement many of the operational programs
 - CRRA cannot be responsible for implementing and maintaining the State Solid Waste Management System when in essence it is a regional authority
- Recognize the important role of the private sector in implementation of the State Solid Waste Management Plan
 - They collect the majority of waste in CT, and also operate the majority of materials processing and RRF capacity

A Role for CRRA as a Regional Player Exists, But Could Look Much Different than Statewide Role

- As a net cost of operation entity, the Mid Conn facility is especially vulnerable to lower energy prices
 - And is more vulnerable to ash residue disposal pricing
- Municipalities representing as much as 250,000 annual tons of waste which are currently delivered to Mid Conn are expected, or have already signed contracts with mass burn facilities
- The rational approach going forward is to view all RRF's, including the Mid Conn facility, as sunk costs
- If state electric purchase contracts can be structured that are beneficial to the state and municipalities, and are sufficient to allow CRRA to offer competitive tipping fees, then Mid Conn should continue to operate
- However if Mid Conn requires long-term above power rates which are significantly greater than mass burn facilities, then alternatives to the Mid Conn facility should be investigated

Points of Accountability, Performance Measurement, Implementation Responsibility

- Achieving State Solid Waste Management Plan goals requires clear definition of:
 - Implementation responsibility
 - Responsibility for measuring performance
 - Accountability for lack of performance
- This is currently lacking in CT's fragmented solid waste management institutions and infrastructure