Building Deconstruction: The Value of Reuse

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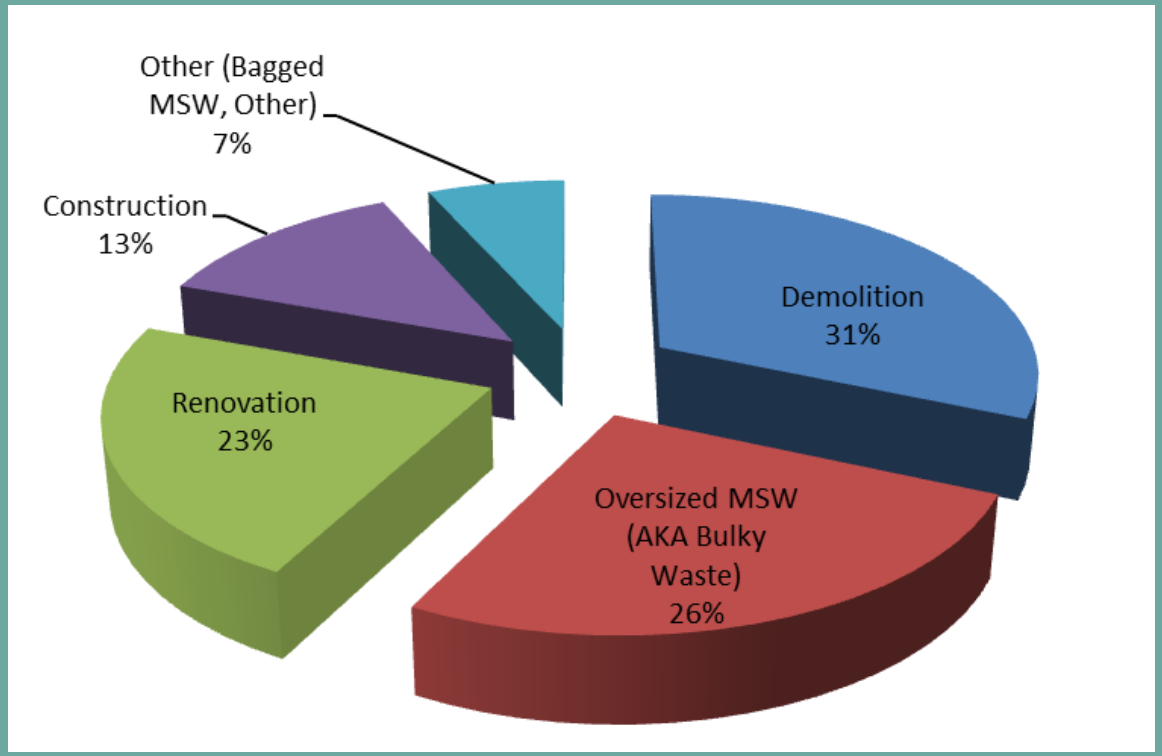
60% Diversion Goal

- To fully achieve the State's diversion goal… the state must also increase the diversion of Construction and Demolition (C&D) waste.

Source: CT Comprehensive Materials Management Strategy, 2015
https://portal.ct.gov/-/media/DEEP/waste_management_and_disposal/Solid_Waste_Management_Plan/CMMSFinalAdoptedComprehensiveMaterialsManagementStrategypdf.pdf

Inbound Waste Loads Observed at CT C&D VRFs – By Category



- In 2013, CT generated about 1,041,643 Tons of C&D debris
- Per capita generation rate:

~ 0.29 T/person/yr

- In 2013, the 4 VRFs with sorting lines avg. 7% recycling rate

Construction and Demolition Waste Characterization and Market Analysis, March 2016, GREEN SEAL ENVIRONMENTAL, INC. https://portal.ct.gov/-/media/DEEP/waste_management_and_disposal/Solid_Waste_Management_Plan/CMMSFinal2016ConstructionAndDemolitionWasteCharacterizationStudyPDF.pdf


VOLVO
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DANGER
THIS EQUIPMENT
STARTS
AUTOMATICALLY
16

REUSE

- **REUSE** is extending the life of an item by using it more than once, for the same or a new function. By taking a useful product and exchanging it without reprocessing (i.e. recycling), reuse retains the embedded energy and natural resources used in the product's initial manufacturing process.

REUSE vs. RECYCLING

Recycling or “down-cycling” is the process of breaking down a used item into its raw materials/components which are then used to make new items. Reuse is often using for original use in original form or “upcycling”.

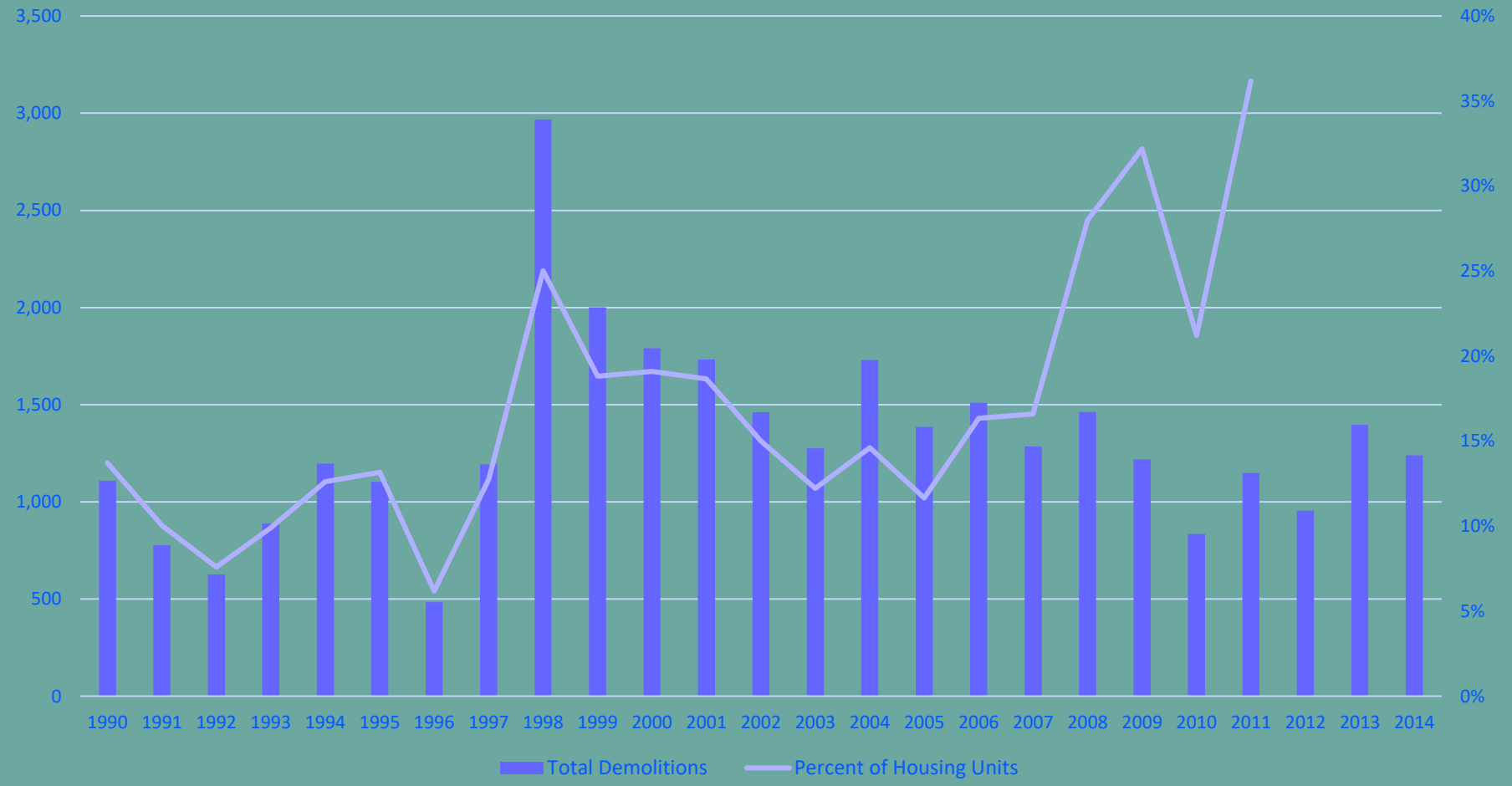
Example: Wood

- Reuse turns unwanted wood/lumber into flooring or furniture
- Recycling turns unwanted wood/lumber into sawdust, mulch or pellets.

Demolitions in CT

Photo: Kelsey Quartuccio/DEEP Intern

Building Demolitions in CT (1990-2014)



Deconstruction

The systematic dismantling of a building or its parts to salvage and harvest the components within; with the purpose of reusing and/or recycling these reclaimed materials and commodities for their maximum economic and environmental value.

-Introduction to Deconstruction: A Comprehensive Training Manual, Building Material Reuse Association, 2012

Parts of Building Material Reuse

- Clean Outs
- Soft Stripping
- Full Deconstruction – structural impact
- Building Material Reuse Center

Photo: Joe DeRisi/Urbanminers, LLC

Reusable Materials

- Wood (lumber, flooring)
- Windows, Doors
- Cabinets
- Plumbing Products (aka ceramics)
- Electrical Products
- Radiators, woodstoves, etc.
- Landscape materials – including plants
- Non-wood flooring
- Roofing materials

Wood (lumber, flooring)

Reuse

- Timbers; large dimension lumber; plywood; flooring; molding; lumber longer than 6 feet

Recycle

- Unpainted and untreated wood unfit for reuse

Photo: Joe DeRisi/Urbanminers, LLC

Reuse

- Windows in good condition (for single panes, consider adding storm windows)

Recycle

- Metal frames and screens; unpainted and untreated wood
- Window “glass”

Cabinets

Reuse

- Cabinets; hardware (hinges and knobs)

Recycle

- Hardware; unpainted and unfinished wood

Plumbing Products

Reuse

- Sinks; tubs; toilets; faucets

Recycle/Dispose

- Metal pipe; outdated toilets; inefficient plumbing fixtures; faucets with lead content

Electrical Products

Reuse

- Electrical products in good working order

Recycle

- Metals (fixtures, conduit)

Landscape Materials

Reuse

- Timbers; stone; concrete; brick
- Shrubs; perennials; small trees

Recycle

- Untreated, unpainted wood

Reuse and Recycling Industry

Increasing commercial and residential recycling collection within the state will directly increase local jobs.

Photo: Dave Bennink/RE-USE Consulting

Source: Institute for Local Self Reliance , "Recycling Means Business," http://www.ilsr.org/recycling/recyclingmeansbusiness.html

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High Performance (Green) Building Standards for State Agency Buildings and School Buildings

2019 Update-Connecticut High Performance Buildings

Connecticut's green construction standards help achieve the state's greenhouse gas emission, energy, and cost reduction goals while driving economic growth. This year, the Connecticut General Assembly passed Public Act 19-35 , titled "The Green Economy and Environmental Protection" bill, which amended the state building construction statute (CGS §16a-38k). Now, DEEP is required to adopt high performance building regulations based on a national sustainable construction code. DEEP has started its review of these nationally recognized models. Until the new regulations are adopted, projects are required to comply with the current regulations (RCSA 16a-38k-1 through 16a-38k-9).

Background

Since 2007, Connecticut law has mandated high performance efficiency buildings (CGS § 16a-38k). As required, DEEP has adopted high performance (Green) building construction regulations that incorporate design, construction, and operation practices that preserve the natural environment (RCSA 16a-38k 1-9). These state construction standards are consistent with, or in some cases, have exceeded the Leadership in Energy and Environment (LEED) silver design building rating system.

Connecticut High Performance Building Standards Apply to:

State Facilities

The project bond funds were allocated after Jan 1, 2008.

New Construction
Projected cost greater than, or equal to $5 million.

Renovation

Projected cost greater than, or equal to $2 million.

Public Schools

The project funds were authorized on or after Jan 1, 2009.

Building Standard Optional Strategies- State Facilities

Recycling, Reuse, and Sustainability

The following thirteen strategies are available for improving recycling, reuse, and sustainability. At least two options within this category must be selected:

Section 16a-38k-4 (d)(1): Retain at least 75 percent, by surface area, of an existing building structure, including structural floor and roof decking, exterior framing, and envelope surface, but excluding window assemblies and non-structural roofing material. This strategy only applies to renovation projects.

Section 16a-38k-4 (d)(2): Same as subsection (d)(1) above, except that a total of 95 percent of the building structure is retained. This strategy only applies to renovation projects.

Section 16a-38k-4 (d)(3): Use existing non-structural elements such as interior walls, doors, floor coverings and ceiling systems in at least half (by square footage) of the completed building. This strategy only applies to renovation projects.

Compliance Assistance for Optional Strategies (d)(1) through (d)(3)

Consider reusing existing, previously occupied buildings, including structure, envelope, and elements. Remove any elements that pose a contamination risk to building occupants and upgrade the components that would improve energy and water efficiency such as windows, mechanical systems, and plumbing fixtures

Section 16a-38k-4 (d)(4): Recycle or salvage at least half of non-hazardous construction and demolition debris.

Section 16a-38k-4 (d)(5): Same as subsection (d)(4) above, except that a total of 75 percent of non-hazardous construction and demolition debris is recycled or salvaged.

Compliance Assistance for Optional Strategies (d)(4) and (d)(5)

Establish goals for diversion from disposal in landfills and incinerators and adopt a construction waste management plan to achieve these goals. Consider recycling cardboard, metal, brick, acoustical tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet, and insulation. Designate a specific area(s) on the construction site for segregated collection of recyclable materials and track recycling efforts throughout the construction process. Identify construction haulers and recyclers to handle the designated materials. Note that diversion may include donation of materials to charitable organizations and salvage of materials on-site

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Construction and Demolition Materials Management

"What's the use of a fine house if you haven't got a tolerable planet to put it on?"
– Henry David Thoreau

Construction and demolition waste (C&D) is managed like other solid waste in that a general solid waste management hierarchy is followed. In the hierarchy of solid waste management methods, source reduction and recycling get the highest priority, and disposal at landfills and incinerators are the least preferred options.

C&D is usually managed as a single waste stream, however, in the state of Connecticut, this material is categorized and regulated as a distinct type of municipal solid waste (MSW) and the materials from demolition and deconstruction activities are a type of 'bulky waste'.

The state's goal is to increase the amount of C&D materials we recover for reuse and recycling. Toward that end, some C&D materials may qualify for a "beneficial use determination" (BUD), in which solid waste is reused in a manufacturing process to make a new product or as an effective substitute for materials used in a commercial product. For example, residential asphalt roofing shingles can be ground and used as paving products, or gypsum wallboard from new construction can be ground and used as an agricultural soil amendment.

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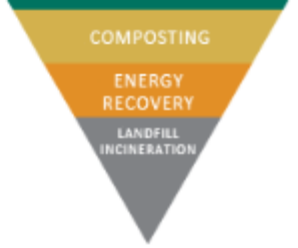

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Learn more about construction and demolition waste management goals in the State Solid Waste Management Plan .

What Is Construction & Demolition Waste?		
Deconstruction	Environmental & Human Health Issues	Green Building
Reuse, Recycling & Disposal Options	Asphalt Shingle Recycling	Local Management of C&D Waste
Construction Waste Management Plans	Beneficial Use of Solid Waste	Additional C&D Resources

Related Topics

Permits & Licenses
Information Resources for Contractors in the Construction Trades
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Contaminated Soil and Sediment Staging and Transfer General Permit
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Deconstruction

Deconstruction focuses on giving the materials within a building a "new life" once the building as a whole can no longer be used as a safe viable structure. Components within old buildings may still be valuable, sometimes more valuable than at the time the building was constructed. Deconstruction is a method that harvests what is commonly considered "waste" and reclaims it into useful building material. Recovering building materials through reuse and recycling will help Connecticut meet its 60% diversion/recycling goal by the year 2024.

Deconstruction vs. Demolition

When buildings reach the end of their useful life, they are typically removed through conventional

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Local Management of Construction & Demolition Waste

Local ordinances create incentives and encourage recycling of construction and demolition (C&D) waste, which can improve a community's overall recycling rate. C&D recycling ordinances include 'green' , 'sustainable' and 'LEED' building techniques and may apply to construction, renovation and/or demolition projects. Several states have passed laws requiring ordinances and other cities are passing ordinances taking the lead in their state.

Most C&D reuse and recycling ordinances or policies that are implemented include the following:

- Recycling of C&D debris
- Reusing building materials on the project site
- Deconstruction to maximize reuse
- Specifying types and quantities of materials recovered for reuse and recycling
- Reporting requirement
- Compliance tools including fees and penalties for non-compliance

Sample Ordinances and Regulation of C&D Waste

Ordinance for Managing Construction and Demolition Waste Created by Deconstruction of a Building (Iowa DNR) - A model template.

Construction and Demolition (C&D) Diversion Informational Guide (CalRcycle) Information about California's C & D Diversion Program, including their model ordinance, case studies, and reference

Green Building Ordinance (City of Newark, CA)

Recycling and Reuse of Construction and Demolition Debris Ordinance (City of Madison, WI)

Local C&D Recycling Regulations (Central Contra Costa Solid Waste Authority, CA)

Examples of Programs Implemented as a Result of Passing C & D Recycling Ordinances

Lee County Government (Florida)

City of Stockton (California)

Foster City (California)

Village of Northbrook (Illinois)

Orange County (North Carolina)

City of Madison (Wisconsin)

City of Chicago (Illinois)

Technical Resources

Overview of Draft Ordinances to Assist Local Governments (Slide presentation by Attorney Ivan T. Webber)

C&D Debris Recycling (Iowa, DNR) Includes case studies and workshop presentations

Deconstruction Case Studies, Technical References, and Directories (King County, WA)

C&D Recycling Tools (King County, WA)

Refuse Permit Ordinance (City of Chicago) - Began April 1, 2009

Other Resources

On the Road to Reuse: Residential Demolition Bid Specification Development Tool September 2013, (EPA)

Questions?

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