



Mattresses as Candidate for Complex Assembly Consideration

USDA Biopreferred Program
Complex Assemblies Public Meeting

February 24, 2010
Pentland Hills Bear Cave
University of California – Riverside

Industry overview –

Primary Materials Used –

- Foam
 - Flexible polyurethane foam (including visco-elastic foam)
 - Latex foam
- Natural and synthetic fibers and fabrics (in woven, knitted and non-woven form)
- Air bladders and compression equipment for air beds
- Steel wire (both for mattresses and foundations/box-springs)
- Wood (for foundation frames)



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Industry structure –

- Plant location:
 - Most mattresses made locally or regionally, minimizing shipping distances
- Industry concentration:
 - Relatively non-concentrated
 - Largest 5 national brands control about 60% of market
 - Balance of market held by smaller national brands and independents
 - > 90% of all mattresses and foundations sold in the US are assembled here



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Industry structure (cont) –

- Few manufacturers are vertically integrated
- Most mattress producers are independent of both their component suppliers and the retailers that sell their products to consumers
- A few mattress producers make their own springs and foam
- Some producers sell their finished mattresses directly to the consumer, and others own or control a retailer group

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Size of the manufacturers (by # of employees) –

Number of Employees	Percentage of Industry
1-30	18.1
31-50	24.6
51-100	31.1
> 101	26.2

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Mattress types –

- Innerspring mattress: Steel innerspring for mattress core, surrounded by foam- or fiber-based upholstery
- Foam mattress: Made of latex or PU foam (including visco-elastic foam)
- Air mattress: Except for camping mattresses, most air mattresses have air bladder for core, surrounded by upholstery material
- Water bed: Uses water-filled bladder as core
- Hybrids: Made of a combination of 2 or more of these systems (e.g., springs + memory foam, etc.)

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Box-spring/foundation types –

- Most are stationary systems that use steel wire unit mounted on wooden frame and covered by upholstery
- Some stationary systems use all wood components in place of steel unit
- Increasing numbers of foundations are adjustable

Typical manufacturing process –

- Manufacturers use manual and mechanical methods to assemble mattress components
- Assembly processes include sewing, gluing, nailing and fastening
- Some manufacturers produce own major components (foam, steel springs, etc.)
- Components are primarily made in US, with some imports

How large is US mattress market? –

2008 Sales:

	Wholesale Value (millions \$)	Units (thousands)	Average Unit Price (\$)
Mattresses	\$4,787.1	19,586.8	\$244.40
Innerspring	\$3,718.4	17,718.8	\$209.86
Non-Innerspring	\$1,068.7	1,868.1	\$572.08
Foundations	\$1,457.5	16,268.8	\$89.59
Total All Products	\$6,244.4	35,855.6	\$174.16

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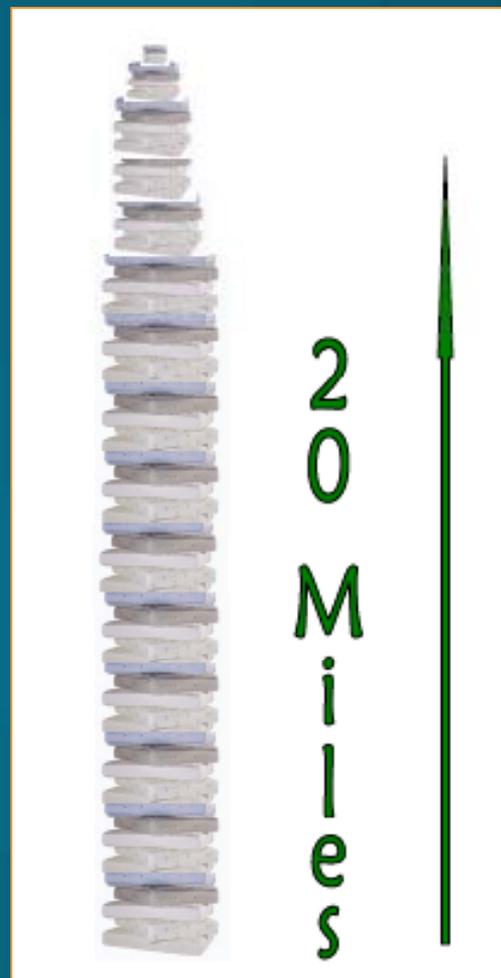


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Mattress industry's new product environmental footprint –

Materials consumed and cubic space occupied by new mattresses and foundations

Steel (Short Tons)	360,000
PU Foam (Short Tons)	135,000
Wood (Million BF)	280
Ticking (Million SF)	4,300
Batting (Million SF)	1,200
Cubic Volume ('000 CY)	50,000



Stated differently –

The US mattress industry EACH DAY sells the equivalent of a mountain of mattresses 20 miles high

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“Greening” efforts within the mattress industry –

- Committed to improving sustainability of its products and the industry
- Using increasing amounts of renewable & recycled materials –
 - Plant-based materials in PU and latex foams
 - Natural & synthetic fibers/fabrics made from plant & animal materials
 - Wood for foundations made from by-products of prime lumber cut in sustainable forests
 - Virtually all steel used in mattresses and foundations made from recycled steel
 - Most polyester fiber and fabrics made from recycled beverage containers and other products



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Mattress industry's ongoing sustainability efforts –

- Minimizing and recycling industrial scrap
- Most mattresses made locally or regionally, minimizing shipping distance
- Using minimum amounts of packing materials to deliver product safely to consumer
- Reducing risks to consumer health, safety and fraud associated with the unscrupulous “renovation” of used mattresses through better used mattress recycling efforts
- Committed to avoiding “green-washing” – e.g., deceptive environmental marketing claims

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Mattress industry's current use of biobased materials –

- Foam: Plant-based materials used in PU foam (polyols derived from soy and castor beans) and latex foam (tree-harvested latex rubber)
- Natural fiber: Mainly cotton, but increased amounts of wool, and limited amounts of other animal hair, silk and coconut materials
- Plant-based synthetic fiber: Rayon
- Wood: For foundations



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Mature market materials issues for mattresses –

- Wood: Has been used for decades to make foundations
- Cotton fiber:
 - Extensively used as upholstery material and ticking (outer fabric cover) in mattresses through mid-1970s
 - Largely abandoned to meet smoldering cigarette fire standard set in 1974
 - Now making a comeback in ticking, as upholstery material and FR barrier



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Opportunities to increase use of biobased materials in mattresses –

- Fiber materials and fabrics: Demand for natural and plant-based synthetic fibers and fabrics has grown as more consumers seek products made from renewable materials
- Wood: Quantity of wood used in foundations could increase due to consumer demand and high steel prices
- Latex foam: Demand for natural latex foam continues to grow
- PU foam: Demand for PU foam made from plant-based materials is growing



Pending efforts –

PU Foam –

- Performance issues limit amount of renewable polyols that can be used
- But industry is developing new technologies to address these limitations

Fabric and Fiber –

- More textiles use more natural and plant-based fibers
- Cotton industry researching new FR materials applications
- Wool producers are experimenting with FR applications and use in ticking



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Barriers to using more biobased mattress components –

Cost:

- Latex foam and wool are generally more expensive than substitute materials
- By comparison, plant-based polyols are often more competitive with petroleum-based polyols



Availability: Short supply can be a constraint for use of cotton (especially organic cotton) and rayon

Barriers to using more biobased mattress components (cont) –

Performance:

- Main barrier to using more plant-based polyols is durability
- Durability also can be issue for natural latex
- Use of natural fibers can require “learning curve” before materials meet quality level necessary for mattresses

Consumer education: Industry needs to use fact- and science-based criteria to describe a mattress’ relevant environmental features (e.g., in terms of its use of renewable materials, recycled materials, etc.) to communicate sustainable product value to consumers

Mattress industry's recycling objectives –



- Encourage national infrastructure for recycling used mattress components
- Recyclable mattress materials include:
 - Steel springs: Recycled into new steel products
 - Foam: Converted into carpet pads
 - Fibers and fabrics: Used in filtration media
 - Wood: Used as landscaping mulch, animal litter and fuel
- At present, ISPA has identified 15 mattress recyclers throughout North America and is helping to establish more

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Possibilities of large scale used mattress recycling operations –

Impact of 25% Recycling Rate	
Steel (Short Tons)	90,000
PU Foam (Short Tons)	34,000
Wood (Million BF)	70
Ticking (Million SF)	1,075
Batting (Million SF)	300

Recycling 25% of mattresses and foundations could produce the following savings



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Mattress industry's recycling objectives (cont) –

Next steps –

- Improve collection efficiency by involving retailer sector in collecting and promoting mattress recycling
- Create strategic partnerships to identify additional mattress recycling opportunities and technologies
- Support new markets for recycled components
- Develop mechanisms to fund new recycling centers



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Industry stakeholders – Trade association representation –

- The International Sleep Products Association is the trade association for the mattress industry
- ISPA committees involved in sustainability issues –
 - Green Product Task Force
 - Sleep Products Safety Council
 - Used Mattress Components Recycling Work Group
 - Suppliers Council
 - Mattress Retailer Council



Opportunities to communicate with the mattress industry –

Industry Events:

- ISPA EXPO: Largest mattress only trade show in the world, held every 2 years. Next EXPO to be March 3-6, 2010 in Charlotte, NC
- ISPA Industry Conference: Held annually



Opportunities to communicate with the mattress industry (cont) –

Industry Publications:

- BedTimes: Targeted to mattress producers and component suppliers
- Sleep Savvy: Targeted to mattress retailers
- BedTimes Bulletin: Weekly e-newsletter delivered to ISPA members



Industry Educational Opportunities:

- ISPA SHOPtalks: Held on as needed basis to inform members of market or regulatory developments



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