

Wood Products

Wood Reuse / Recycling

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FEBRUARY 10, 2023

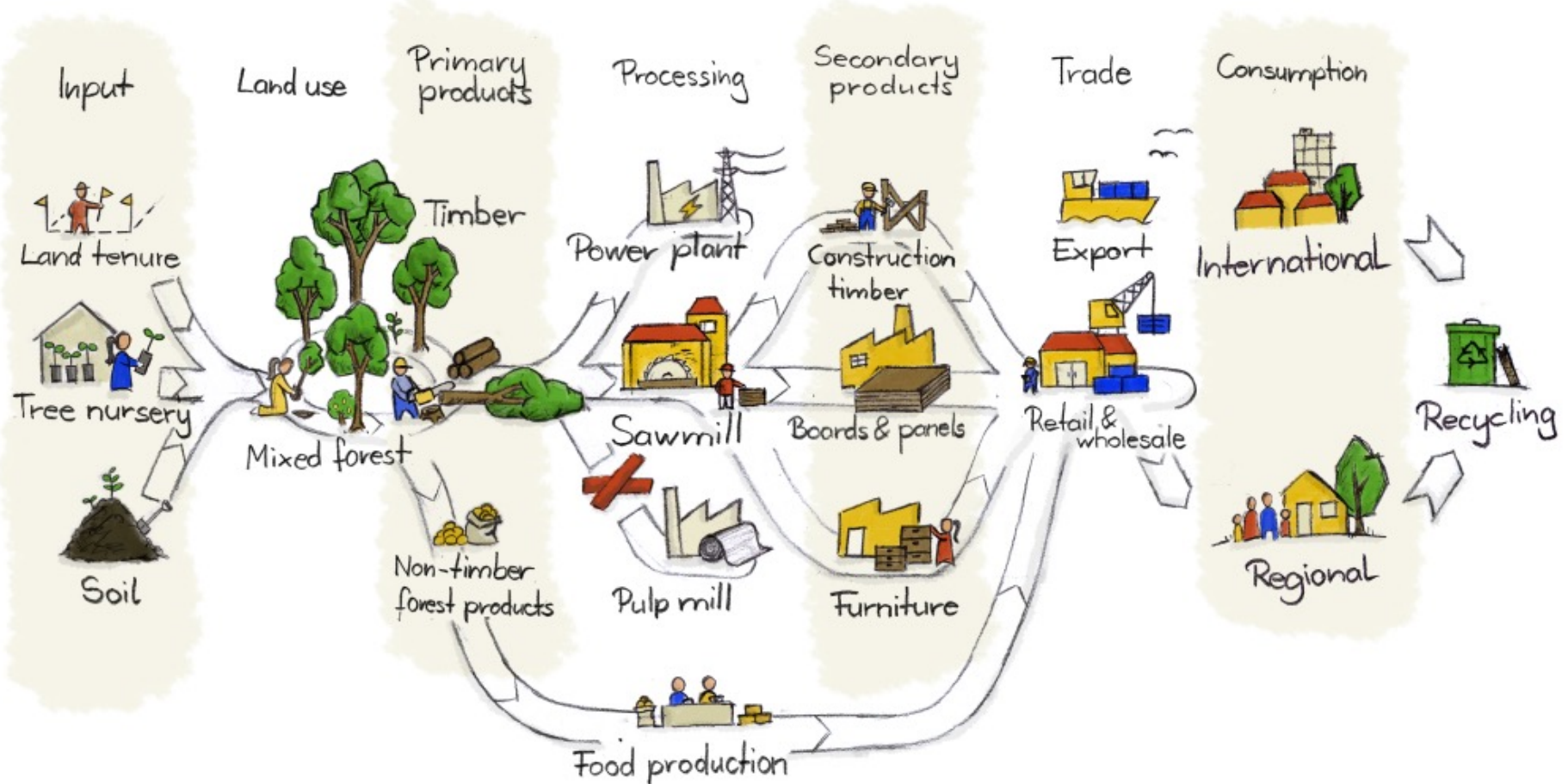
URS BUEHLMANN
VIRGINIA TECH

Acknowledgement:

This presentation is based on work done by Phil Araman, US Forest Service station leader (retired), Blacksburg, VA.



THE VALUE CHAIN OF TIMBER



WOOD in Housing



Wood in Nonresidential Construction

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Furniture, Cabinets, Windows, Flooring



Paper, Pallets, Packaging

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Musical Instruments

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The Range of Hardwood Roundwood - -Hardwood Veneer Logs



Hardwood Veneer

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<https://kjselecthardwoods.com/>

Hardwood Plywood

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Sawlogs

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Hardwood Lumber

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Hardwood lumber for export

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Pallets

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Crossties or Sleepers

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OSB or Pulpwood or Pallet Roundwood



Pulp

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<https://www.paper-pulper.com/>

Hardwood Trees Pulp Uses

Writing paper

Envelops

Copy paper

Fine stuff



Softwood Trees Pulp Uses

Newsprint

Cardboard

TP

Utility Stuff



OSB

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LVL and LSL beams

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<https://www.ptbotruss.com/>

Cross-Laminated Timber (CLT) Panels – a new engineered wood product



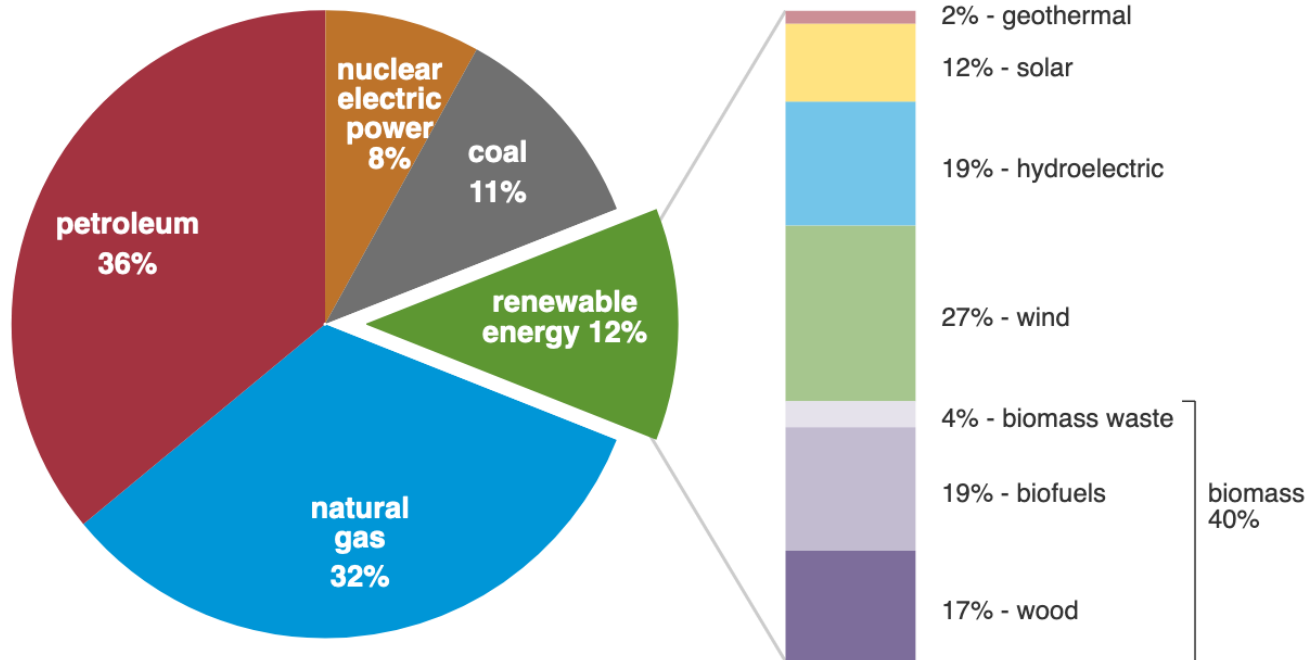
Wood used for Energy in the United States

25

U.S. primary energy consumption by energy source, 2021

total = 97.33 quadrillion
British thermal units (Btu)

total = 12.16 quadrillion Btu



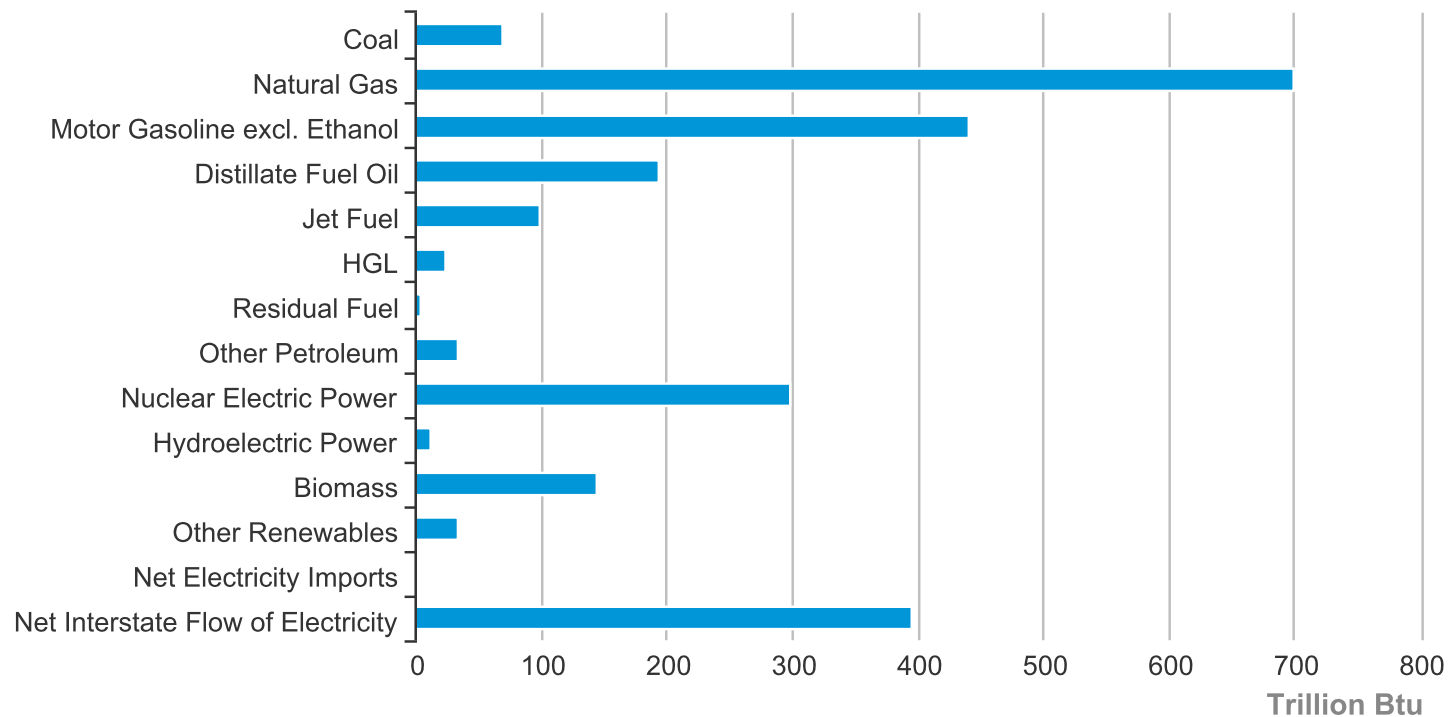
Data source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 1.3 and 10.1, April 2022, preliminary data

Note: Sum of components may not equal 100% because of independent rounding.

Wood used for Energy in Virginia

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Virginia Energy Consumption Estimates, 2021



Source: Energy Information Administration, State Energy Data System

Dominion VA Power – Pittsylvania Station

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- State of VA pushing for 15% of power from renewable sources
- Converted 3 coal plants to biomass



- All Biomass Power
- Wood burning
- Mostly logging waste wood
- 150 trailers/day (20 tons each)
- Uses 2,500 tons/day
- 83 megawatt
- Power for about 20,000 homes

Dominion Co-firing Biomass with Coal

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- An example like the Dominion Virginia Power plant in St. Paul – 585 megawatt power station – 146,000 homes
- Dominion Power says up to 20% biomass mixed with coal products – 540,000 tons/year
- Cleanest coal plant in US

Virginia City Hybrid Energy Center



Wood for Energy can also be as simple as firewood from Kroger or Food Lion

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Wood Pellets for Heating Stoves and Boilers

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- Made from recovered sawdust and other waste wood
- Uniform
- Easy to handle
- Easy to transport
- Burn efficiently



Module 5: Utilization of Biomass

Bulk Export pellet shipments to Europe



Renewable trees have helped and continue to help build and supply this country with products

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Over the past 60 years (1950 thru 2010)

34

- **Renewable trees**

- 847 billion cubic feet of wood was harvested (a football field 10,000 miles high)
- 90 millions home built
- Trees and wood are renewable!

- **Nonrenewable Oil**

- 163 billion barrels of petroleum were extracted in the US
- This consumption also released over 75 billion tons of Carbon dioxide to the atmosphere

Used pallets can be recovered – They should be reused or recycled and not landfilled

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What we like to see ...Urban Wood Pallet Recovery, Reuse, and Recycling

(SAVES TREES SAVES LANDFILL SPACE AND PROVIDES NEEDED WOOD PRODUCTS)

The Urban Resources



Shouldn't Do



Repair



Pallet Disassembly



Mulch



Animal Bedding



Flooring/
Paneling



Fuel

Natural and Colored Mulch

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“Green” flooring can be made from used pallet parts

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Zero Wood Construction Waste is Possible in Homebuilding

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Work to determine much wood waste is generated in home building ...



From a little over a 2000 sq. ft. house

Total wood waste – 5,059 lbs.

- **OSB waste – 1,419 lbs.**
- **Treated wood waste – 417 lbs.**
- **Spruce structural lumber waste – 3,134 lbs.**
- **LVL – 64 lbs.**
- **Paralam – 25 lbs.**

The Waste ...

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Recycled Construction Waste OSB Sold at Habitat for Humanity Restore

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We grind other materials

- Tub grinder
- Small horizontal grinder
- Larger horizontal grinder



WOOD

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- Wood is an extraordinary material
- Naturally renewable, it grows in abundance in North America
- It is beautiful, light, and strong to build with
- It is warm and welcoming to live with
- Plus ... did I mention it is renewable and sequesters CO₂?

Properly used – wood can last a long time – 14th century structure in Lucerne, Switzerland

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