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Conceptual Specification of Forest Residue Balers

U.S. DEPARTMENT OF
ENERGY

 **HUMBOLDT
STATE UNIVERSITY**

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Why Bale? Enable Cost-Effective Collection of Tops and Branches

Benefits of Large Rectangular Bales

- » Increase transport payload compared to roll-off containers and chip trailers
- » Enable use of conventional flatbed trucks (with tarps or curtains)
- » Increase storage density
- » Enable efficient grinding with horizontal grinders
- » Rectangular bales handle just like other baled recyclables and hay.



Customer Needs Drive Two Baler Types - Light Modular System and High-Production

Light Modular Baler (**Forest Utility Baler**)

- » Mount on All-Wheel-Drive truck, forwarder, trailer, etc.
- » Access logging debris that has to come off the site, stranded landings, roadside windrows, ...
- » Support thinning, pruning, fuels reduction, roadside vegetation management, and other uses
- » Replaces tow-behind chipper and arborist truck or loader and roll-off containers

High Production Self-Propelled Baler (**Forest Biomass Large Baler**)

- » Track undercarriage (much like self-propelled horizontal grinders)
- » Supported by and Tele-Operated by trackhoe grapple loader operator...
- » Replaces in-woods grinding operation
- » Uses flatbed trucks and trailers for hauling bales
- » Hauling can be decoupled from baling by weeks or months

Forest Utility Baler

Modular Baler

- » 40-80 hydraulic horsepower
 - » From prime mover or onboard power-pack
- » 8,000 – 11,000 lb weight
- » Optional engine power pack and self-loader

Universal Mounting for

- » On-road and off-road trailers
- » Log forwarder – replace log bunk
- » Truck chassis or bolt to flatbed truck
- » Flatbed hook-lift skid



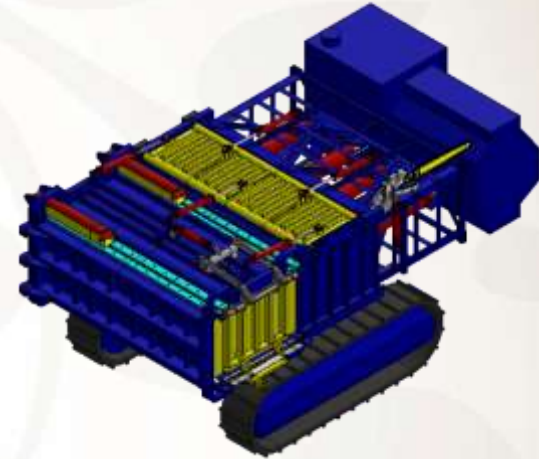
Forest Biomass Large Baler

High Hydraulic Power and Flow (250-350 hp)

- » Fast cycle times and high compression pressures
- » Hydraulic track drives

Trackhoe Support and Tele-Operation

- » Single operator much like horizontal grinding operations today
- » Power and size enable larger, heavier bales
- » Baler could be programmed to follow trackhoe around the forest during moving



Woody Biomass Baler Family of Models

	Conceptual BRDI Project Balers			
	FCLLC Engineering Prototype (FCEP)	Urban Chipper Replacement	Forest Biomass Utility Baler	Forest Biomass Large Baler
Bale Size (inches)	32x48x56	36x48x72	32x48x56	34x48x96
Bale Density (lb/cu.ft – @ 50% MC wb)	15-25	15-20	20-30	20-30
Bale Weight (lb)	800 – 1,400	1,000 – 1,400	1,000 – 1,500	2,000 – 2,700
Loader	Self-loading grapple	Self-loading grapple	Self-loading grapple	Track-hoe with brush grapple
Theoretical/Operational Capacity (bales/hr)	3/2	5/3	10/4	18/10
Horsepower	28	49	49	260
Crew	2 (manual tie)	2 (manual tie)	1 (auto-tie)	0 (remote-operated)
Running Gear	5 th Wheel Trailer	Category 3 trailer	Modular	Tracked
Capital Cost (\$) Est.		\$110,000	\$130,000	\$350,000

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Thank you!



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