

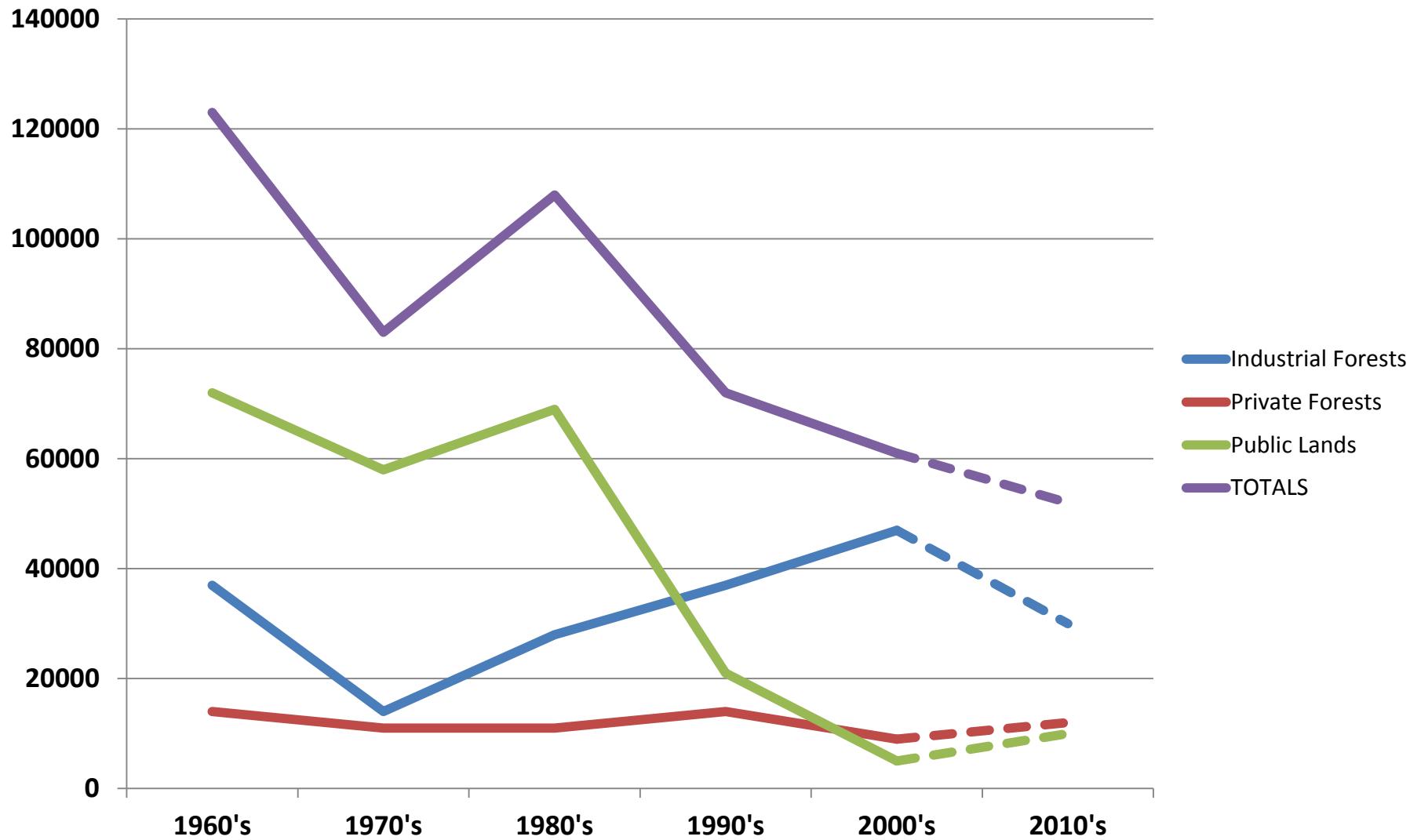
Integrated Biomass Energy Campus: Creating value from woody biomass in NE Oregon



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Wallowa Resources
Enterprise, Oregon

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Timber Harvest in Wallowa County: Average by Decade (mbf) - *Projection for 2010-2019*



Haypen 3 stewardship contract

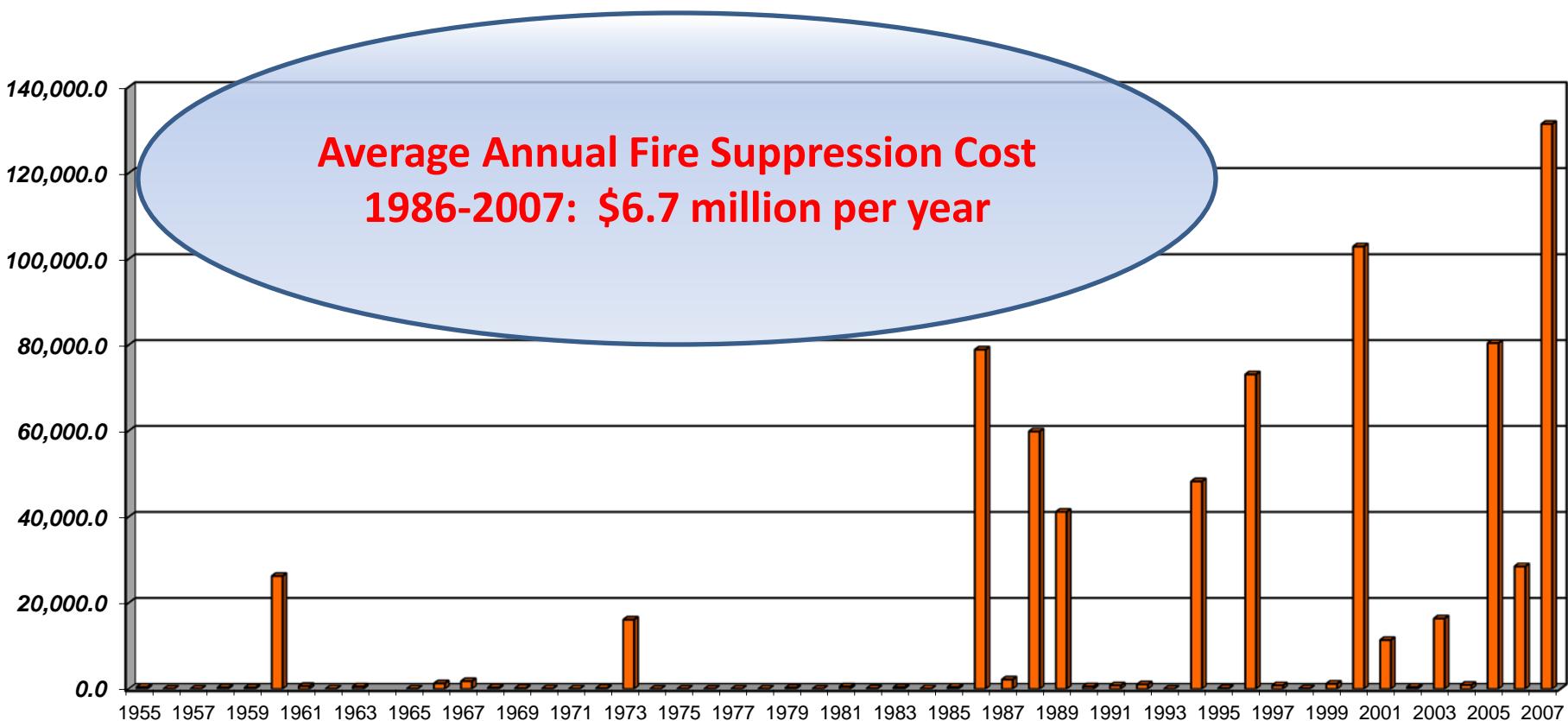


Pulp fiber – (5.0"-6.9")
33% of cut trees per acre.

Biomass – (1.0"-4.9")
23% of cut trees per acre.



Wallowa Fire Zone - Wildfire Occurrence 1955-2007 Acres Burnt and Total Cost of Suppression



731,541 acres burnt since 1955; 680,705 acres (93%) have burnt since 1986.

\$144 million spent in suppression since 1970; \$140 million (97%) spent since 1986

Public Forest Land in Eastern Oregon



Draft Blue Mountain National Forests Management Plan

- >60% of the 3 national forests in eastern Oregon are at risk of catastrophic wildfire (Dec 2009)
- Impact to watershed function, endangered species recovery, recreational opportunities, and jobs.
- 1.5 million acres targeted in Eastside Restoration Strategy.
- Restoration and biomass utilization = win-win-win.

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Wallowa Resources Early Efforts

- Contract restoration and stewardship work on WWNF support diversification of work and revenue for forest contractors. Program continues.

\$500,000 per year over last 8 years

- Invest in Joseph Timber Company Build small log processing system Chip-n-Saw, post and pole and kraft chips.

Investment failed when majority Owner shut down mill.

A Quiet Truce in the Green Wars

Former Foes Unite to Create Eco-Friendly Employment In the Hard-Hit Rural West

By JIM CARLTON
Staff Reporter of THE WALL STREET JOURNAL

ENTERPRISE, Ore.—Mike Mahon used to spend his time in forests chopping them down. Now, he and a growing number of Northwestern loggers who have lost jobs in recent years are finding it pays to go green.

The burly 43-year-old hikes through a dark woods to the place where he recently used a shredding machine, the MeriCrusher, to reduce a chest-high thicket of shrubbery to pulp, giving a stand of towering Douglas firs more breathing room. His job is part of a joint local and federal project to restore forests where decades of aggressive logging have permitted thick clusters of small trees to grow, creating fire hazards and endangering valuable old-growth trees.

"This is sure a lot different from what I used to do," says the third-generation lumberjack, "but at least it keeps me in the woods."

All over this rural corner of northeastern Oregon, laid-off timber workers are working with their former adversaries from the environmental movement to rettool logging skills for eco-friendly causes. Just a few years ago, the idea would have been unthinkable, in a region where thousands of loggers have lost jobs. In addition to its abundant trees, the Wallowa-Whitman National Forest also is home to spawning grounds for the Chinook salmon, which landed on the federal endangered species list in 1993. The resulting federal logging limits have left many local economies in ruins.

Now, one former lumberjack is working for federal officials enforcing the Endangered Species Act of 1973, going into the forest and counting lynxes. "Luckily I didn't find any, or else I would have made a lot of enemies in Wallowa County," says the 51-year-old logger, Del Stanley, referring to the additional logging limits even one lynx sighting might have invited.

The loggers' new jobs are largely the result of an unusual effort by a Portland, Ore., nonprofit group called Sustainable Northwest, which is trying to help revive local economies with eco-friendly projects. In the five years since the group has been working in Wallowa County, it has helped create about 100 green jobs, paid for in part by the federal government. Those jobs have helped to offset the 400 timber jobs lost to sharp logging restrictions in the surrounding national forest.

Similar partnerships are forming elsewhere in the rural West. In Arizona, the Sonoran Institute is helping ranchers to diversify from cattle grazing on public lands to pursuits



Loggers returning to work at the Joseph Timber mill (top); the Wallowa Mountains (center) are home to spawning grounds for the endangered Chinook salmon; the mill this year has brought back 47 timber jobs

Photography by Rick Swart (top) David Jensen

such as hosting eco-tours. In California's Monterey County, struggling strawberry farmers have found work controlling soil runoff on steep slopes. "To make these kind of projects work, it has to benefit both sides," says Ashley Boren, executive director of Sustainable Conservation, a San Francisco group that helped start the erosion project.

The greening of Wallowa County's economy is one of the more visible achievements of the so-called sustainability movement, a compromise-minded faction of environmentalists that tries to turn grassroots foes into allies by offering them incentives, such as jobs, to go green. While many environmentalists blast the Bush administration for trying to expand drilling, mining, and other resource

use in the nation's Western expanses, the sustainability movement is quietly working with local and federal officials to create jobs that balance economic and environmental needs.

"We want to make eco-entrepreneurs of people who have been viewed... in the environmental community as the bad guy," says Martin Goebel, president of Sustainable Northwest.

The new eco-friendly jobs aren't the absolute economic equivalent of the ones lost in natural-resource industries in recent years. For starters, the new jobs are far fewer in number, and many don't pay nearly as well. Still, in communities such as Wallowa County, where mills and workers have been idled for years, they are a welcome step in the right

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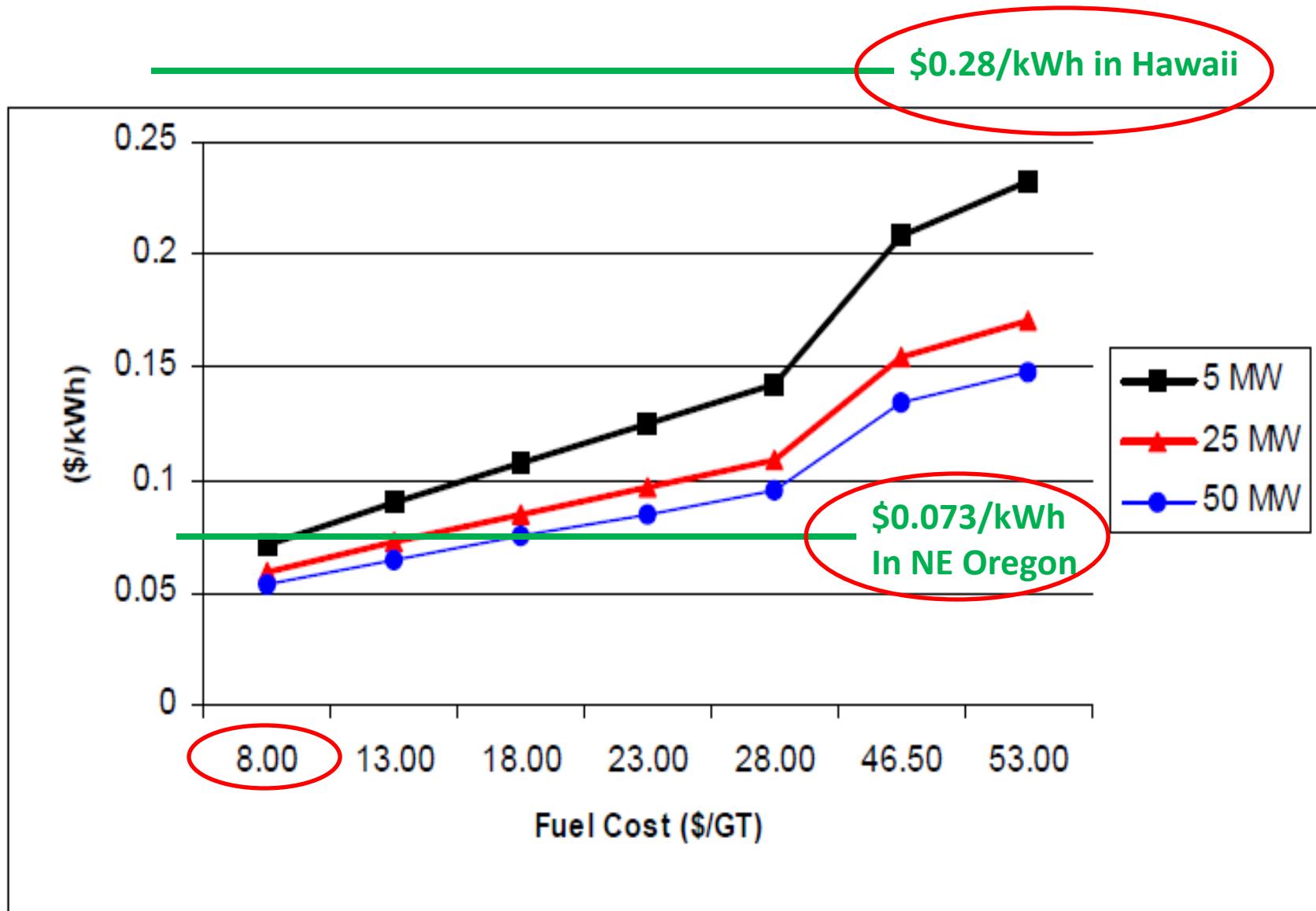


Figure 12-7. Cost of biomass electricity as a function of biomass fuel cost

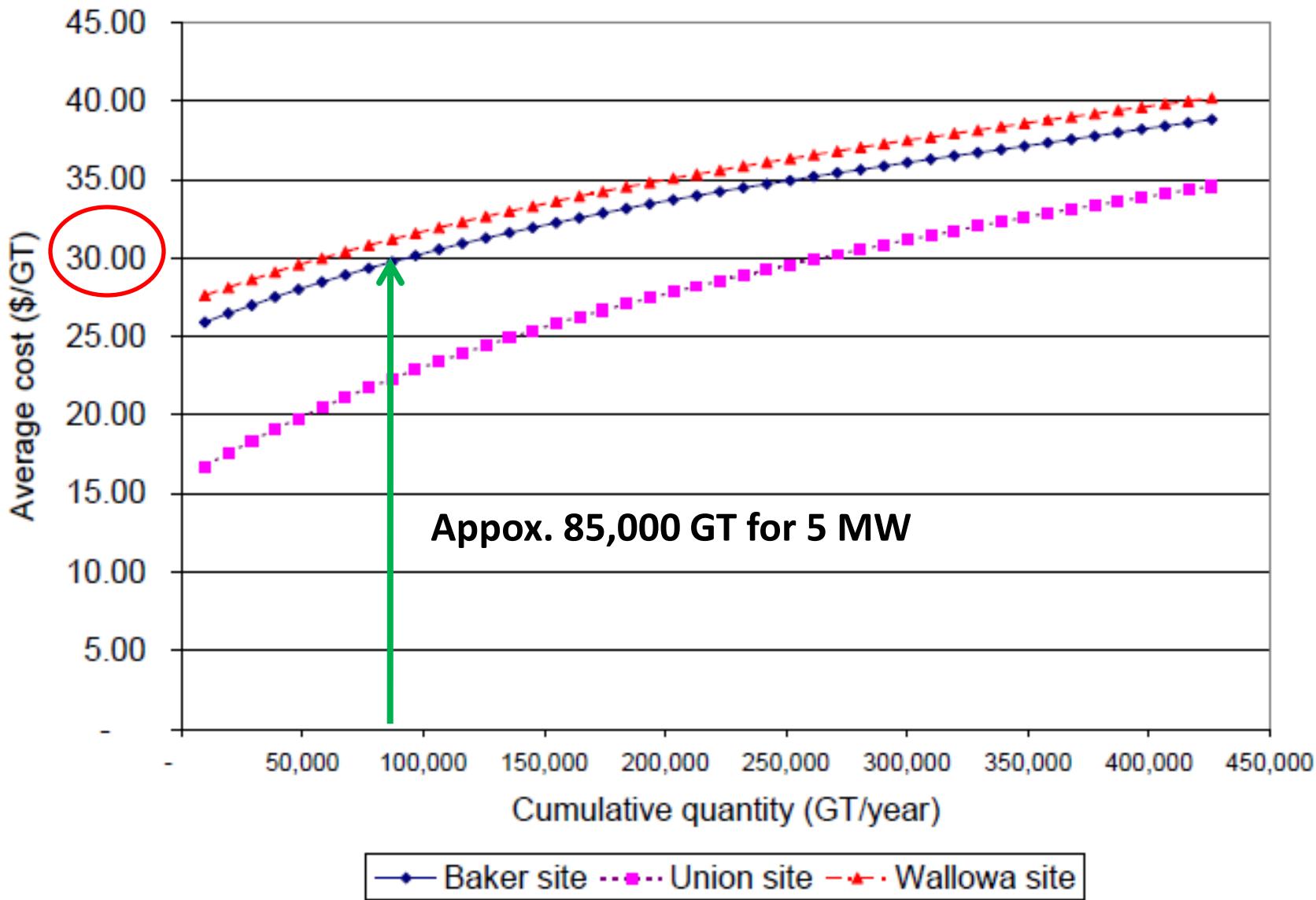


Figure 7-5. Forest biomass supply curves for potential conversion sites in Baker, Union and Wallowa Counties

Table ES-1. Biomass supply quantity and weighted average biomass cost delivered to potential plant sites in Baker, Union and Wallowa Counties

Supply type	Quantity (GT/year)	Average cost (\$/GT delivered)		
		Baker County	Union County	Wallowa County
Biomass ethanol				
Agricultural residue	80,009	35.24	31.39	34.31
Forest biomass	425,934	48.66	48.20	49.49
Mill chips	308,794	25.39	15.93	27.15
Veneer cores	1,458	12.46	3.00	14.22
Total	816,195	38.47	34.26	39.51
Biomass power				
Forest biomass	425,934	48.66	48.20	49.49
Mill chips	308,794	25.39	15.93	27.15
Veneer cores	1,458	12.46	3.00	14.22
Total	736,186	38.22	34.57	40.19

NE Oregon Biomass Assessment

Table 3-3. Estimates of annual biomass generation from overstocked land³⁰

Biomass source	Total overstocked area (acres)	Annual treated area (acres)	Total biomass generated (GT)	Annual biomass generation over a 20-year time frame (GT/year)
Timber harvest on economically viable forest land	16,100	850	176,316	8,816
Thinning overstocked forest land (assumes 10 GT/year yield)	234,900	11,745	2,349,000	117,450
Total	251,000	12,595	2,525,316	126,266

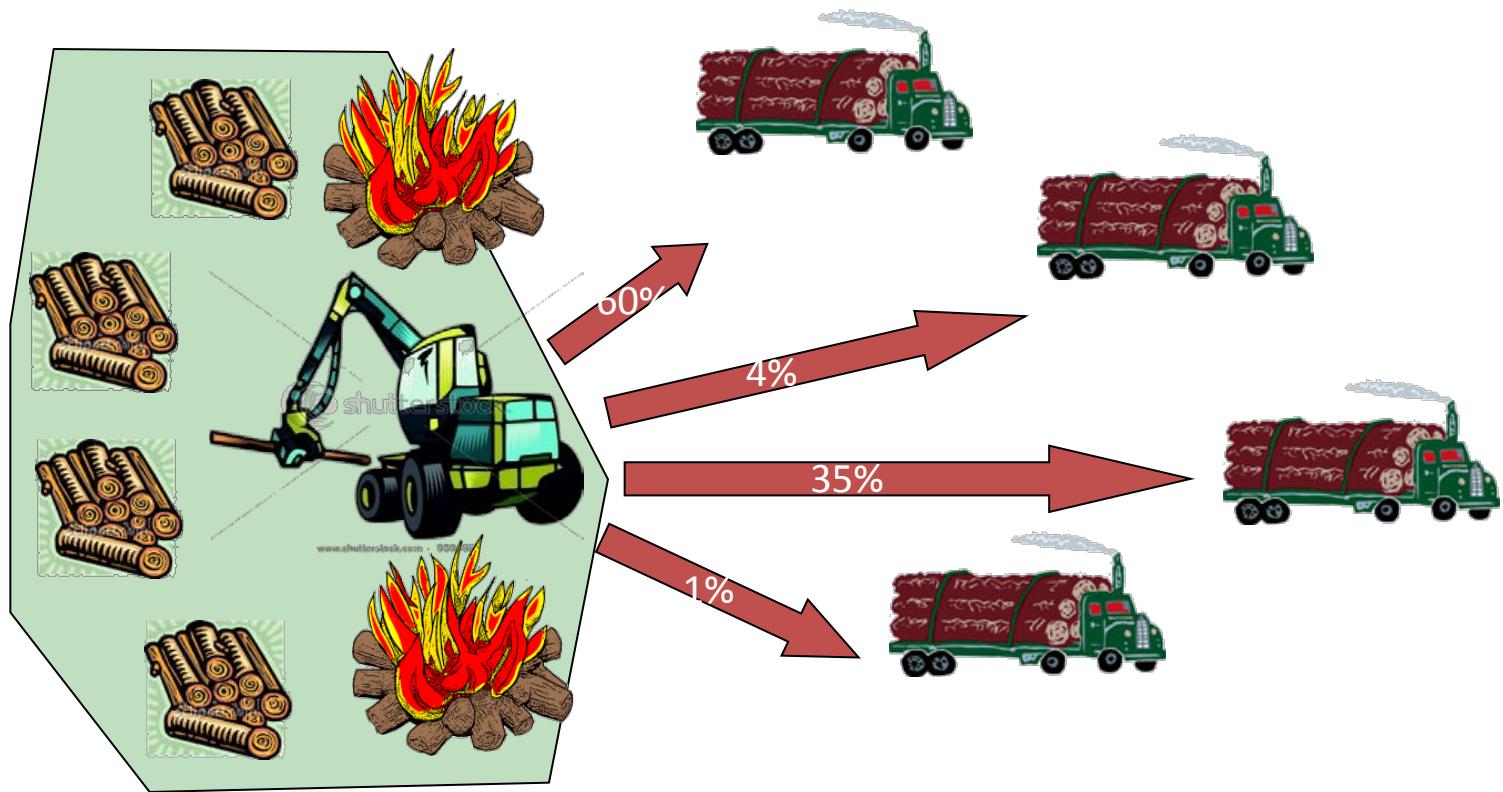
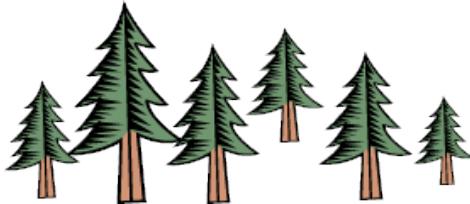
Blue Mountains Assessment – Across 3 Counties

251,000 overstocked acres on USFS in commercial management zone.

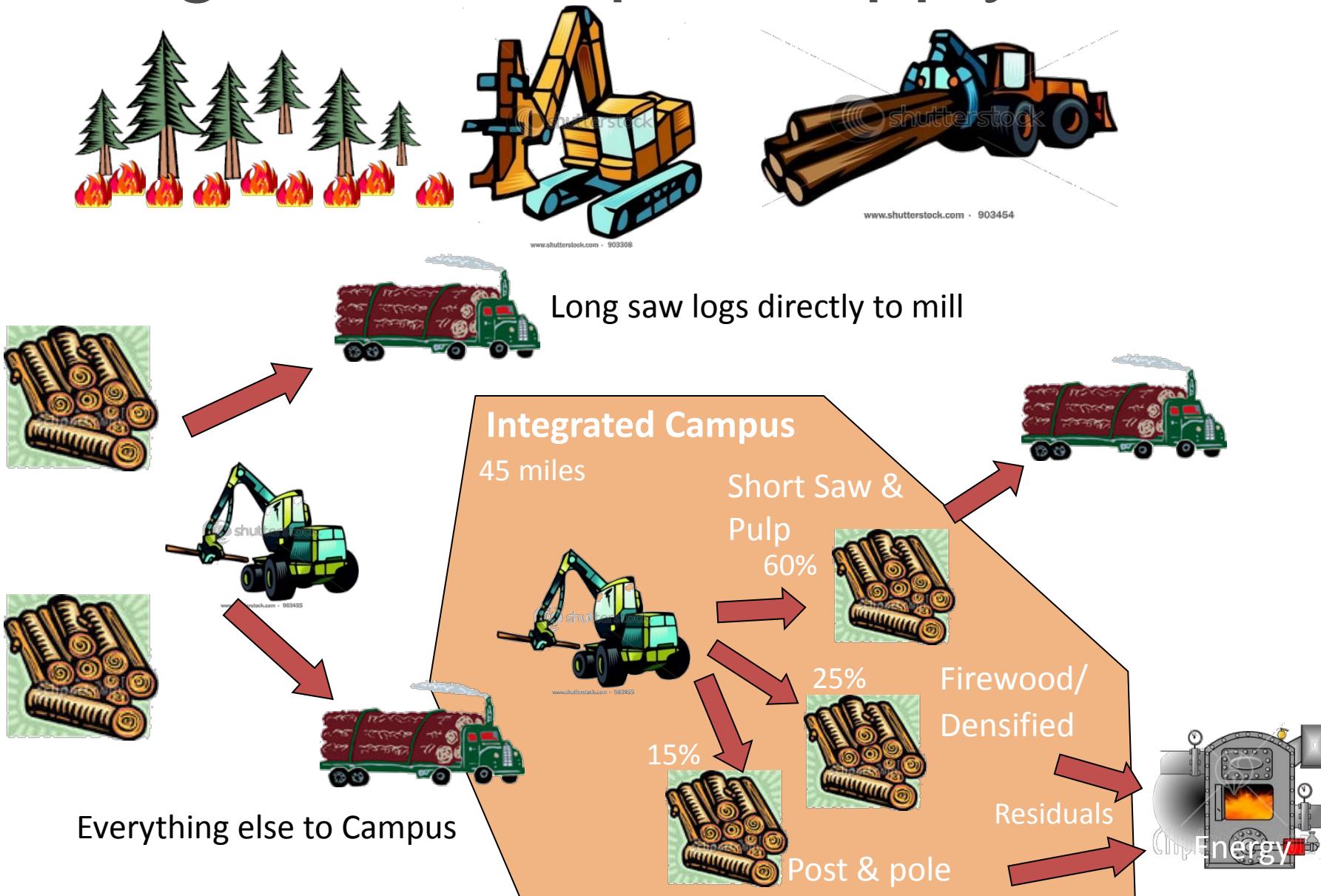
Timber harvesting on 16,100 acres of this area could result in a positive net value – producing an average of 9,000 GT per year over 20 years.

Limited funding and markets to support thinning on remaining overstocked land (234,900 acres).

“Typical” forest supply chain



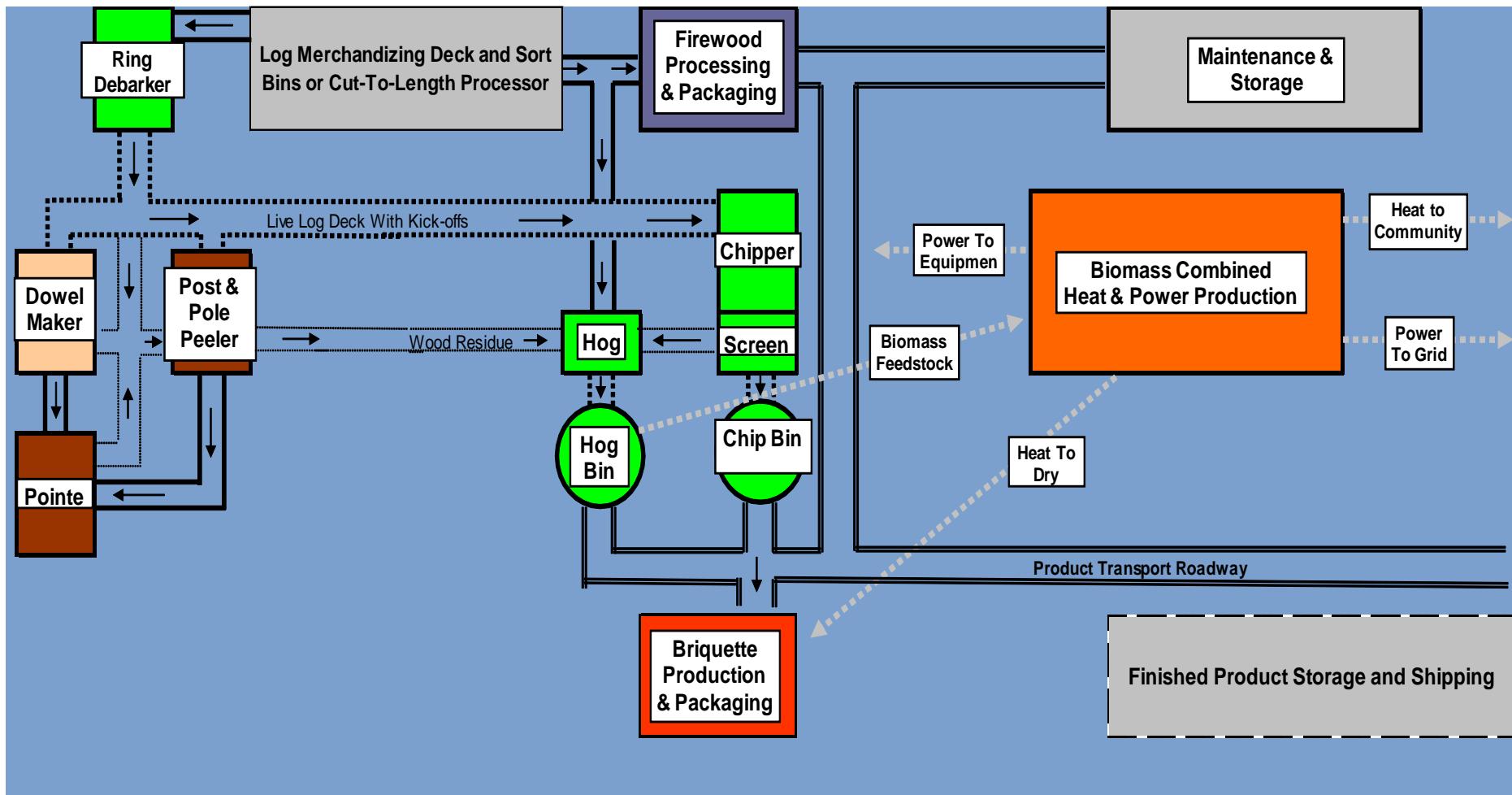
Integrated campus supply chain





Whole-tree yarding of small logs /
woody biomass for shipment to
integrated campus.

Integrated Biomass Utilization Campus



County-Scale Impacts

- Employment: 25-30 Jobs on Site, More in the Woods (>1% of workforce)
- Renewable energy
 - Export substitution
 - Carbon reductions
- Benefits to existing forest management
 - Reduced forest health management costs
 - Market-based incentives
 - New supplies to existing industry















GRID PROTECTION
RELAY



CONTROL POWER #1 RUN #2 RUN

OFF ON #1 START #2 START



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