

The NARA logo consists of the word "NARA" in white, sans-serif capital letters, centered within a dark gray rectangular box. A thin red horizontal line is positioned directly beneath the gray box.

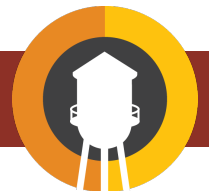
Regional Economic Impacts on the Introduction of Biorefinery Facilities Utilizing Forest Residual in Pacific Northwest

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Objective: To quantitatively estimate how the proposed bio-refinery project in C2P and WMC can contribute to local and regional economies.

Total Economic Impact

- **Direct Effects:** result from expenditures associated with the bio-refinery facility.
- **Indirect Effects:** result from the suppliers of the bio-refinery to meet demand.
- **Induced Effects:** result from the employees of the facility and the suppliers at a household level.
- The part supplied by imports from foreign country and other region is regarded an **economic leakage** → no impact



Direct, Indirect and Induced Effects

The Bio-Refinery Plant

Suppliers in the region



Direct Effects



Indirect Effects



Induced Effects



Employees



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Results C2P: Annual Operation

Income Statement of the Hypothetical Biorefinery at Longview WA

Total Revenues	(\$ 318.1 million)	\$MM
	IPK	\$91.5
	RINs	\$88.1
	Lignosulfonates	\$39.2
	Activated Carbon	\$99.3
Total Costs	(\$ 215.7 million)	
	Feedstock	\$53.0
	Hog Fuel	\$11.3
	Utilities	\$40.8
	Chemical Products	\$67.2
	Others	\$6.6
	Maintenance	\$31.8
	Insurance	\$5.0
Value Added	(\$ 102.4 million)	
	Employee Compensation	\$15.9
	Property Tax	\$16.5
	Proprietors Income	\$45.4
	Income Tax	\$24.5





C2P Economic Impacts

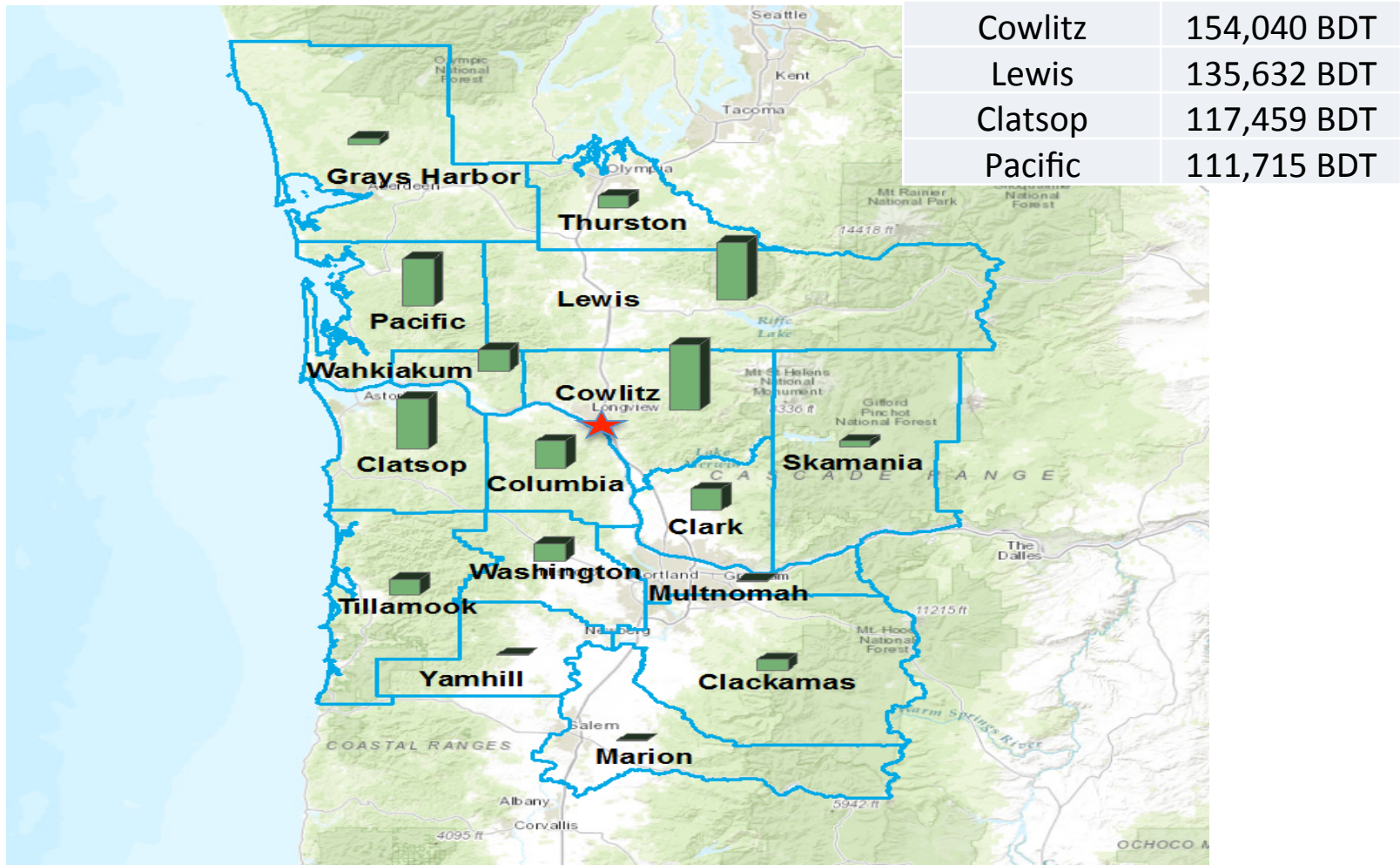


	Direct	Indirect	Induced by Employees	Induced by Proprietors	Total
Output (\$MM)	\$318	\$258	\$81	\$37	\$657-694
Value Added (\$MM)	\$57-\$102	\$127	\$47	\$22	\$230-\$297
Jobs (persons)	173	1,171	561	260	1,905 - 2,166



Result C2P: Forest Residual Collection

The Supply of Forest Residuals to the hypothetical plant @ Longview WA.



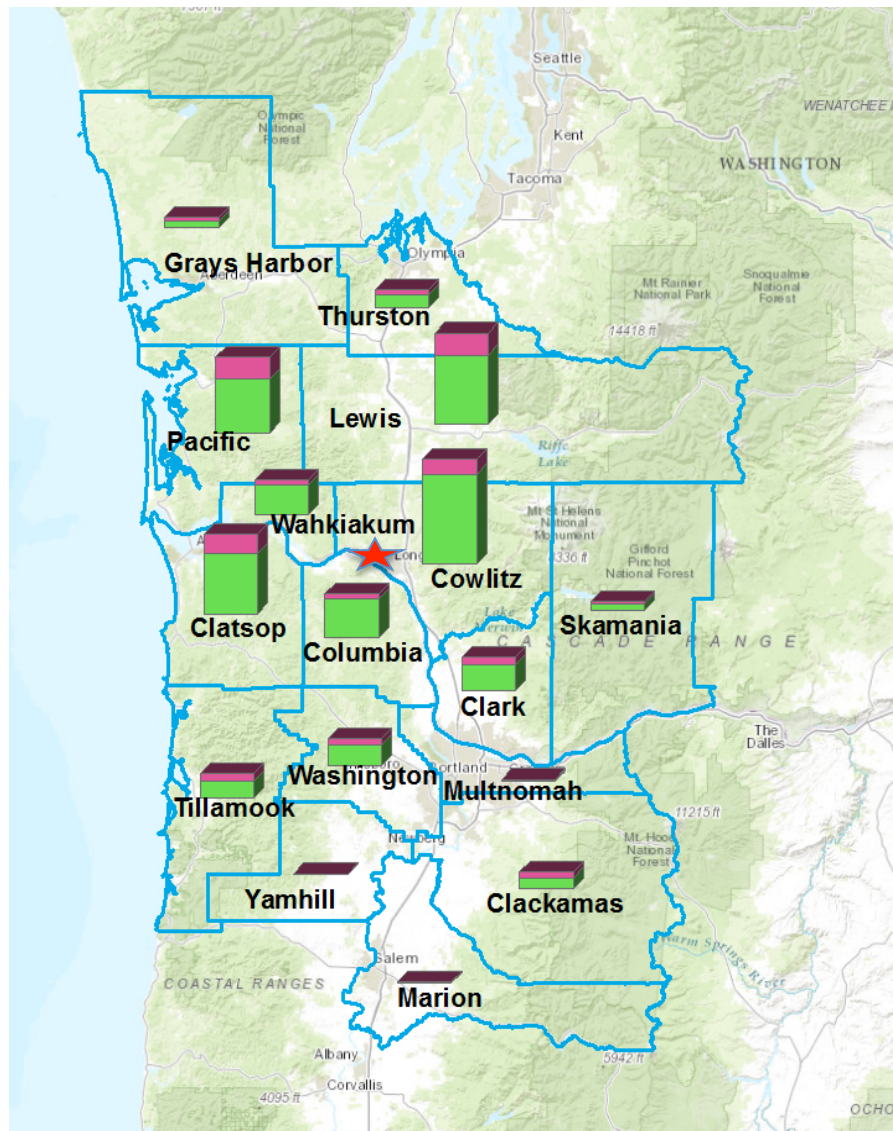
Needs 846,059 BDT At gate price → \$62.60/BDT



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Result C2P: Economic Impacts of Forest Residual Collection



\$ by Truck Transp. Sector



\$ by Logging Sector

	Output	Jobs
Cowlitz WA	\$ 19.1 M	139
Lewis WA	\$ 11.1 M	95
Clatsop OR	\$ 9.0 M	72
Pacific WA	\$ 8.2 M	69
Total	\$ 76.3 M	630

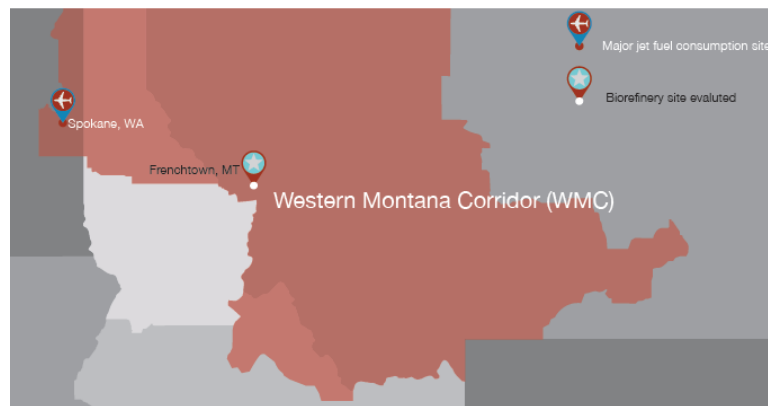


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Results WMC: Economic Impacts

WMC Economic Impacts



	Direct	Indirect	Induced	Total
Output (\$MM)	\$71	\$61	\$25	\$156
Value Added (\$MM)	\$16	\$31	\$13	\$ 60
Jobs (persons)	174	400	203	777



Results WMC: Economic Impacts of Forest Residual Collection

If a biorefinery plant and a larger depot co-located in Frenchtown (Missoula County, MT) and two smaller depots were in Post Falls (Kootenai County, ID) and in Moyie Springs (Boundary County, ID)

County	St.	Biomass (BDT)	% of Biomass Supply	Economic Impacts	
				Output (\$MM)	Jobs
(P) Missoula	MT	33,452	11.9%	\$10.5	75
Sanders	MT	33,313	11.9%	\$2.6	24
Lake	MT	24,355	8.7%	\$1.8	18
Bonner	ID	20,693	7.4%	\$1.5	10
(D) Kootenai	ID	18,367	6.6%	\$3.0	21
Shoshone	ID	17,673	6.3%	\$1.5	13
Powell	MT	16,081	5.7%	\$1.2	13
(D) Boundary	ID	15,113	5.40%	\$3.4	28
Total		280,000	100%	\$33.5	277





Conclusion

- Developing a biorefinery industry in C2P and WMC will bring substantial economic prosperity to the related industries and livable diversified economy through employment.
- Feedstock collection activities are beneficial for forest dependent rural counties in PNW where society has been economically struggling for decades.

