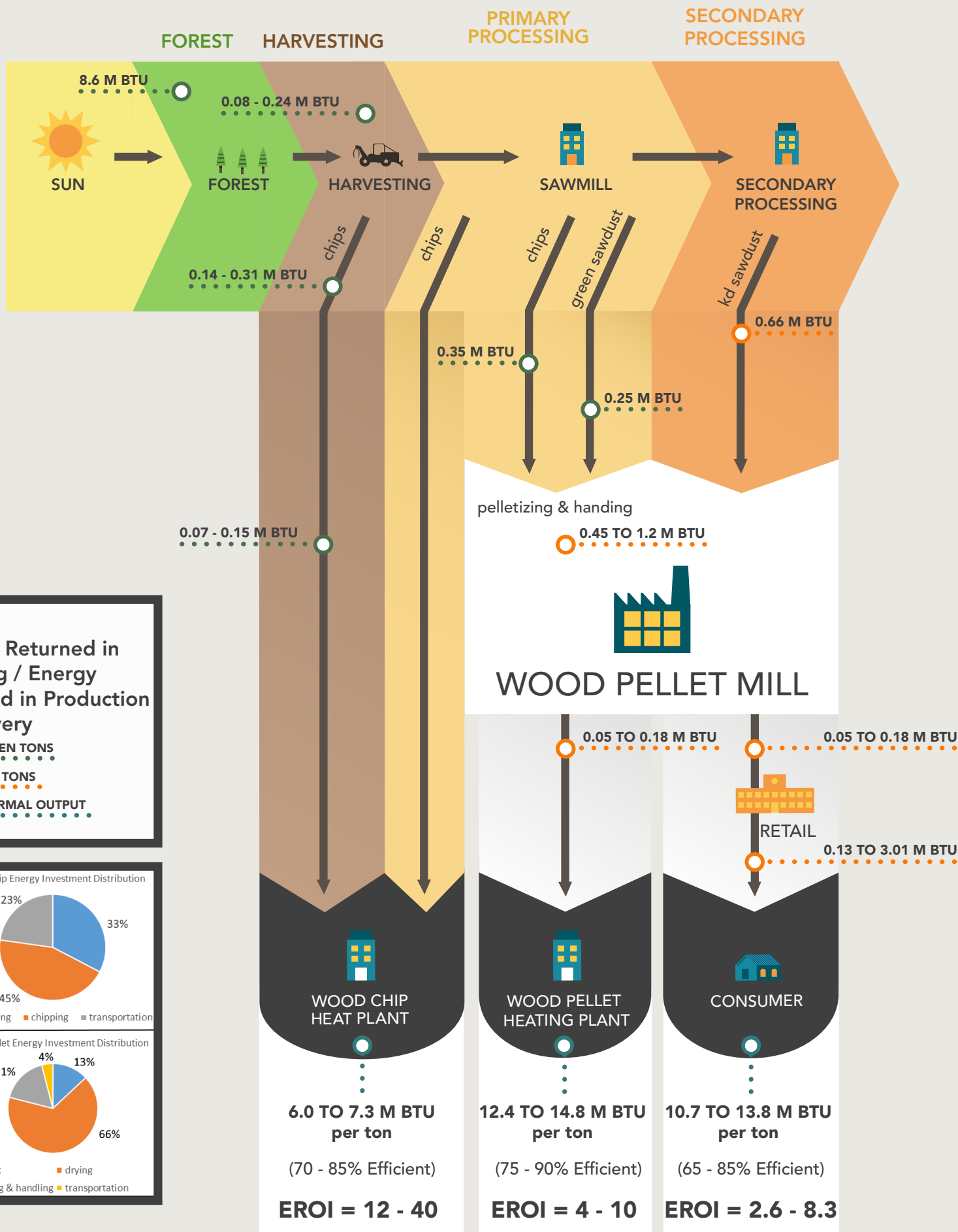
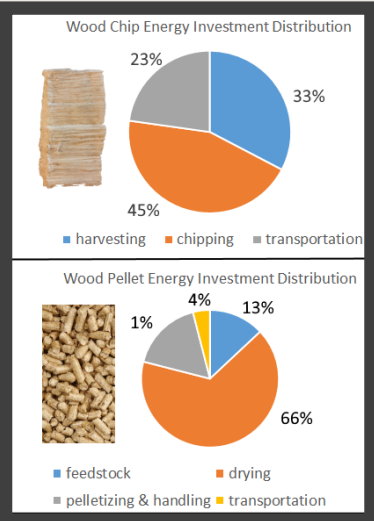


EROI of Woody Biomass Heating Fuels in New York State



EROI = Energy Returned in Heating / Energy Invested in Production & Delivery

- GREEN TONS
- DRY TONS
- THERMAL OUTPUT



Energy Returned on Energy Invested (EROI) Ratios for Wood Chip Heating Fuels in New York State

Wood Chipper Type	Boiler Efficiency	Trucking Distance (miles)									
		10	20	30	40	50	60	70	80	90	100
self	70%	33	29	27	24	22	21	19	18	17	16
	75%	35	31	29	26	24	22	21	19	18	17
	80%	37	34	30	28	26	24	22	21	20	18
disk chipper	70%	30	27	25	23	21	20	18	17	16	15
	75%	32	29	26	24	22	21	20	18	17	16
	80%	34	31	28	26	24	22	21	20	19	18
drum chipper	70%	26	24	22	21	19	18	17	16	15	14
	75%	28	26	24	22	21	19	18	17	16	15
	80%	30	28	25	24	22	21	19	18	17	17
flail chipper	70%	21	19	18	17	16	15	14	14	13	12
	75%	22	21	19	18	17	16	15	15	14	13
	80%	23	22	21	19	18	17	16	16	15	14
85%	25	23	22	21	19	18	17	17	16	15	

Energy Returned on Energy Invested (EROI) Ratios for Wood Pellet Heating Fuels for large scale boilers in New York State

Feedstock Types	Boiler Efficiency	Trucking Distance (miles)									
		20	40	60	80	100	120	140	160	180	200
wood	80%	4.4	4.4	4.4	4.3	4.3	4.3	4.2	4.2	4.2	4.1
	85%	4.7	4.7	4.6	4.6	4.6	4.5	4.5	4.5	4.4	4.4
	90%	5.0	5.0	4.9	4.9	4.8	4.8	4.8	4.7	4.7	4.7
typical mixed sources	80%	4.3	4.3	4.2	4.2	4.2	4.1	4.1	4.1	4.0	4.0
	85%	4.6	4.5	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.3
	90%	4.8	4.8	4.7	4.7	4.7	4.6	4.6	4.6	4.5	4.5
evenly mixed sources	80%	4.9	4.8	4.8	4.8	4.7	4.7	4.6	4.6	4.6	4.5
	85%	5.2	5.1	5.1	5.1	5.0	5.0	4.9	4.9	4.8	4.8
	90%	5.5	5.5	5.4	5.4	5.3	5.3	5.2	5.2	5.1	5.1
kiln-dried sawdust	80%	9.0	8.9	8.7	8.6	8.5	8.3	8.2	8.1	8.0	7.9
	85%	9.6	9.4	9.3	9.1	9.0	8.9	8.7	8.6	8.5	8.3
	90%	10.1	10.0	9.8	9.7	9.5	9.4	9.2	9.1	9.0	8.8

Notes:
 1. 23 ton loads and 5 MPG assumed for delivery trucks
 2. typical mixed sources are wood chips and mill residuals in the proportions reported by pellet mills
 3. evenly mixed sources include a uniform mix of wood chip and residual types