

Municipal Solid Waste (MSW) to SAF Efforts



WSU Feedstock Study

- Examined the potential of Northwest feedstocks to meet the Port's SAF goal (75 million gallons)
- Looked at lipids, forest residuals, and municipal solid waste (MSW)
- Developed cost per gallon of SAF for purposes of comparison



Sufficient MSW and Forest Residuals

	Lipids	Forest Residuals	MSW
Total (million tons/yr)	0	3.4	7.8
Total Possible Distillates (million gal/yr)	0	140-174	166-234
Possible SAF (million gal/yr)	0	61-112	121-171

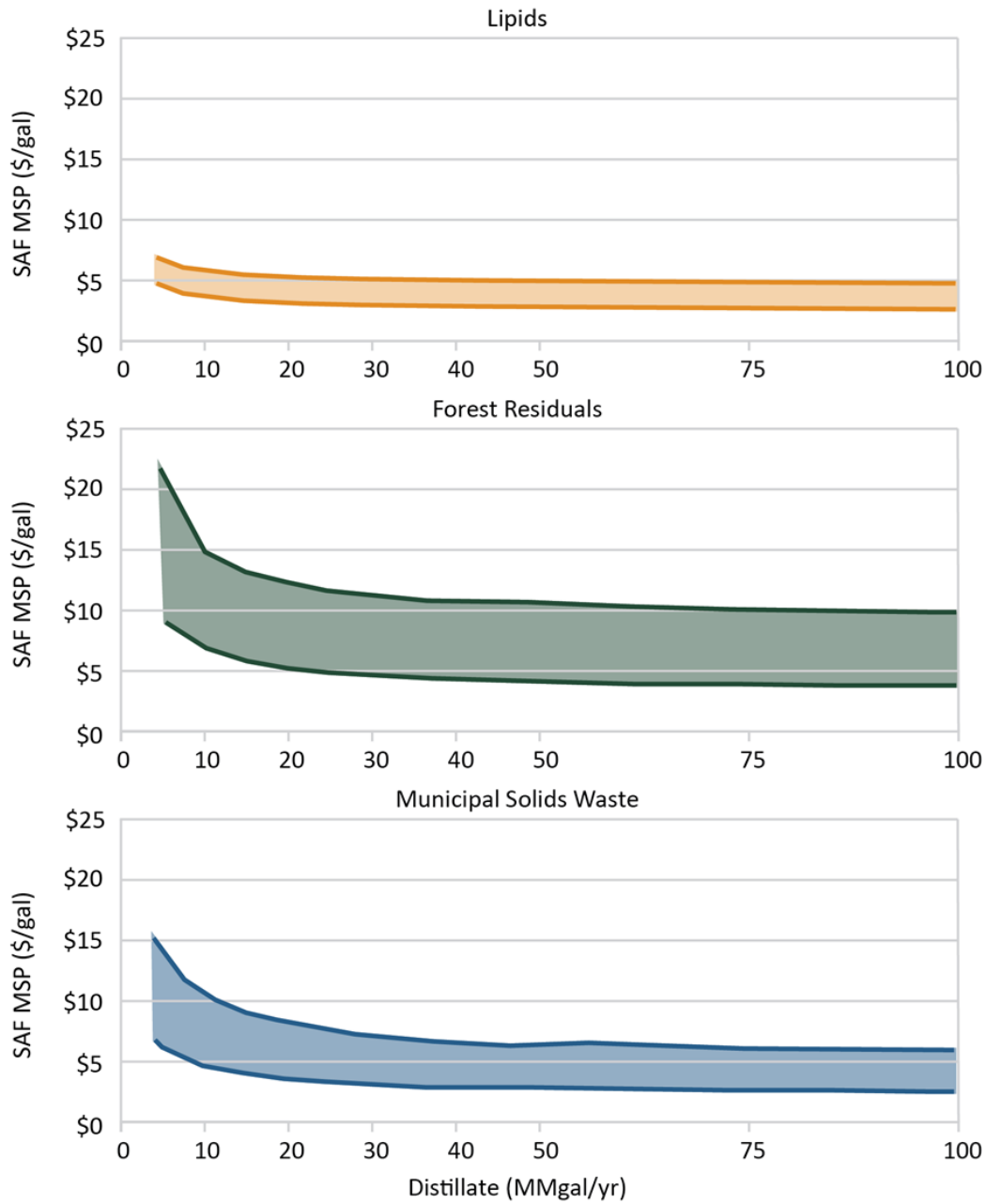
Total Possible SAF (million gal/yr)

182-283

Total CAPEX to total SAF*

\$8-15 billion

*assumes 3 facilities each for MSW and forest residuals, range is high and low scenarios



- Units are \$/gallon and MM gallons/year produced
- \$/gallon of SAF is dependent on volume of feedstock and production facility scale
- High values are controlled by pioneer CAPEX
- Range relates to risk with current technology

MSW Offers best availability-price combo

Pathway	HEFA	ATJ	GFT	GFT
Feedstock	NW Mix Lipids	Forest Residuals	Forest Residuals	MSW
SAF (million gal/yr)	75	75	75	75
Total Distillate (million gal/yr)	144	100	175	96
TCI (billion \$)	0.27-0.31	2.0-4.1	2.8-6.5	3.5-4.6
Multiplier to Petroleum Jet	1.6	2-4.5	2.8-5.5	1.5-3

MSW Partnership Study with King County

- King County Cedar Hills landfill is nearing capacity
- County has explored options for export-by-rail or waste to energy facilities in the past
- Agreement to co-finance and work collaboratively to evaluate the opportunity to convert the region's MSW to liquid fuels in a way that is economically, socially and technically feasible
- Scope of Work currently in development