

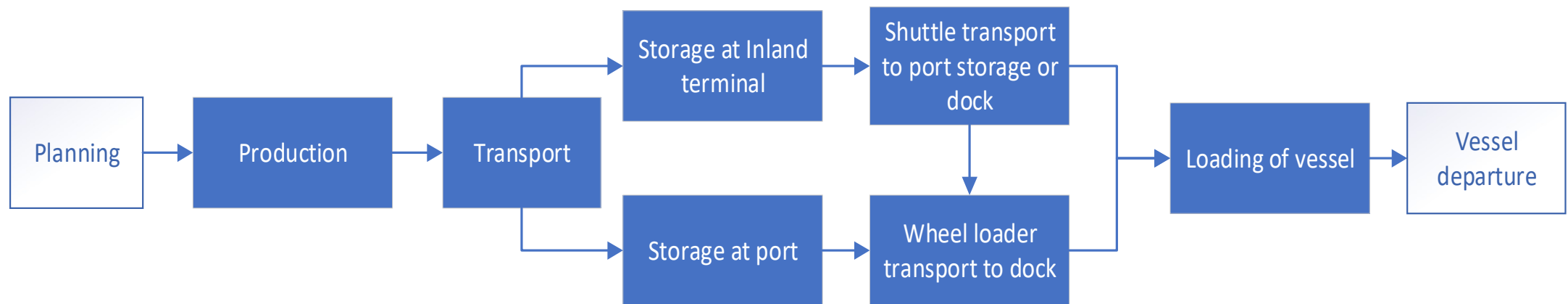
Designing a supply chain for wood fuel over the Baltic sea



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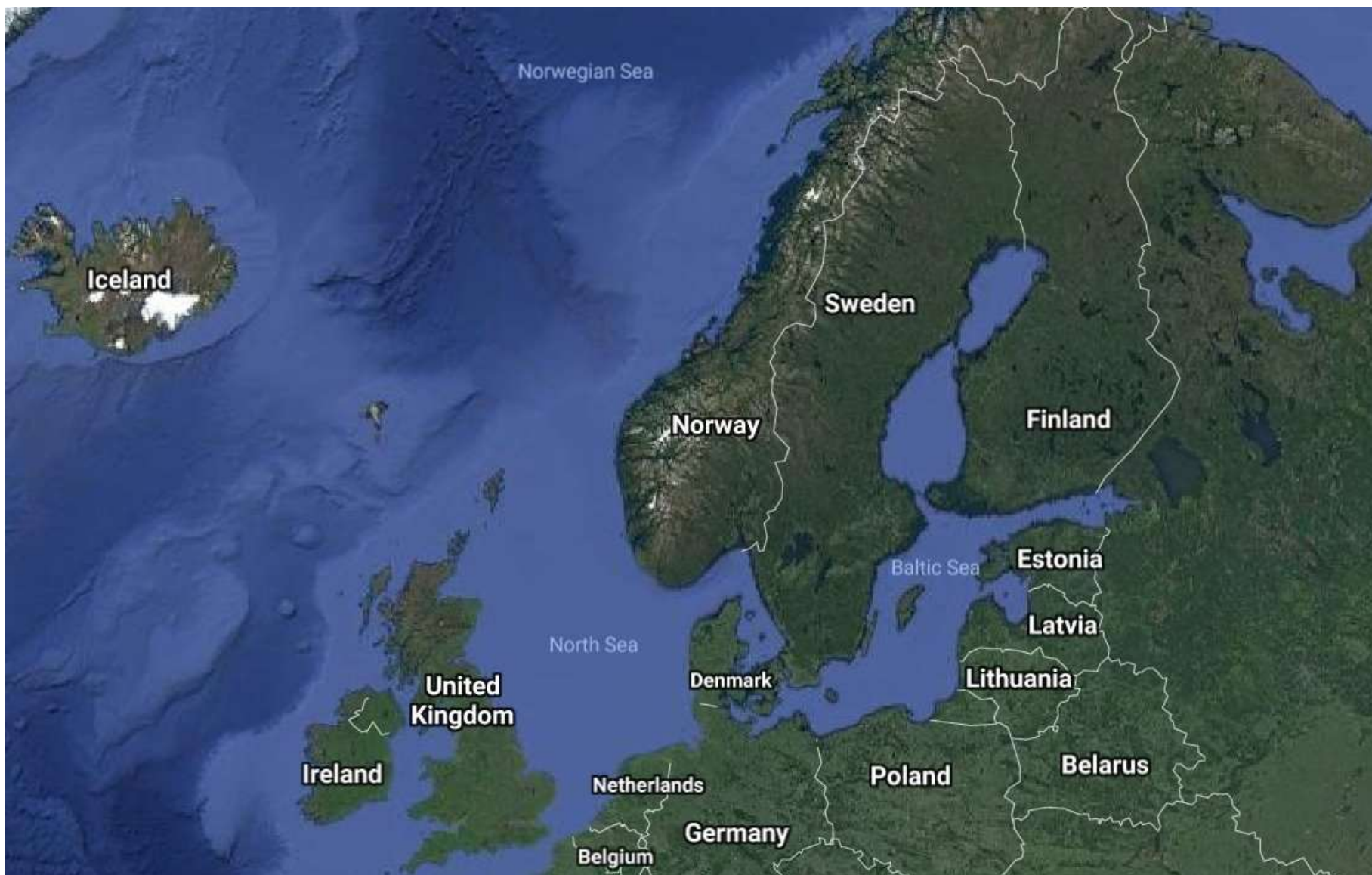
The system

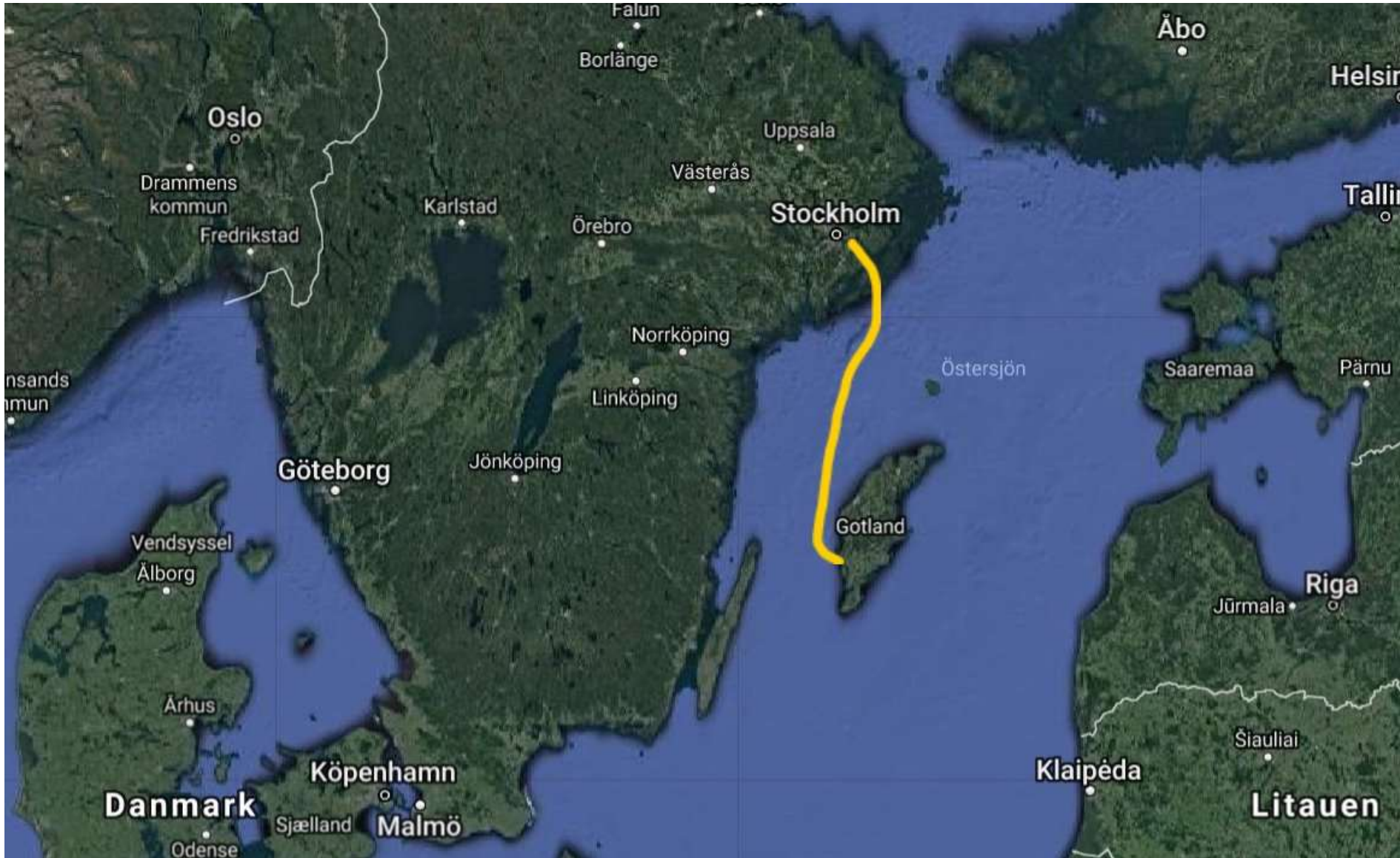


Objective

Assembling data and system information to evaluate...

- the effects of using an intermediate terminal verses direct delivery to the port.
- an alternative technique for loading of vessels with two loaders in cooperation with a small material handler.





M/V Vingaren, frame volume 5720 m³



Wheel loader: Volvo L150, with 16 m³ bucket.



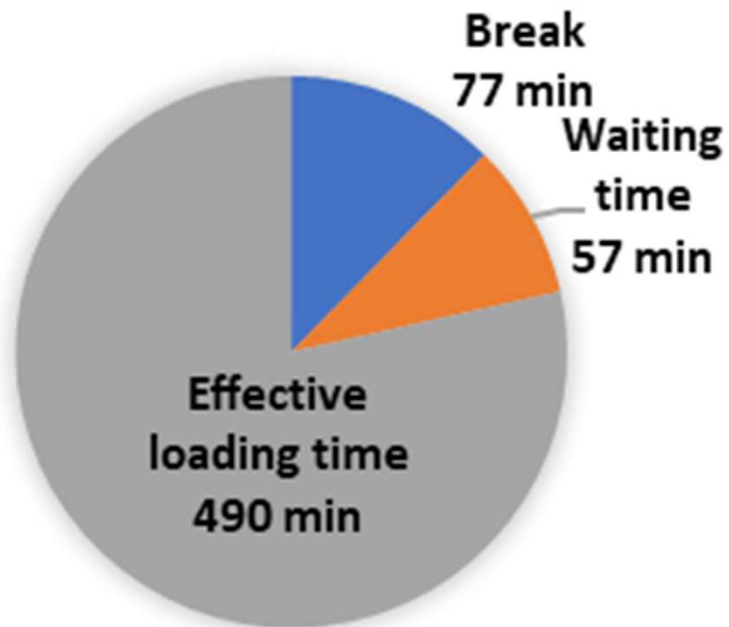
Telescope loader: Merlo P72.10 with a 6 m³ bucket.





Results

– time study of loading operation

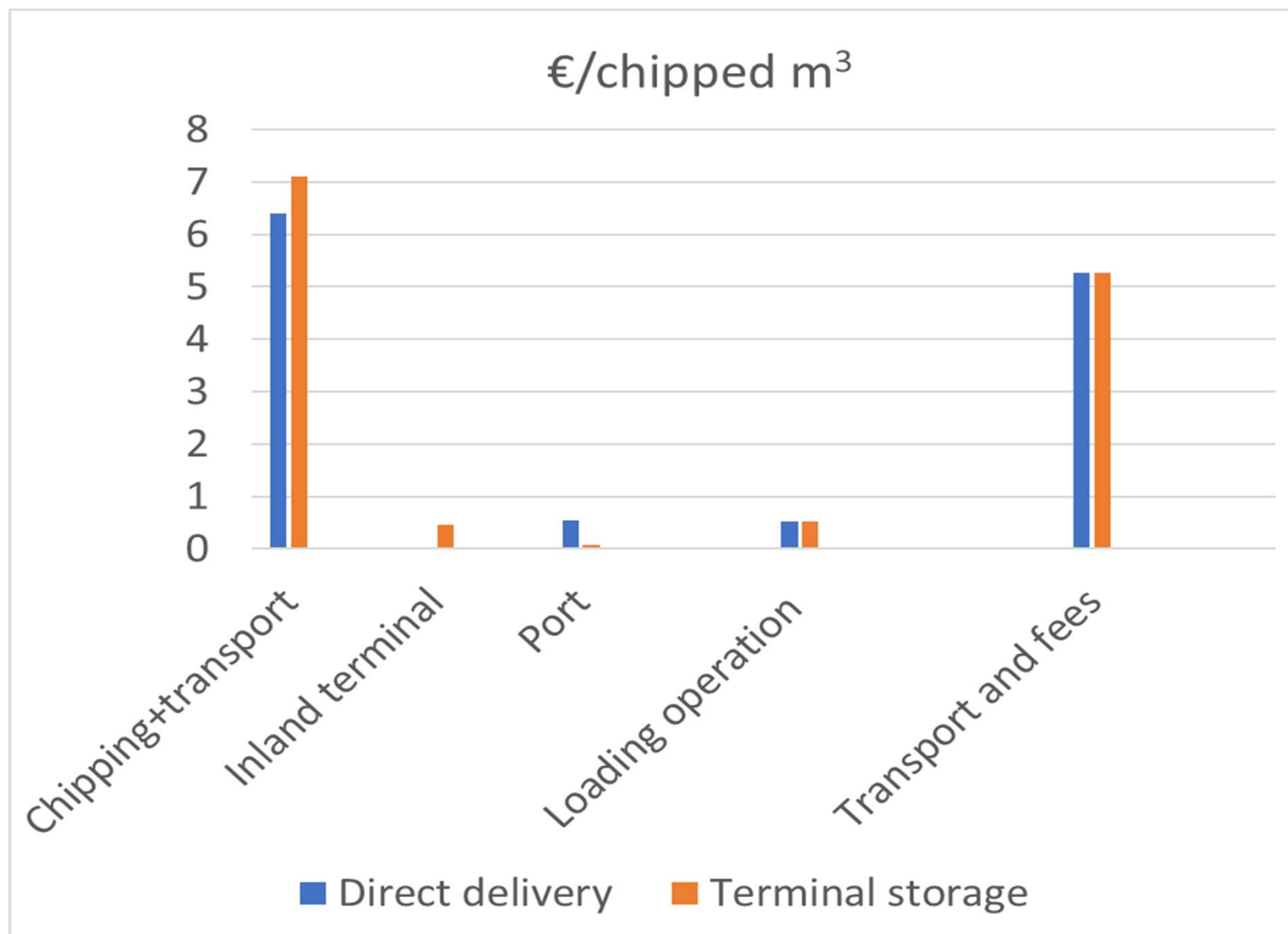


Operation
performance:
660 chipped m³/h

Assembling data and system information to evaluate:

- The effects of using an intermediate terminal compared to direct delivery to the port.

		Direct delivery	Terminal storage
Comminution + transport	Chipper-truck, 35 km	6,4	6,4
	Chip-truck, 8 km to port		0,71
Inland terminal	Site acquisition and pavement		0,05
	Handling at inland terminal		0,4
Port	Volume measurement at port	0,07	0,07
	Storage rental at port	0,17	
	Wheel loader transport to dock	0,3	
Loading operation	Loaders + material handler	0,53	0,53
Transport and fees	Cargo Due	0,27	0,27
	Sea transport, 6000 m3 vessel	5	5
	Including hourly cost for vessel at dock	(0,3)	(0,3)
Sum direct / terminal		12,7	13,4



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Summary of Results

- The three loading machines have a high performance.
- A higher machine cost could be motivated if reducing loading time.
- Small difference between direct delivery and inland terminal.
- More sensitivity analyzes are required, possibly with variation considered.