TECHNOLOGY FACTSHEET

HYDROGEN TRANSPORT BY TRAILER (GASEOUS)

Date of factsheet	43425
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Sector	Hydrogen
ETS / Non-ETS	non-ETS
Type of Technology	Transport of gaseous hydrogen by hydrogen trailer
Description	Transport of gaseous hydrogen by hydrogen trailer. Assumed is a diesel-based truck to transport hydrogen. For more information, see 'Truck info' tab.
TRL level 2020	TRL 9
	Matured

TECHNICAL DIMENSIONS

	Functional Unit		Value and Range		
Capacity	MW				0,42
			0,42	-	0,42
Potential	MW	NL		unlimited	
			-	-	-
Market share	%				-
			Min	-	Max
Capacity utlization factor	1,00				
Unit of Activity	PJ/year				
Technical lifetime (years)	30,00				
Full-load running hours per year	8.760,00				
Progress ratio	1,00				
Hourly profile	No				
Explanation	Yang and Ogden (2007) report 300 kg hydrogen per day, or 120*300*365 MJ/year = 0,42 MW (LHV-based)				

COSTS

Year of Euro	2015

	Euro per Functional Unit	Current			2030			2050		
Investment costs per year	mln. € / MW			0,71			0,67			0,59
		0,71	-	0,90	0,67	-	0,90	0,59	-	0,90
Other costs per year	mln. € / MW			0,27			0,27			0,27
		0,27	-	0,27	0,27	-	0,27	0,27	-	0,27
Fixed operational costs per year (excl. fuel costs)	mln. € / MW			0,04			0,03			0,03
		0,04	-	0,04	0,03	-	0,03	0,03	-	0,03
Variable costs per year	mln. € / MW			-			-			-
		Min	-	Max	Min	-	Max	Min	-	Max
Costs explanation	[1] assume 31 dollar (2007) per year of driver costs. For the investment cost development, we look to [1] and [3]. In [2], cost data is also reported, but for their model they have units of euro/MW, i.e. independent of fleet size or distance. They do not describe distance or fleet size, but they do describe cost developments over time. We extrapolate their cost developments to data in [1] and [3]. The costs from [1] and [3] have been amended to reflect 2015 euros.									

ENERGY IN- AND OUTPUTS

	Energy carrier	Unit	Current			2030			2050		
Energy carriers (per unit of main output)	*Main output:* Hydrogen	PJ			-1,00			-1,00			-1,00
			-1,00	-	-1,00	-1,00	-	-1,00	-1,00	-	-1,00
	Hydrogen	PJ			1,00			1,00			1,00
			1,00	-	1,00	1,00	-	1,00	1,00	-	1,00
	Diesel	PJ			0,02			0,02			0,02
			0,02	-	0,02	0,02	-	0,02	0,02	-	0,02
		PJ			-			-			-
			Min	-	Max	Min	-	Max	Min	-	Max
Energy in- and Outputs explanation	Based on the number for CO2 below. We have ((1/0.000142)*0.48 kg CO2) / (74.3 kg CO2/GJ) in PJ = number of PJ needed to provide this much hydrogen.										

MATERIAL FLOWS (OPTIONAL)

	Material	Unit	Current			2030			2050		
Material flows					-			-			-
			Min	-	Max	Min	-	Max	Min	-	Max
					-			-			-
			Min	-	Max	Min	-	Max	Min	-	Max
Material flows explanation											

EMISSIONS (Non-fuel/energy-related emissions or emissions reductions (e.g. CCS)

	Substance	Unit	Current			2030			2050		
Emissions	CO2	kton			0,00			0,00			0,00
			0,00	-	0,00	0,00	-	0,00	0,00	-	0,00
	0	0			-			-			-
			Min	-	Max	Min	-	Max	Min	-	Max
					-			-			-
			Min	-	Max	Min	-	Max	Min	-	Max
					-			-			-
			Min	-	Max	Min	-	Max	Min	-	Max
Emissions explanation	Yang and Ogden (2007) report 480g CO2/kg H2. 1 PJ hydrogen corresponds to 7042 kg. This is 3380 kg CO2										

OTHER

		Current			2030			2050		
Other				-			-			-
		Min	-	Max	Min	-	Max	Min	-	Max

REFERENCES AND SOURCES

Yang, C., & Ogden, J. (2007). Determining the lowest-cost hydrogen delivery mode. International Journal of Hydrogen Energy, 32(2), 268-286.

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