

# High level Roadmap for the green hydrogen economy in the Northern Netherlands up to 2030

Under construction A A Priority to realize  
 Included in investments A A (A) Not included in investments

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Wind offshore	600 MW Gemini				1,000 MW		1,000 MW		1,000 MW		1,000 MW		(Far offshore wind)
Electrolysis			20 MW		480 MW		500 MW			(1,000 MW)			(1,000 MW)
Biomass gasification					20 MW		480 MW		500 MW				
Solar-hydro areas		Ameland	1 icon area	1 icon area		5 areas	5 areas	10 areas	10 areas	15 areas	15 areas	15 areas	20 areas
Offshore cable	600 MW Gemini		700 MW Cobra		1,000 MW wind		1,000 MW wind		1,000 MW wind		1,000 MW wind		(1,000 MW NorNed 2)
Ammonia					(Magnum Nuon First import)	Delfzijl 150,000 tons production		Delfzijl 150,000 tons production		(Magnum Nuon 1.3 million tons import)			
Methanol								Delfzijl 150,000 tons		Delfzijl 150,000 tons			
Pipeline					Delfzijl, Rotterdam, Limburg			Ruhr area, Harlingen, Emmen			Bremen-Hamburg		(Offshore gas/hydrogen pipeline)
Fueling stations	Delfzijl	2	4	6	8	10	10	10	10	10	10	10	10
Distribution centers					Harlingen i.e. trains	Groningen i.e. trains	Emmen	Leeuwarden		Hoogeveen		Harlingen electrolysis	Emmen electrolysis
Fuel cell balancing									100 MW	100 MW	100 MW	100 MW	100 MW
Harbor facilities			Truck loading		Ammonia import			Biomass import					(Hydrogen shipping)
Busses	2	6	20	20	20	20	50	50	50	50	50	50	50
Trains			Groningen-Leeuwarden		10	20	20						
Trucks	2	6	10	20	30	50	50	50	50	100	100	100	100
Cars		20	100	500	1,000	3,000	6,000	10,000	10,000	15,000	15,000	20,000	20,000
Boats			Ecolution	Sail boats	Sail boats	First ferry	First yacht	First fishing boat	First freight ship				
Others		Forklifts	Drones	Robots	Mobile								
Research, innovation centers	Energy Academy Europe, research universities, universities of applied sciences, EnTranCe (Groningen), Wetsus (Leeuwarden), Emmtec (Emmen)						Energy Academy Europe, research universities, universities of applied sciences, EnTranCe (Groningen), Wetsus (Leeuwarden), Emmtec (Emmen)						
Trading platform													Established
Trade fair		Shows	Shows	First time	1	1	1	1	1	1	1	1	1
Green certificates					Established NL	Established Germany			Established Europe				
Regulations		Provisionally established			Fully implemented								
Education	MBO, HBO, universities, high schools, primary schools, etc.						MBO, HBO, universities, high schools, primary schools, etc.						
Training	Automotive, fire department, police, installation technicians, builders, technicians, regulators, etc.						Automotive, fire department, police, installation technicians, builders, technicians, regulators, etc.						