IEA Bioenergy
Technology Collaboration Programme

Status report on thermal gasification of biomass and waste 2025
Output: Hydrogen

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Annex 3
Gasification facilities for CHP production with Hydrogen Output
- operational, under construction / under commissioning, on hold

Output: Hydrogen

	Operational
	Planned
	Under construction / under commissioning
	On hold / Non operational

CATEGORY	INFORMATION
PROJECT OWNER	Advanced Biofuels Solutions Ltd (ABSL)
PROJECT NAME	Swindon Advanced Biofuels Plant
STATUS	Operational (first gas production achieved January 2024)
STARTUP	2022 (commissioning phase completed in 2023)
LOCATION	United Kingdom
CITY	Swindon
TYPE	TRL 8 First-of-a-kind commercial
TECHNOLOGY	Fuel Synthesis
TECHNOLOGY ADDITIONAL INFORMATION	ABSL RadGas and Wood VESTA technology
RAW MATERIAL	organic residues and waste streams
INPUT 1	Refuse derived fuel and waste wood (8,000 t/y)
OUTPUT 1	SNG (1,500 t/y)
OUTPUT 2	Hydrogen (500 t/y)
OUTPUT ADDITIONAL INFORMATION	- 22 GWh biomethane (heats 1,800 homes) - 6,000 t/y liquified CO_2 for industry - 400 t/y vitrified ash aggregate
TOTAL INVESTMENT	GBP 30,000,000
FUNDING	GBP 11,000,000 public funding + £4.75M government grant for biohydrogen
TECHNOLOGY BRIEF	8-step process: 1) Waste preparation 2) Oxy-steam fluidized bed gasification 3) Plasma-assisted tar reformation 4) Syngas cooling 5) Particulate/acid removal 6) Catalytic conversion to methane/CO_2 7) CO_2 liquefaction 8) Grid injection. Flexible biohydrogen/biomethane production with carbon capture
ADDITIONAL INFORMATION	- First plant globally to convert household waste to grid-quality biomethane - Achieved negative emissions via carbon capture - Feedstock: Local municipal waste equivalent to 75 HGV trucks/year - Partnered with Petrofac/Sumitomo for 120,000 t/y scaled project

CONTACT INFORMATION	Tel: 01793 832 860 Unit A4, Marston Gate South, Marston Industrial Estate, Stirling Road, Swindon SN3 4DE UK Commercial: a.angeletti@nextchem.it Technical: Nathan Burkey (Executive Chairman)

CATEGORY	INFORMATION
PROJECT OWNER	CAPINGELEC
PROJECT NAME	CAPPYRO H2
STATUS	operational
STARTUP	2024
LOCATION	France
CITY	Le Barp
ZIP	33114
TYPE	TRL 6-7 Demonstration
TECHNOLOGY	Fuel Synthesis
RAW MATERIAL	biomass
INPUT 1	Biomass (80 kg/h)
OUTPUT 1	hydrogen (3 kg/h)
TECHNOLOGY BRIEF	Pyro-gasification with two gasification stages in the same reactor
ADDITIONAL INFORMATION	ADEME project page. Funded under AAP/AMI call for projects. Aims to validate and scale renewable hydrogen production from biomass.
CONTACT INFORMATION	e.fourcassies@capingelec.com

CATEGORY	INFORMATION
PROJECT OWNER	Dillinger Saar GmbH
PROJECT NAME	Project Selma
STATUS	planned
LOCATION	Germany
CITY	Premnitz
TYPE	TRL 9 Commercial
TECHNOLOGY	Other Gasification Technology
RAW MATERIAL	waste materials (non-recyclable plastics, wind turbine blade composites)
INPUT 1	waste materials (44,000 t/y)
OUTPUT 1	hydrogen (2,200 t/y) ; full capacity target: 7,500 t/y
TECHNOLOGY BRIEF	Plasma gasification producing 99.99% pure hydrogen and liquid CO_2
ADDITIONAL INFORMATION	- Total investment: €70 million - Certified green hydrogen with negative CO_2 footprint (-5.47 kg CO_2e/kg H_2) via DNV - Processes 44,000 t/y waste into 7,500 t/y H_2 and 100,000 t/y liquid CO_2 - Partners: Richter Group, Plagazi
CONTACT INFORMATION	info@plagazi.com

CATEGORY	INFORMATION
PROJECT OWNER	GO Dupuy + Active SMO
PROJECT NAME	Site de Transformation des algues Sargasses
STATUS	planned
STARTUP	2026
LOCATION	France
CITY	Guadeloupe
ZIP	97100
TYPE	TRL 6-7 Demonstration
TECHNOLOGY	Other Gasification Technology
TECHNOLOGY ADDITIONAL INFORMATION	Gasification with CO_2 sequestration
RAW MATERIAL	other
INPUT 1	Sargasses algues (33,000 t/y)
OUTPUT 1	hydrogen (2,550 t/y)
OUTPUT 2	power (electricity) (28 MW)
OUTPUT 3	other (5,000 t/y)
OUTPUT ADDITIONAL INFORMATION	hydrogen, heat for own consumption, activated carbon
TECHNOLOGY BRIEF	Plasma gasification/pyrolysis (SMO/NST/NT) to combat sargassum pollution, sequester CO_2, and produce hydrogen, electricity, drinking water, and activated carbon.
CONTACT INFORMATION	sarlgodupuy@gmail.com

CATEGORY	INFORMATION
PROJECT OWNER	H2Herten GmbH
PROJECT NAME	Blue Tower Technology Herten
STATUS	on hold
STARTUP	2009
LOCATION	Germany
CITY	Herten
TYPE	TRL 6-7 Demonstration
TECHNOLOGY	Other Gasification Technology (PVC2: Power and Heat via Gasification)
RAW MATERIAL	lignocellulosics
INPUT 1	roadside greenery
INPUT 2	Syngas (13 MW)
OUTPUT 1	hydrogen (150 m^3/h)
OUTPUT 2	heat
PARTNERS	Blue Tower GmbH, Dresden
TECHNOLOGY BRIEF	Green hydrogen is produced using a multi-stage reforming process. Roadside greenery is decomposed at around 600°C, with 80% converted to gas; remaining solids become coke, reused for process heat. The resulting gas is purified into a hydrogen-rich "blue gas" (~50% H_2) at ~950°C with steam. This gas is then concentrated into pure hydrogen or used in gas engines for electricity. With a thermal input of 13 MW, the process yields 150 m^3/h hydrogen and 37,500 MWh/year electricity-enough for 12,000 homes. The process uses a circulating bulk heat carrier (e.g., ceramic balls) for efficient heat transfer and clean operation, enabling use of challenging biomass types. The Blue Tower sets new technical and economic standards for hydrogen and power from biomass.
ADDITIONAL INFORMATION	The project was supported by EU and North Rhine-Westphalia funding, with a planned investment of €24–26 million. The 42-meter tower was designed as a flagship for hydrogen competence in Herten. The process achieves a product gas with 43–57% H_2 (dry), 18–24% CO_2, and 14–18% CO, with a calorific value of ~12 MJ/Nm^3. The pilot plant

	successfully demonstrated hydrogen-rich gas production from various biomass types. The project is currently on hold due to financial and technical challenges following the insolvency of a key investor.
CONTACT INFORMATION	CHP Herten & other innovation

CATEGORY	INFORMATION
PROJECT OWNER	Hafner Energy
PROJECT NAME	R-Hynoca
STATUS	operational
STARTUP	2024
LOCATION	France
CITY	Strasbourg
ZIP	67000
TYPE	TRL 6-7 Demonstration
TECHNOLOGY	Other Gasification Technology
TECHNOLOGY ADDITIONAL INFORMATION	Thermolysis
RAW MATERIAL	biomass residues
INPUT 1	biomass residues (450 kg/h)
OUTPUT 1	hydrogen (120 t/y)
OUTPUT 2	other (64 kg/h)
OUTPUT 3	other (128 kg/h)
OUTPUT ADDITIONAL INFORMATION	64 kg/h biochar, 128 kg/h CO_2, 165 kWh electricity
ADDITIONAL INFORMATION	Industrial-scale test platforms for biomass and other types of inputs
CONTACT INFORMATION	Gurvan DANO (gurvan.dano@haffner-energy.com)

CATEGORY	INFORMATION
PROJECT OWNER	Neue Energy Premnitz
PROJECT NAME	Premnitz project
STATUS	planned
LOCATION	Germany
CITY	Premnitz
TYPE	TRL 9 Commercial
TECHNOLOGY	Plasma gasification
RAW MATERIAL	waste materials (non-recyclable plastics, composites from wind turbine blades)
INPUT 1	waste materials (44,000 t/y)
OUTPUT 1	hydrogen (2,200 t/y) (full capacity up to 7,500 t/y)
TECHNOLOGY BRIEF	The project will use plasma gasification to convert 44,000 tons of otherwise unrecyclable waste per year into up to 7,500 tons of high-purity green hydrogen (99.99%) and 100,000 tons of liquid CO_2 for industrial use. The process is certified as producing green hydrogen with a negative CO_2 footprint (-5.47 kg CO_2e/kg H_2) by DNV.
ADDITIONAL INFORMATION	The €70 million project is a partnership between Neue Energien Premnitz, Plagazi, and Richter Group. A Special Purpose Vehicle, 'SPV Premnitz Hydrogen Park GmbH', was created for the project. A long-term offtake agreement for 4,000 t/y green hydrogen has been signed with WIRTZ Energie + Mineralöl.
CONTACT INFORMATION	info@plagazi.com

CATEGORY	INFORMATION
PROJECT OWNER	Qairos Energies
PROJECT NAME	Qairos Châteauroux
STATUS	planned
LOCATION	France
CITY	Châteauroux-Indre
ZIP	36044
TYPE	TRL 8 First-of-a-kind commercial
TECHNOLOGY	Fuel Synthesis
TECHNOLOGY ADDITIONAL INFORMATION	Gasification + WGS + methanation
RAW MATERIAL	agricultural residues (industrial hemp)
INPUT 1	agricultural residues (5 MW)
OUTPUT 1	SNG (200 m^3/h)
OUTPUT 2	hydrogen (2 t/d)
OUTPUT 3	CO_2 (30 t/d)
OUTPUT ADDITIONAL INFORMATION	5 MWth heat
TECHNOLOGY BRIEF	Pyro-gasification of biomass followed by gas cleaning, methanation, and hydrogen synthesis.
ADDITIONAL INFORMATION	Requires 1,000 hectares of locally grown hemp. CO_2 liquefied for industrial use; potential future liquid fertilizer production.
CONTACT INFORMATION	Jean Foyer (jfoyer@qairos-energies.com)


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