

PRUVIA



Overview

Pruvia is a German chemical technology company developing a circular-economy solution that converts mixed plastic waste into pyrolysis oil, with a first commercial facility under development in Gendorf, Bavaria, Germany

Introduction

- Pruvia GmbH (“**Pruvia**”) is a German cleantech company commercialising a patented chemical-recycling process (“**MLM-R®**”) that converts mixed, polyolefin-rich plastic waste into circular pyrolysis oil for petrochemical reuse.
- Headquartered in Bavaria, Pruvia has progressed from early R&D (2016–2019) to a pilot plant (Italy, 2020) and then a demonstration plant (the “**Demo Plant**”) (Germany, 2022–today), validating technical feasibility and product quality.

Market context

- Global plastic use continues to rise sharply (**+70%** worldwide by 2040 vs 2020), resulting in an increase in plastic waste generation, while recycling infrastructure and technologies remain insufficient.
- Most plastics are still incinerated or landfilled, prompting increasingly strict EU regulations and corporate targets that mandate the use of certified circular feedstocks.
- In the Bavarian region where Pruvia will set up its commercial facility, ~500k tonnes of plastic waste is generated annually, presenting an opportunity to save up to 1m tonnes of CO₂ per year and generate €520m in annual sales.

Source: OECD, Management

Current investment opportunity

Pruvia is raising **€15m of equity** to address this imbalance by commercialising its proprietary chemical-recycling technology. The remaining financing has already been soft-committed by other parties, enabling a total investment of 73.25€ for the construction of its first commercial plant in Gendorf, Germany (the “**Gendorf Plant**”), international expansion and licensing of its technology.

Type	Remaining requirement	Ticket size (per investor)	Use of proceeds
Equity	€15m	€1m – €15m	Gendorf Plant (Phase 1) & business development

Investment merits

Signed agreements and advanced-stage negotiations with offtakers and suppliers provide strong visibility on revenue and costs (refer to **page 6**)

€18m raised to date from reputed institutional and private investors

ESG-aligned circular conversion of plastic waste into **pyrolysis oil**

Technology Readiness Level (“**TRL**”) of 7-8

Technology **patented until 2040** in Europe, US, Canada, China and India

+75% on-spec oil yield achieved through multiple test runs in the Demo Plant

Nominated for the **Bavaria Innovation Award 2026**

Bayern Kapital* committed to **match capital** of any additional equity investor

Long-term growth driven by **technology licensing and international expansion**

(*) A venture capital company funded by the Bavarian government, supporting innovative start-ups

Gendorf Plant (Phase 1 & 2)

2026-2029
expected construction of the plant

52,000 tonnes
output capacity

€120m CAPEX
requirement needed

Other KPIs

56% EBITDA margin
expected by 2032

€78m revenue
expected by 2032

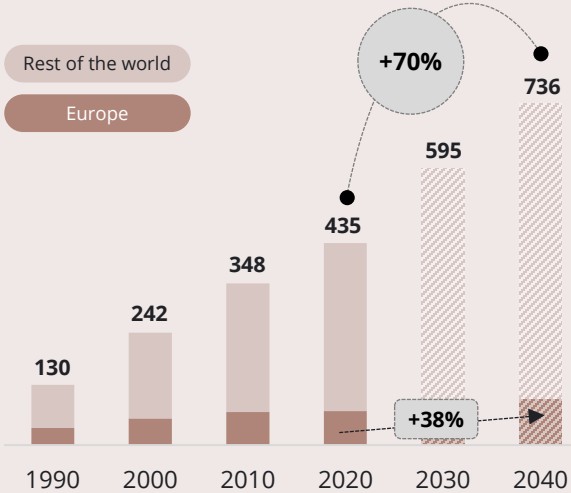
83 – 90%
reduction in GHG emissions vs.
incineration



Market context

Global plastic use continues to accelerate, while recycling infrastructure and technologies lag behind, leaving most waste incinerated or landfilled, turning plastic into a growing environmental challenge

Plastic use in the world (million tonnes)



Plastic use in Europe

Post-consumer plastic waste

More than **400 million** tonnes of plastic are used every year, and this figure is expected to increase **by 70% worldwide**, and **by 38% in Europe from 2020 to 2040**.

Polyolefins – mainly polyethylene and polypropylene – represent 45% of this total and are the primary component of household packaging and consumer goods.

Source: OECD and nature.com

Treatment of post-consumer plastic waste in Europe

Most post-consumer plastic waste is either incinerated or landfilled, while a significant share is also unrecorded – leaking into the environment, entering informal disposal systems, or lost during collection and sorting.

Destination of post-consumer plastic waste

%

Limitations

(million tonnes, 2020)

Incineration

12.4

42%

Emits CO₂ and destroys material value

Landfill

6.9

23%

Wastes resources and risks long-term pollution

Mechanical recycling

4.6

16%

Limited to clean plastics and degrades quality



Chemical recycling

0.1

0.3%

Still capital-intensive and early-stage



Other

5.5

19%

Exported to emerging countries or lost during the sorting process

Source: The Circular Economy for Plastics – A European Overview, Plastics Europe, 2022.

Environmental sustainability level



Medium



High

Among chemical recycling technologies, **pyrolysis** can handle the broadest range of plastic waste and yield the widest variety of end-products, achieving **true circularity**.

Pyrolysis thermally depolymerises plastic waste into vapour-phase hydrocarbons, which are then condensed into pyrolysis oil. This oil can substitute fossil naphtha in petrochemical steam crackers to produce virgin-grade polymers used in applications such as pharmaceuticals, base chemicals and cosmetics.



Market drivers

Growing demand for circular feedstock is driven by corporate sustainability goals, tax incentives and subsidies fostered by EU regulations

What is driving demand for recycled products?

The transition to a circular plastics economy is a long-term EU policy commitment, supported by binding regulation, harmonised standards, and dedicated public funding.

This framework provides regulatory certainty and investment visibility, supporting the industrial scale-up of recycled and circular feedstock solutions across the EU.

European Union regulations (examples)

European Climate Law (Regulation (EU) 2021/1119)

Legally binds the EU to reduce net GHG emissions by 55% by 2030 and achieve climate neutrality by 2050.

Waste Framework Directive (2008/98/EC, amended by 2018/851)

Establishes the waste hierarchy and requires Member States to achieve 55% municipal waste recycling by 2025, 60% by 2030, and 65% by 2035.

EU Plastics Strategy (2018)

Calls for all plastic packaging on the EU market to be recyclable or reusable by 2030; promotes the uptake of recycled plastics in new products.

EU Green Deal (2019) & Circular Economy Action Plan (CEAP, 2020)

Aims to double circular material use by 2030, cut waste, and promote advanced plastic sorting and chemical recycling.

Packaging and Packaging Waste Regulation (PPWR, adopted 2025)

Requires all packaging to be recyclable by 2030; sets minimum recycled-content targets (e.g. 30% for contact-sensitive plastic packaging by 2030).

Regulations drive member states to introduce subsidies and tax incentives that encourage corporations to comply with circular-economy targets.

Corporate ESG and reputational commitments

Regulations, corporate sustainability policies, and tax incentives are driving companies to set ambitious recycling targets for their products.

Examples:



Unilever targets a 25% share of recycled plastic in its packaging by 2025 and a 30% reduction in virgin-plastic use by 2026.



PepsiCo aims to reach at least 40% of recycled content in its plastic packaging by 2035.



Procter & Gamble plans for all packaging to be recyclable or reusable by 2030.



Coca-Cola aims to use 35-40% recycled material in its packaging and increase the share of recycled plastic to 30-35% by 2035.

This leads brand-owners' suppliers to increasingly secure access to circular feedstock.

Examples:



SABIC targets to process at least 1m tonnes of TRUCIRCLE™ products annually by 2030 from bio-based or recycled feedstock.



LyondellBasell intends to produce and market at least 2m tonnes of recycled and renewable-based polymers annually by 2030.



OMV plans to sell up to 1.4m tonnes of sustainable base chemicals and polyolefins per year by 2030.



Dow aims to commercialise 3m tonnes of circular and renewable solutions annually by 2030.



Technology edge

Pruvia's patented MLM-R® technology addresses the limitations of the standard pyrolysis process, such as indirect heating and char formation, which drive up maintenance and operating costs

Limitations of competing pyrolysis technologies



Poor heat transfer

- Plastics have intrinsically low thermal conductivity, which prevents heat from spreading efficiently through the molten mass during the pyrolysis process.
- Most existing technologies rely on indirect heating through the reactor walls, but this approach fails to ensure uniform heat distribution inside the reactor.
- As a result, the process operates with uneven temperatures, non-uniform reaction kinetics, and limited control. Such indirect heating systems are also difficult to scale up, with typical capacities below 25k tonnes per year.



High fuel demand and cost

- In addition, indirect heating depends on continuous external energy supply, increasing energy consumption and operating costs.
- Pruvia's technology** overcomes these challenges by using hot particles as an internal heat carrier, ensuring uniform temperature distribution, faster reactions, and lower operating costs.



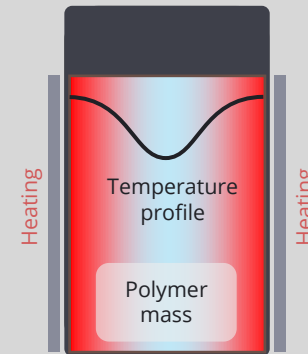
Char formation

- During every plastic waste pyrolysis process, the formation of char is intrinsic. Char is a carbonaceous residue with a high calorific value.
- All competing technologies need to reduce the formation of deposits on internal surfaces and avoid a decrease in the heat transfer rate, which results in the necessity of extracting char from their reactor by using mechanical systems.
- The necessity of char removal is associated with increased risk of hazardous emissions and accidents, increased CAPEX/OPEX and disposal costs for char as well as risks of leakage in the mechanical systems.
- Pruvia's technology** utilises the calorific value of char to increase energy efficiency by channeling it onto a circulating heat carrier, which is combusted in a regenerator to clean and reheat it. This prevents char buildup, maintains efficient heat transfer and scalability, and eliminates the need for mechanical removal, reducing emissions, maintenance, and disposal costs.

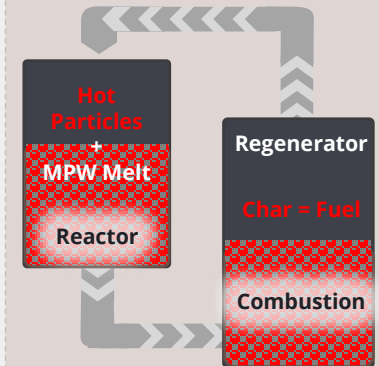
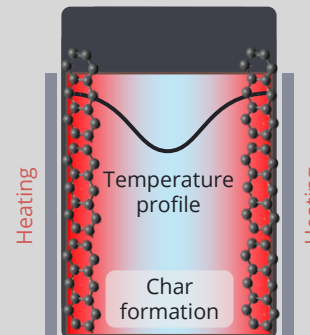
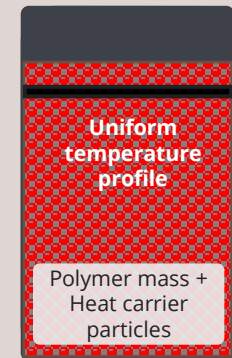


High CAPEX and limited scale

Competitors
indirect heating



Pruvia's solution
direct heating





Proof of concept

In 2022, Pruvia developed and operated a Demo Plant that successfully validated its technology, demonstrated operation robustness, and confirmed scalability toward commercial performance

Demo Plant overview

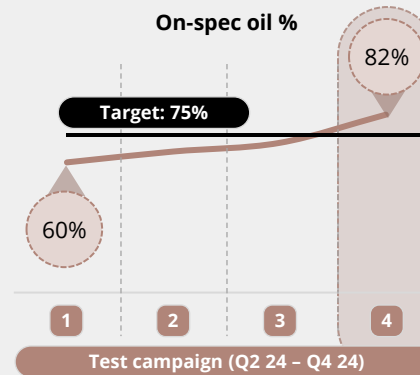
Pruvia started the construction of its Demo Plant in 2022 and commenced operations in Q3/Q4 2023.

- **Purpose-built scale-up validation:** The 100 kg/h demo plant was designed to validate and adjust various parameters to ensure that the technology is suitable for industrial deployment, rather than to demonstrate commercial performance at demo scale.
- **Extensive real-world operation:** Operated for over two years on mixed plastic waste to enable optimization of underlying processes.
- **Technology risks mitigated:** Key scale-up and operational risks were addressed, including stable self-sustaining operation and reliable handling of materials at high temperatures.
- **Commercial-ready outcome:** Demo results directly informed the 4,000 kg/h commercial design, supported by model-based scale-up and independent engineering review.



Actual control panel of the Demo Plant, monitoring over 300 parameters to ensure process stability and operational safety

Key metrics and resulting parameters achieved



- During test campaign **4**, the process achieved **18 consecutive on-spec runs**, with pyrolysis oil yields exceeding 75%, demonstrating a high reliability.
- Positive **independent product quality analyses conducted by offtakers**, including a leading integrated energy company, supported progression to offtake contract discussions.
- A **successful 24-hour, three-shift continuous test run** was completed at the Demo Plant, confirming operational robustness.

Minimum scale up risk



- Despite the Gendorf Plant (Phase 1) having 40x capacity of the Demo Plant, scale up risk is minimised due to the model-based scale-up design.
- Key performance ratios are close to 1x.

	Demo Plant	Gendorf Plant
Capacity (Kg/h)	100	4,000
Parameter	Scaling factor	
Ratio Particle Loop Rate / Plastic Feed Rate	1.1	
Melt concentration at injection	0.9	
Ratio: Heat flow / Reacting flow	1.5	
Residence time particles	2.2	
Residence time vapour (primary cracking)	1.3	
Ratio: Reactor volume / Melt volume	1.1	
Ratio: Reactor surface / Melt rate	0.9	

Strategic partnerships



The business model is underpinned by signed agreements, advanced-stage negotiations, and strategic partnerships across the value chain, providing strong visibility on revenue and costs

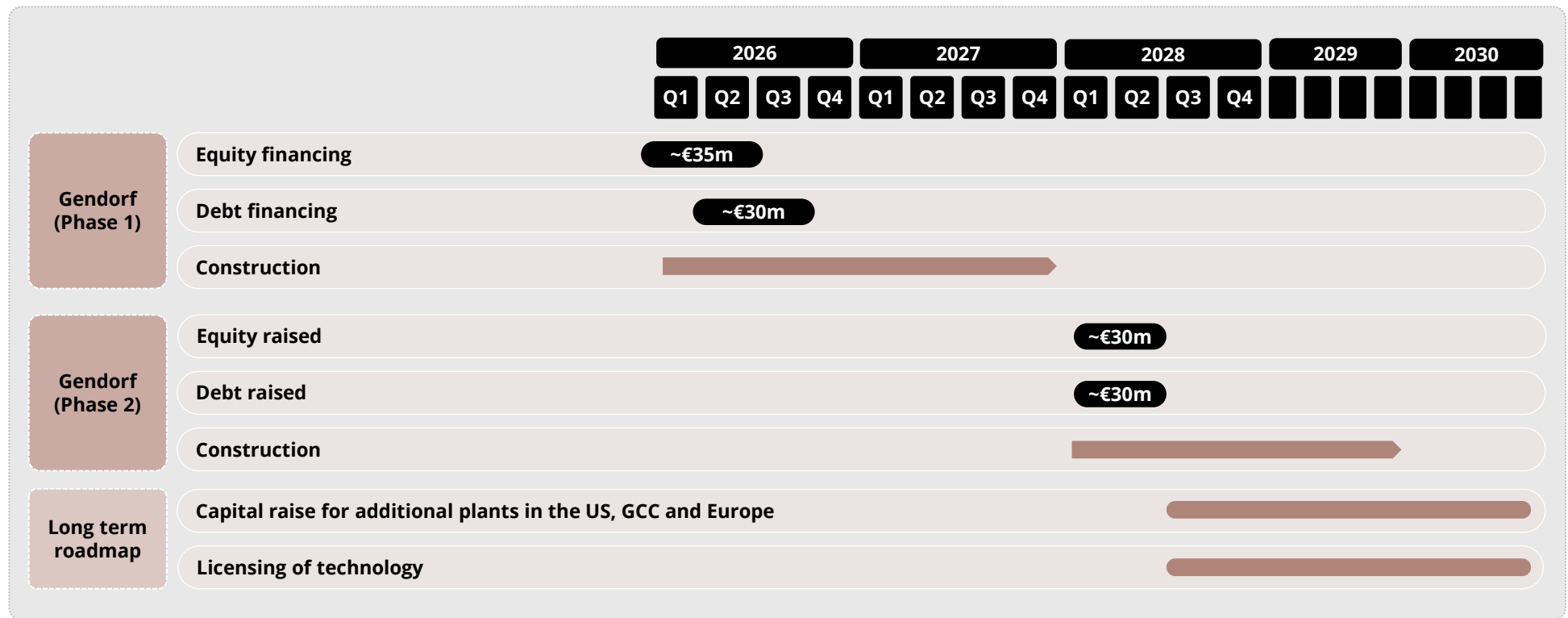
Stakeholder	Current collaboration	
EPC Partner	<i>Large, established European engineering and industrial services group</i>	Appointed as EPC contractor, responsible for basic and detailed engineering, procurement, construction management, and construction
 Off takers	<i>A global integrated energy company</i>	Signed agreement to purchase up to 7,500 tonnes per year for 4.5 years, priced under a formula, resulting in an initial price of c.€1,250/tonne
	<i>Top-tier global commodities trader</i>	In advanced-stage negotiations for up to 10,000 tonnes per year at a fixed price of €1,150/tonne for three years. In addition, an off-spec oil offtake agreement has been negotiated and agreed
 Suppliers	<i>Leading Central European integrated oil, gas, and chemicals group</i>	Term sheet stage for a 5-year offtake agreement at a fixed price of c.€1,200/tonne (formula-based price), with volumes of up to 20,000 tonnes per year
	<i>German recycler</i>	Term sheet stage to supply 26,000 tonnes per year of feedstock requirements under a 5-year fixed-price agreement for a blended price of c.€350/tonne
	<i>Austrian packaging and waste recovery organization</i>	Signed agreement for a 10-year feedstock supply agreement for 15,000 tonnes per year at €267.61/tonne
		In advanced-stage negotiations for a 5-year agreement covering 15,000 tonnes of feedstock per year at a fixed price of €300/tonne



Strategy and investment plan

Building on the successful validation of the Demo Plant, Pruvia is progressing to industrial scale through the construction of the Gendorf Plant, while preparing for international expansion and licensing opportunities

Building on the successful demonstration of its proprietary MLM-R® technology in Germany, Pruvia's plans to expand its footprint internationally by replicating its modular plant concept in Gendorf (Germany) and selected high-potential markets. The company aims to establish a network of advanced chemical recycling facilities across the US and the Gulf Cooperation Council ("GCC") as core target regions, where favourable industrial ecosystems, low operating costs, and supportive tax regimes create strong foundations for growth. Further expansion within Europe will be pursued opportunistically, leveraging existing infrastructure, feedstock availability, and regulatory alignment. Expansion will follow a Build-Own-Operate model, complemented by strategic partnerships and licensing, enabling Pruvia to retain technological control while scaling efficiently across regions.



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