ThermoSteam

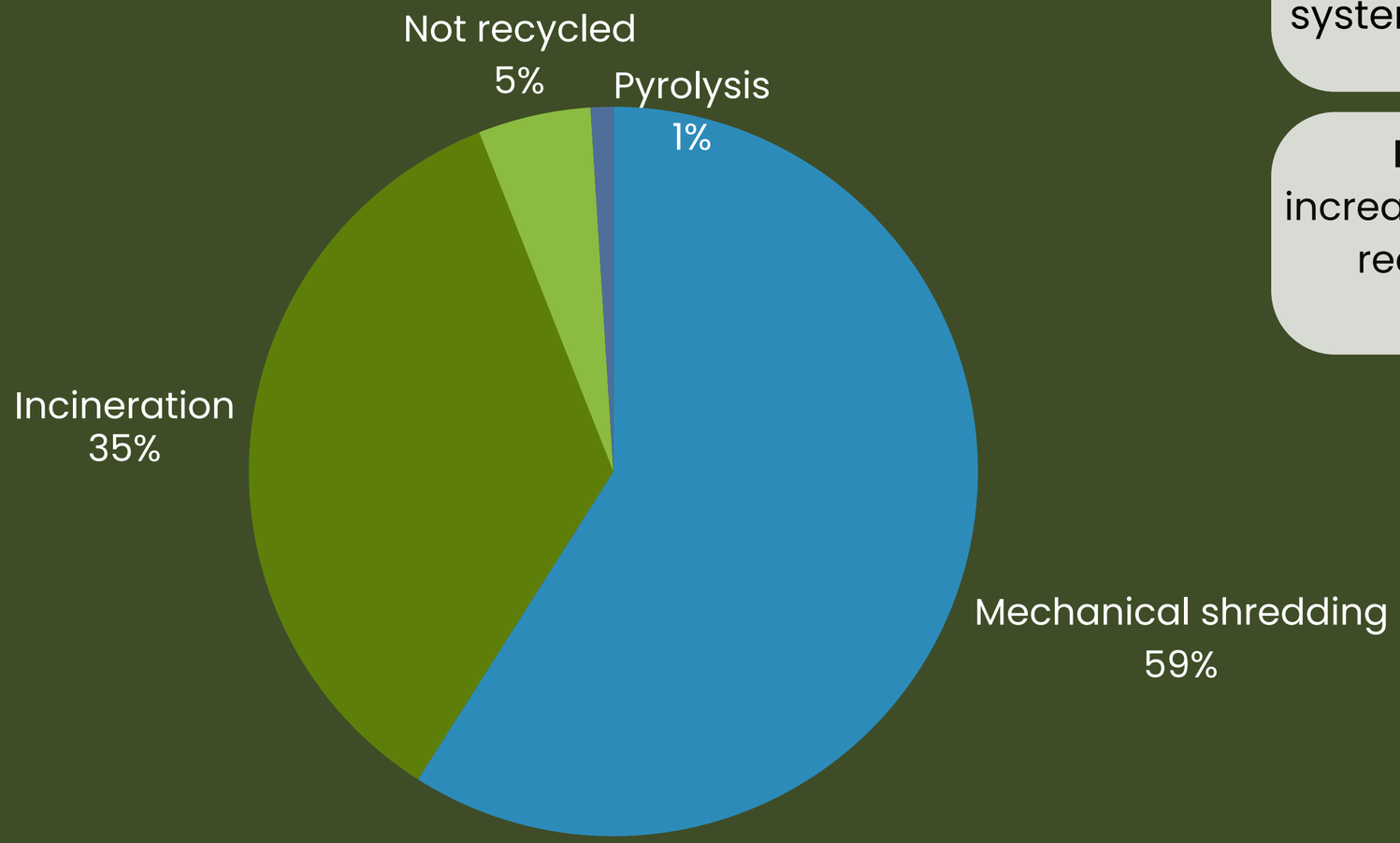
Steam thermolysis technology for circular recovery of end-of-life tyres

I'm Daria Sigida, Founder & CEO.
I need your support to bring the technology to its first industrial implementation in Spain and scale it up through partner platforms.

Contact: info@thermosteam.eu.com | thermosteam.eu.com | Spain

The Problem

Current distribution of used tyres by recycling and disposal methods in Spain



Spain generates **315,000 tonnes** of end-of-life tyres each year under a regulated collection system (**25M** tyres).

EU circular economy and waste policies increasingly prioritise material recovery over energy recovery, raising requirements for compliant recycling routes.

Buyers reject inconsistent rCB quality. Without QA protocols and repeatable specs, rCB struggles to qualify for industrial use — so tyre fractions are downgraded to low-value routes.

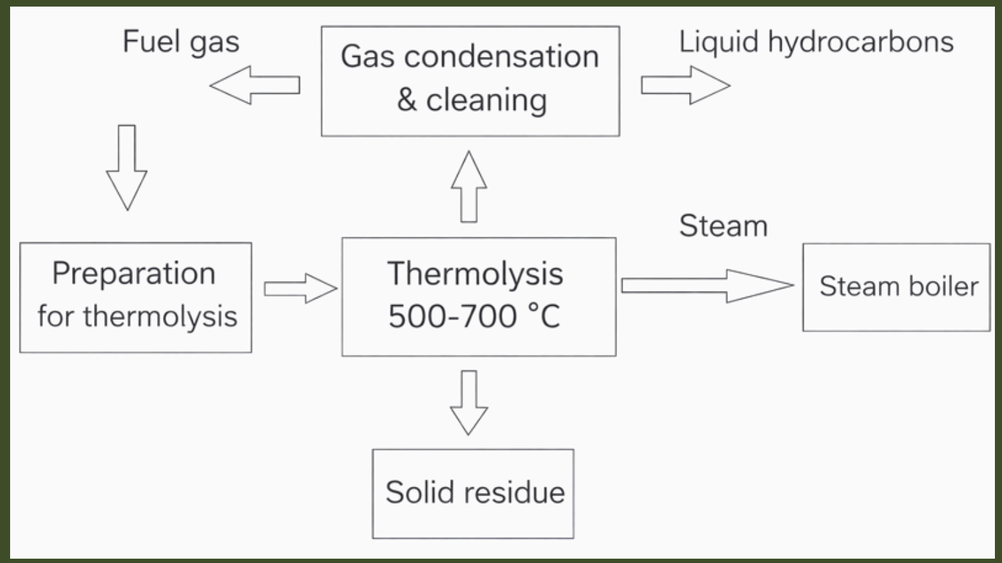
Sources:

1. *TNU report (Jan 2026)*
2. *SIGNUS 2022–2023*
3. *EU Regulation 2023/2055*

Our Solution

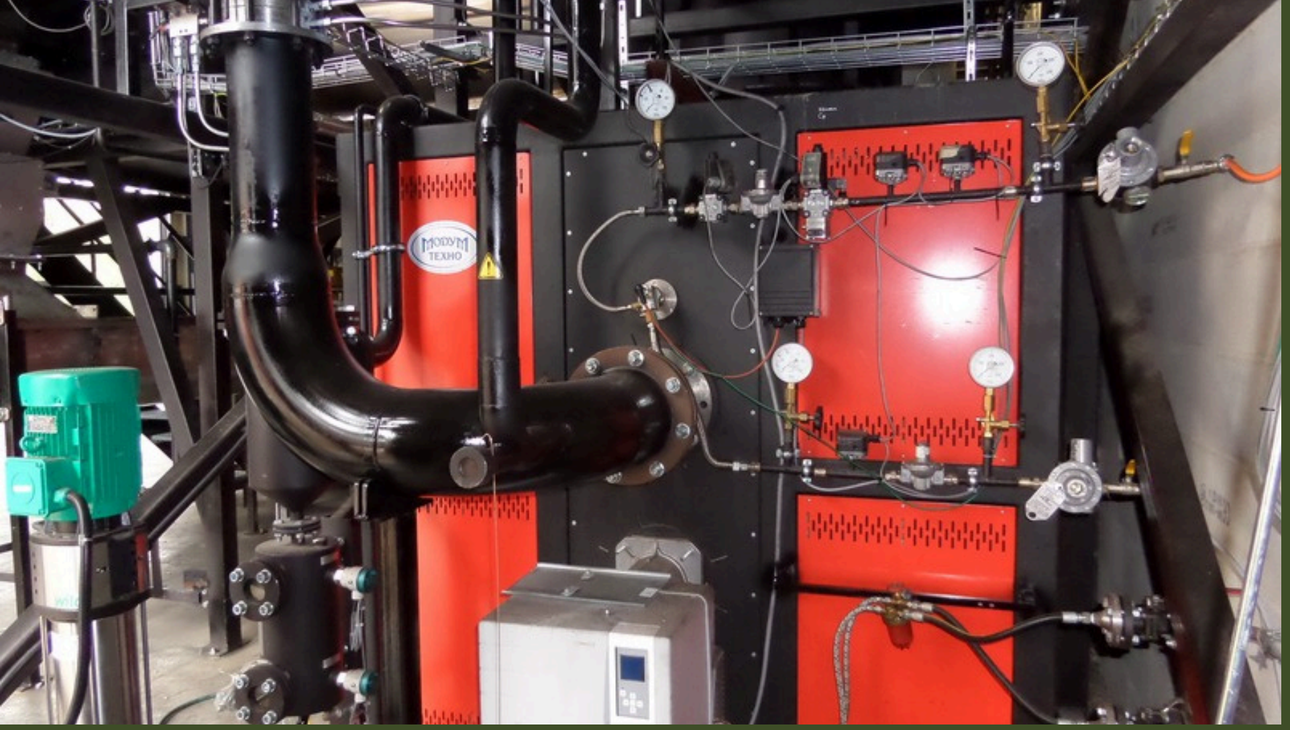
ThermoSteam converts mixed and contaminated end-of-life tyres into industrial-grade secondary raw materials using a controlled steam-thermolysis process.

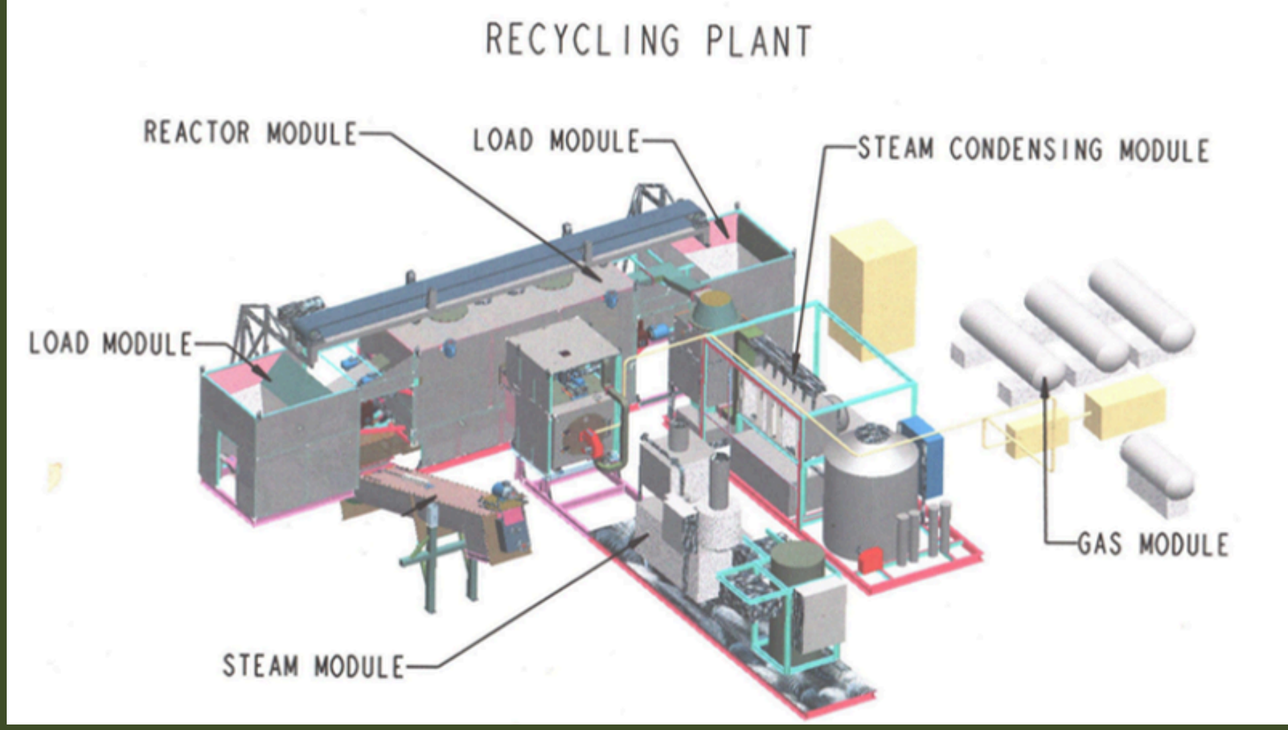
Superheated steam in the reactor delivers uniform heat and provides a direct control lever through steam flow, improving process safety and reducing output variability versus conventional tyre pyrolysis.



From 1 t ELT feedstock

35 – 40 % - carbon black
40 - 45 % - liquid hydrocarbons
5 - 10 % - metal
5 – 10 % - gaseous hydrocarbons





Technology & validation

Technology readiness: TRL 6

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TRL6 proof on real ELT feedstock

Scope: feedstock prep
• controlled steam conversion
• condensation & phase separation
• rCB finishing

- 500–700°C steam operation
- rCB: 60–80 m²/g (surface area)
- Liquid: 38.6–40.6 MJ/kg (LHV)

Next (TRL 7 Spain): 1,500-2,000 t/y demonstrator
permitting | emissions | buyer KPIs

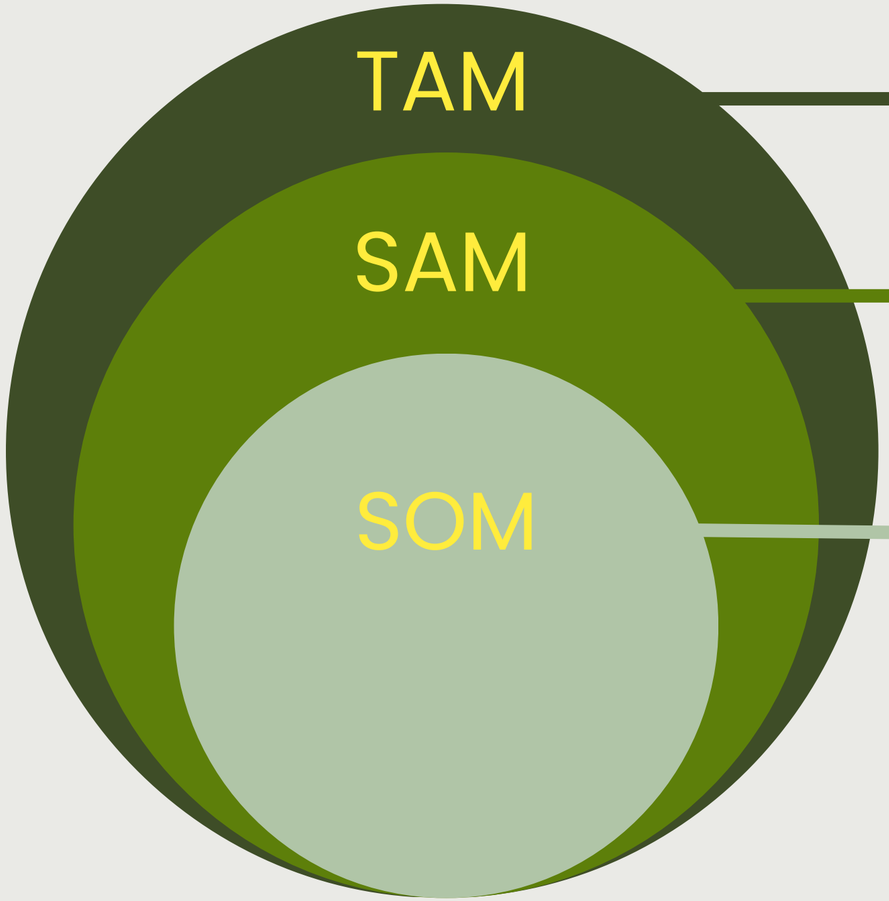
Industrial evidence & references

France verification: EN-aligned measurement + lab analyses
Documented product characterisation supports buyer qualification

Dole, France (Alpha Recyclage/AlphaCarbone): 2×1 t/h industrial lines
Benchmark for equipment sizing, utilities and product finishing for Spain

Taiwan (Enrestec): implementation reference
Shows transferability beyond a single site and geography

Market Opportunity



€0.9B
~3.5M t/y ELT in EU

€60M
Spain ELT: 315k t/y (~25M tyres)
Treatment mix: 59% shredding / 35% incineration / ~1% pyrolysis

€12M
Base case: 2–3 partner sites (licence + €/t royalty + services)

CAGR (forecast to 2030): **+53%** p.a.

Sources:

1. *SIGNUS 2022–2023 (Spain ELT treatment mix)*
2. *EU Reg. 2023/2055 (microplastics)*
3. *TNU report Jan 2026 (Spain ELT volume)*

COMPETITION: why Spain needs a faster bankable pathway

	THERMOSTEAM	LIFE FOR TYRES (PUERTOLLANO)	GREENVAL (ZARAGOZA)	BLACK BEAR	PYRUM INNOVATIONS
Output consistency (QA-ready)	Controlled heat transfer (steam) QA protocol + acceptance KPIs	Tyre pyrolysis project (ES) Limited public QA detail	Semi-industrial operation reported Limited public QA detail	rCB producer (EU) Quality depends on upgrading	Buyer-driven rCB quality Offtake traction (tyre industry)
Permitting & compliance	Spain permit roadmap + checklist EU-aligned emissions pathway	Greenfield complexity (typical) Ramp-up in progress	Plant-level permitting required Thermochemical route complexity	Industrial site permitting Execution continuity can vary	EU industrial plant permitting Proven compliance context
Time-to-reference site	Partner-hosted integration Modular deployment kit	Longer time-to-reference Project-dependent schedule	Scale-up underway New sites: multi-year projects	Operational transition Timelines can vary	Greenfield expansions Typically multi-year per site
Deployment model	Licence + €/t royalty Partner funds CAPEX/OPEX	Own/project plant model Asset-heavy build	Project/plant model (ES) Asset-heavy rollout	Asset model Higher funding dependence	Own/asset model CAPEX-intensive rollout

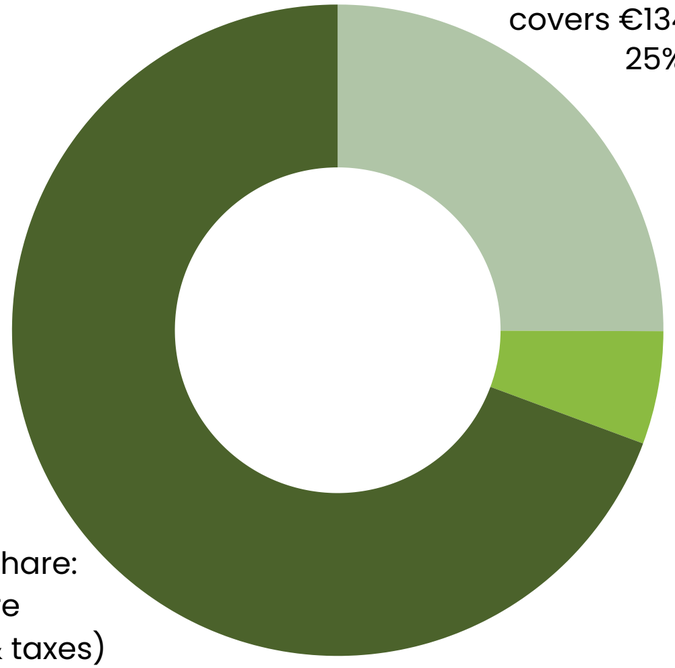
USP: A partner-hosted deployment kit designed for faster Spain reference proof

Gap: first Spanish reference unit not commissioned yet. **Next**: 1,500–2,000 t/y demonstrator to lock permits + buyer acceptance KPIs.

Business model: capital-light sublicensing

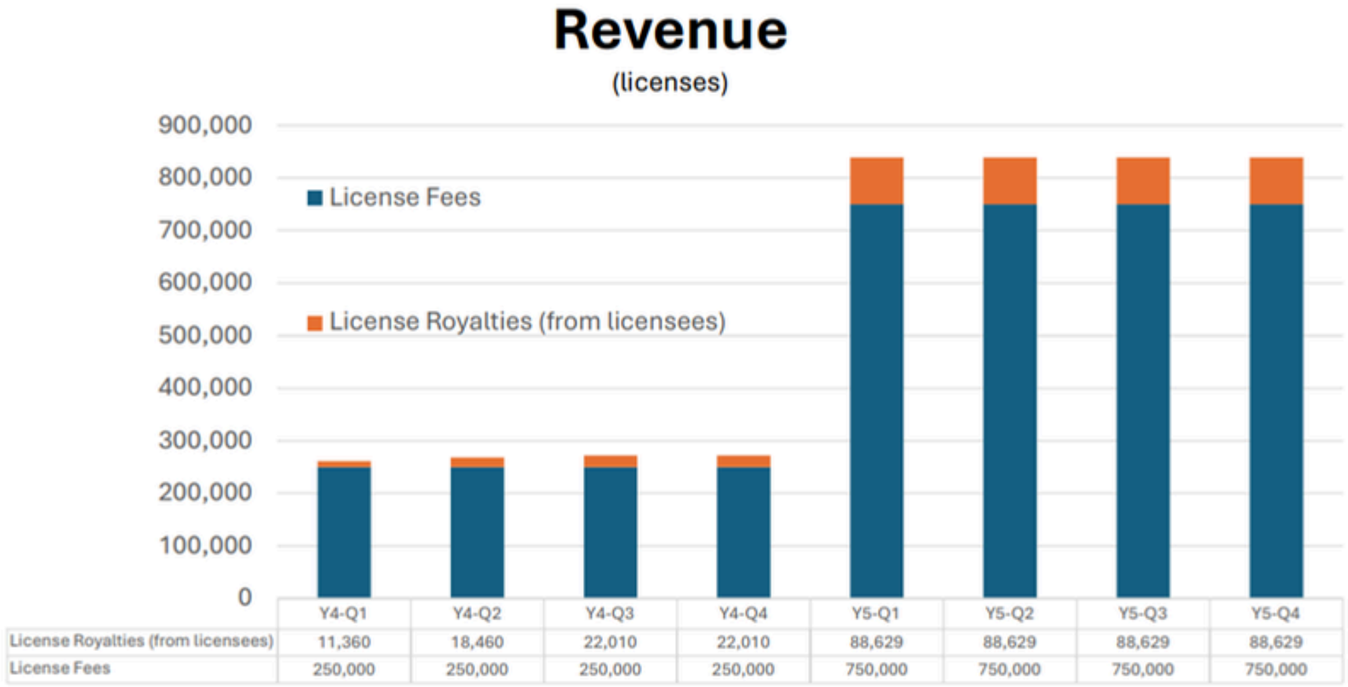
We scale by licensing a patented steam-thermolysis deployment kit to existing Spanish operators

From each processed tonne, the value chain generates €535/t (model, Y4–Y5)



Deal option	Upfront fee	Royalty	What's included
Pilot licence	€100k	€30/t	Deployment kit + commissioning supervision + buyer trial / acceptance protocol
Full site licence	€600k	€/t royalty (banded)	Full deployment package + training + QA framework + replication-ready documentation
Royalty-only	€0	€30/t	Core IP access; optional paid engineering / commissioning / QA services

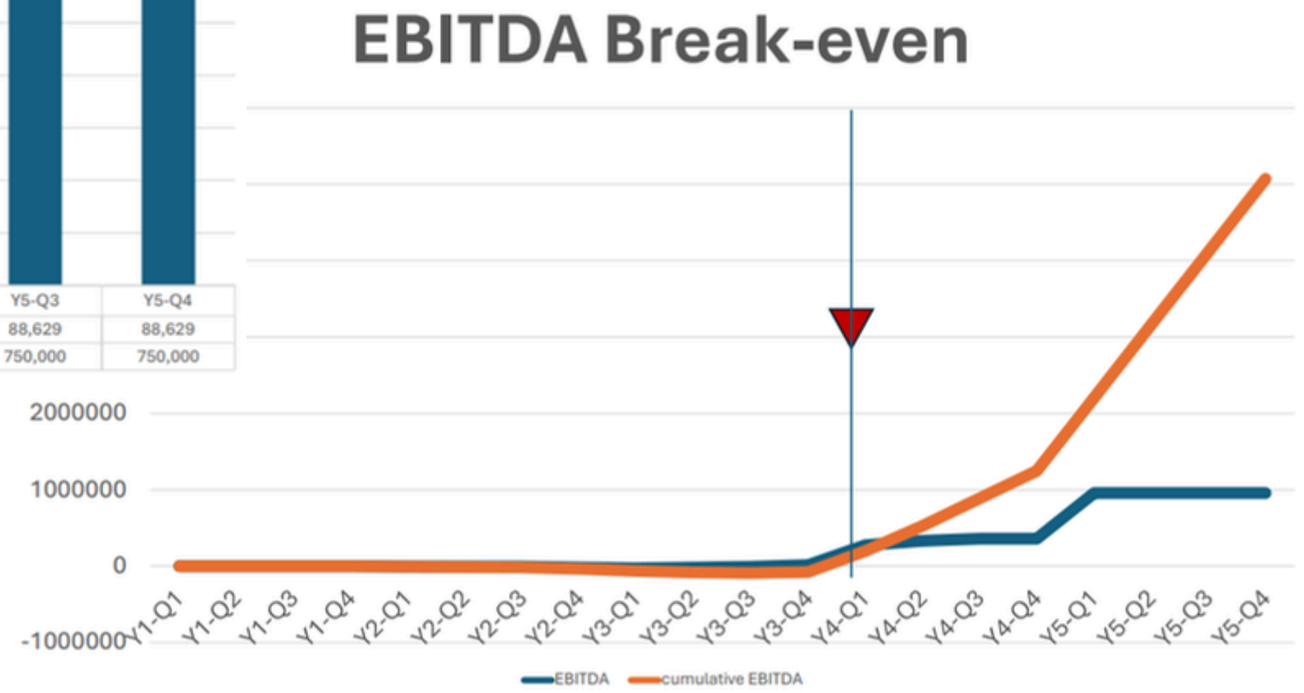
Financial forecast



	Y4-Q1	Y4-Q2	Y4-Q3	Y4-Q4	Y5-Q1	Y5-Q2	Y5-Q3	Y5-Q4
License Royalties (from licensees)	11,360	18,460	22,010	22,010	88,629	88,629	88,629	88,629
License Fees	250,000	250,000	250,000	250,000	750,000	750,000	750,000	750,000

Licensing revenue (base case):
site licence fees + per-tonne royalties

- Y4 total: €1.07M (€1.00M fees + €0.07M royalties)
- Y5 total: €3.35M (€3.00M fees + €0.35M royalties)



- EBITDA break-even: Y4-Q1
- EBITDA margin (base case): 62%
- Sensitivity (utilisation): ~56–60%

Primary scale pathway is licensing: upfront site fee + €30/t royalties; the demonstrator accelerates permitting + buyer qualification to reach break-even by Y4-Q1

Industrial Deployment Roadmap

Phased industrial scaling aligned with licensing and modular deployment strategy.

1

Spain Demonstrator (TRL 7) — Build & Compliance (2026)

- Build & commission 1,500-2,000 t/y Spain demonstrator
- Complete permitting + emissions compliance for the host site
- Extended run to prove stability + industrial KPIs
- Produce buyer acceptance pack (specs, test protocols, data)

2

Commercial & Licensing Launch (2026–2027)

- Convert results into a standard deployment kit (modular design + manuals + QA)
- Sign first sublicensing deal with a Spanish operator (partner funds CAPEX, operates)
- Start revenue: licence fee + €/t royalty + paid engineering/QA support

3

Replication & EU Expansion (2028+)

- Replicate via sublicensing to partner-operated 10,000 t/y reference units
- Scale in Spain + EU using the same kit + QA pathway
- Expand finishing / post-treatment options to match buyer rCB specs

Team

Daria Sigida
Founder & CEO

Experience: Venture background, technology scouting, cross-border structuring, EU market entry

Leads Spain deployment & partnerships
Fundraising & public funding strategy
Spain market pipeline

Evgeny Susekov
CTO

Experience: Process engineering, thermochemical systems, industrial pilot execution; led pilot construction.

Process design & optimisation
Engineering supervision
Product quality control (rCB, liquid fraction)

Prof. Gennady Zhuravskii

Professor, expert in thermochemical conversion.
Leads test protocols, validates key process assumptions, and defines optimization parameters for EU compliance, turning science into reliable operating windows.

Grace Peel

Spain / EU Permitting & Environmental Compliance

- Development of Spain permitting roadmap
- EIA screening & emissions compliance alignment
- Pre-application authority engagement

Javier Nicolas

Waste-to-Energy & Industrial Operations

- Host-site evaluation and industrial fit
- Operational integration strategy
- Deployment sequencing

Agusti R.

Technical & Operational Due Diligence

- Process risk assessment
- Technical audit for investors and partners
- Engineering feasibility review

Contact & Next Steps

info@thermosteam.eu.com

www.thermosteam.eu.com

www.linkedin.com/company/thermosteam

www.linkedin.com/in/daria-sigida

I’m not asking for belief. I’m asking for the chance to prove this in Spain fast — with the right operators, the right permitting pathway, and buyer qualification