

LSF

*radical science producing
recycled products*

LSF is a Chemtech business based in Amersham, UK, with extensive industry experience. A B2B operation, generating revenue from customers Proof of Concept (PoC) testing and a roadmap to deliver the first demonstrator facility. Currently raising a £1M angel EIS round, with 40% of funds committed.

Presenter:

Glenn Halliday

Co-Founder & COO

Angel Round Presentation



#greenerchemistry

#cleanercarbon

#chemicalrecycling

www.lowsulphco.com



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Problems



> **50%** of used rubber tyres are dumped or incinerated annually

Solution



A unique, patented, electrochemical process that produces valuable recovered outputs

Emission Reductions

- Distillate: **90%** SO₂
- Raw Carbon Black: **75%** CO₂

Waste Tyres Generated Annually



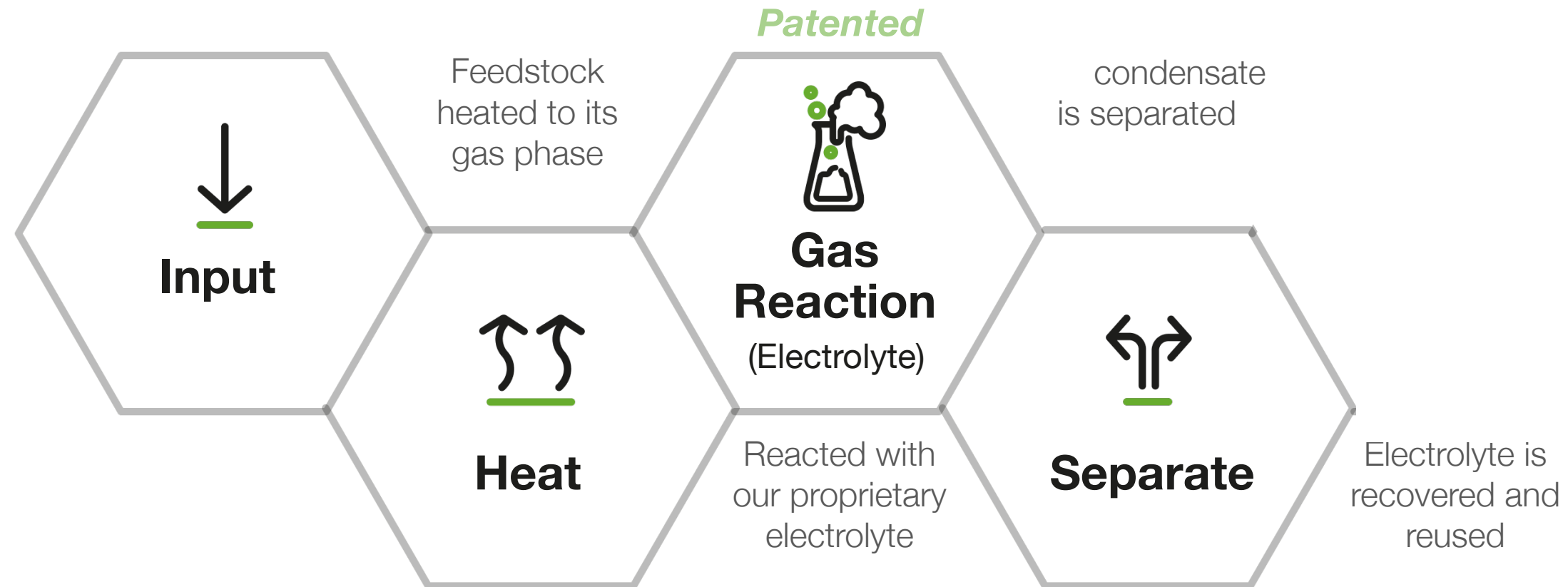
Photo by [Imthaz Ahamed](#) on [Unsplash](#)

Source: End-of-life options of tyres. A review, by Valentini & Pegoretti, 2022 [SciencDirect](#)

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Technology Outline



In simple terms, we heat the input feedstock to a gas phase, at reduced pressure and temperature.

The electrolyte reacts with and cools the gas stream to produce a condensate and electrolyte mix

Condensate ready to be sold and electrolyte is recovered and reused

USP: We produce a clear, saturated condensate and recovered Carbon Black



Total Available Markets for LSF Outputs

Global

Annual Low Sulphur (LS)
distillate market

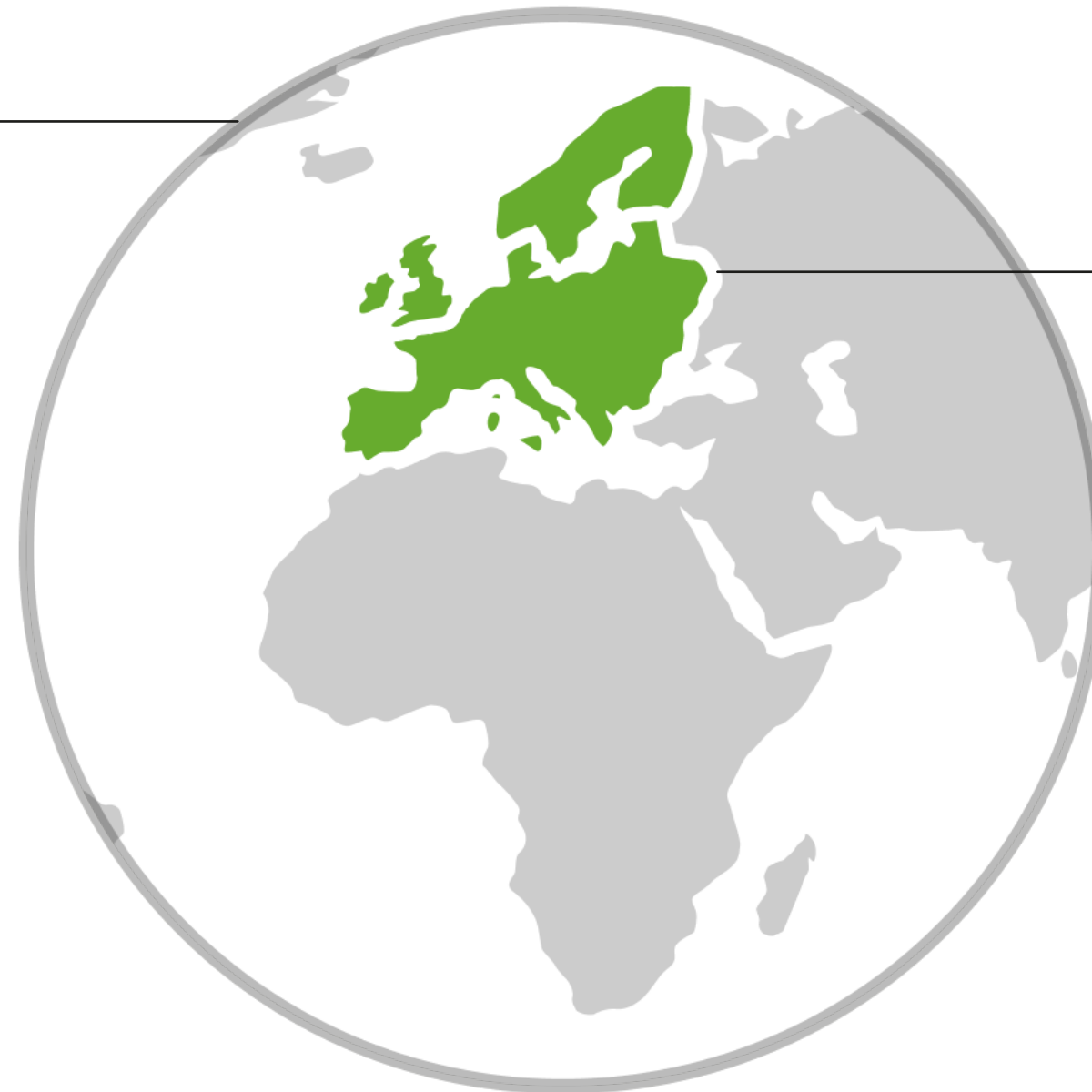
€ 800bn

Annual Naphtha market

€ 150bn

Raw Carbon Black

€ 0.2bn



EU

Annual Low Sulphur (LS)
distillate market

€ 220bn

Annual Naphtha market

€ 22.0bn

Raw Carbon Black


















€ 0.03bn

LSF will initially focus on the low-cost used rubber tyre streams that arise in every developed and developing countries.

Source: BP Statistical Review of World Energy 2022, Ship Bunker & Trading and raw Carbon Black from Data Bridge & Chemanalyst



Competitor Technology Comparison

	 Oil Processing	 Plastic Processing	 Rubber Processing	 Rubber, Oil, Plastic Processing
Description	Re-refining by hydrotreatment	Selective. PVS & PCB's problematic	Pyrolysis, low value hazardous output	FEP, used oils, rubber tyres, plastics
Equipment Capex	6 \$ icons	3 \$ icons	3 \$ icons	2 \$ icons
Output Emissions	5 CO ₂ icons	4 CO ₂ icons	4 CO ₂ icons	2 CO ₂ icons
Outputs: Distillate/ Naphtha/ Raw Carbon Black	Y / Y	N / Y	N / N	Y / Y
	  	    	   	



Competitive Advantage



Technology

Novel Fast Electrochemical Process (FEP) producing valuable saturated, low contaminant outputs



Cost

CAPEX and OPEX are lower than for existing refining technologies



Ownership/Patents

UK Environmental Patent awarded Q3, 21
US Patent awarded, Q1, 22
European Patent expected Q1, 24



Flexibility

Ability to process three different feedstocks, with further future potential. Completing paid feedstock testing for Corporates using our Pilot Unit in UK.

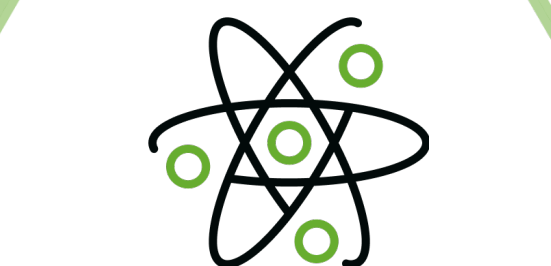
CA: A simplified process with strong IP and significant feedstock flexibility



Business Model

LSF will generate revenue in the long term by:

- Operating \approx 10%
- Licensing \approx 90%



Owning and operating its technology

€ 14m /yr +



Licensing technology to customers

€ 3.0m /yr +

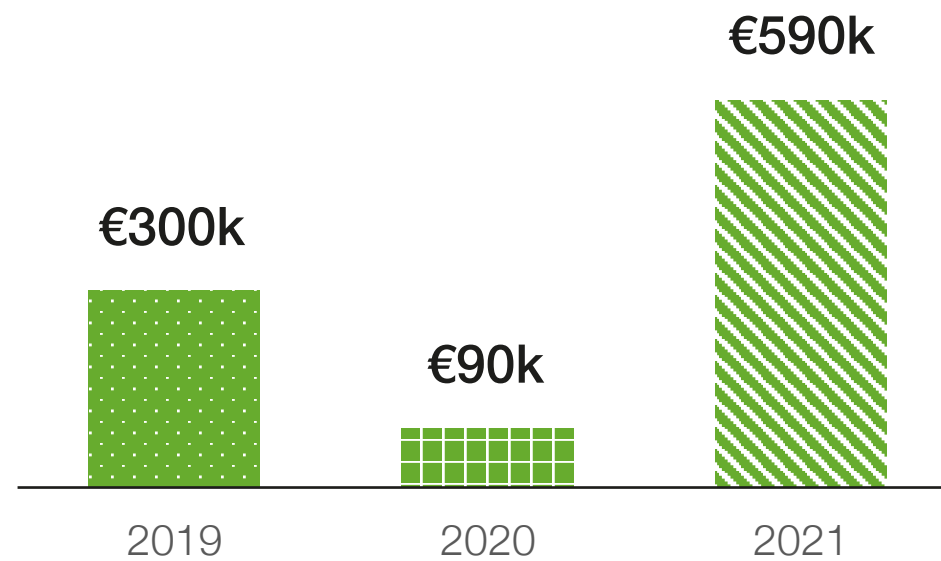
Note: Each Modular Production Unit (MPU) has an Annual Input Capacity: 50,000 T/Yr

Note: + Revenue Per MPU and based on Oil, Tyre & Plastic Feedstocks and associated yields



Progress

● Innovate UK Grants in:

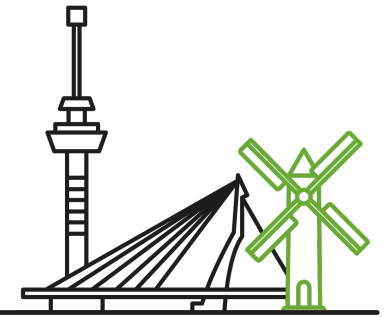


● NBD funnel
€+50m

● Low Carbon
Innovation
fund investment
€300k

● UK angle investors
+ 1 x founder
investor
€100k

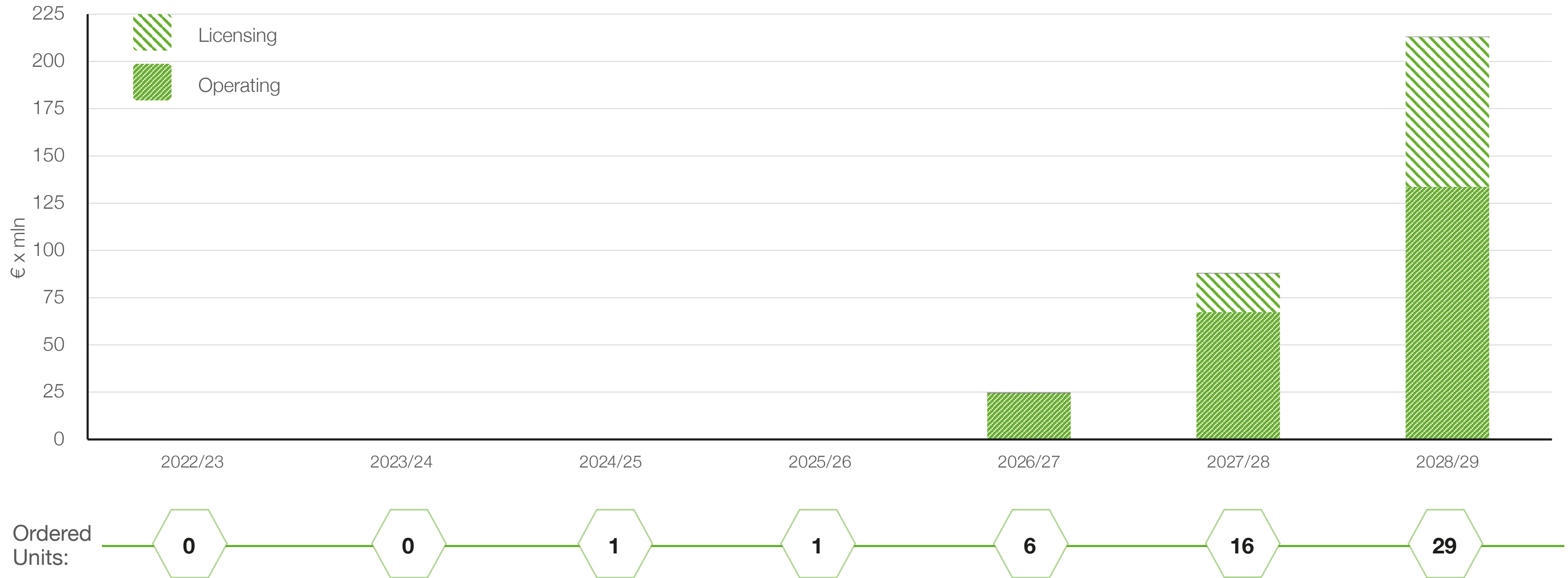
Traction



- Awarded **€0.5M** TSE Grant for a Feasibility Study for our first operating unit in The Netherlands
- Winner of Royal Society of Chemistry 2022 Emerging Technologies Prize
- Agreed LOI / PoC testing with [Continental](#)
- Estab. Low Sulphur Fuels BV,
- Environmental Fund application in NL
- Corporate suppliers, off takers & customers: Continental, Dow, and others
- Pilot Unit Operating, Customer Testing, PoC consulting since 2019.



Revenue Projections (€)





Financial Projections (€)

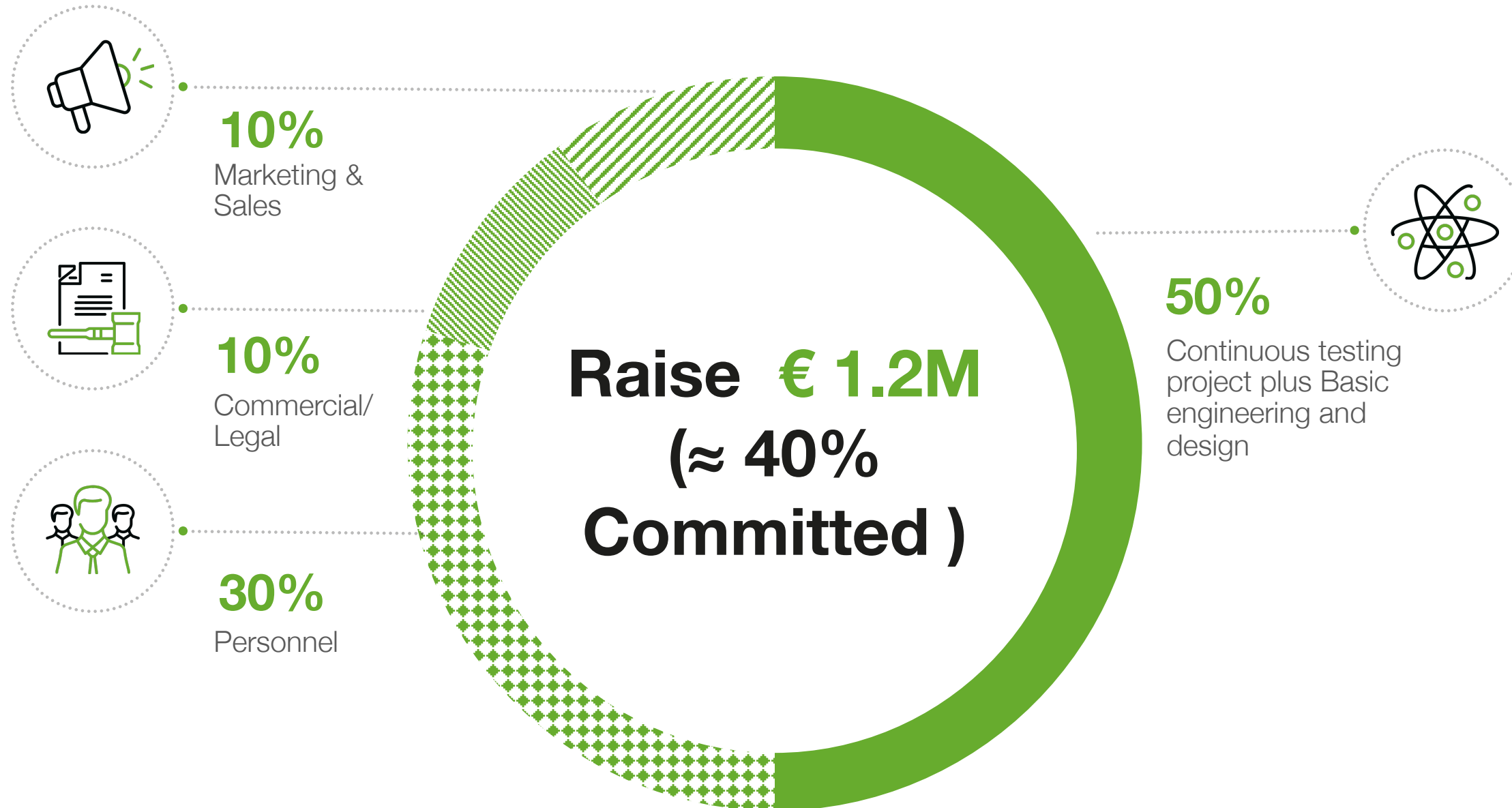
(€ 000)	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29
Operating revenues	0	0	0	0	113	24,887	68,161	134,931
Licensing revenues	0	0	0	0	0	0	20,682	80,126
Consulting revenues	0	54	176	172	206	247	297	297
Operating & Licensing	0	54	176	172	318	25,134	89,139	215,354
Cost of Sales	0	0	0	0	49	10,906	30,461	65,605
Direct Costs	6	14	33	167	420	3,001	17,736	49,086
Gross Profit	(6)	40	144	4	(151)	11,227	40,943	100,663
Grants Received	7	232	226	3,522	2,700	0	0	0
Product Development	70	113	220	429	538	735	825	889
Sales & Marketing	0	0	34	186	505	1,704	5,288	8,848
Administration	31	23	291	884	1,642	2,677	4,146	7,145
Establishment	28	32	53	92	148	282	335	425
Finance	2	4	3	2	337	18,226	39,936	66,937
Total Overheads	131	171	601	1,594	3,170	23,624	50,529	84,244
Net Profit Before Tax	(130)	100	(231)	1,933	(620)	(12,398)	(9,587)	16,419

Drivers: 29 Operational units processing used HGV rubber. Producing Condensate & recovered Carbon Black



Angel Raise with 2-year runway

Use of funds

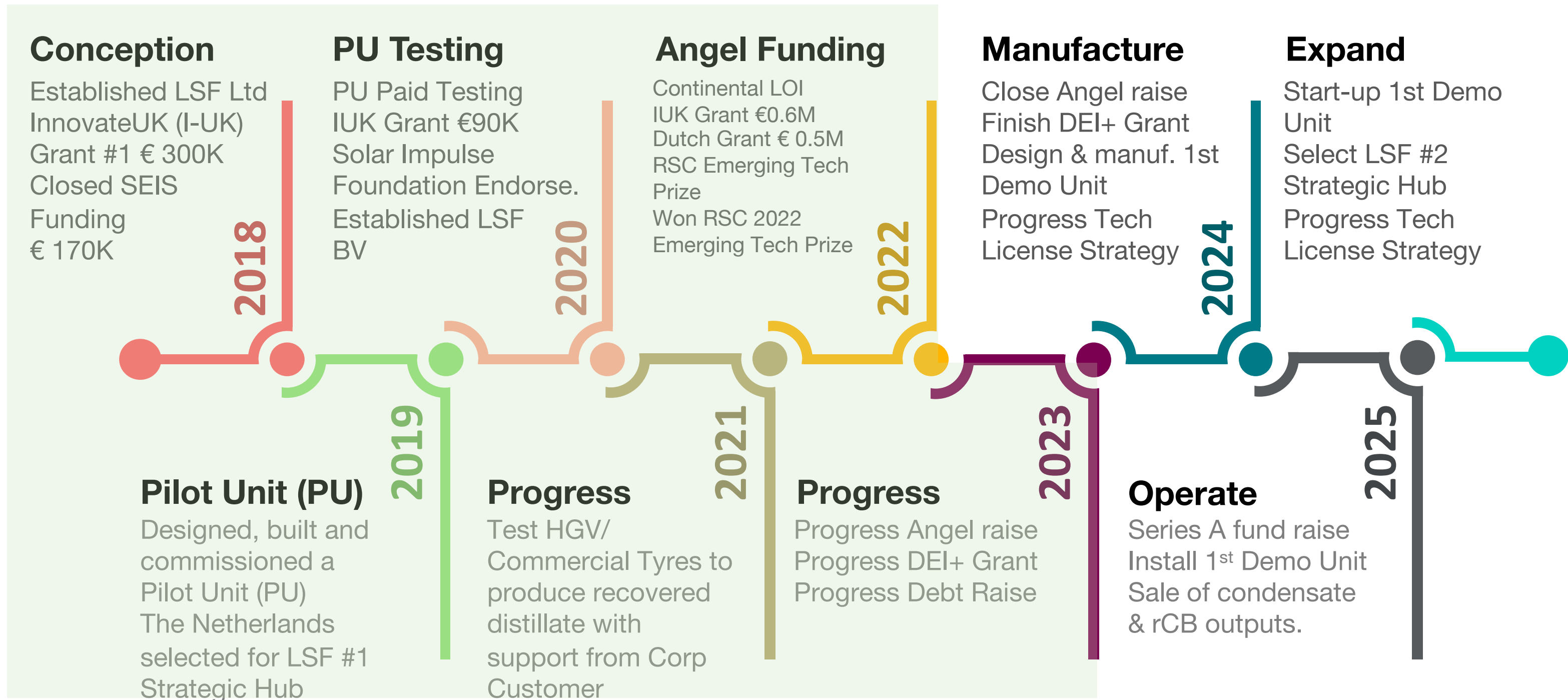


Grants & Equity:





Strategic Plan & Progress



Completed



Management Team



John Taylor
Co-Founder & CEO

Developed and patented the Fast Electrochemical Process and Operation of RD&C Lab



Glenn Halliday
Co-Founder & COO

Successful commercial and technical delivery with ICI, BP and Shell on major projects globally.



Paul Jacob
VP Bus Dev, USA

Senior executive with extensive technical and commercial experience.



Sherif Salah
VP Bus Dev, MENA

Successful, experienced CFO in three continents, in energy, manufacturing and service industries.



Valerie Lim, IoT Tribe
Bus Dev, Asia

Partnered with IoT to accelerate LSF regional growth and development.





Media Coverage

Media

Link

TSE Grant of €0.5M for Feasibility Study for our first operating unit in The Netherlands	Not public
Winner of Royal Society of Chemistry 2022 Emerging Technology Prize	https://bit.ly/3aGtrFO
Finalist in AdMaCom Accelerator in Germany	https://bit.ly/3IMW9qA
LOI agreed with Continental / ContiTech	Not currently public
Won Continentals Challenge for Polymer Recycling Solutions	https://bit.ly/3JTS6mm
Deep Tech TechTour Accelerator in The Netherlands	https://bit.ly/3BNztgO
IoT Tribe Deeptech Accelerator in Singapore	https://bit.ly/3IIHQ6I
LSF endorsed by Solar Impulse Foundation	https://bit.ly/2XxSIF_LSF
LSF recognised by KTN in UK as a capable chemical recycler	https://tabsoft.co/35aSC0h
Won InnovateUK Grant, Tyres to Refinery Distillate, 2021	(Confidential)
Won InnovateUK Grant, test novel plastic feedstocks, Jul-Dec,2020	Not public
Won InnovateUK Grant, successfully built/operated a Pilot Unit, 2019	https://bit.ly/3hgF9GI

IP Milestones

UK Environmental Patent Awarded, Q3, 21	USA Patent Awarded Q2, 22
European Patent expected award Q1, 2	USA Patent continuation filed Q2, 22



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Endorsed/Supported by:



Sustainable Development Goals

SDG 9. —
Industry, innovation and
infrastructure

SDG 12. —
Responsible consumption and
production



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#cleanercarbon

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