



M A P P E S TM

MAPPING PRODUCT ECOSYSTEMS

PV CELLTECH USA 2026 · SAN FRANCISCO

Ankit Singhal · Co-founder & CEO, Mappes Inc.



A SIMPLE QUESTION

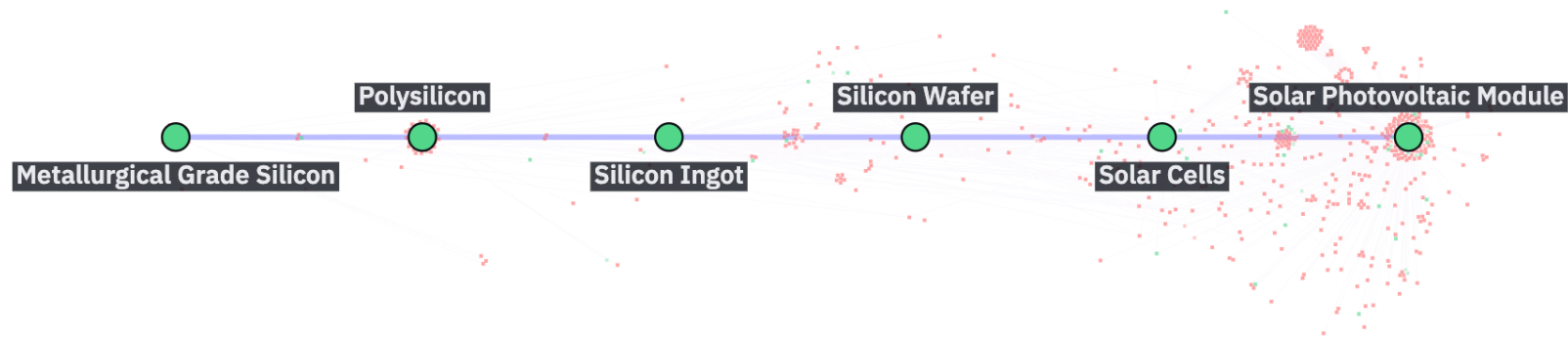
BUILDING SOLAR IN THE US

How deep does the US solar value chain go?



SOLAR VALUE CHAIN

WHAT WE PICTURE: SIX PRODUCTS IN A ROW



6

products with a US supplier

0

products with no US supplier

581

suppliers mapped

48

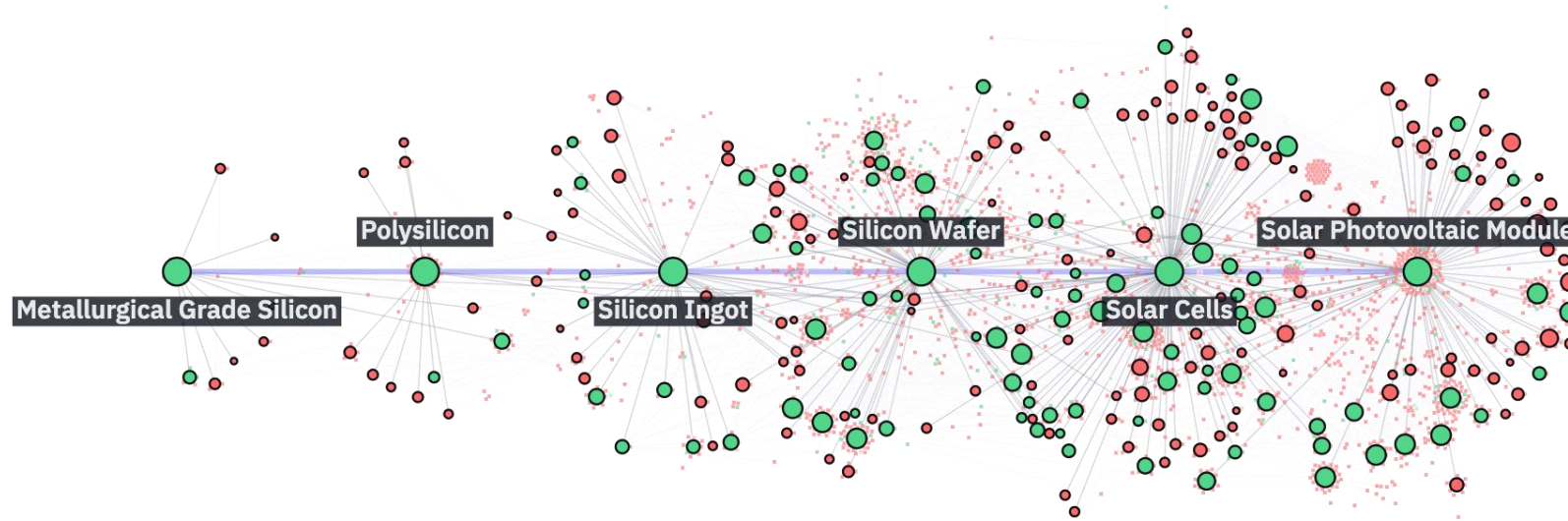
US-based suppliers

● Has a US supplier ● No US supplier ■ US-based supplier ■ Non-US supplier



FIRST LEVEL PRODUCTS

BUT THE ECOSYSTEM IS MUCH BIGGER : 248 MORE PRODUCTS



176

products with a US supplier

70

products with no US supplier

2,027

suppliers mapped

198

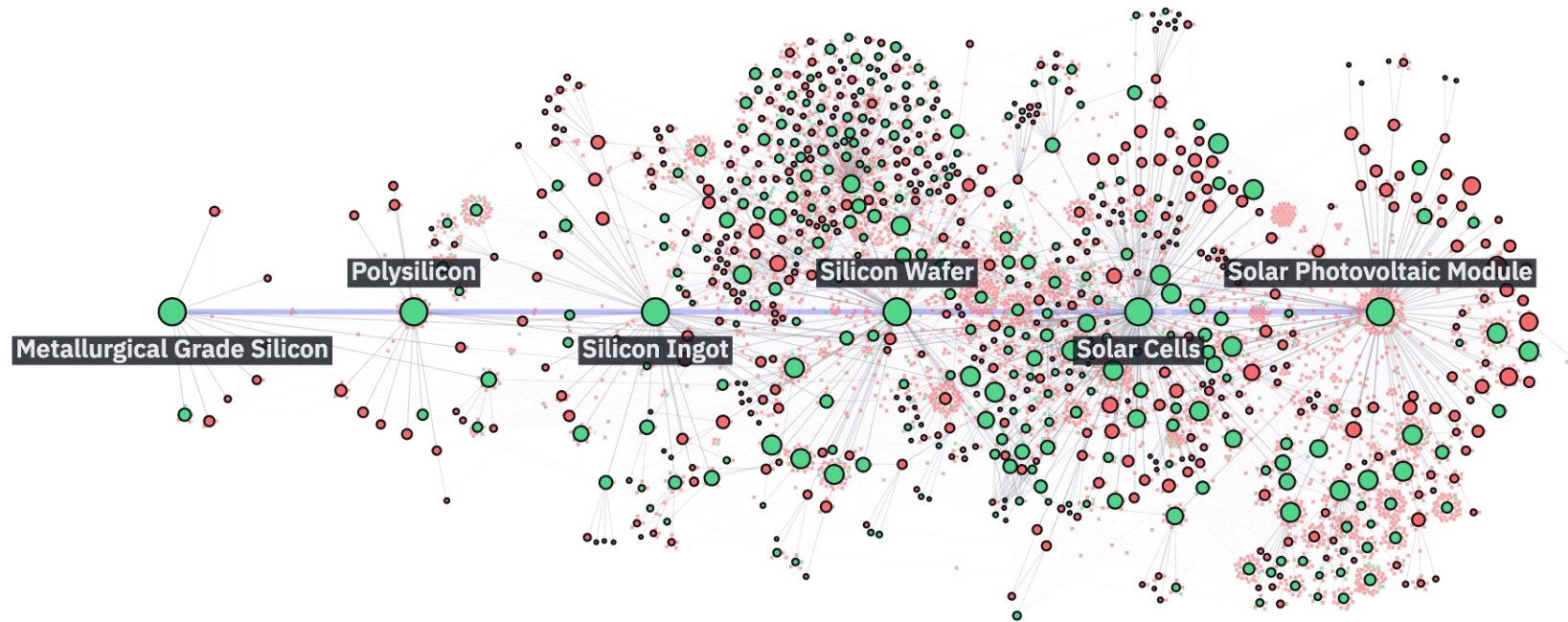
US-based suppliers

● Has a US supplier ● No US supplier ■ US-based supplier ■ Non-US supplier



SECOND LEVEL PRODUCTS

IT'S A RABBIT HOLE: 504 MORE PRODUCTS



619

products with a US supplier

121

products with no US supplier

3,680

suppliers mapped

345

US-based suppliers

● Has a US supplier ● No US supplier ■ US-based supplier ■ Non-US supplier



WHERE THE GAPS ARE

WHAT THE MAP TELLS US ABOUT US MANUFACTURING

121

products in the solar chain with no US supplier at all

9%

of mapped suppliers are US-based: 345 of 3,680

Each red dot is a sourcing risk for a buyer, and an opening for a US manufacturer.



BOTTLENECKS AND OPPORTUNITIES

PRODUCTS THE US DOESN'T MAKE TODAY, AND WHO COULD MAKE THEM

STRATEGIC BOTTLENECKS: MAINLY CHINA

Fine diamond wire

China, Japan, Korea · For: wire and abrasives makers

Production-scale wire saws

China, Japan, Germany · For: machine builders

Production-scale ingot squarers

China, Japan, Germany · For: machine builders

Solar silver paste

Asia, Europe · For: chemical companies

Graphite and quartz boat cleaning equipment

China, Korea, Italy · For: wet-process tool makers

Automatic cell packaging lines

China, Malaysia · For: automation makers

CZ seed crystals (verify)

China · For: crystal and wafer makers

DOMESTIC GAPS: ALLIED SUPPLY EXISTS

Pitch-based carbon fiber for furnace insulation

Japan, China · For: carbon fiber companies

Large quartz crucibles

Germany, Japan, China · For: quartz and ceramics makers

Polysilicon etching and crushing systems

Germany, Switzerland · For: equipment makers

Polysilicon process equipment (verify)

Germany, Korea, China · For: US fabricators (tech from AMS)

Submerged arc furnaces (verify)

Germany, South Africa · For: furnace builders

Turnkey cell production lines (verify)

China, Germany, Italy · For: equipment integrators

Silicon kerf recycling into silicon metal or Si-C anodes

Norway, France · For: recyclers, battery materials makers



RELEVANCE OF ECOSYSTEM MAPPING

FOR US MANUFACTURERS AND INVESTORS



Sourcing decisions

See every input three levels deep, and line up qualifying alternate suppliers before a rule change or a shortage forces you to.



Investment priorities

Identify the gaps and map it with proven buyers and demand across industries.



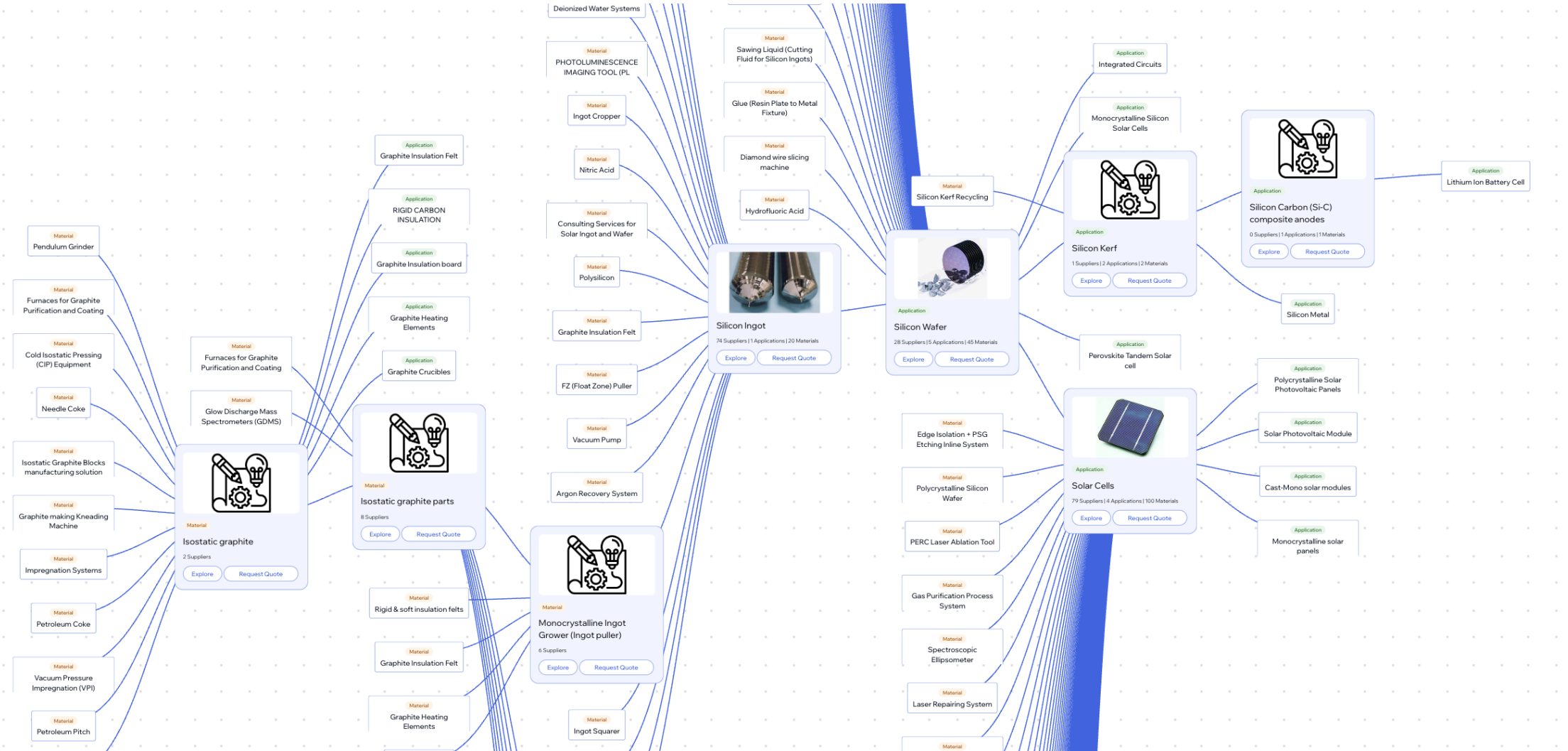
Supply-chain resilience

Find single points of failure, across deep levels in your value chain. Potential for mapping Carbon footprint across the value chain as well.



PRODUCT ECOSYSTEM

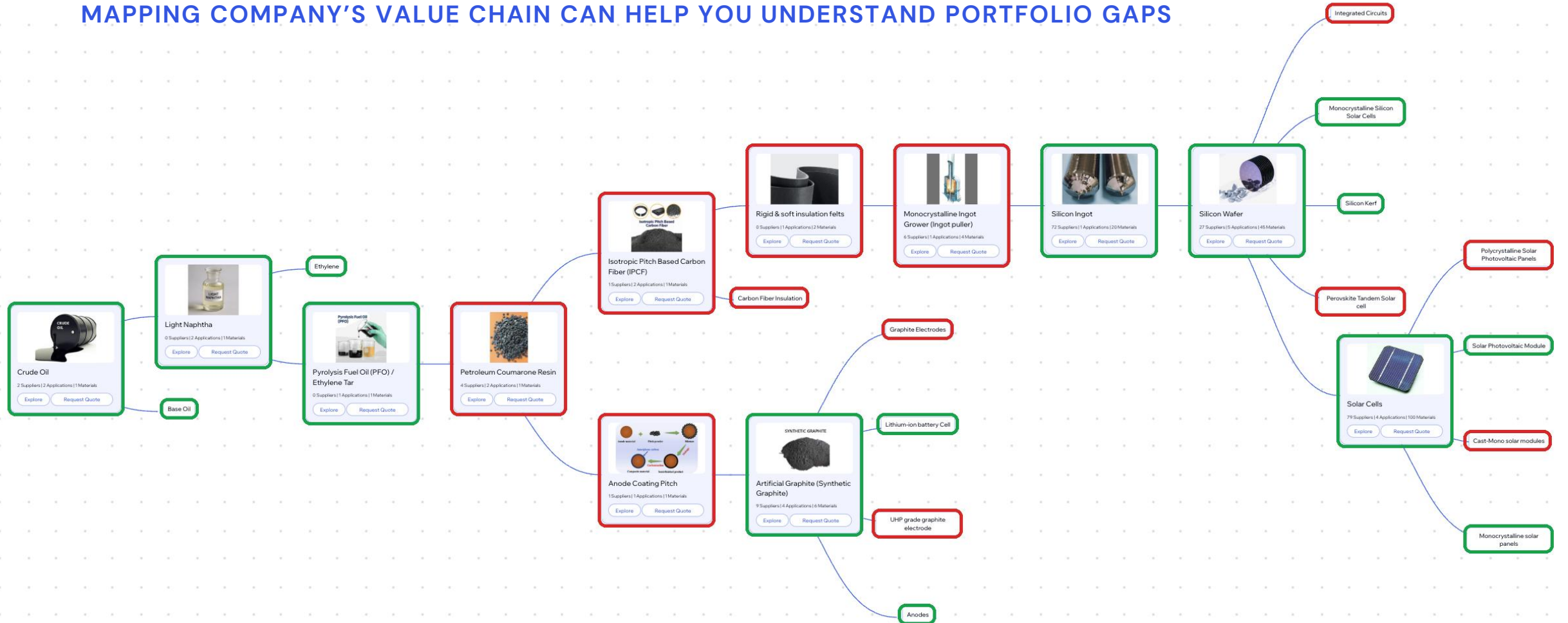
UNDERSTANDING PRODUCT ECOSYSTEM CAN HELP YOU DIVERSIFY INTO NEW MARKETS





COMPANY ECOSYSTEM

MAPPING COMPANY'S VALUE CHAIN CAN HELP YOU UNDERSTAND PORTFOLIO GAPS





ONE PRODUCT. ONE PAGE.

MAPPES.IO : THE WHOLE ECOSYSTEM



Silicon Ingot

43 Followers

✓ Following

Request Quote

A silicon ingot is a massive, highly purified cylinder of crystalline silicon used as the foundational raw material in both the semiconductor (computer chip) and solar cells. It is created by melting and crystallizing ultra-pure silicon into a single, continuous structure.

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+

[Feed](#) [Suppliers \(73\)](#) [Prospects \(92\)](#) [Materials & Equipment \(20\)](#) [Applications \(1\)](#) [Value chain](#)

Follow a product, request a quote, and open any tab for the full list.

Feed

News and posts on the technology

Suppliers 73

Every manufacturer, with contacts

Prospects 92

Potential buyers, worldwide

Materials & machinery 20

Inputs, each with its suppliers

Applications

Where it goes next

Value chain

Upstream and downstream maps

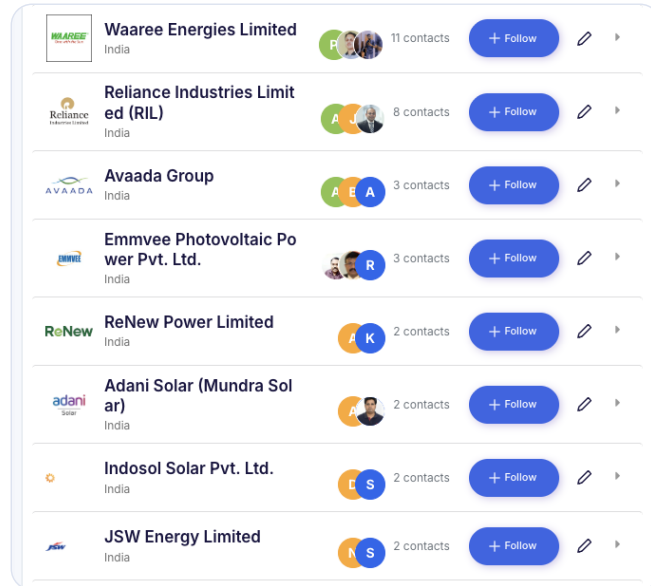
Events

Trade shows for this technology



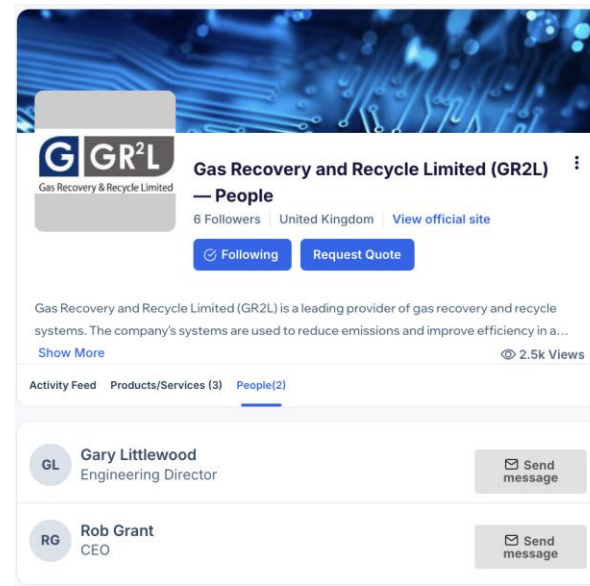
FROM A PRODUCT TO A COMPANY TO A PERSON

BEYOND THE PRODUCT PAGE



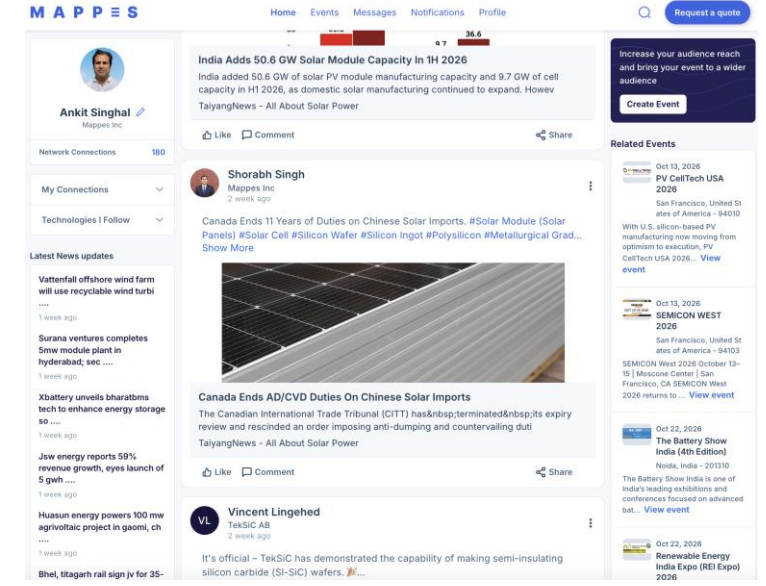
1 · PRODUCT

Every supplier and prospect, with contacts



2 · COMPANY

Its technology & news feed, products and its people; message them directly



3 · YOU

A feed of the technologies you follow: new supplier and customer updates, news, events and your network

THE FUTURE

Mappes AI : OS for Your Product Ecosystem

Operating system for your product, your industry and your company



Map the value chain

Materials, products and applications, map relationships as you talk.



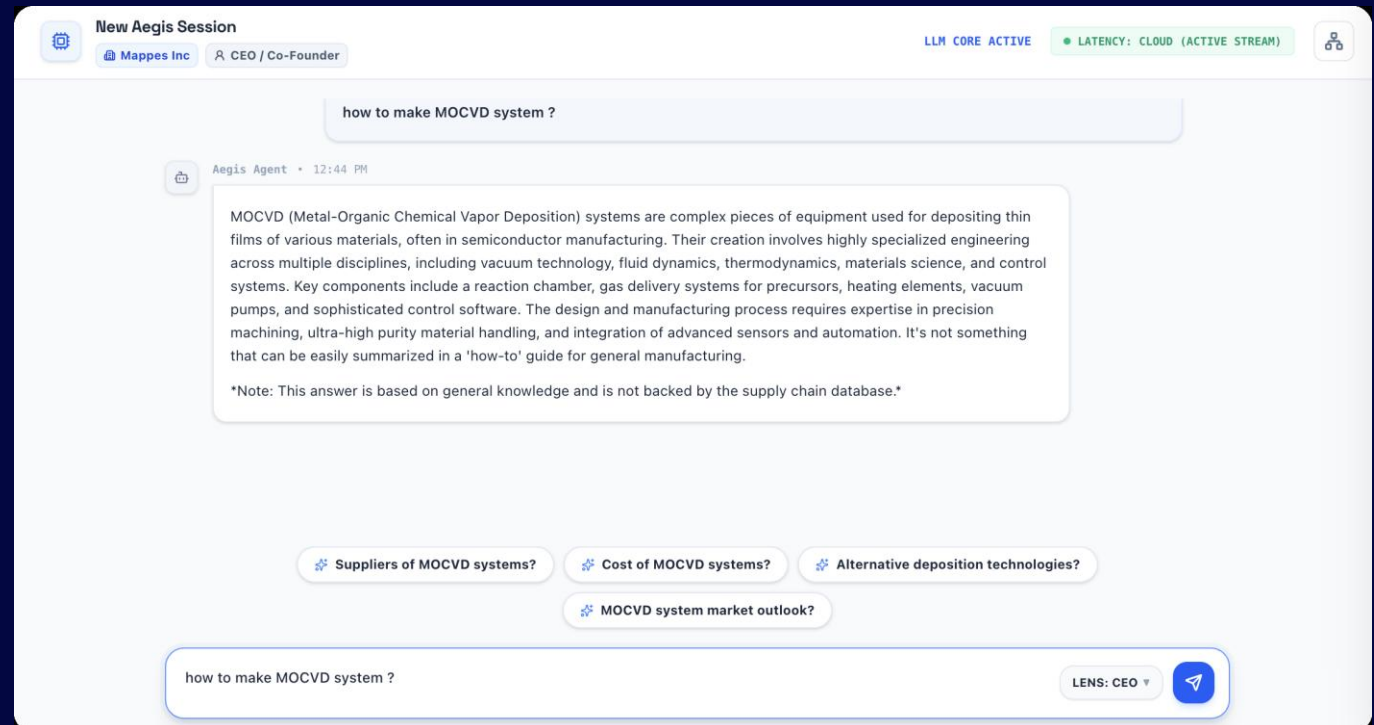
All the information in one place

Product specs, News, Events, Suppliers, prospects and all contacts.



Interact in plain language

One question replaces tabs, lists and filters.





TEAM



Co-founder and CEO

Ankit Singhal

New Delhi, India

M.S. in Electrical Engineering, USC

Over 16 years of experience with B2B sales of high technology Industrial products working with advanced technology companies, globally . Highly connected with many global industrial behemoths and varied manufacturing industries supporting new technology product development.



Co-founder and Data Scientist

Charmee Patel

Virginia, USA

M.S. in Computer Science, USC

Data Science, University of Washington

Well versed using large scale data and AI to drive results out of Digital Marketing, Personalization, Customer Analytics and Digital transformation initiatives of largest brands in B2C world. Built and led data teams at multiple start-ups in early and late stage



Co-founder and CTO

Amit Bhatnagar

Virginia, USA

M.S. in Computer Science, USC

Built successful SaaS products at multiple startups starting from seed stage to late stage. Well versed with Software design, architecture, and development using Cloud, Serverless and modern technologies. Experience in building and scaling software teams of various sizes



M A P P E S TM

**TELL US YOUR PRODUCT AND WE'LL SHOW
YOU IT'S ECOSYSTEM.**

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