

# Smart Manufacturing: Where AI Meets Industrial Impact



The industrial sector is responsible for 1/5 of global emissions and consumes 54% of delivered energy, positioning smart manufacturing as one of the most powerful levers for climate action. A new generation of AI-powered software tools is unlocking the ability to optimize energy and material flows at scale, making climate impact and industrial productivity mutually reinforcing.



**Thesis**  
At AENU, we back startups applying next-gen digital technologies – from advanced IIoT to AI agents – to cut energy and material waste in CO<sub>2</sub>-intensive industries. We look for solutions focused on process optimization, energy efficiency, or predictive maintenance, and that succeed by getting data integration, user adoption, and scalable execution right.

## Why It Matters

Decarbonizing manufacturing is one of the biggest levers to reach climate goals:

54%

of global delivered energy use  
(EIA)

**The Massive Energy Footprint**  
The industrial sector uses more delivered energy than any other end-use sector, consuming about 54% of the world's total delivered energy.

1/5th

of global carbon emissions  
(World Bank)

**The High-Emissions Problem**  
Manufacturing and construction are responsible for one fifth of global emissions. They are key leverage points for climate impact through decarbonization and efficiency innovation.

1% vs. 4%

current efficiency progress vs. target  
(IEA / COP28)

**The Efficiency Gap**  
Global energy efficiency improvements have slowed to just 1% per year, while the COP28 pledge calls for over 4% annually until 2030. A fourfold acceleration is needed to stay on track for 1.5°C.

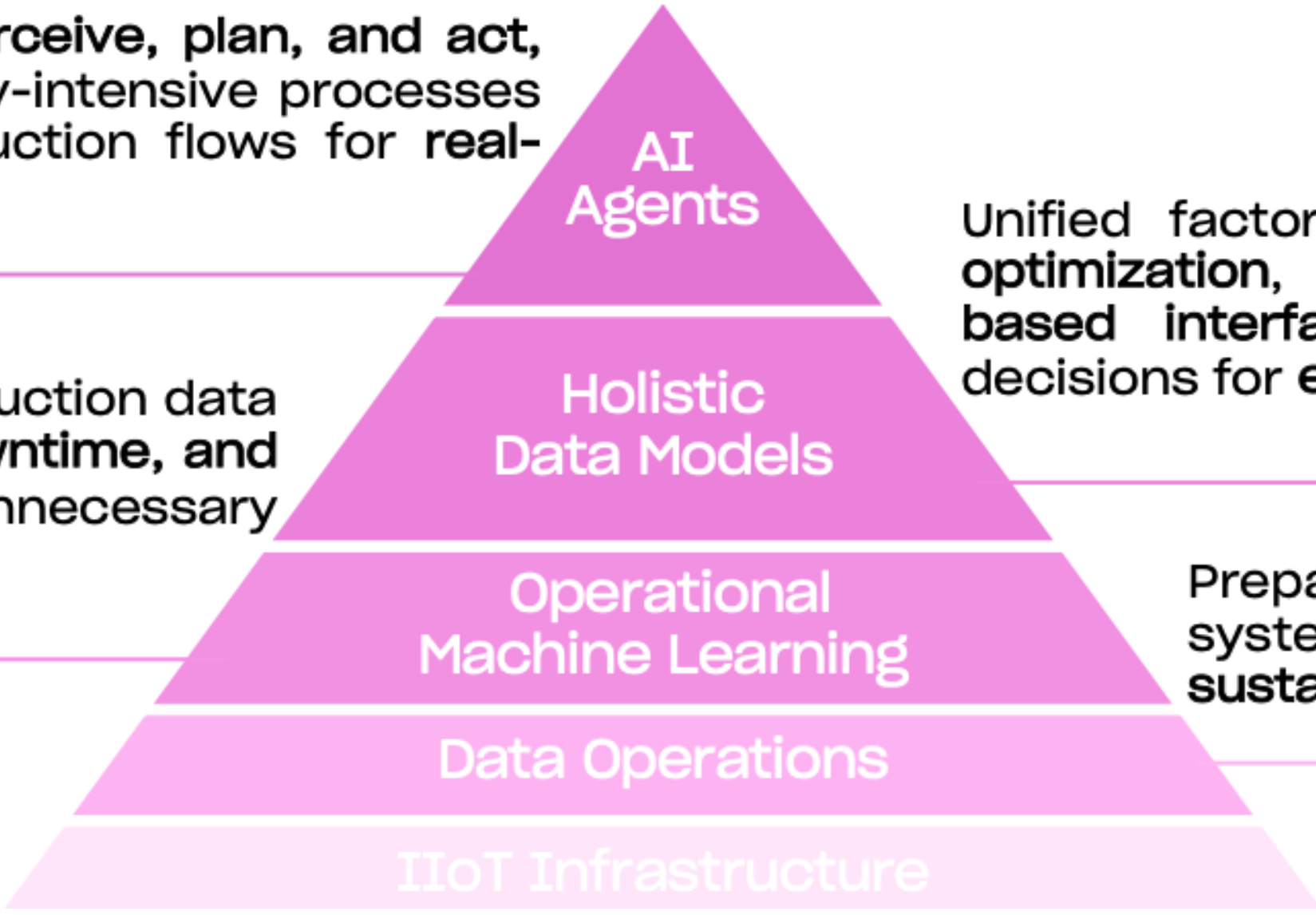
## The Opportunity

### From Data to Impact

Smart manufacturing stacks now enable the full loop: **data capture → insight → action.**  
With measurable energy and material gains at every step.

Autonomous systems that **perceive, plan, and act**, continuously optimizing energy-intensive processes like heating, cooling, or production flows for **real-time CO<sub>2</sub> reduction.**

AI models that learn from production data to **minimize waste, reduce downtime, and optimize efficiency**, cutting unnecessary energy and material use.



Unified factory models that power **process optimization, scenario simulation, and chat-based interfaces**, enabling smarter, faster decisions for **energy and material efficiency.**

Prepares and connects data across systems: the backbone for reliable, **sustainability-driven AI.**

## The Challenge

### The Gap

89%

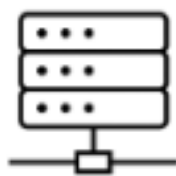
Manufacturing companies want to implement AI

68%

Have already **started** implementing at least one AI use case

16%

Of AI-adopters have **achieved** their AI-related targets  
(WEF & BCG)



### The Bottlenecks

#### #1 Challenge: Data Infrastructure

Scaling smart manufacturing solutions is held back most by data infrastructure (McKinsey)

**People & Processes = 70% of the Work**  
As tech advances, people, processes, and culture remain a key barrier to scaling AI in manufacturing. (BCG)

## What AENU Looks For

### Data-defensible solutions

with flywheels or contextual layers that make AI sticky and scalable

### Plug-and-play architecture

Fast ROI without deep consulting or integration

### Impact Focus & Next-Gen AI

Solutions that drive measurable CO<sub>2</sub>e and energy savings via process optimization or predictive maintenance, powered by next-gen AI and digital technologies.

### Operator-first design

trusted, intuitive systems for industrial users

### Vertical focus, horizontal reach

beachhead in one industry, platform potential in others

## Startups To Watch

Aris Machina



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| Enabling Layer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Operational Machine Learning                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Holistic Models / Digital Twins                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Data Operations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Process Control / Optimization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Agentic Features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  Meddle <small>Just Connect</small>  ENLYZE<br> UNITED<br><small>MANUFACTURING HUB</small>  EMITU<br> quindi<br><small>avv. [quin-di]</small> |  Intelecy  juna.ai  alcemy<br> phaidra  luffy.ai  DeepMeta<br> vernaiio  TVARIT  OPTIMITIVE<br><small>EFFICIENCY THINKING</small><br> Spiro  Differential Bio<br> FACTORYMIND  Geminus<br> JU NO  SMARTEX.AI  fēro labs  CarbonRe | Aris Machina  RONJA<br> tomorrow things  ONIQ<br> Matta<br> Manex AI  Ailoys<br><small>Forefront of Innovation</small> |
| IIoT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Predictive Maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Advanced Analytics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|  QUICK ALGORITHM  stereo<br><small>CONNECTED FUTURE</small><br> SANCHIP                                                                                                                                                                                                                                    |  IPercept  digiclean<br> DIAGRAMS<br><small>TECHNOLOGIES</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  ethon.ai  AUGURY<br> RESONIKS                                                                                                                                                                                                                                                                                                                                              |
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\*Includes only companies with European headquarters, at pre-seed to Series A stage, offering solutions with impact potential.