Designing the Next Generation of Energy-Efficient Electrical Systems by Leveraging Direct Current

KODNYX

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As Energy Demand Grows, Efficiency Becomes the New Competitive Edge for Manufacturers

Electricity Demand until 2030

25% ↑

International Energy Agency (2025)

Electricity as a Share of Operating Costs in EU Industry

14% Second-largest cost driver after raw materials (20 %)

Deloitte (2025)

Drop in total production of Europe's energy-intensive sectors due to high energy costs

-10% ↓

Eurostat (2023)

Electrification is driving a surge in energy use.

More demand means higher total energy spend - even if prices stay flat.

Energy costs are already eroding competitiveness for manufacturers.

A 35%* Efficiency Potential Hidden in a Historically Grown Inefficiency

Grid in AC

Alternating current (AC) became the global standard 135 years ago, the best choice for **long-distance transmission.**

Sources & Loads in DC

Today's energy world runs on **direct current (DC)** - from **solar & batteries to EVs, data centres, robotics, computers & LED lighting.**

Inefficiency due to legacy

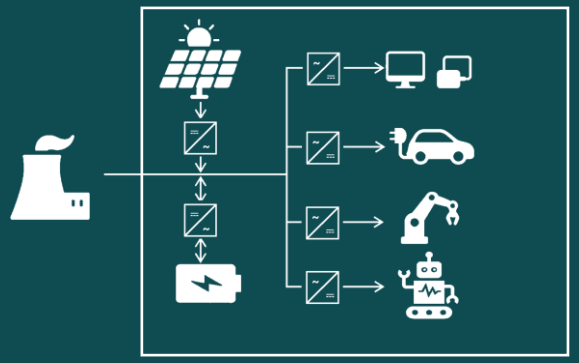
This legacy mix causes repeated **AC/DC conversions** leading to energy losses of up to **35%.**

*Low-voltage DC distribution power losses compared to prevalent AC system (EU Commission, 2024).

What If We Designed Energy Systems for How the World Actually Runs Today?

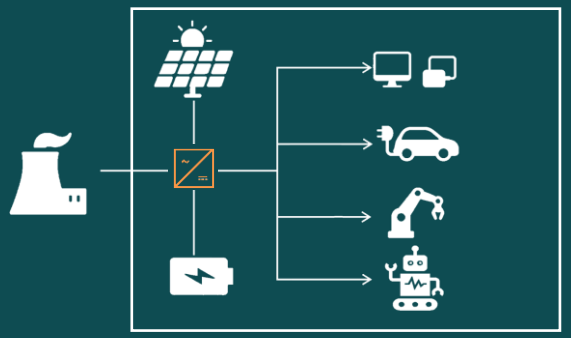
Legacy Set-up*

Inside a Facility



Updated Set-up*

Inside a Facility



Inverter (DC/AC) Rectifier (AC/DC) * Illustrative schematics

DC Design Unlocks Major Efficiency & Cost Advantages

Fewer conversions, higher efficiency

Eliminating repeated AC/DC transformations cuts conversion losses by up to 15 %, which is the foundation of up to 35 % total energy savings.

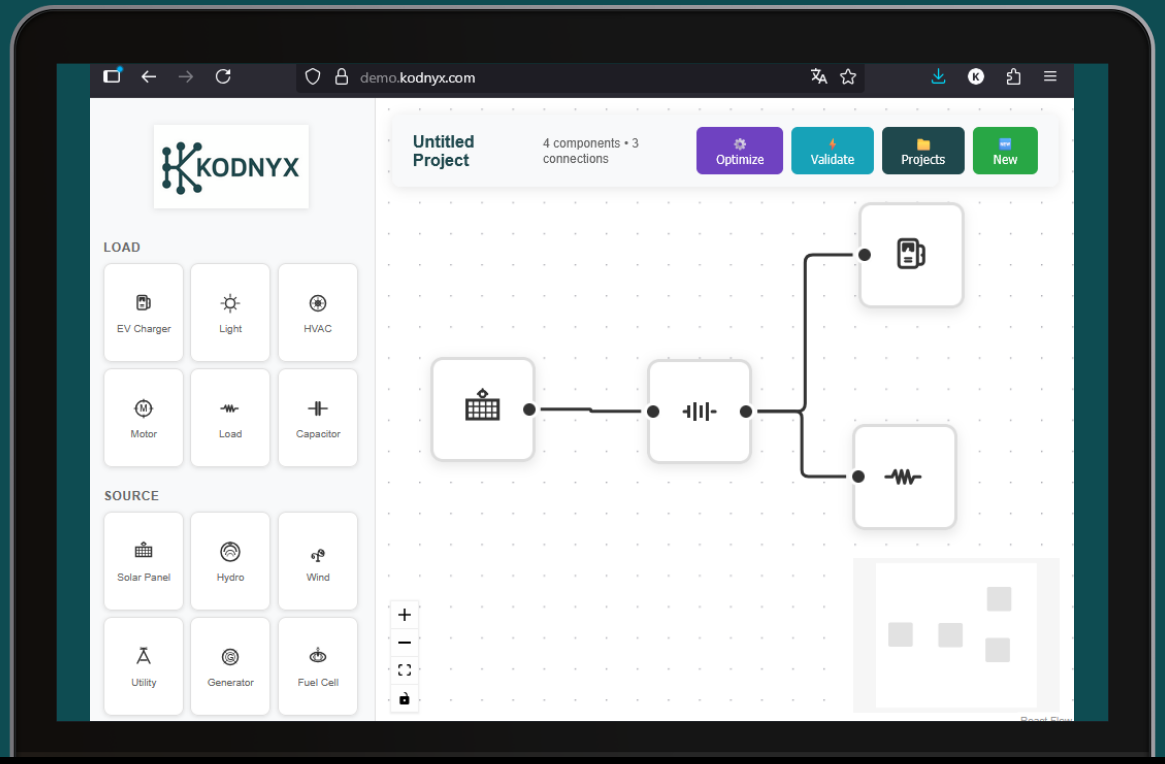
Lower material and operating cost

Smaller cables and fewer transformers reduce copper use of up to 55% and installation cost.

Smarter, more resilient operations

DC links renewables, storage, and loads directly, improving efficiency, stability, and energy independence.

Kodnyx Builds The Optimisation Software That Turns Hidden Inefficiency into 35% Energy Savings



Map & Design

- Map and design electrical systems in AC/DC
- Component library & digital twin

Validate & Simulate

- Ensure safety, compliance and avoid costly rework with built-in validation
- Simulate electricity flow

Optimize with DC

- Identify the optimal layout - AC, DC, or hybrid - and unlock hidden efficiency

Equipping designers of electrical systems with a new optimisation dimension: Direct current

Building a Defensible Leadership Position in Energy Optimisation Software

Defensible IP

As AC has been the default, there is a lack in control algorithms for DC.

We collaborate with leading research institutes (like Fraunhofer) to **develop DC-control algorithms**, forming the foundation **proprietary IP**.

Unique Differentiator

The **first software** integrating DC **design** and **cost optimisation** in one physics-based engine.

This bridges the gap between design simulation and real-world economics.

First mover advantage

Industry, regulators, and governments are now accelerating DC adoption.

By moving early, we are building **a data, customer, and partnership moat** as standards are being implemented.

While AC Has Been The Default, DC Is a "Sleeping Beauty" with Growing Momentum & Opportunity

Regulators

"Blatant demand for DC equipment, systems & standards"

Research

"The technical part is solved already"

Industry

"In 2030, more than 20% of all new industrial applications will be in DC."

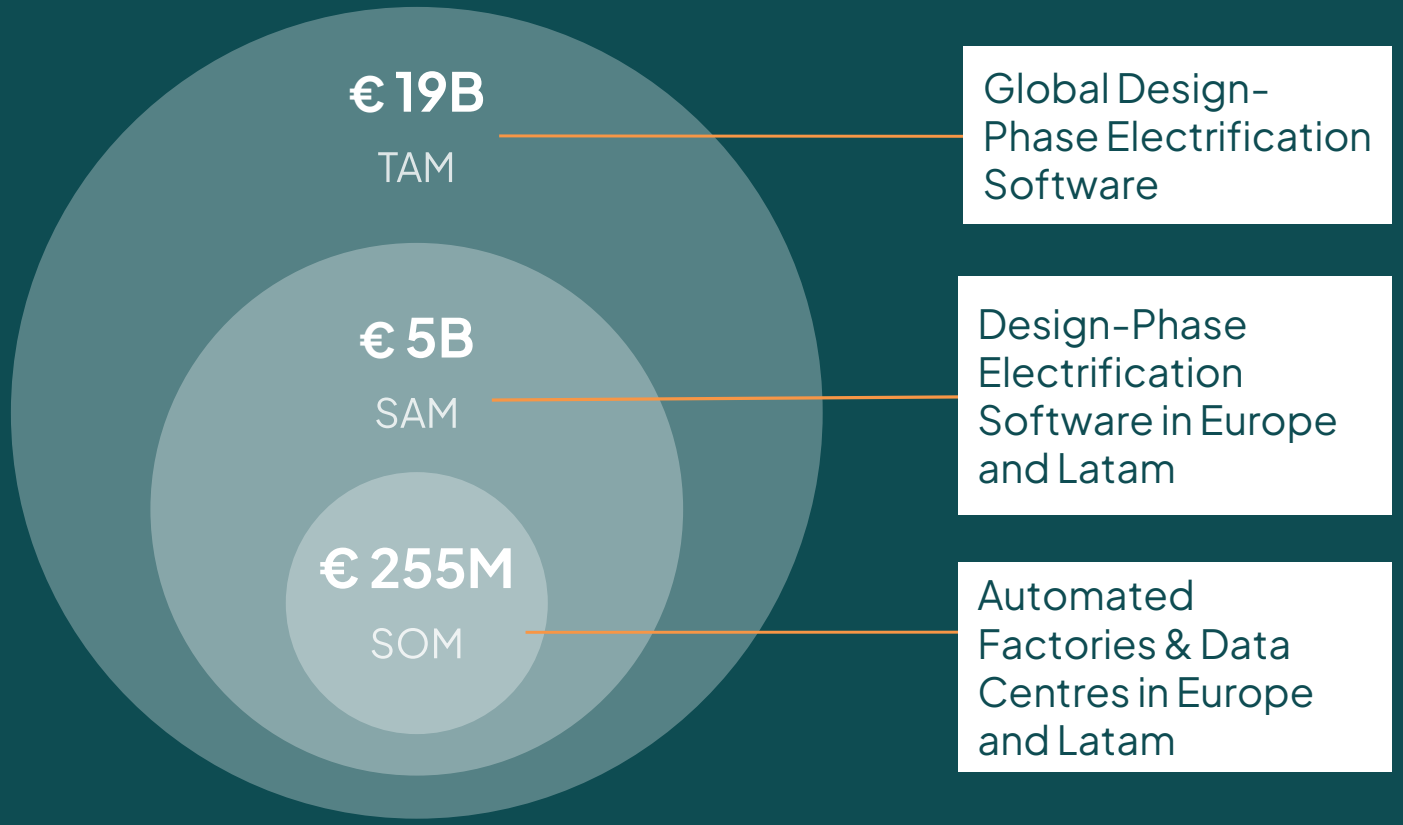
Governments

"Power losses can be reduced by up to 35%"

Energy Efficiency Providers

"There is no standard tool for design in DC"

We Target €8.7M ARR in 2030. From a € 19B Global Market Opportunity



2030 Targets

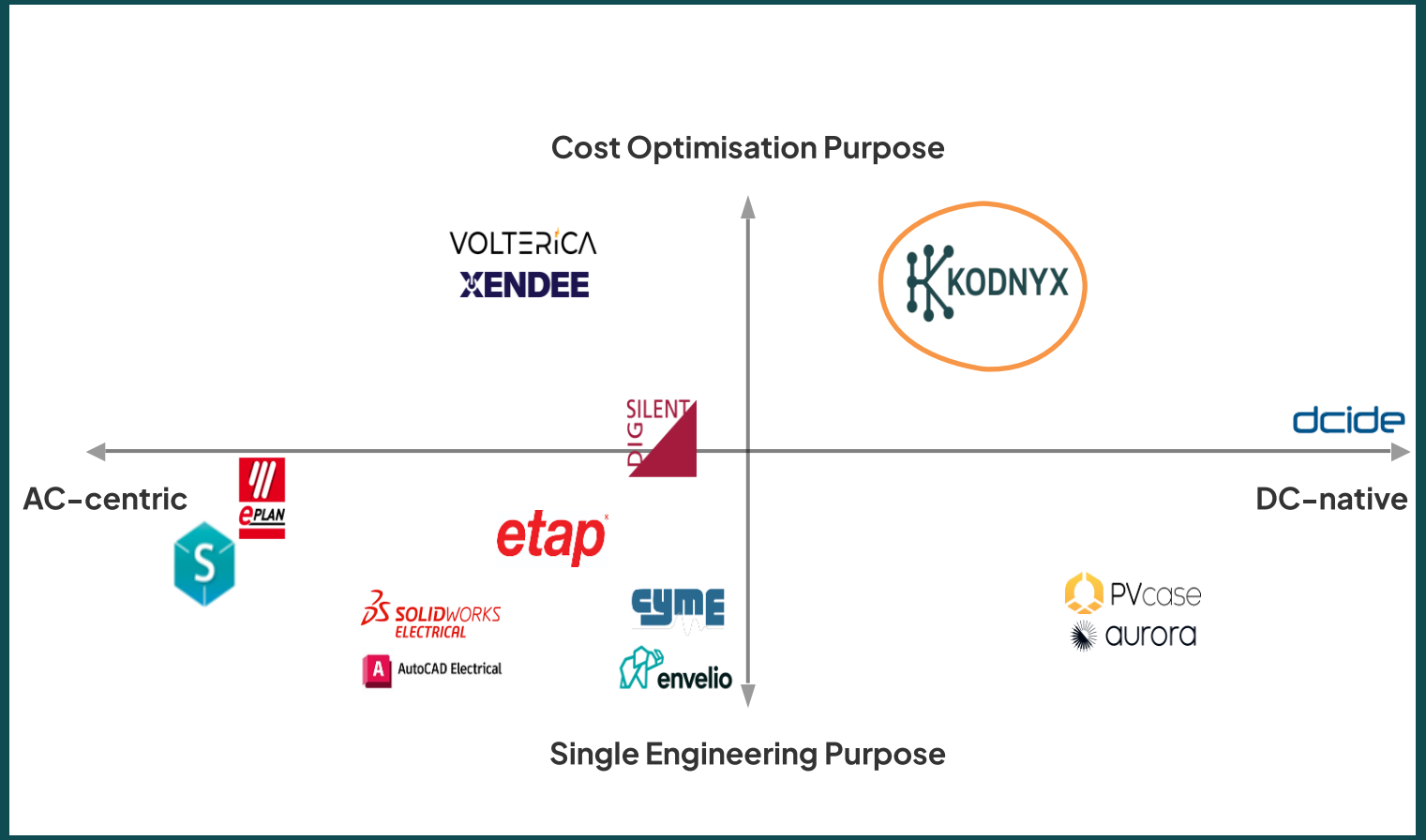
Capturing 3.2% of Market Share

In Europe & Latam

€ 8.7M ARR

Evolving from project revenues to scalable SaaS, growing ARR 2–3× annually from 2027.

Kodnyx is the Only Design Tool Optimizing Costs Across AC and DC



Single Engineering Purpose

Traditionally, software in electrical engineering solves a specific engineering challenge.

Cost Optimisation Purpose

A few start-ups focus on cost optimisation, mainly in alternating current.

AC-Centric

Being the default, most software tools are built for alternating current.

DC-Native

Electrical system design in DC is still a white space, with only one niche and very technical solution without focus on optimisation.

Equipping Energy Efficiency Providers (EEPs) With a New Optimisation Dimension: Direct Current

Our Model: SaaS

- Kodnyx sells SaaS to EEPs
- EEPs design power distribution systems for industry customers
- With Kodnyx's software, EEPs can cut energy costs for the industry
- EEPs have a new offering and win more projects

Our Customers: EEPs

- EPCs*
- Energy Managers
- Energy Consultants
- Facility Managers

Their Pain

- Design process is slow for AC/DC
- It requires many tools and expert knowledge
- Uncertain project wins despite effort
- Compete mainly on price, little differentiation

* Engineering, Procurement, Construction

Phased Go-to-Market Plan: From Project Revenue to Scalable SaaS Growth

De-risking commercial traction through necessary proof-points for a conservative industry

	2025-26 Product Market Fit	2026-27 Scaling	2027+ Expansion
Business Model	Build SaaS product from energy efficiency projects (project pricing)	Transition to SaaS subscription model	Scale SaaS model
Ideal Customer Profile	Automated factories with (planned) PV and power-electronics-heavy loads	EEPs* serving automated factories and those facing power or capacity limits	Extend to EEPs of all sizes, with a strong focus on data centres
Sales & Channels	Founder-led sales: Exploiting networks in industry and energy Partnership with industry associations (ODCA and Current/OS)	Add 1 sales expert EEP networks to double customer reach	Build explicit sales team Cross-selling via OEMs (MR, ABB, Scheider Electric etc.)
Targets	20 Energy efficiency projects	Convert 5 project EEPs into SaaS customers	€ 1.6M ARR in 2028, growing it 2-3x annually with sectoral and geographical expansion
Geographies	Focus on higher DC adoption Founders' network 	Pan-European countries 	Latam expansion, leveraging founder's knowledge and networks 

* Energy Efficiency Providers

Team combines deep expertise in energy engineering, infrastructure finance & AI-driven product scaling

Andrés Andrade, CEO

MSc. Industrial Engineering

Industrial engineer & 2nd time founder with 15 years in global energy innovation & sustainability

Duygu Çağman, CSFO

MSc. Business Economics

Ex-ING & KfW-IPEX - originated and executed financings over € 2B for sustainable infrastructure projects

Dr. Kristoffer Möller, CTO

PhD Economics

Scaled Flix's AI-driven network planning software from an early MVP to a full tech department, managing 40 FTE

From Idea to Industry Validation in Just Months

First project with Hartig GmbH & Co. KG
→ Industry interest

Hartig

First place at GITEX North Star Europe Competition
→ Investor readiness

GITEX NORTH STAR EUROPE

Start
July 2025

2026

2027

Cooperation with research institute
→ Technical validation

Fraunhofer

First software corporation negotiations with Maschinenfabrik Reinhausen
→ Market interest

MR

Ongoing Pilot Project to Build the Foundation for Product Development

The projects validate the software in a real factory environment.

Analyse current energy system → **Model & simulate digital twin** → **Optimize design & quantify savings**

Understand real customer workflows

Start manually, automate through insights gained

Co-develop product with early adopters, integrating direct feedback

One of our projects: Hartig GmbH & Co. KG (Aschaffenburg): High-precision instruments manufacturer

We are Raising € 450k Pre-Seed Funding to Build optimisation MVP and Start Commercialization

Now raising a Pre-Seed

- Net raising: €450,000
- Expected closing: Q1-2026
- Runway: 12 months
- Use of funds: Build MVP and Commercialize

Targeted sources of funding

- Carbon 13*
- Business Angel
- Venture Capital
- Grants

* Under review by Carbon13 Investment Committee.

Get In Touch With Us

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Appendix 1

Kodnyx discovery from Interviews with Industry Experts, Research Institutions, and Sector Alliances.

We Have Discovered Significant Interest and Saving Potentials in DC Industry Projects from Interviews

Daimler and Volkswagen are interested in DC for "lighting purposes" to "boost optimisation energy efficiency by a lot.“

signify

At a Daimler factory, "all production lines are converted to DC because they have robots."

ABB

"Data centers topic is very important currently with all AI topics."

CurrentDS

“At Schaltbau, we reduce peak power compared to AC based system by 85%."

SCHALTBAU

For public lighting, in DC, "it's really like 75% of copper savings."

DC

"The connection to AC grid is a big headache nowadays – in some places waiting time 5, 7 years, 10 years."

TAL TECH

We Have Discovered DC's Technical Feasibility and Upward Momentum from Interviews

"Technically speaking it's totally feasible to build it. And it does exist."

"The technical part is solved already."

In marine segment, "people know what they are doing. They've been doing it for more than 10 years."

BMW introduced DC in the body shop of their plant in Dingolfing. "At the end, it was not really a technical issue."

"Standards are being created."

"Develop standards for low voltage DC."

We Have Discovered a Lack of Tools from Interviews

"The industry often relies on custom-developed tools as there is no standard tool available."

SIEMENS

“We don't have tools to design the architecture of DC.”

Jacobs

We "don't have a very structured tool right now" and often rely on "overqualified engineers to figure it out."

DC

"A manageable tool can accelerate the widespread adoption of DC technology in the industry."

Fraunhofer

„There’s no single software solution for DC.”

Weidmüller

“We are right now programming ourselves a TCO tool. Just Excel based. A different thing which would be the web-based calculation tool. That will be more difficult, more complex.”

MR

Appendix 2

DC Implementation in Practice

DC Saves Up To 35% Energy. But The Question Is: Can It Really Be Implemented In Practice?”

Scaling

From Balcony to Factory: Real Proof That DC Works in Practice

1) PV at Home: Simple Fix, Clear Result

- In a residential balcony PV system that powers a laptop, removing one conversion raised efficiency by 12 %.
- A small, tangible example proving fewer conversions mean less wasted energy.

2) Schaltbau NExT Factory: Efficiency Made Visible

- Built as a showcase DC factory.
- Began by converting selected zones (like EV charging and logistics) — proving you can upgrade factories section by section.
- Result: up to 35 % lower energy costs and 25 % less copper use.

Source: Schaltbau (2024)

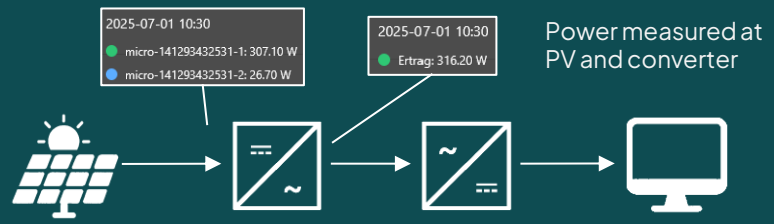
3) Industry Leaders: Sequential Adoption Process

- Maschinenfabrik Reinhausen: Introducing hybrid DC grids in existing plants, one section at a time.
- Phoenix Contact: Promoting “DC islands” within AC factories as a practical retrofit path.
- Schaltbau and VDE: Confirm that staged DC integration is commercially and technically feasible.

Source: MR (2025), Phoenix Contact (2025)

1) Even at Home, a Simple DC Fix Saves 12% Energy. Imagine This Across an Entire Factory

Legacy Set-up



Conversion loss: 5.3% + 11.5% = 16.8%

Updated Set-up

Conversion loss: 5.0%

My old converter

My new converter

What if we rewire my balcony power plant?

Legacy set-up: Energy gets **converted twice** from the PV to my laptop (DC/AC + AC/DC).

Updated set-up: As PV and laptop are both in DC, I only need **one** DC/DC **converter.**

The updated set-up comes with

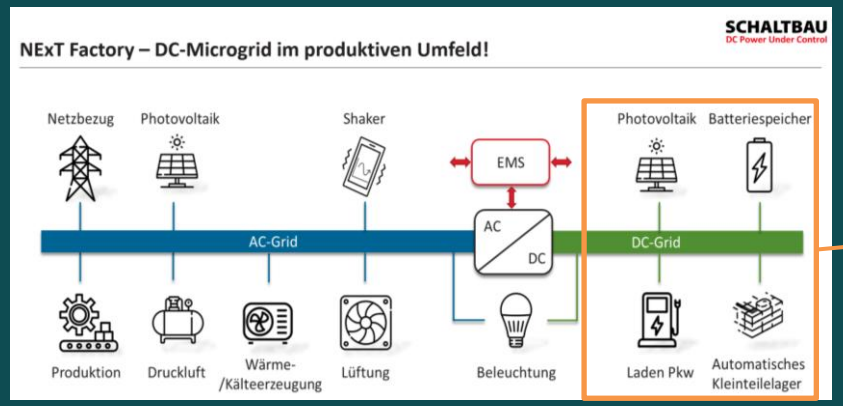
- Energy efficiency savings of **11.8%**
- at the cost of a one-time investment for a DC/DC converter of 18 €.

The business cases yields a pay back period of 1 year and 9 months.

Inverter (DC/AC) Rectifier (AC/DC) Converter (DC/DC)

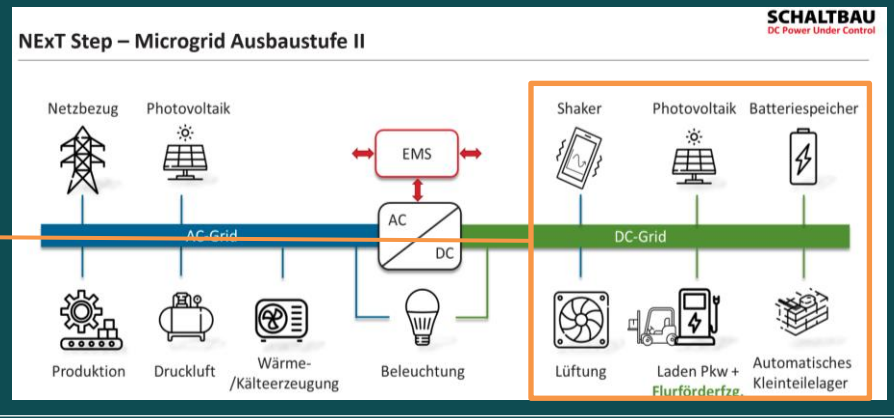
2) Schaltbau's NExT Factory Is an Industrial DC/Hybrid Use Case Illustrating a Sequential Upgrade

DC Extension Phase 1



DC powered

DC Extension Phase 2



Project goal

- Showcase measurable energy and cost savings by applying DC in real operations.

Project results

- +15 % Conversion efficiency.
- –25 % Copper use (due to less cabling).
- –35 % Total energy costs.

Project design

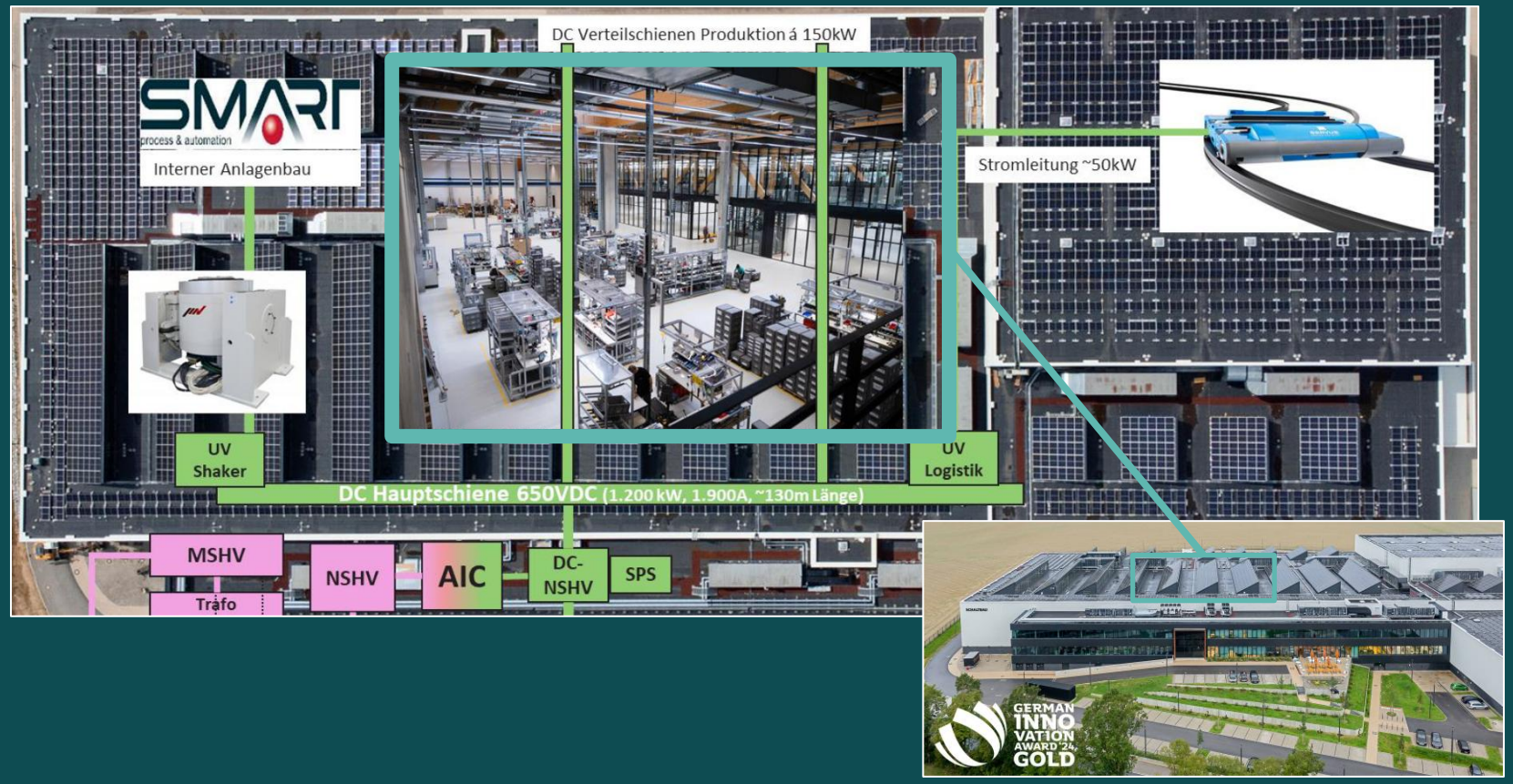
- The design is hybrid and staged with the final goal of an entire factory in DC.
- In the first step, two DC "islands" were created, one for EV charging and one for logistics (to recuperate braking energy).
- These areas connect directly to solar panels and batteries, forming local DC microgrids inside the factory.

The approach proves a gradually conversion.

Source: Schaltbau (2024)

2) Inside the NExT Factory, Supplying Their High-Bay Warehouse with DC, Schaltbau yields high savings

Close-up of a DC island



High-Bay warehouse with DC supply

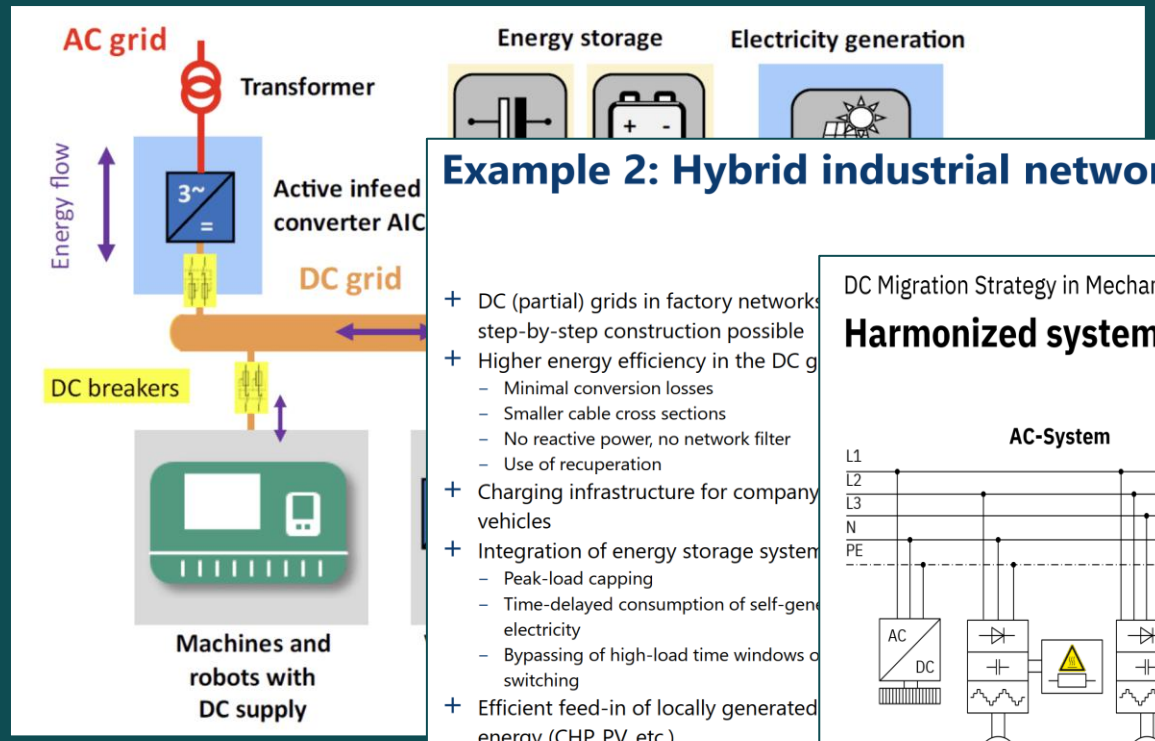
- Over 55,000 storage positions
- 80 ceiling-guided swarm robots

Realized savings

- Energy recuperation of **85%**
- Annual energy savings of up to **800 MWh**
- Annual cost savings of up to **€120,000**

Source: Schaltbau (2024)

3) DC Implementation Is More Than Swapping Converters. It's a Structured Design Challenge.

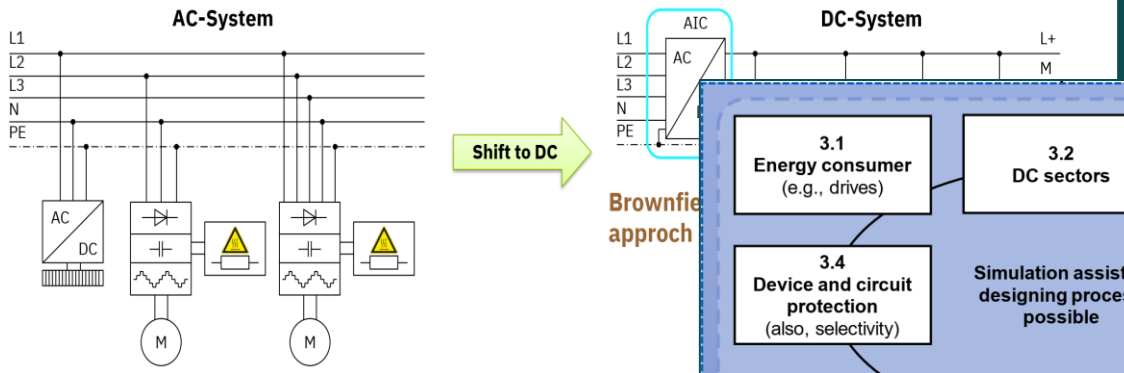


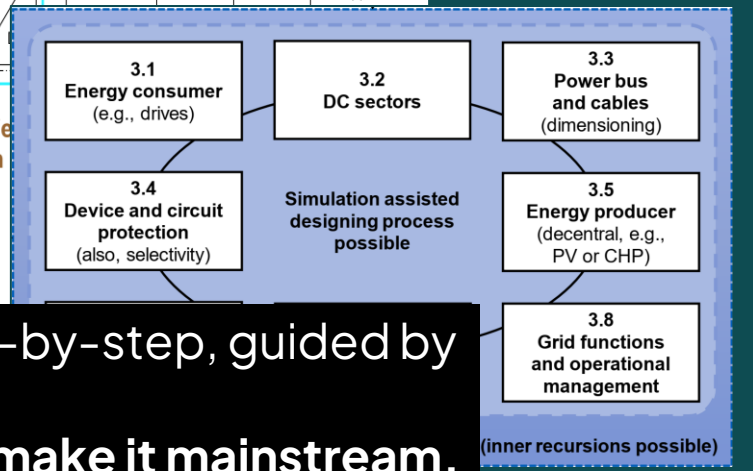
Example 2: Hybrid industrial networks

- \+ DC (partial) grids in factory networks step-by-step construction possible
- \+ Higher energy efficiency in the DC g
  - Minimal conversion losses
  - Smaller cable cross sections
  - No reactive power, no network filter
  - Use of recuperation
- \+ Charging infrastructure for company vehicles
- \+ Integration of energy storage system
  - Peak-load capping
  - Time-delayed consumption of self-gen electricity
  - Bypassing of high-load time windows o switching
- \+ Efficient feed-in of locally generated energy (CHP, PV, etc.)

DC Migration Strategy in Mechanical and Plant Engineering

Harmonized system approach





Industry pioneers have proved it can be done step-by-step, guided by what are now VDE standards.

And software will make it mainstream.