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Energy Management

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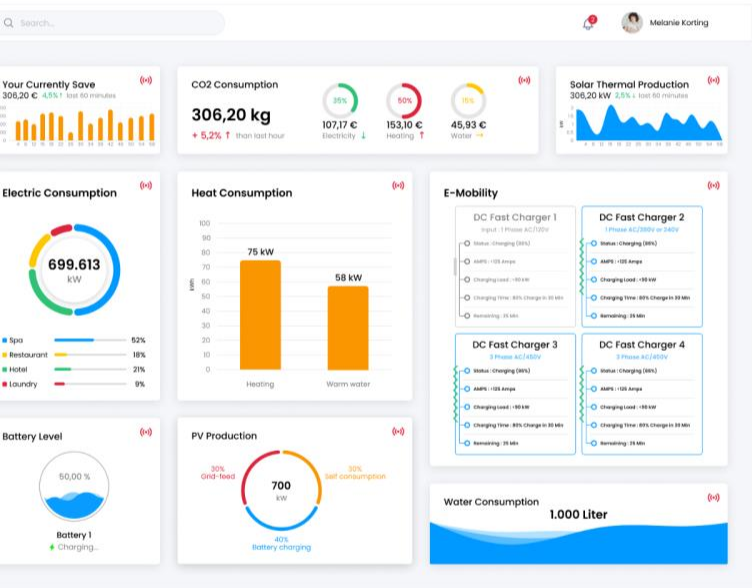
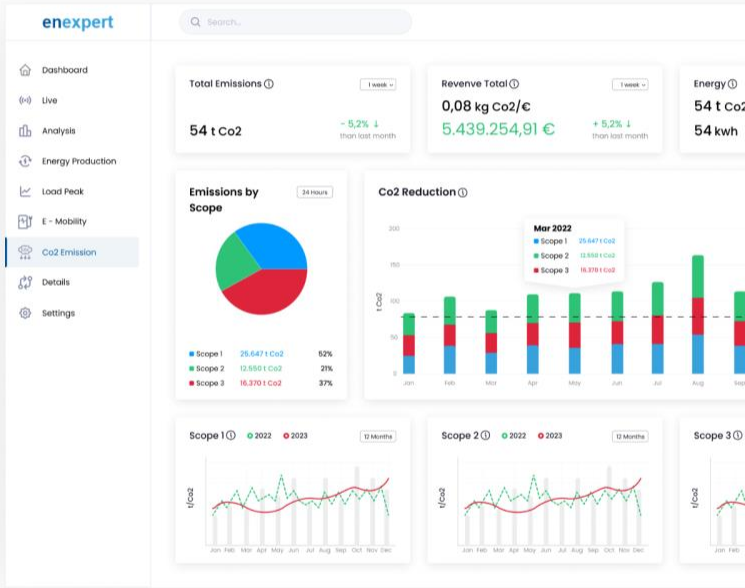
EnExpert System

Energy Management Software



Energy Management System

CO2 Management



IoT Energy Sensors

LoRaWan

Wifi + GSM (4G, NB-IoT)

ModBus

NB-IoT

ModBus TCP & RS485

LAN

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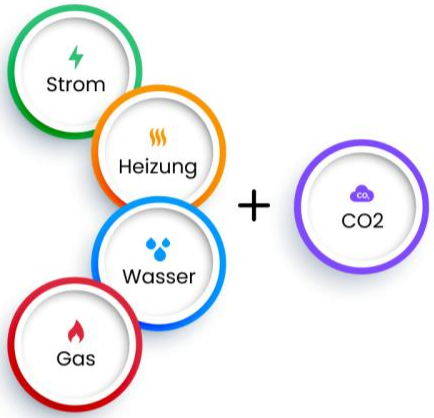
EnExpert Energiemanagement

Energie-Nutzung

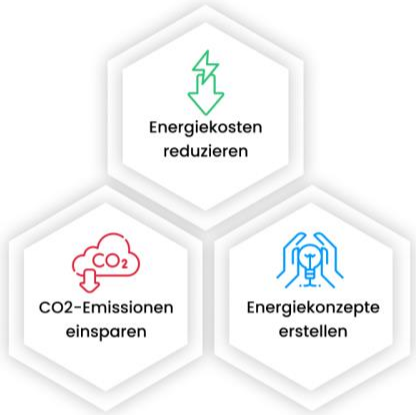


Hotels

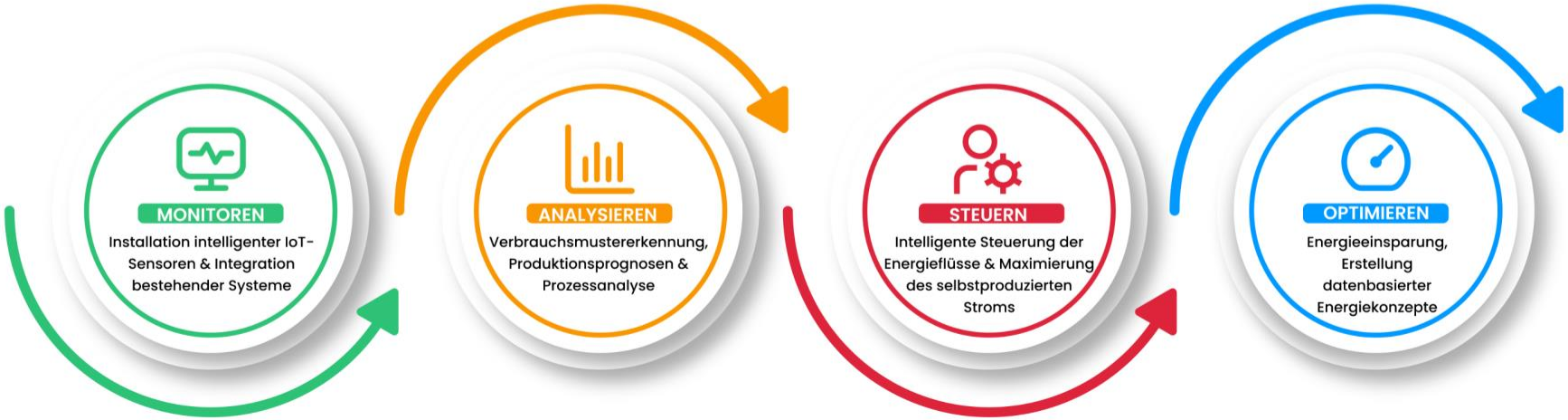
Industrie

Stadtwerke

Gemeinden



EnExpert Leistungen



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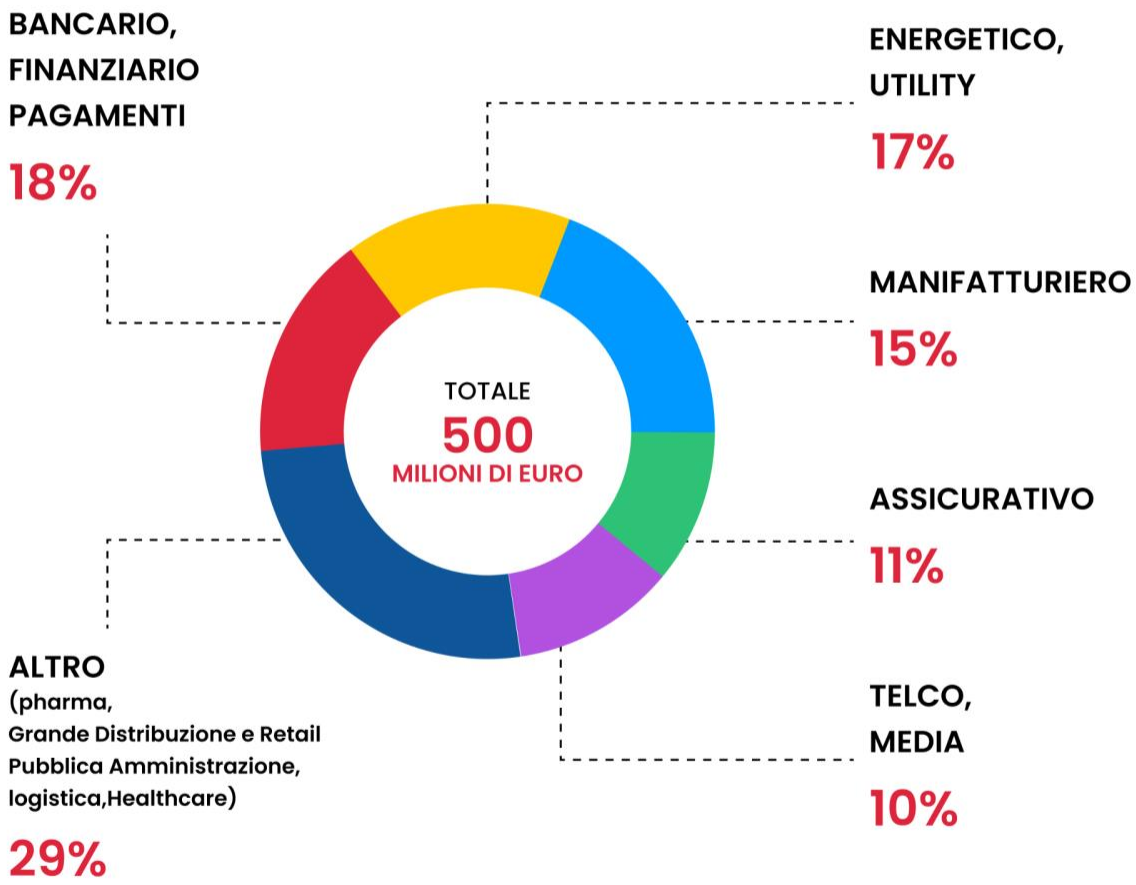
Nutzung von KI nach Sektoren



Quelle:Osservatorio artificial intelligence del Politecnico di Milano

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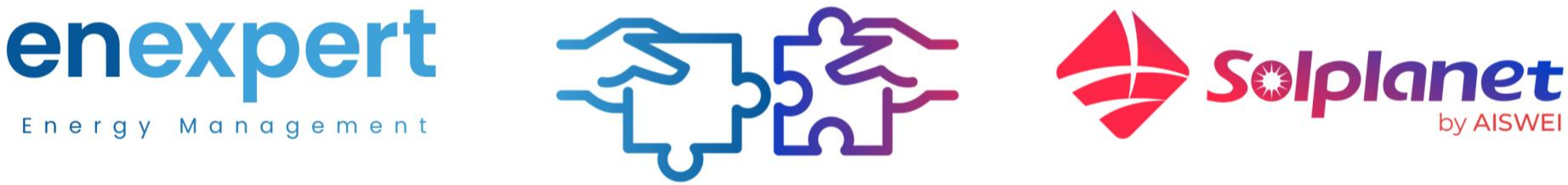
KI in der Praxis:

PredictivePowerManager



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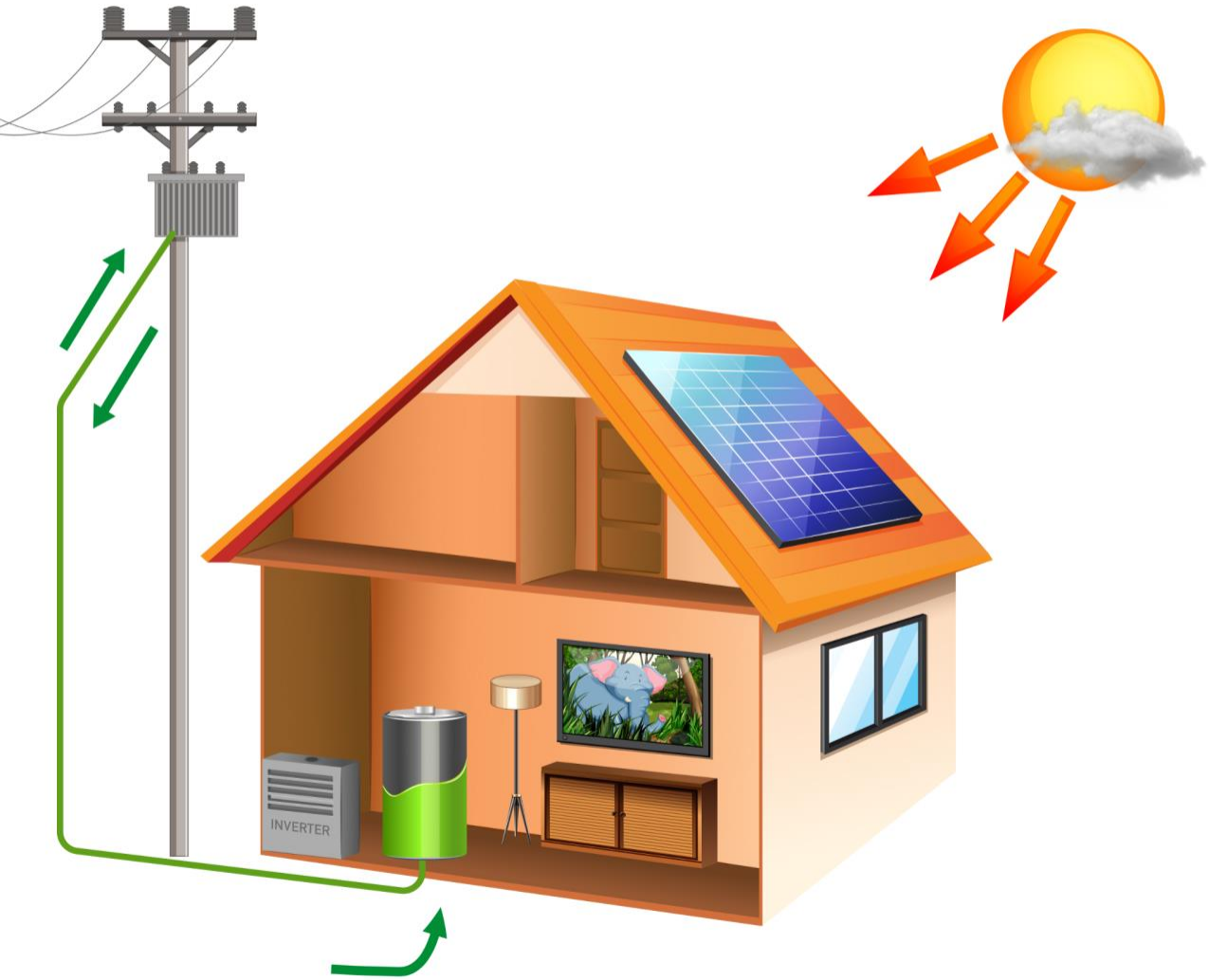
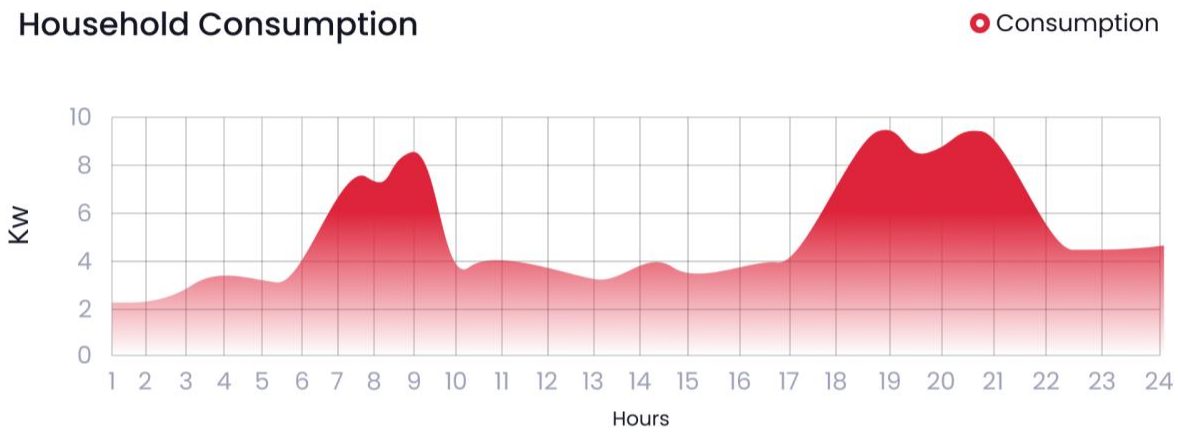
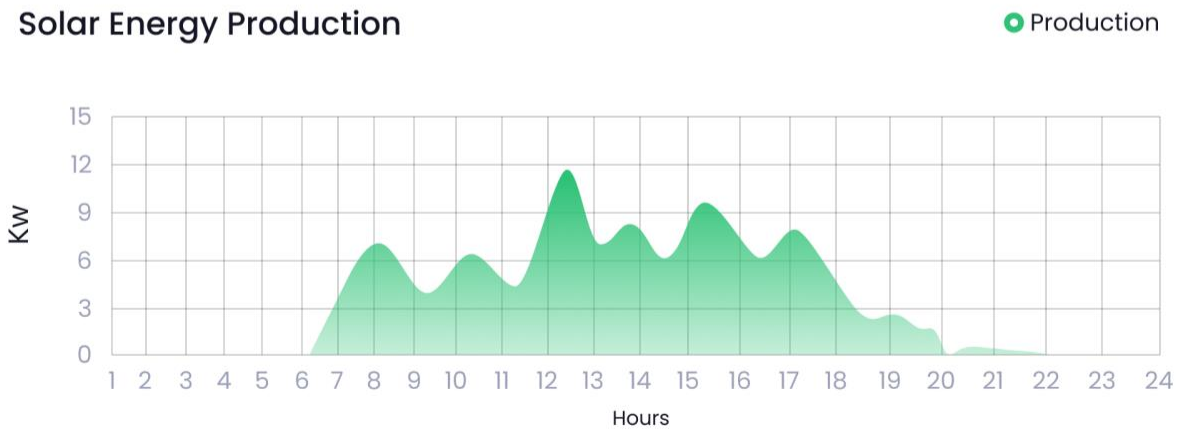
Hintergrund







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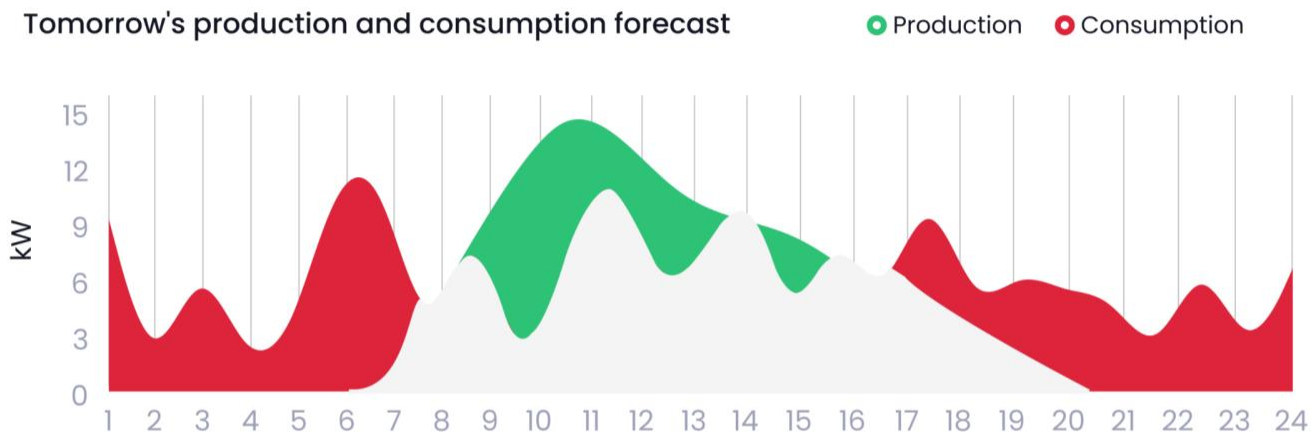
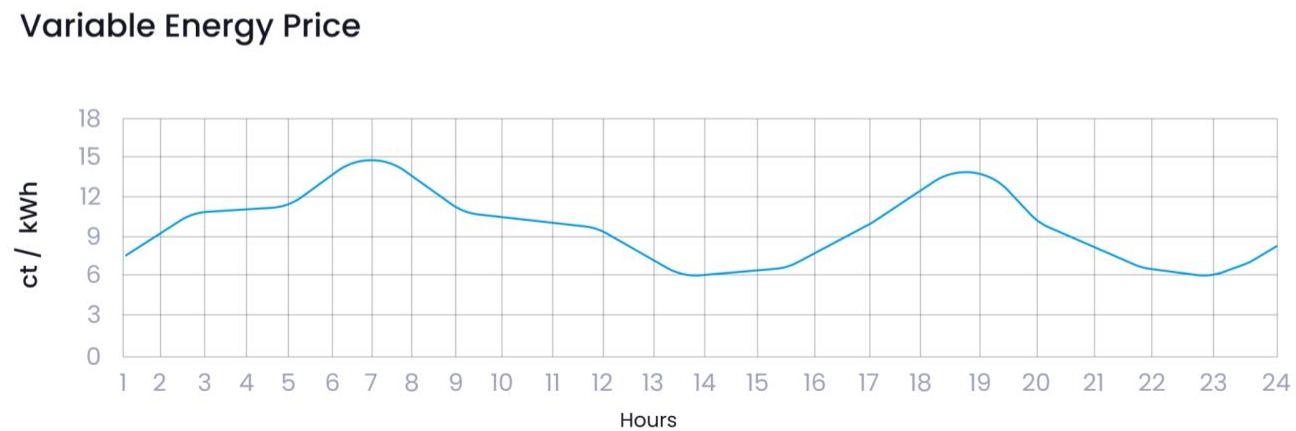
Energiespeicher <-> variable Energiepreise





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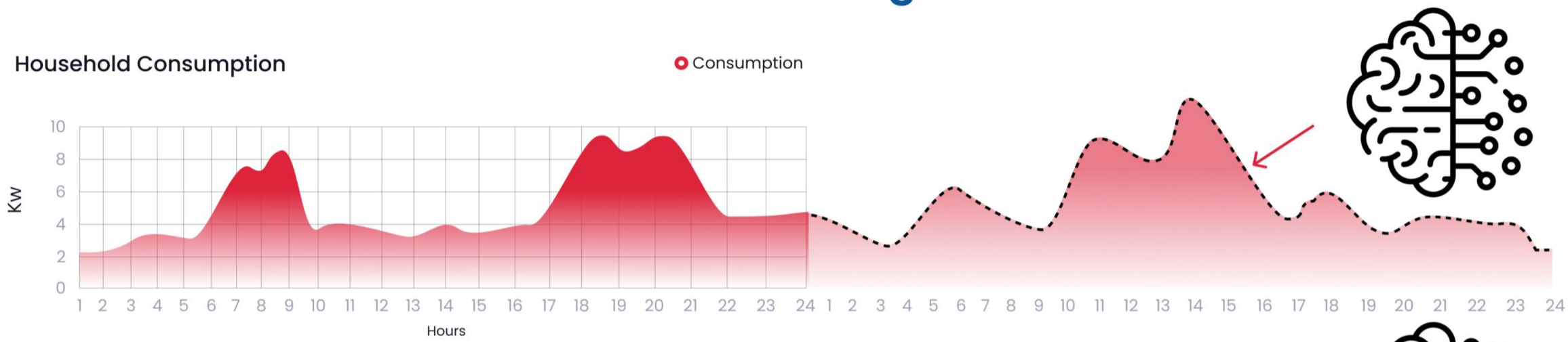
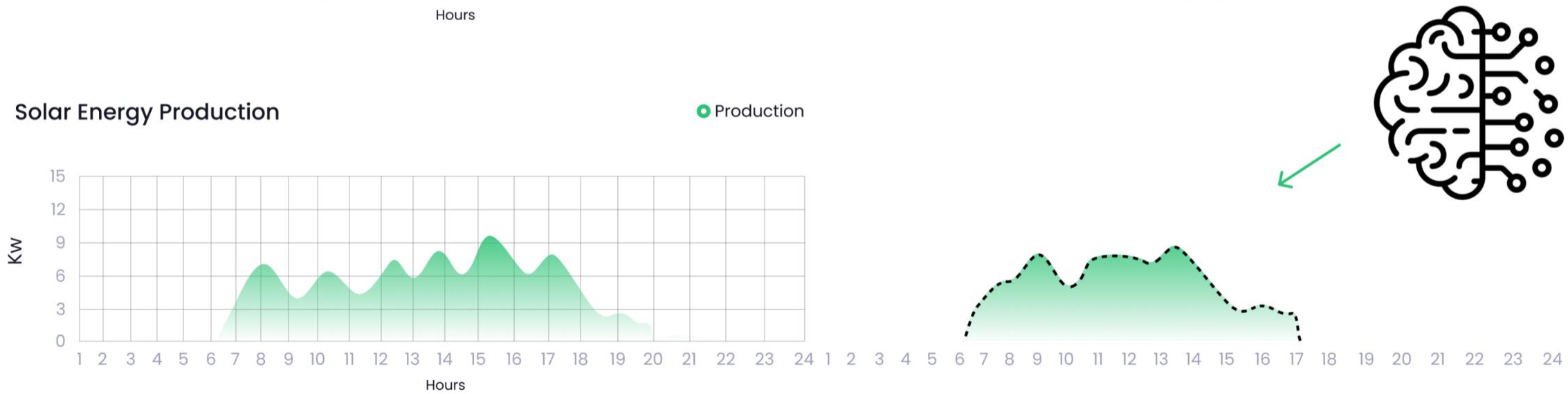
KI Vorhersage





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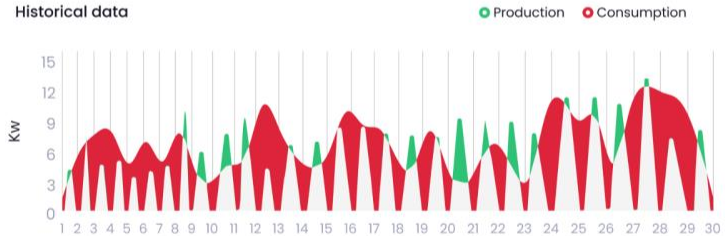
Informationsfluss

Weather Forecast 23 m/s

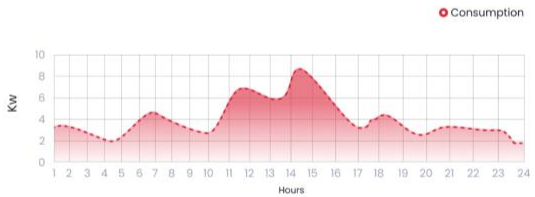
Now	08.00	12.00	16.00	20.00
12°	18°	20°	19°	14°

Prediction Model Pv Generation

Historical data



Prediction Model Household consumption

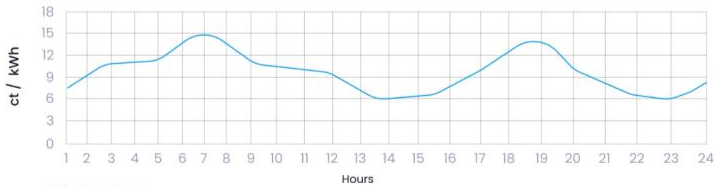


Battery Charging/ Discharging Strategy

Time Schelude

00:00 - 00:15	+3,9 kW ↑
00:15 - 00:30	-1,1 kW ↓
03:15 - 03:30	-1,3 kW ↓
05:00 - 00:15	+1,2 kW ↑
07:15 - 07:30	-2,1 kW ↓
09:15 - 09:30	-1,2 kW ↓

Variable Energy Price



NORD POOL

Custom settings + regulations

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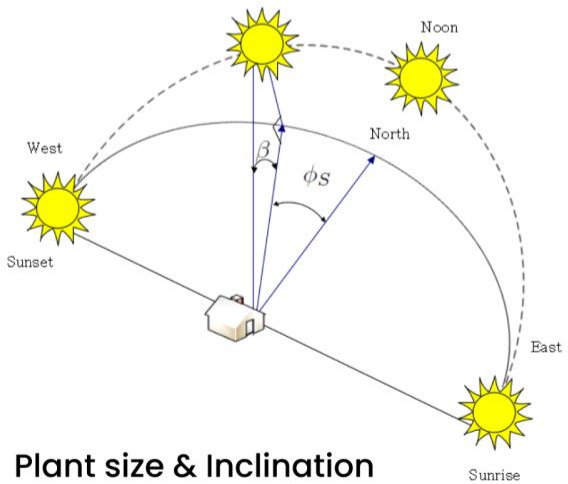
Warum KI?

Weather Forecast Correllation

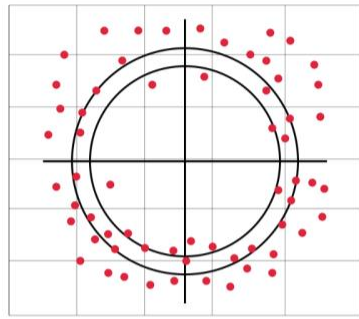


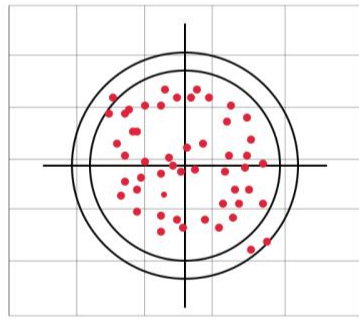
Plant size & Inclination

$$\Gamma_{Lev}(x) = \|\nabla p(x)\|_2^{0.8} + \sum_i |\frac{\partial^2 p(x)}{\partial x_i^2}|^{0.8}$$

Physikalische Modelle

KI Modelle





- Systematische Fehlerkorrektur
- Bessere Trefferrate

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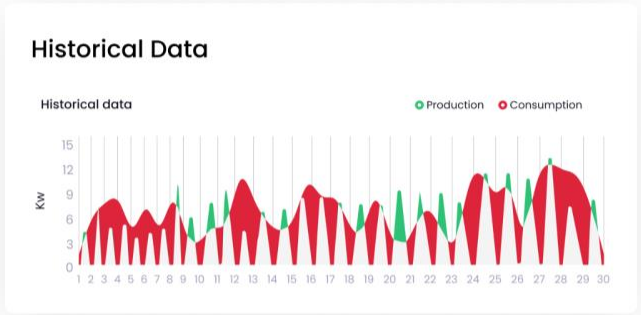

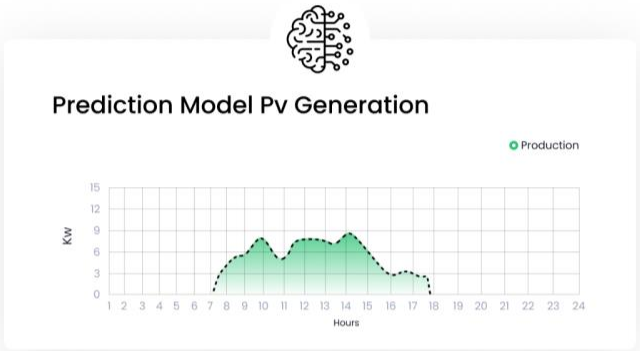

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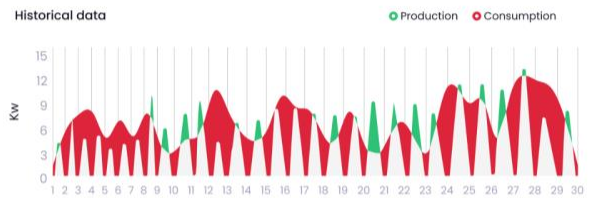
Warum KI?

Historical Data



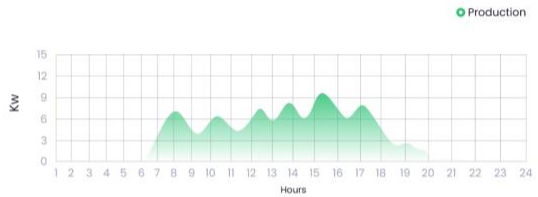
Weather Forecast 23 m/s

Now	08.00	12.00	16.00	20.00
12°	18°	20°	19°	14°

Prediction Model Pv Generation

1 Day Later

Reality



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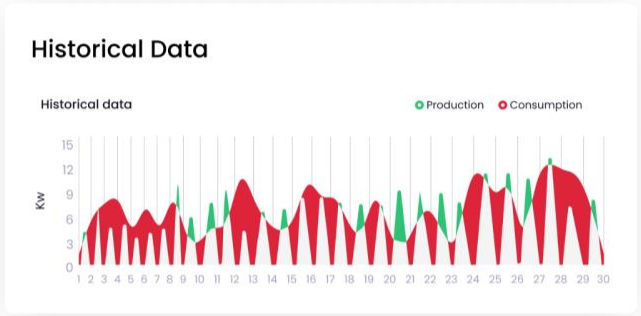
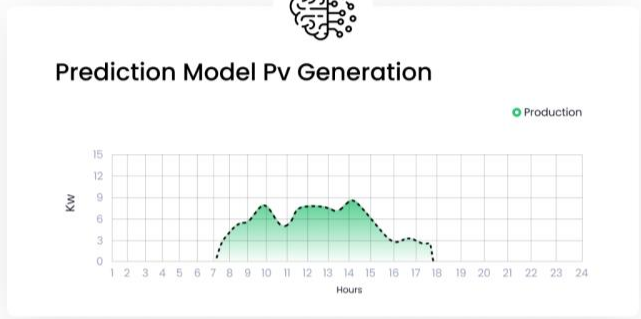
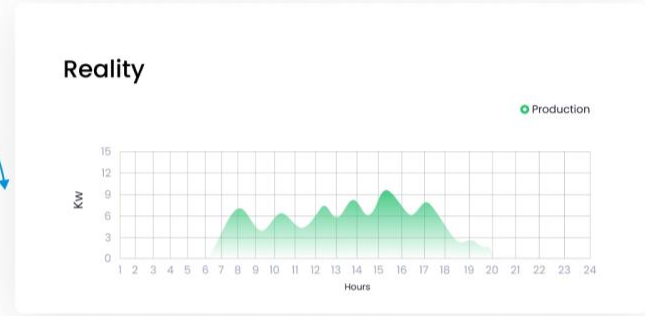
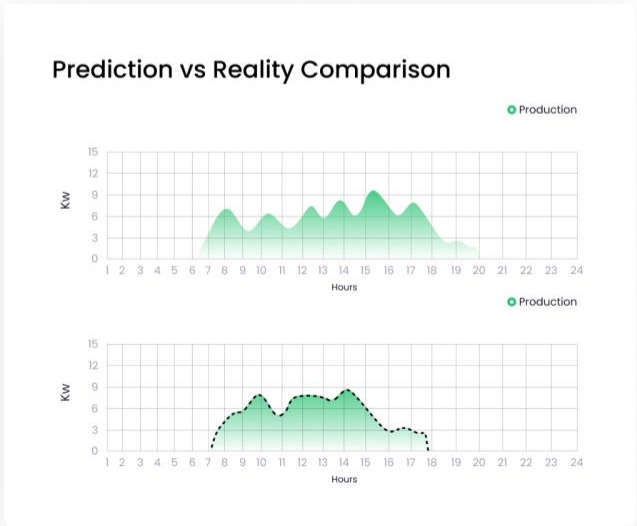
Warum KI?









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Cloud- Struktur

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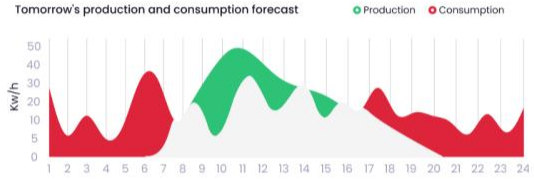
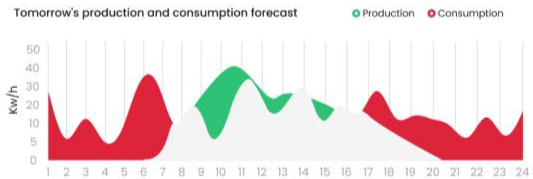
AI-Cloud



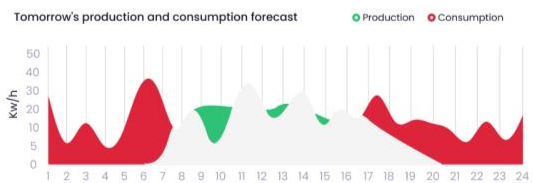
Time Table

00:00 - 00:15 +2,8 kW ↑	05:00 - 00:15 +3,8 kW ↑
00:15 - 00:30 -1,3 kW ↓	07:15 - 07:30 -2,3 kW ↓
03:15 - 03:30 -1,8 kW ↓	09:15 - 09:30 -1,9 kW ↓



Time Table

00:00 - 00:15 +2,4 kW ↑	05:00 - 00:15 +1,8 kW ↑
00:15 - 00:30 -1,6 kW ↓	07:15 - 07:30 -1,1 kW ↓
03:15 - 03:30 -0,8 kW ↓	09:15 - 09:30 -0,5 kW ↓



Time Table

00:00 - 00:15 +3,9 kW ↑	05:00 - 00:15 +1,2 kW ↑
00:15 - 00:30 -1,1 kW ↓	07:15 - 07:30 -2,1 kW ↓
03:15 - 03:30 -1,3 kW ↓	09:15 - 09:30 -1,2 kW ↓

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Individuelle Nachbesserung der Parameter

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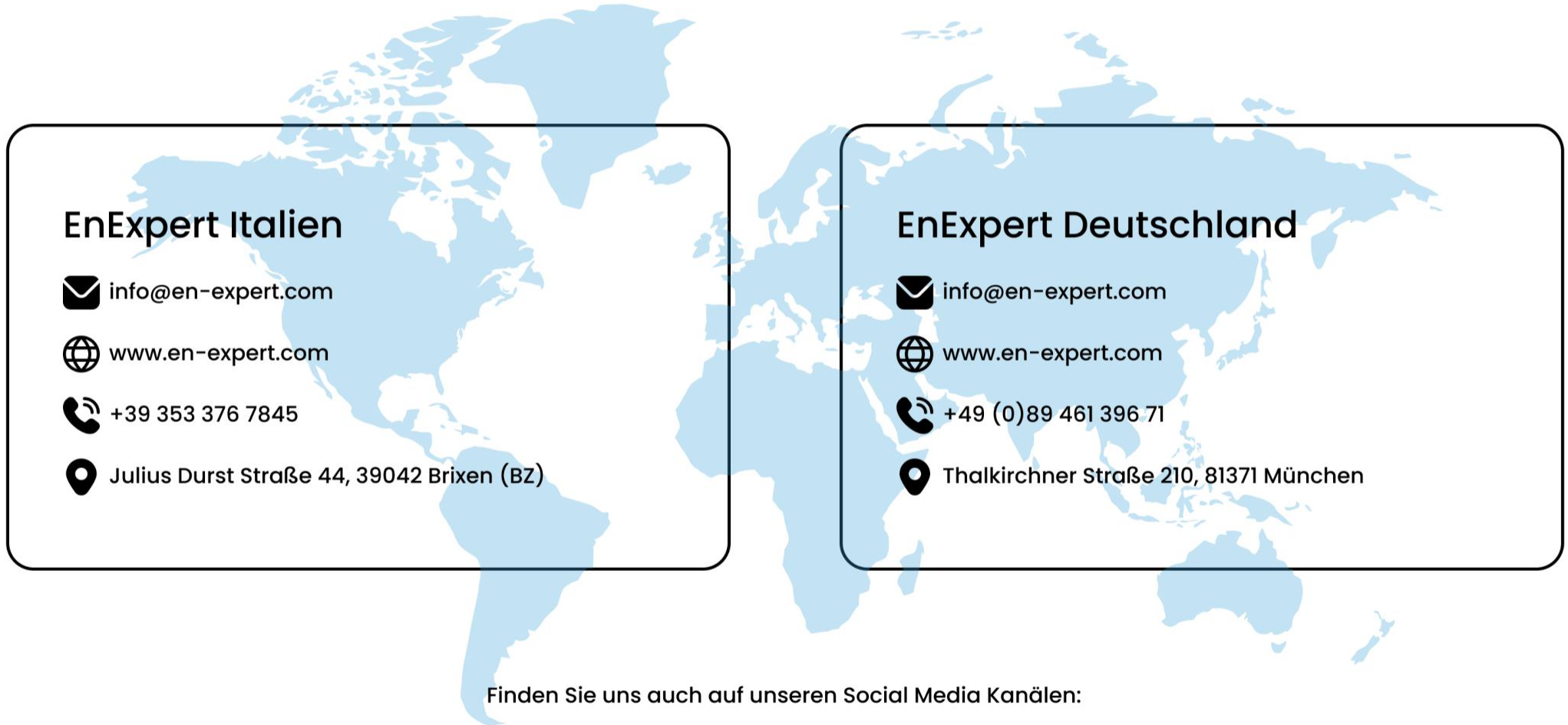
Vielen Dank!



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