

„Solarallianz – Energy Storage Düsseldorf 2016“



Dr. Andreas Piepenbrink, CEO and founder
17th. March 2016



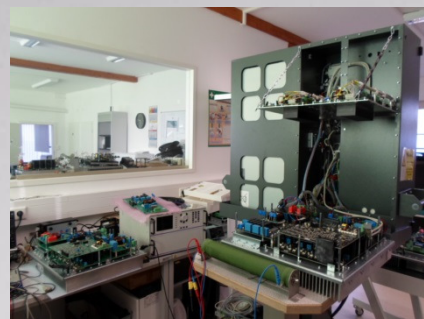
Marke des Jahrhunderts 2016



Inverter manufacturer E3/DC



Osnabrück (HQ)
R+D system and software
Sales
Service



Göttingen
R+D power electronics



Wetter
Production



Osnabrück/ München
Sales Office

Balanced Scorecard Februar 2016 (vertraulich)

	Febr.
Umsätze Ist	1.523.586 €
Kosten Material+Herstellung	1.113.177 €
Kosten Plan	436.128 €
Kosten Ist	333.984 €
Marketing	16.698 €
Entwicklung	34.884 €
Mieten + Pachten	17.942 €
Fahrzeuge	9.998 €
Servicekosten	160 €
sonstige	39.799 €
Personal Ist	214.503 €
<i>Rückstellungen Ist</i>	343.881 €
Abschreibungen Ist	15.000 €
Finanzergebnis Monat	76.425 €
Finanzergebnis YTD	76.425 €
Finanzergebnis YTD kum.	33.311 €
offene Forderungen	918.984 €
Verbindlichkeiten	1.557.963 €
Liquide Mittel	1.125.494 €
Personal	
Vertrieb	9,50
Service+Qualität	8,00
Entwicklung	17,00
Administration	15,00

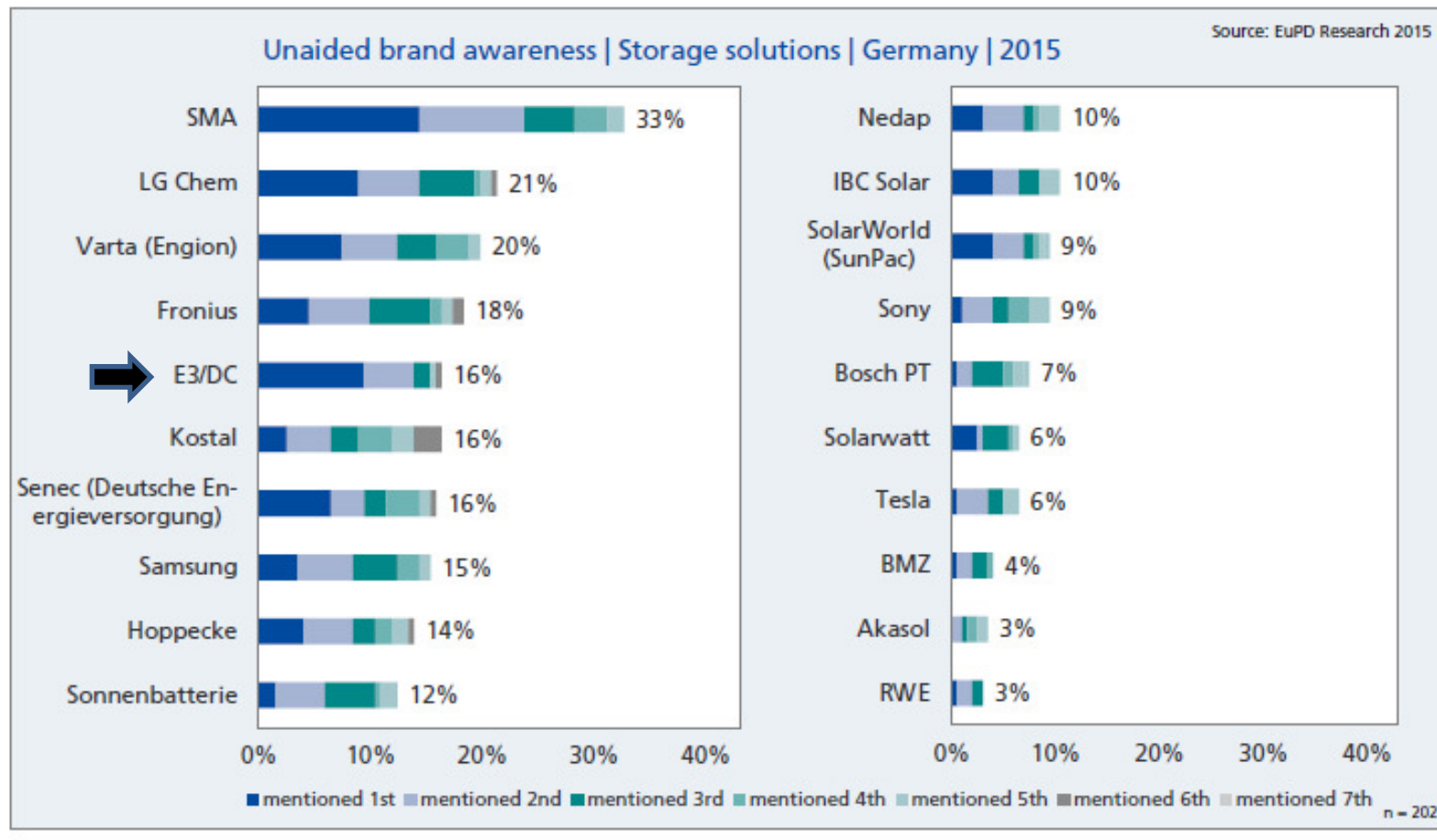
Profitable Company!

E3/DC – TOP 5 unaided brand awareness



Unaided brand awareness – Germany 2015

In 2015, SMA still clearly leads the field, but lost a few percentage points. LG Chem took the biggest leap and leads the competitors, who are still close together.

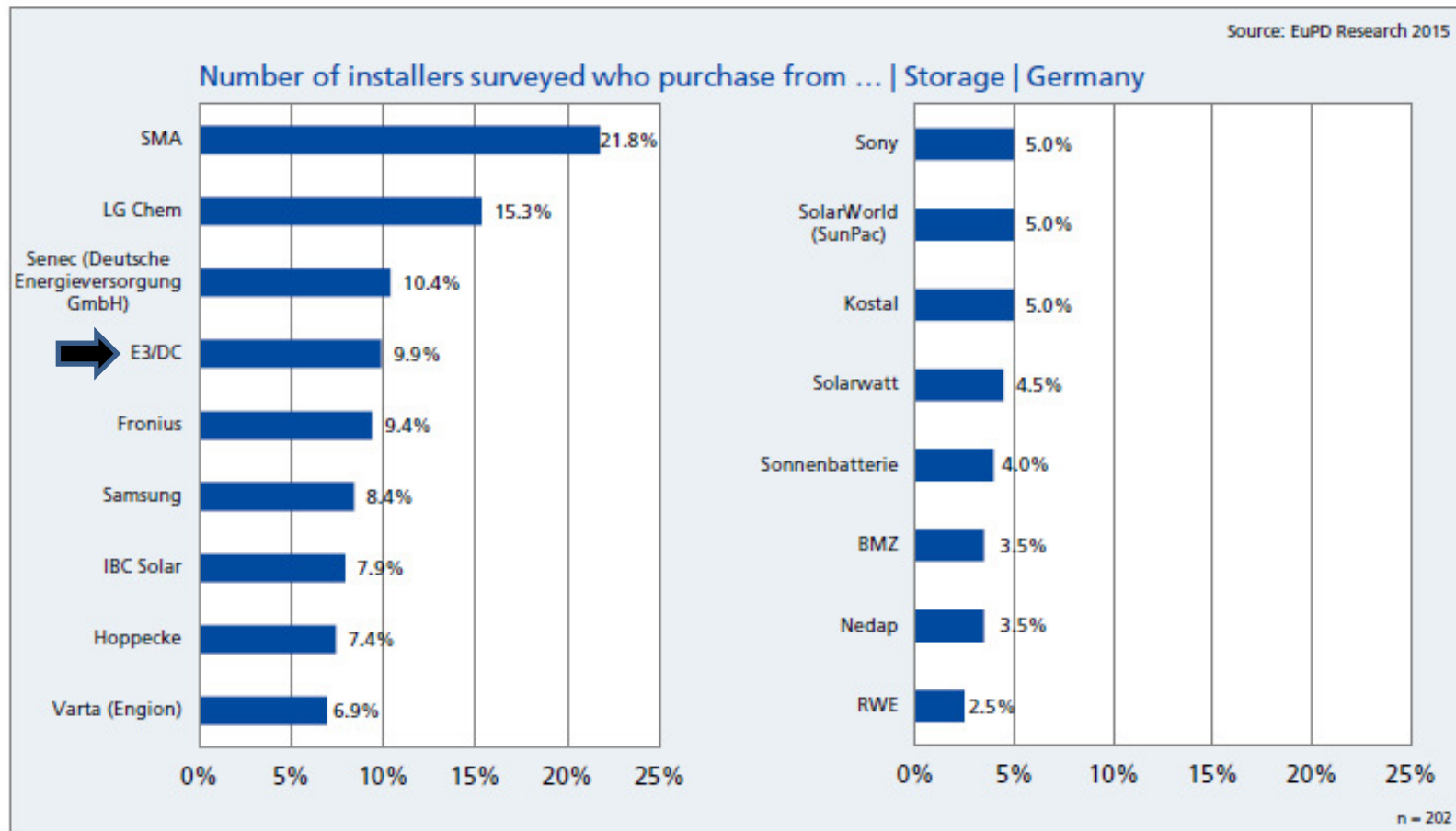


E3/DC – TOP 4 in distribution (sales)



Distribution width of energy storage suppliers

SMA is the most purchased energy storage brand ahead of LG Chem, however the competition is reasonably close together.

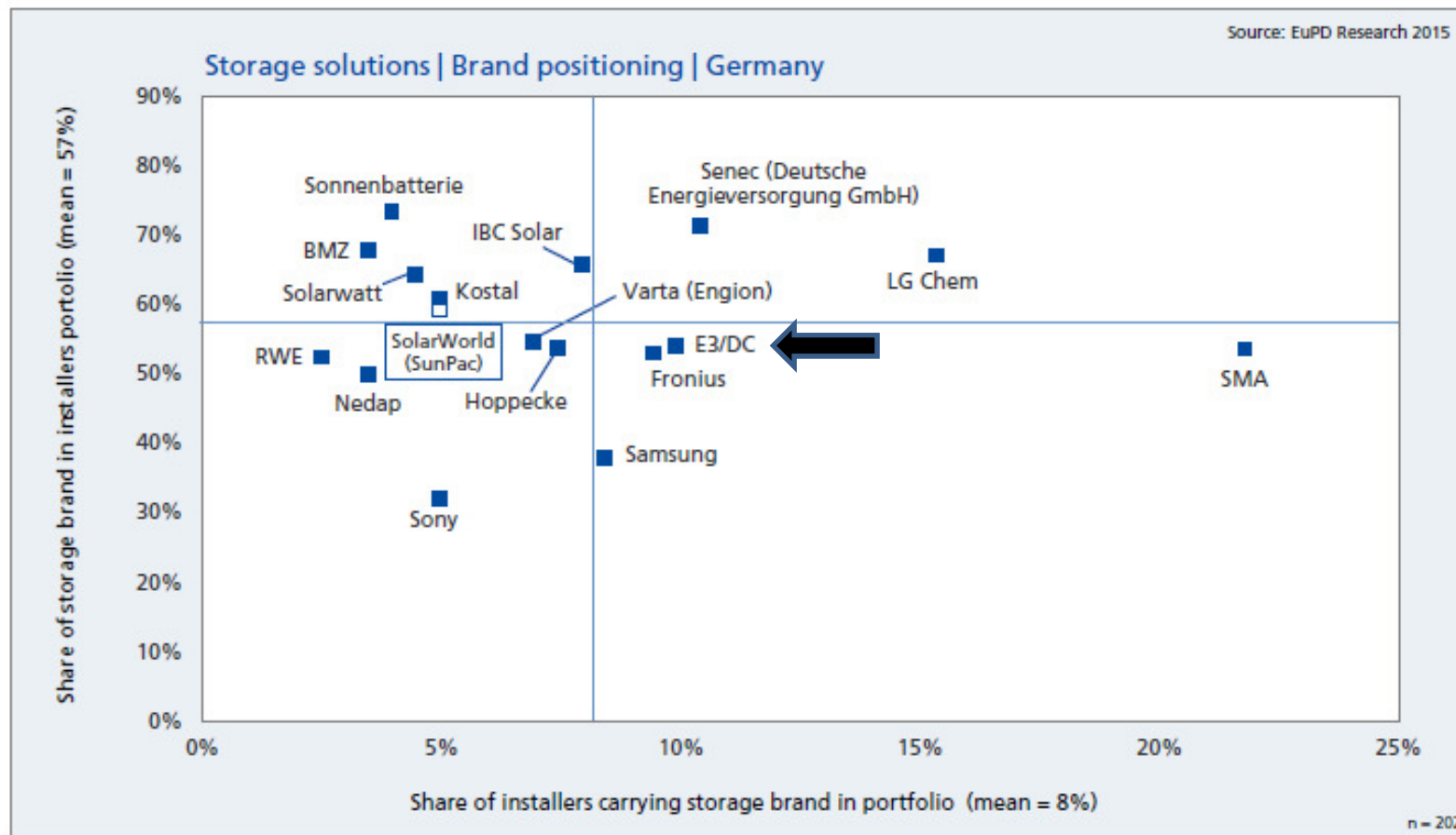


E3/DC – 55% in portfolio of installator!



Energy storage suppliers – Brand positioning

SMA is offered by the largest share of installers, however brands such as Sonnenbatterie and Deutsche Energieversorgung benefit from a high exclusiveness.



Virtual power plant from E3/DC

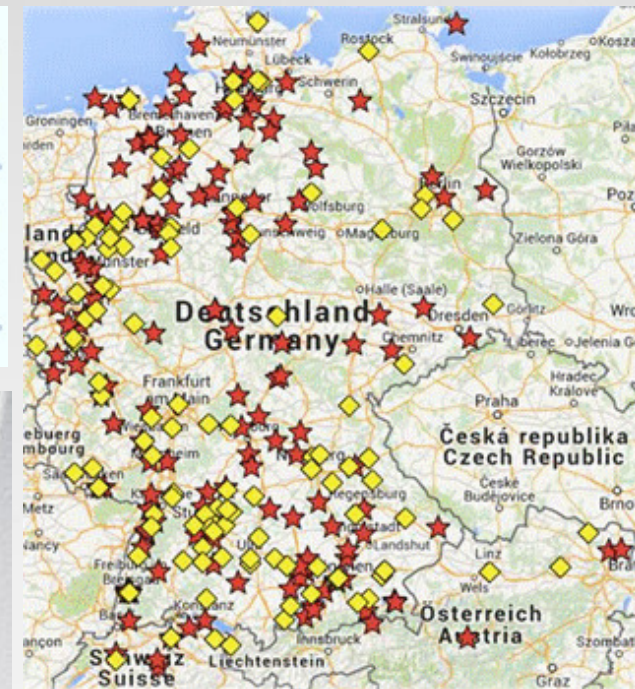
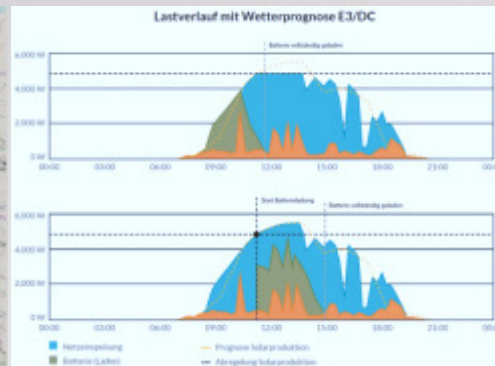
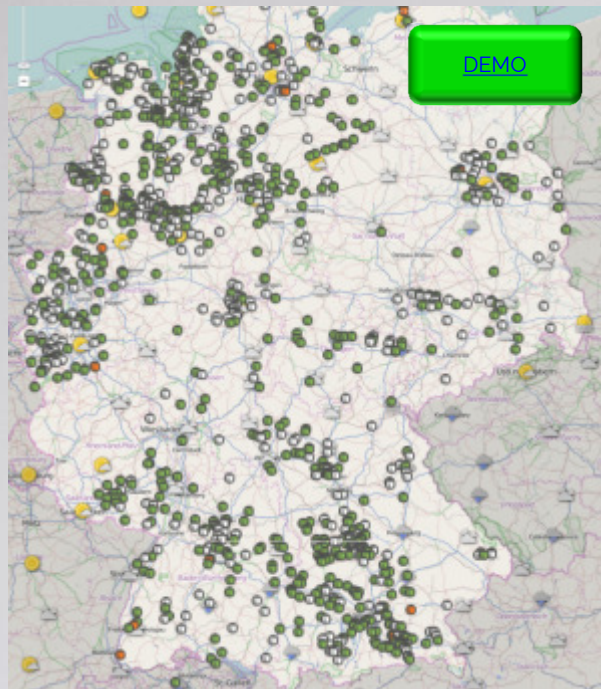
Remote maintenance and monitoring

<https://s10.e3dc.com>



9.3.2016

SmartCharge / SmartPower
E3/DC



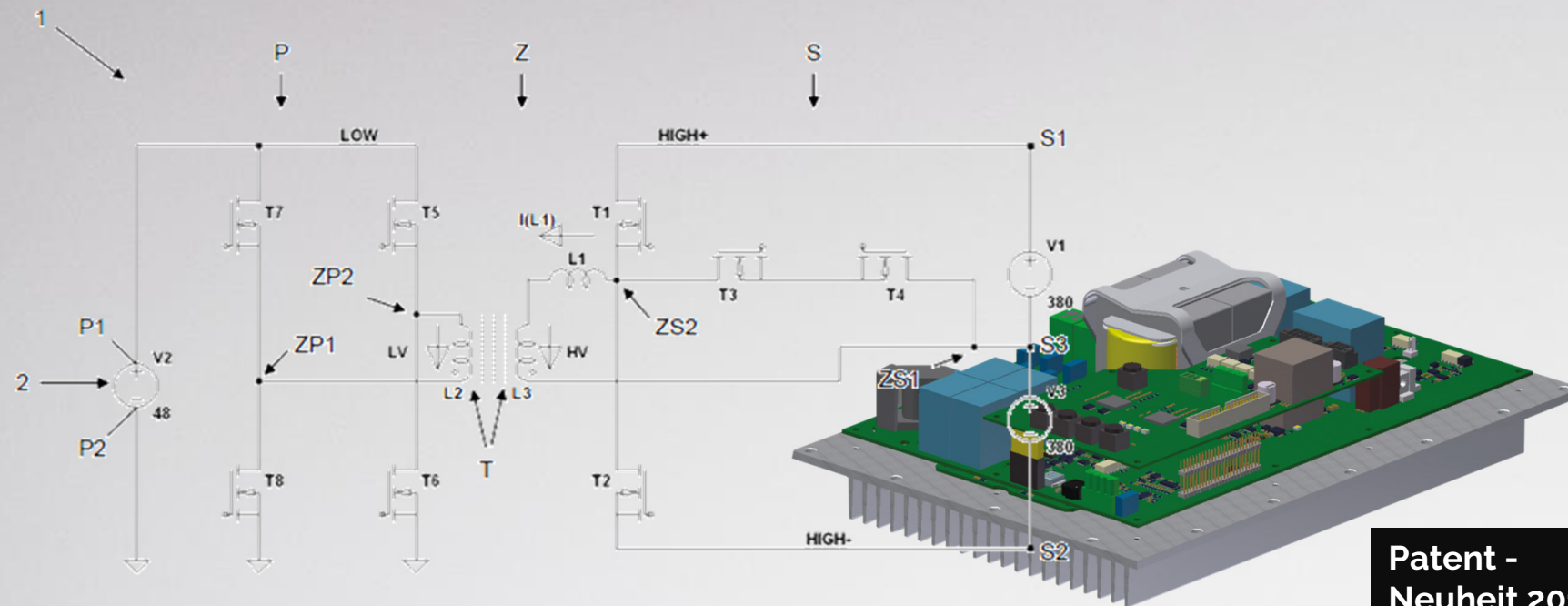
➤ **2500** units 2016 planned
(1500 units 2015)

97% online
100% up to date
1+2nd Level via E3/DC

★ > 600 certified installers

◆ Enquiries 2015

State of the art inverters (E3/DC 2017) – best cost@best power



**Patent -
Neuheit 2017**

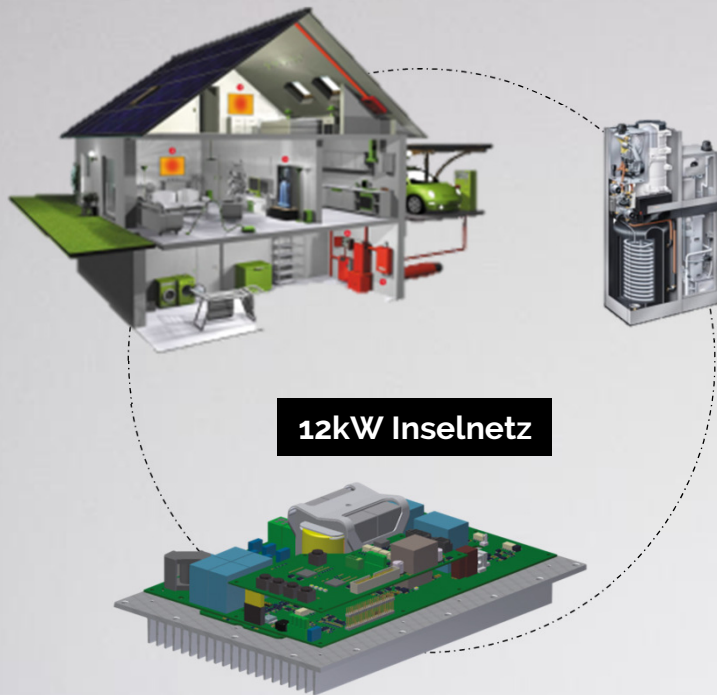
Universal
DC Converter
to NPC DC Link

Fig. 1

- **2x6kW 48V** – galvanic insulated DC Link charger for 3ph NPC® inverters (650V)
- **1x12kW 350V** – galvanic insulated DC Link charger for 3ph NPC® inverters (650V)

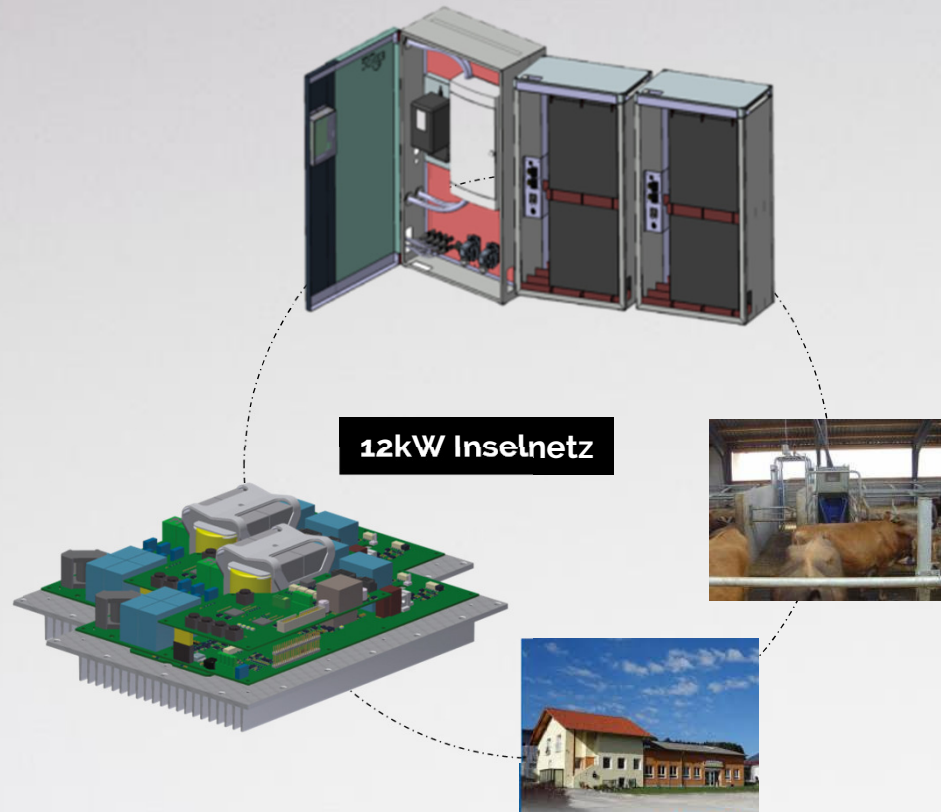
Echte Unabhängigkeit 2017

EFH ohne Stromnetz



- uKWK Kopplung (Pellets) im Inselnetz (Winterstrom)
 - bis 50kWh Speicher

Echte Gewerbelösung



- 2x6...12kW Wandler für Notstrom
- 100kWh Speicher in zwei Batteriesätzen (30% günstiger)
- 20 Jahresgarantie und Autarkiegarantie

Technology E3/DC

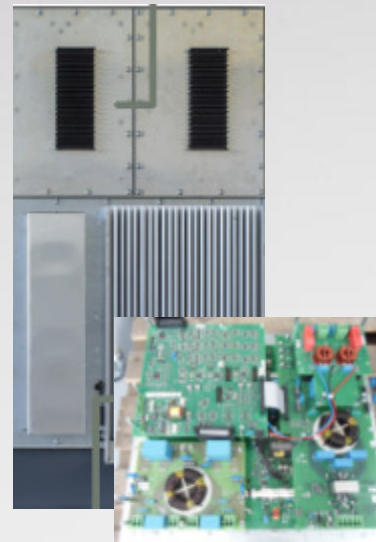


concept All In One
(3ph island operation + Design)

Self defined energy supply

data technology +
energy management

future stability +
extensibility via PC



**Integrated TriLINK®
solar inverter**

**10-15% higher efficiency
against AC-systems**



**Integration ONLY
(48V)**

basic function – energy storage

Store2Market Technology E3/DC

Regelenergie und Direktvermarktung - auch mit Elektrofahrzeugen nutzbar!



Nach wie vor Regelenergie für 2017 eingeplant

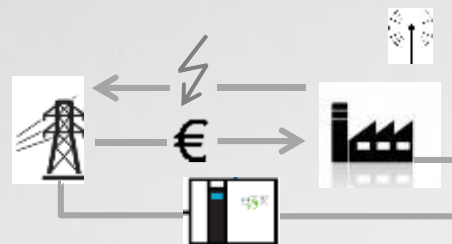
- Konzept 2016
- Präqualifizierung 2017
- Unterstützung durch Bundesnetzagentur 2018
(**Fraglich**, weil große Speicher den Markt besetzen und Strom günstiger wird Flatrates)



VKW
(Virtuelles Kraftwerk)
der E3/DC



Nach Installation des S10 können über das virtuelle Kraftwerk der E3/DC zusätzliche Einnahmen generiert werden, wenn der freie Speicher ferngesteuert wird, präqualifiziert ist und im Verbund angeboten werden kann.

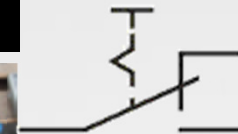


Ihr Stromanbieter muss gleichzeitig Regelenergievermarkter sein und das virtuelle Kraftwerk der E3/DC benutzen.

Die Bilanzkreise müssen komplett korrigiert sein und für jeden ÜNB aktuell sein.

Ihr Stromzähler muss demzufolge fernauslesbar sein und im virtuellen Kraftwerk der E3/DC vorhanden sein.

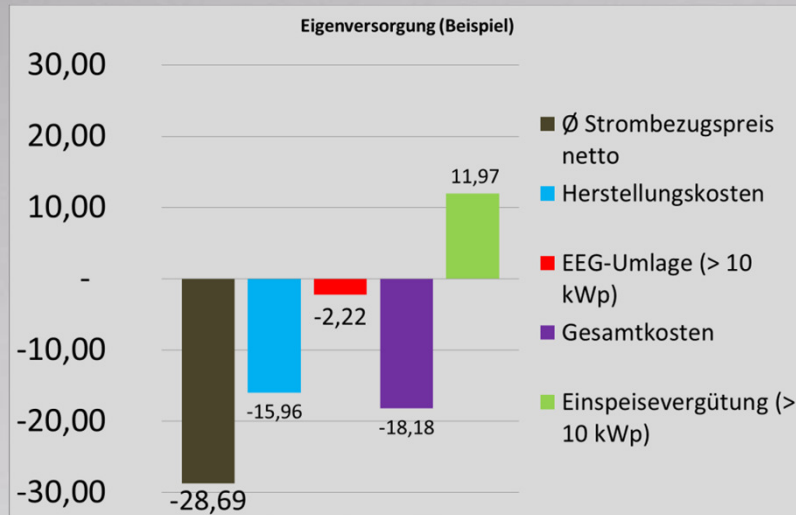
TriLINK® 2.0



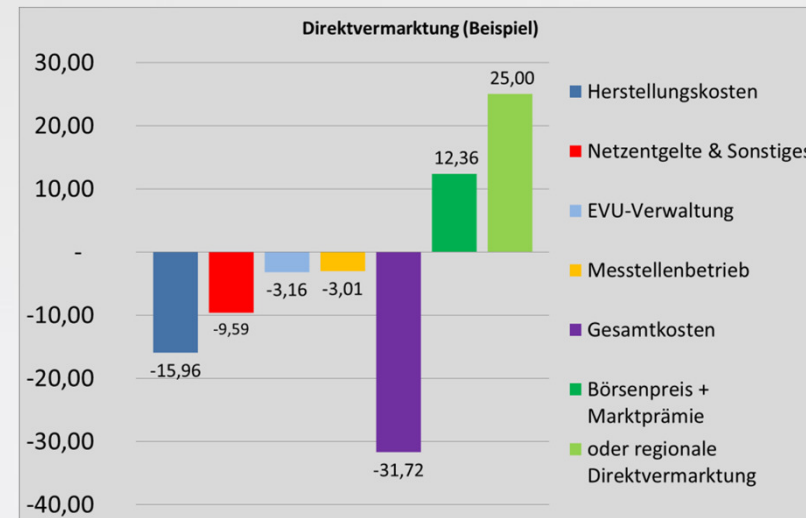
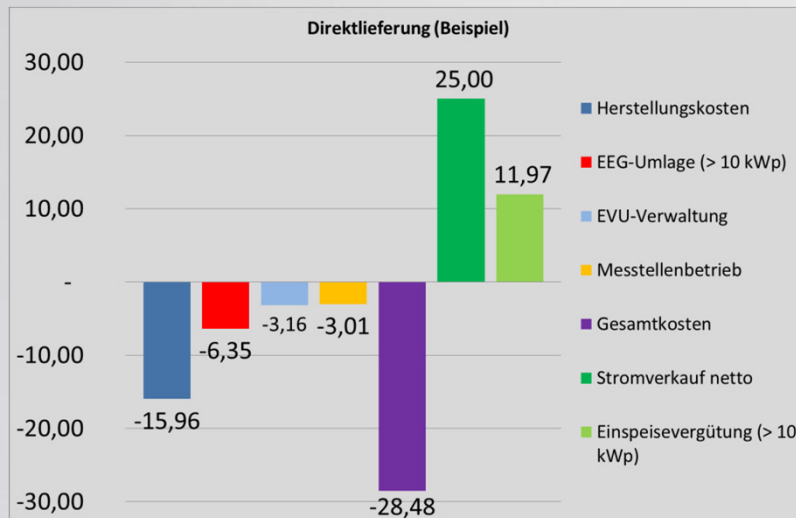
**Unterbrechungsfreie 3ph 63A
Netzumschaltung E3/DC**

Neuheit 2016

Profitable Geschäftsmodelle (Eigenstrom)



Mit Speicher eher unwirtschaftlich Geschäftsmodelle



Electric Vehicles



- AC intelligent charging up to 22kW (Standalone Q4 – 2016)

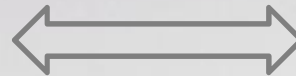


- 12kW DC charging@home; 12kW DC discharging@home

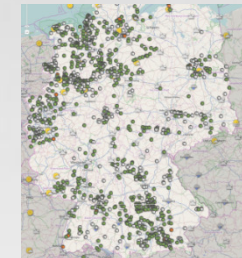
Automation/Schnittstellen



1 RSCP Web S10E/M



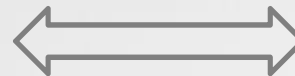
Bidirectional Realtime Control for single system / fleet



2 Onboard Home S10E/M Automation (USB Eaton)

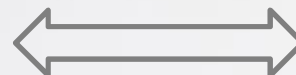


3 ModBus TCP S10E/M (SW Update März 2016!)



LOXONE
u.v.m.

4 SG Ready ab Juni 2016 (onboard S10E)



Quelle: myGEKKO

Complete product range E3/DC (2017)



- String Storage**
- **1.5-3.0kW DC**
 - Capacity up to **9.2kWh netto** (up to 4 modules)

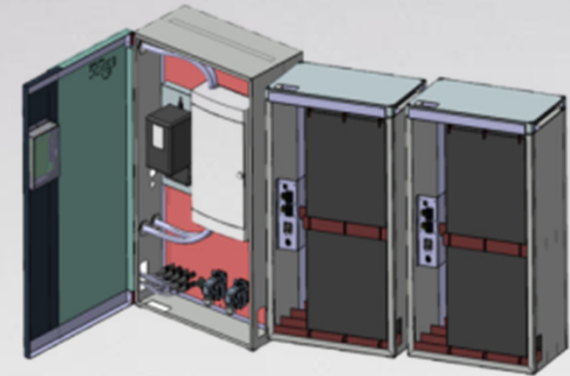
Neuheit Ende 2016 / 2017



- S10 MINI M4**
1ph (measure is 3ph)
- **4.6kW AC**
 - **1.5kW DC battery**
 - **7.5kW DC PV**
 - Capacity up to **9.2kWh netto** (up to 4 modules)



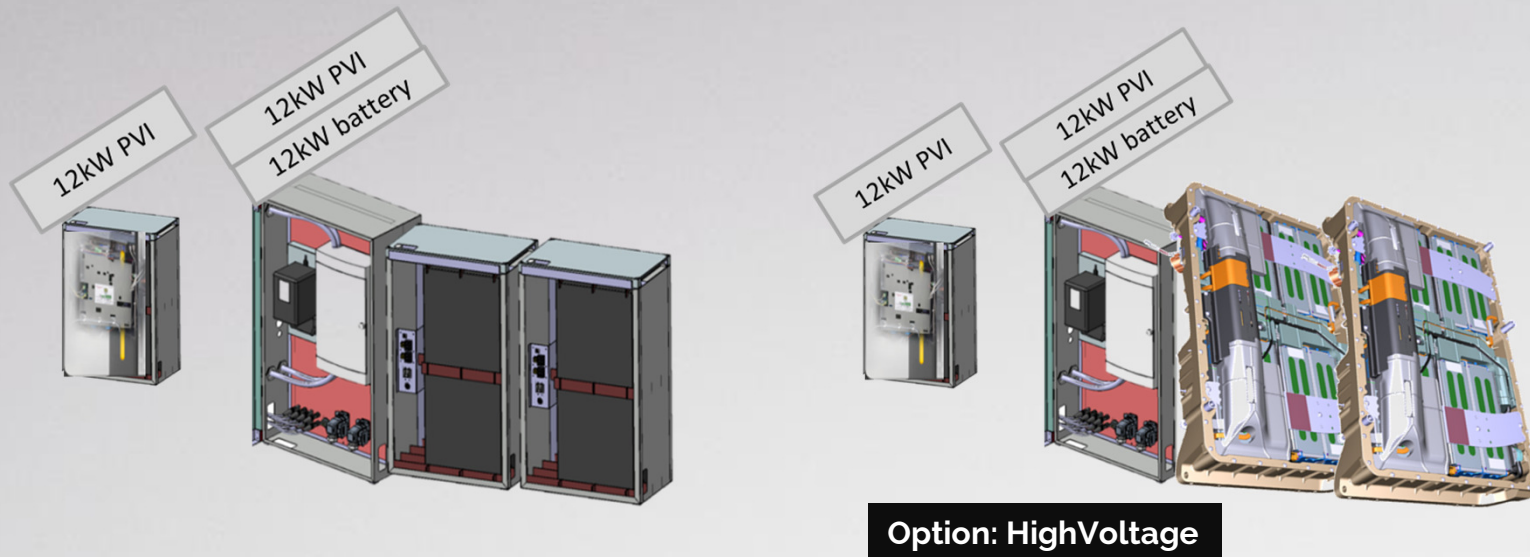
- S10 E12 AI**
3ph
- **12kW AC**
 - **3kW DC battery**
 - **15kW DC PV**
 - Capacity up to **13.8kWh netto** (up to 6 modules)



- S10 commercial 3ph**
- **2x12kW AC**
 - **2x12kW DC battery**
 - Capacity up to **100kWh netto** (up to **12-16** modules)
 - **2 battery sets**

Neuheit Mitte 2017

Target: 2017-2018 **best commercial solution up to 100kWh**



- 20 years warranty approach (spare battery concept)
- **Best profitability** by best architecture / efficiency
- **Best Emergency power** up to 12kW 3ph!
 - up to 100 kWh storage
 - 12kW battery power per unit

Summary

- Learning curve done – profitable company!
- Proven business, reliable people, conservative shareholder (100% EWE AG)
- Best reputation at customers and best technology strategy
- String storage and commercial storage as new products 2017