

A clean switch to clean energy World's first energy autonomous multi-family home

F-Cell and BATTERY+STORAGE

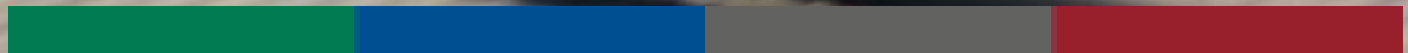
K2: Sector coupling – Potential markets for fuel cells and batteries (11th October)

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Proton Motor Fuel Cell GmbH is an complete energy solutions provider with A focus on developing and manufacturing LT-PEM fuel cell systems

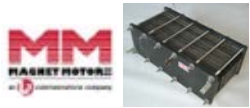


- PEMFC development since 1994 (Magnet Motor),
- PM founded 1998 as independent company,
- Today 75 employees.
- Focus on providing complete energy solutions in maritime, transport and stationary applications



- Proton Motor Fuel Cell GmbH, Headquarters Puchheim
- Production plant, labs & offices on ca. 6000 m².
- Complete development cycle from feasibility studies to delivery on onsite training

Proton Motor History



Start development of Fuel Cell Technology

1994



Bayernbus set into operation

2000



Foundation Proton Power Systems PLC

2006



World first Triple Hybrid City Bus

2009



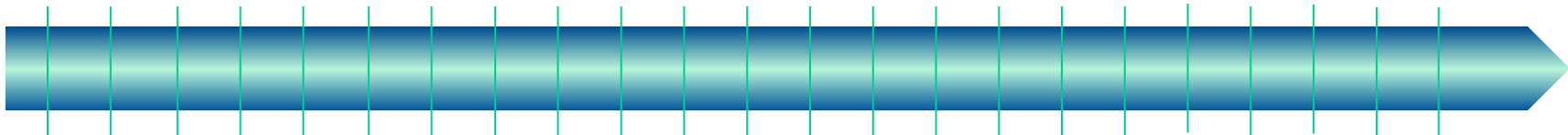
EPS System installed in Bachhausen

2012



Cooperation with Deutsche Bahn Bau Gruppe

2015



1998

Foundation Proton Motor Fuel Cell GmbH



2001

World first Fuel Cell Fork Lift



2008

Fuel Cell Ship "Alsterwasser" in operation



2011

Road approval Newton with HyRange®



2016

Energy autonomous House, Brütten



2016

Presentation of FC REEV vehicle





When is a house energy self-sufficient?

For the first energy self-sufficient house in the world:



The sun is the only external energy source



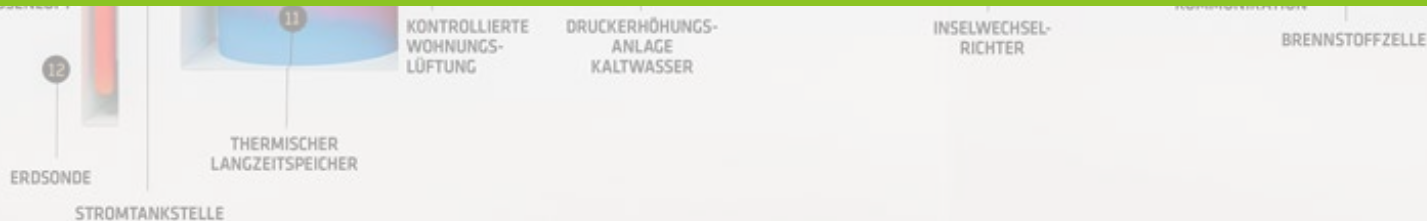
The building requires no external energy source such as domestic diesel, no current, no natural gas or wood



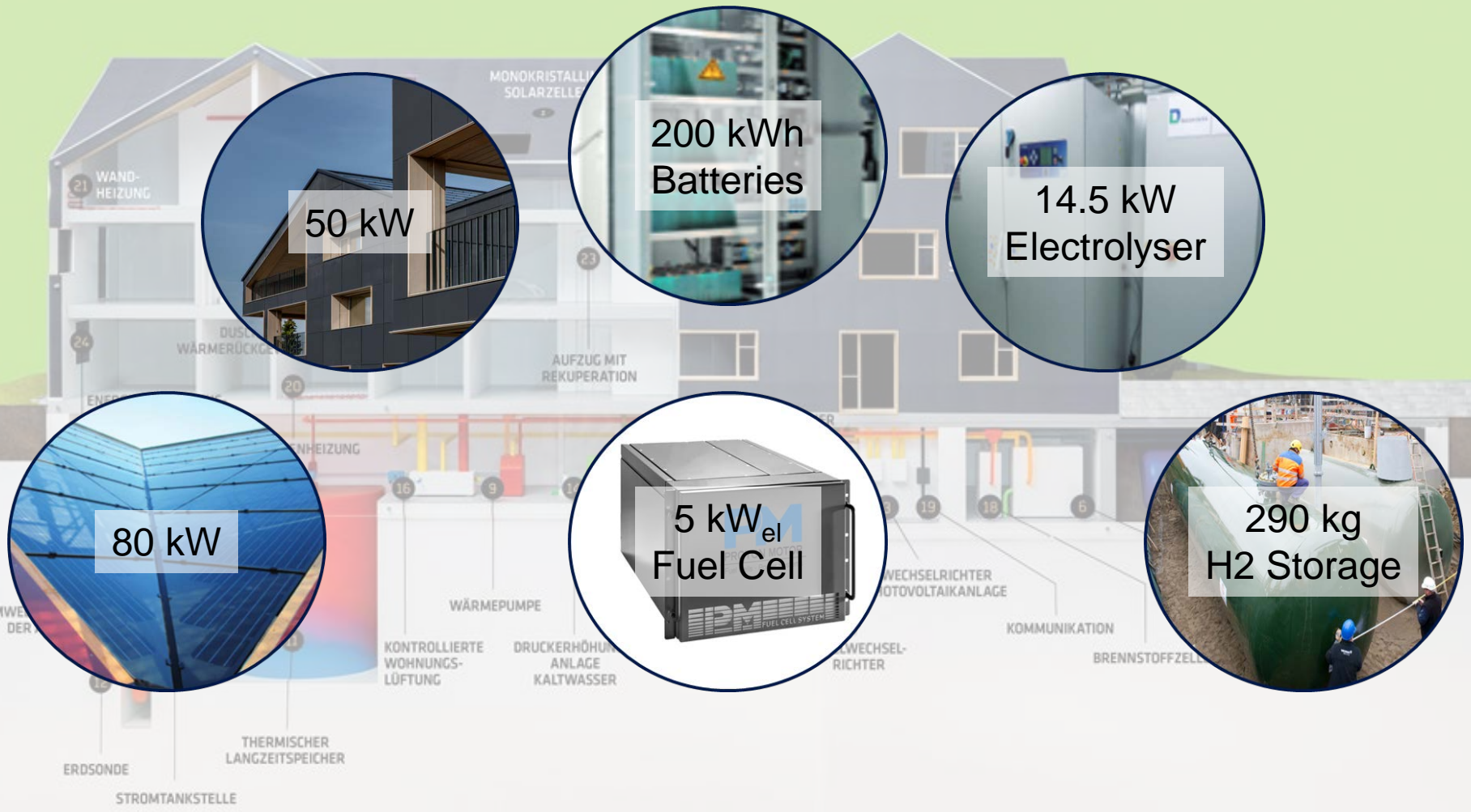
The building requires no connections to the power grid



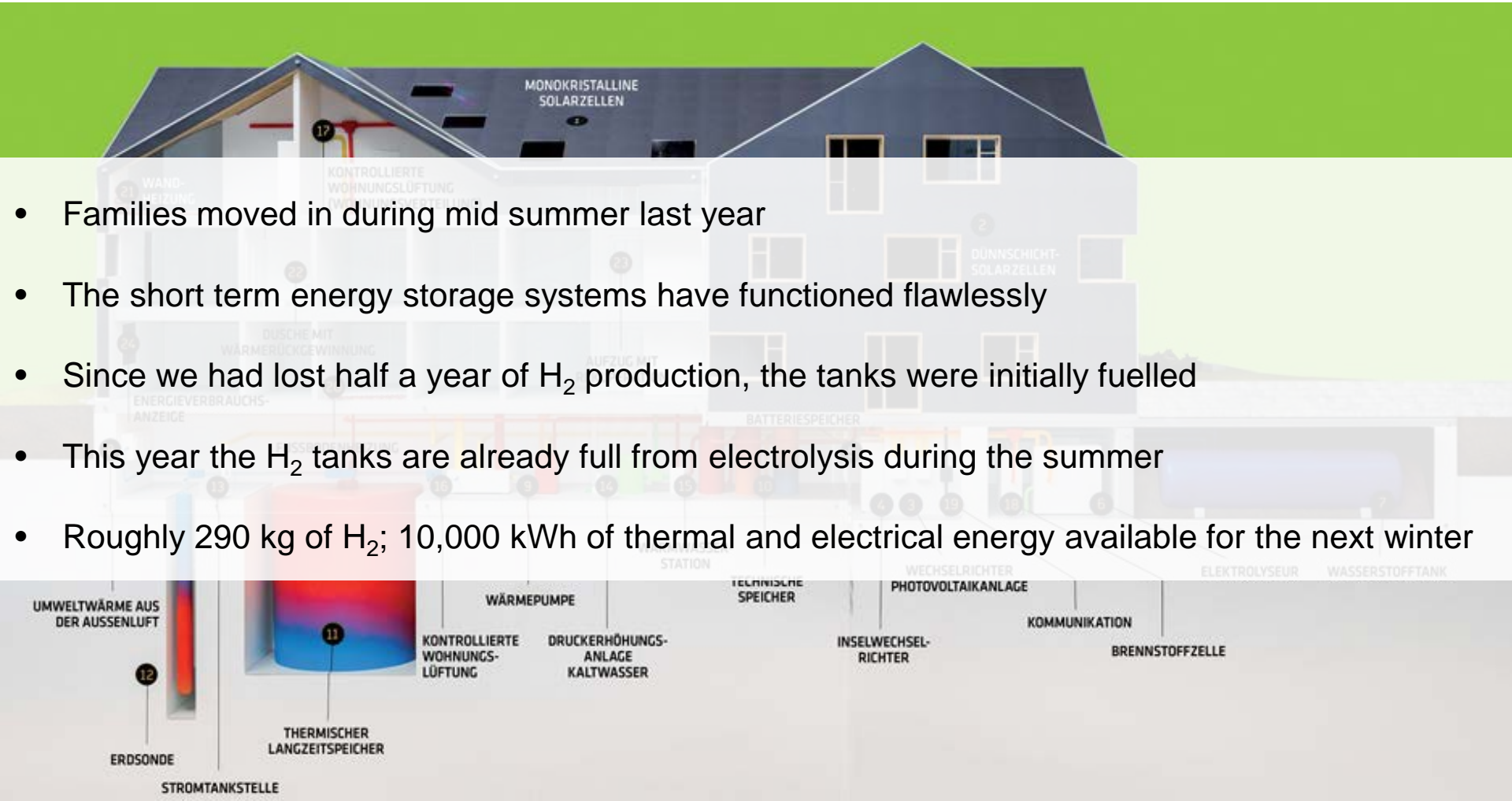
All the energy required by residents (including for domestic and transport purposes) is produced and stored within the house



Autonomous Energy Concept

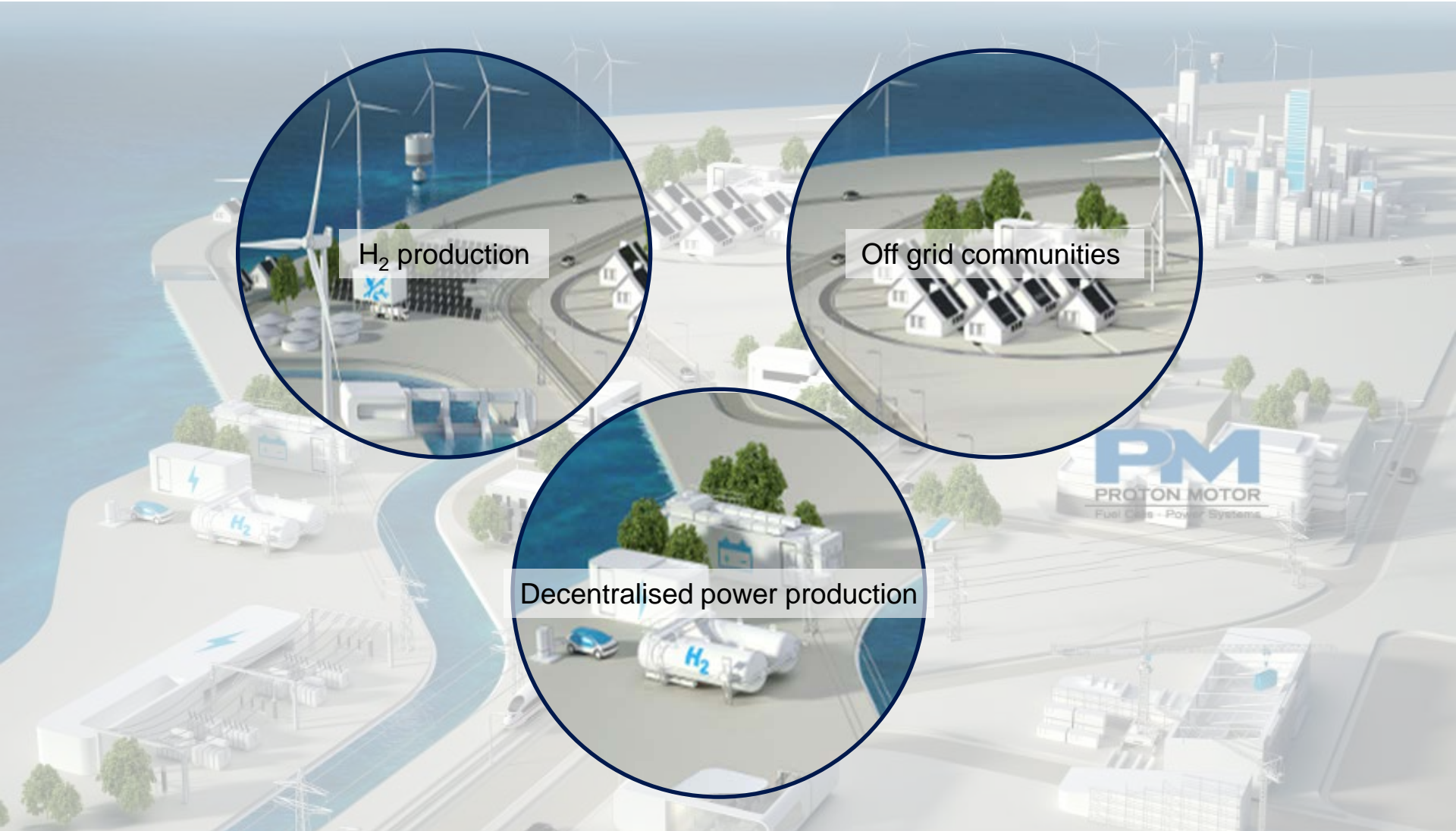


What has happened so far



- Families moved in during mid summer last year
- The short term energy storage systems have functioned flawlessly
- Since we had lost half a year of H₂ production, the tanks were initially fuelled
- This year the H₂ tanks are already full from electrolysis during the summer
- Roughly 290 kg of H₂; 10,000 kWh of thermal and electrical energy available for the next winter

What could be next ?



H₂ production

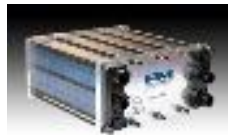
Off grid communities

Decentralised power production

PEM-Stacks

PM200

PM400



Automotive – Stationary –
Maritime

Developed by Proton Motor
Manufactured in Germany

Power Range

2 .. 35 kW_{elect.}

PM Module

S3 / 5 / 6 / 8

S25



Stationary applications

UPS applications

Parallel operation possible

Nominal Power Range

3 / 5 / 6 / 8 and 25 kW_{elect.}

HyRange[®]

HyRange25



Automotive applications

Range – Extender (electric drive)

Logistic and public transport

Nominal Power Range

25 kW_{elect.}



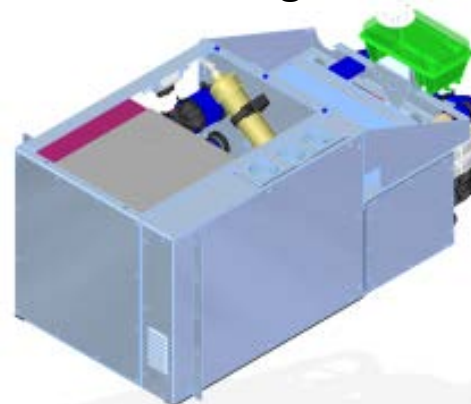
PM Module S25 (PM400 inside)

Stack Module



Dimensions: 881 x 445 x 408 mm
Weight: 108 kg

Air / Cooling Module



Dimensions : 930 x 445 x 409 mm
Weight: 147 kg

Nominal power	25 kW
Peak power	30 kW
Min power	4 kW
Output current	50 to 500 A

Output voltage	50 to 110 V DC
Ambient temperature	3°C to + 55°C
Comm. interface	CAN v2.0A
Conformity	CE conformity

Thank you for your attention!



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