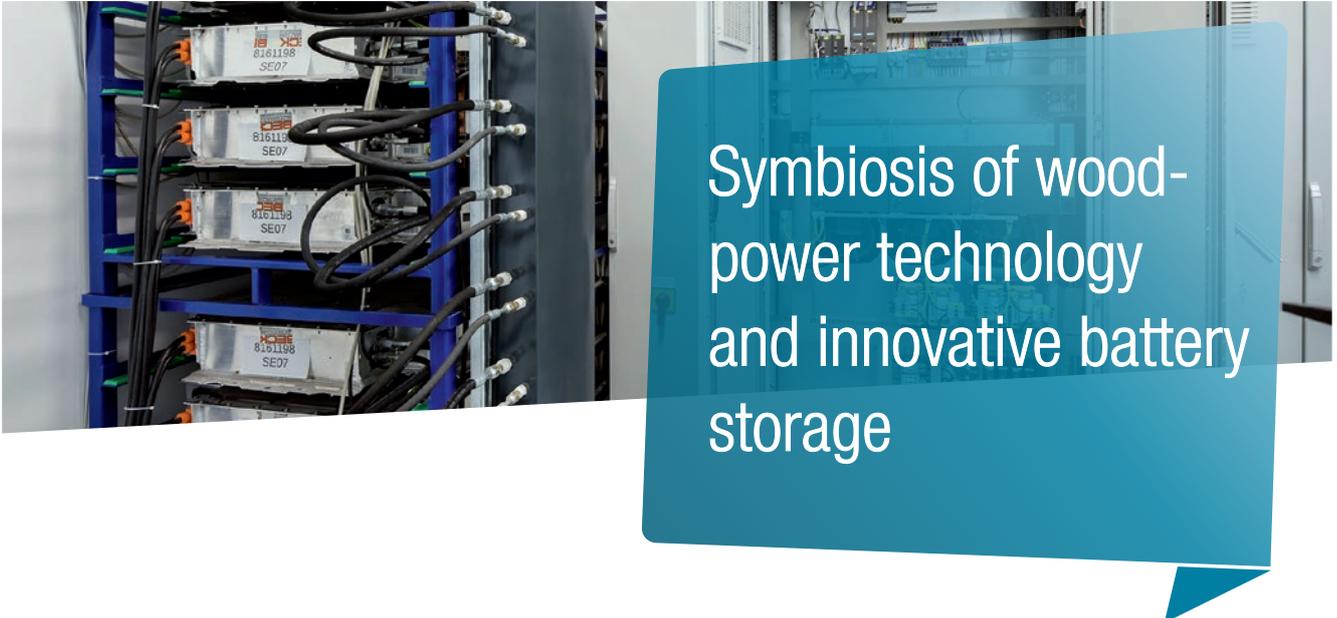


## SPANNER RE<sup>2</sup> – REFERENZ-CASE



Symbiosis of wood-power technology and innovative battery storage

### Smart energy management ensures that industrial enterprises will benefit from a reliable and profitable electricity supply

Optimizing energy costs, making energy consumption more sustainable and testing new and commercially successful concepts – that's what Spanner Re<sup>2</sup> has been doing since the company was first founded. The market leader is operating production facilities in Neufahrn (Lower Bavaria) and looks back on more than ten years of expertise in wood-based combined heat and power units. The company provides the whole world with sustainable wood gasification technology, even the most remote regions of Canada or Japan. Constantly searching for innovative energy concepts, Spanner Re<sup>2</sup> has found the ideal partner for optimizing its own digital energy management: Digital Energy Solutions.

### Overview of the pilot project in Neufahrn

- Complex 4-year field test
- The key focus is on island operation and the reinforcement of self-sufficiency and the self-sufficient energy supply of industrial enterprises
- Perspective – establishment of reliable electricity networks for customers with challenging environmental conditions
- Building a local smart electricity network from renewable energy sources and innovative methods of storing energy
- Digital network management and control of energy consumption by Digital Energy Solutions
- Early approval by the network operator despite complex requirements
- Energy Monitor combines all components into an integral system

## SPANNER RE<sup>2</sup> – REFERENZ-CASE

### Products and solutions applied



#### Energy Monitor

Energy Monitor is a software solution enabling better transparency of energy flows and costs.



#### Re:Flex storage solutions

Re:Flex storage solutions are based on a combination of hardware, smart management and services.

### Project pictures



#### Spanner Re<sup>2</sup>: Electromobility in Neufahrn

Self-generated electricity produced by the photovoltaic system and block heat and power plant (BHKW) is used to recharge Spanner Re<sup>2</sup>'s e-car in Neufahrn. The charging station is made available to visitors as well.



#### Spanner Re<sup>2</sup>'s EnergyBlock

Spanner Re<sup>2</sup>'s Energy Block is a turnkey container solution for generating electricity and heat from wood. As part of the Digital Energy Solutions project, the EnergyBlock used has an output of 45 kW<sub>el</sub> and about 102 kW<sub>th</sub>.



#### 62 kWp photovoltaic system

According to the assessments made, Spanner Re<sup>2</sup>'s total energy consumption is 240,000 kW hours per annum. The photovoltaic system chosen based on this assessment will be a Viessmann Vitovolt, with a capacity of 62 kWp.



#### BMW i3 high-voltage batteries

The sustainable self-generation of electricity based on photovoltaics and the combined heat and power unit has been optimized by innovative BMW i3 high-voltage batteries with a system output of 280 kW and integrated peak load shaving.

## SPANNER RE<sup>2</sup> – REFERENZ-CASE

### Detailed report

The pilot project is designed to run for a period of four years. The project partners aim to reduce Spanner Re2's total energy consumption, to control consumption in an intelligent manner and make it more sustainable. With the establishment of a local smart electricity network feeding on renewable energy sources and an innovative energy storage system managed via digital network management and digital consumption control, a complex field test is currently in its trial phase. Isolated operation plays a special role in this project as Spanner Re2's main focus is on self-sufficient energy solutions. The first test runs in different application scenarios are boding well.

#### Successful deployment of all components

Since the start of the project in late 2016, Digital Energy Solutions has been analyzing Spanner Re2's energy consumption by real-time visualization. The assessment of total energy consumption resulted in 240,000 kW hours per year. Energy generating units were chosen based on this outcome: on the one hand, the 62 kWp Viessmann Vitovolt photovoltaic system, and on the other hand, Spanner Re2's EnergyBlock, a turnkey container solution generating electricity and heat from wood with an output of 45 kW<sub>el</sub> and about 102 kW<sub>th</sub>. This kind of sustainable self-generation of electricity has been optimized by an innovative battery storage system with an output of 280 kW and integrated peak load shaving. Island inverters for island operation are used to control a total of seven BMW i3 high-voltage batteries. All units are connected by the software solution Energy Monitor developed by Digital Energy Solutions to create an integral system. Digital Energy Solutions has successfully installed all units and completed deployment in October 2017.

#### Early approval by network operator

The project team quickly solved the problems that initially emerged by applying network operator Bayernwerk's accounting concept for measuring. The increasing use of innovative storage technologies has turned the traditional energy industry upside down due to the generation and consumption of energy in real time. Accounting and compensation for feeding energy into the battery from different energy sources is a challenge. What matters most to network operators is: where does electricity come from and where does it go to? So far, regulators have stipulated that a battery providing electricity is considered an energy generating unit and a battery feeding in electricity is considered an energy consuming unit. The project was delayed

because distribution network operators had modified the definition with regard to electric mobility requirements in the summer of 2017. As a result, the early approval by network operator Bayernwerk is a great success for the project partners as they were given the green light even before official recommendations for actions were made and published by the Federal Association of the Energy and Water Industry (BDEW).

#### Island operation supplies site with energy

Digital Energy Solutions is planning to test a variety of application scenarios during the course of the project. After maximizing the self-consumption rate of the photovoltaic system in combination with the combined heat and power unit, the main focus now is on island operation. The complex system design proves that the self-sufficient supply of the industrial enterprise is possible by linking battery storage to the combined heat and power unit. The peak shaving test scenario which prevents peaks in electricity consumption by reducing and consequently balancing peak loads has also been off to a successful start. That is significant not only for network reliability, but also for the costs of buying electricity: network use charges account for a large proportion of the costs and are, among other aspects, based on the highest rate of consumption in the billing period. The battery storage device used at Spanner Re2 enables the advanced peak load management of the integral system which will contribute to substantial cost savings in the future.

## SPANNER RE<sup>2</sup> – REFERENZ-CASE

### Raising the potential of sector coupling

The next project steps for 2018 include the integration of charging stations into smart load management, enabling Digital Energy Solutions to integrate electromobility solutions into the integral project. Sector coupling is of particular interest to Spanner Re<sup>2</sup>: “The wood-based generation of electricity and heat is our core focus, but beyond that we are also interested in the potential resulting from the fluctuating integration of solar energy into the integral system and its use for e-mobility“, explains Bernhard Seiler.

### Gaining valuable experiences for future energy management

Digital Energy Solutions’ team has been in close contact with Spanner Re<sup>2</sup> since the project’s planning phase to ensure interface management. Successful management of the systems in the future ultimately depends on the customer’s realistic understanding of the process. Moreover, Bernhard Seiler has been gaining valuable experience from the project: “Constant feedback from Digital Energy Solutions is very helpful as the team is more aware about how to better and constantly utilize our systems.“ The future of energy management is off to a successful start at Spanner Re<sup>2</sup>.

“Spanner Re<sup>2</sup> is a strong player in regions where wood is readily available, electricity networks are poor, and the transport of diesel as a fuel for energy generation is difficult.“

Bernhard Seiler, Head of Overall Systems,  
Spanner Re<sup>2</sup>

Do you have any questions about the issues covered in this report? Please contact us:

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