

sonnen

energy is yours

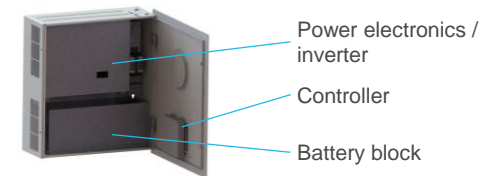
Which business opportunities does storage offer?



State-of-the-art storage solutions go well beyond a dumb box of batteries

» Best possible system performance

- » Fully-integrated storage systems with perfectly synchronized components
- » Safest and most suitable cell technology for behind-the-meter storage currently available (Example of sonnen: LFP battery with 10,000 cycles @ 100% DoD)



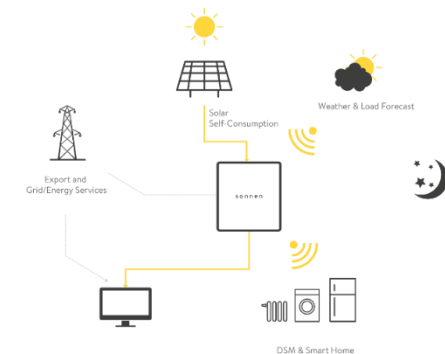
» Superior customer experience

- » Plug & Play – quick and easy to install/one-man mountable
- » Online monitoring – system operator must know if something goes wrong before the customer does
- » Remote control – Customers can easily control system via app



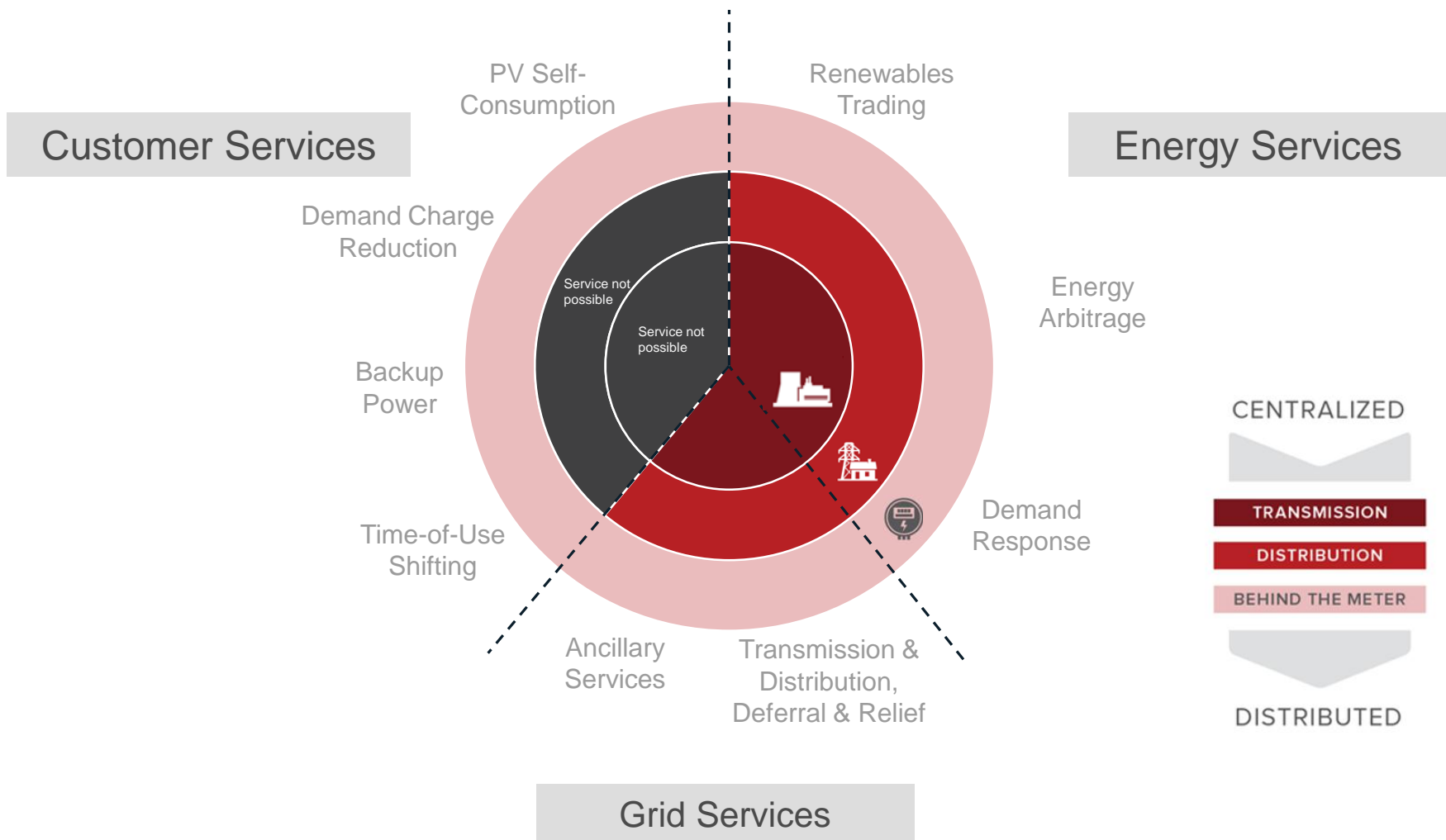
» High software intelligence

- » Increased PV self-consumption through self-learning algorithm, use of weather forecast data
- » Tariff optimization (T-o-U Shifting, Demand Charge Reduction)
- » DSM & Smart Home functionalities
- » VPP ready



Storage business opportunities

Overview



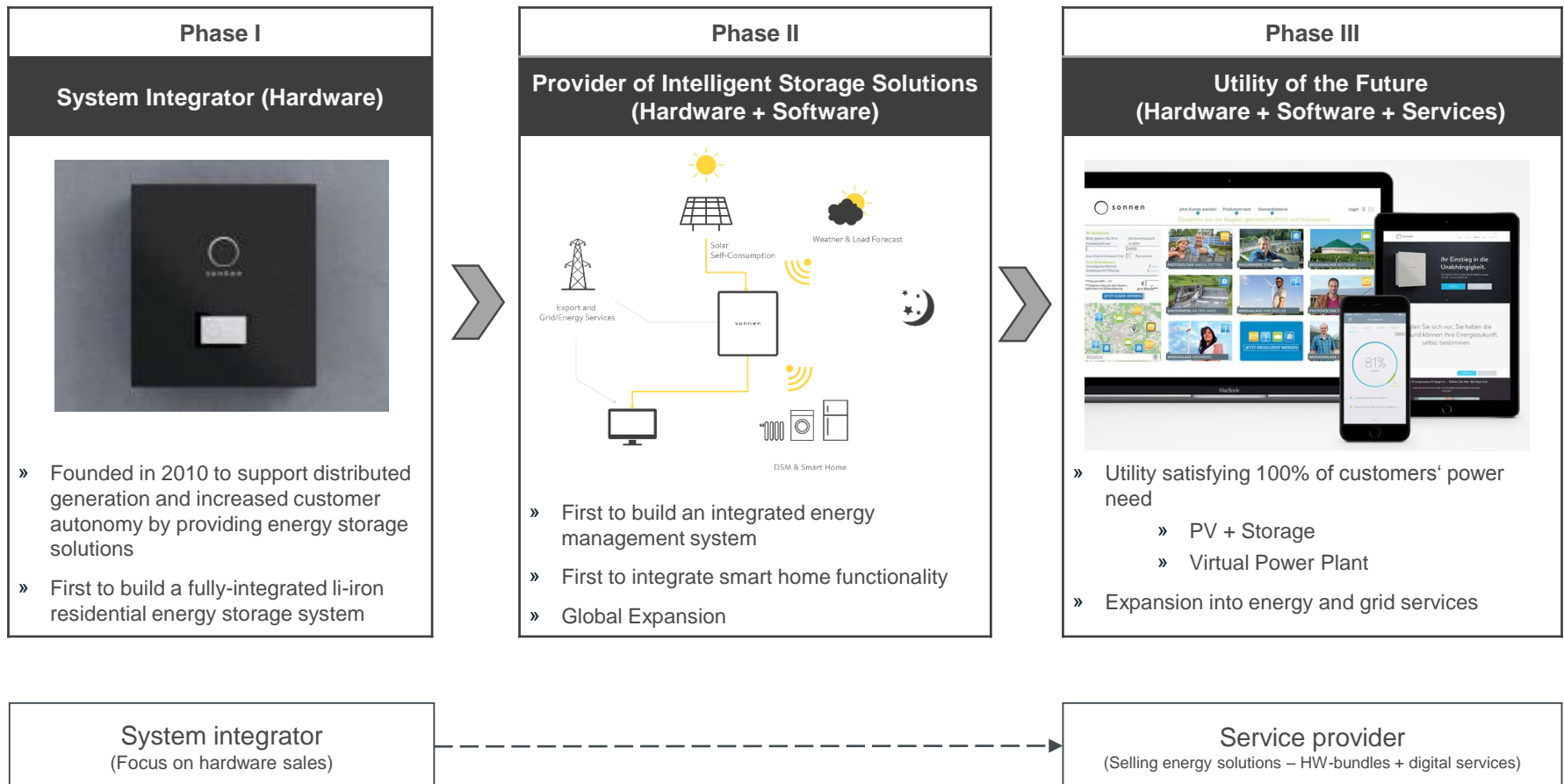
Source: Rocky Mountain Institute (October 2015)

September 2016

sonnen GmbH

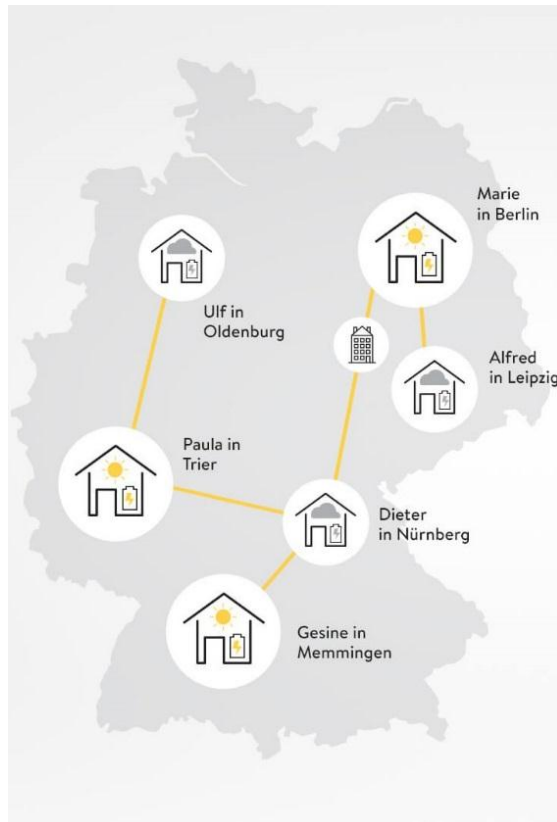
Innovative storage players lead the way towards the Utility of the Future ...

Steps in the development of sonnen from its foundation in 2010 until today:

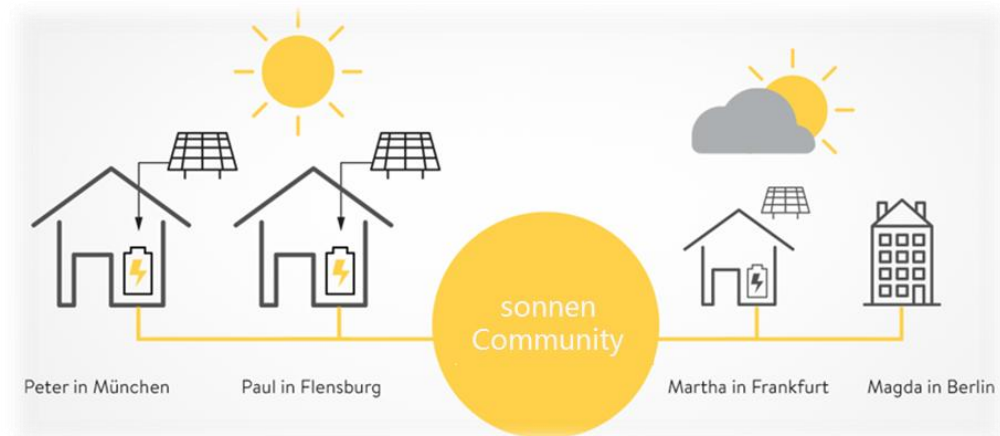


sonnenCommunity - Creating the Utility of the Future Sharing Platform





First of its kind decentralized Energy Sharing Platform connecting small scale assets

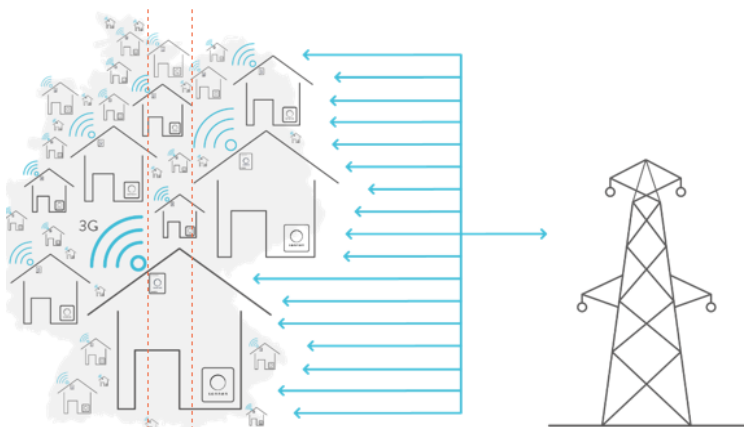


- » Producers and consumers form a virtual electricity pool
- » The intelligent software platform balances supply & demand within the community
- » Produced energy will be shared online, which enables 100% independence of conventional utilities.
- » Small and medium producers can take part in energy Trading & Grid Services
- » Opportunity to achieve additional income / Savings



sonnenFlat – Zero Electricity Costs for Storage owners

 kWp	5,5	7,5
 kWh	6	8
Maximum electricity consumption/year	 4.250	 5.500



sonnenBatteries with sonnenFlatBoxes

Real-time electricity supply and consumption to improve grid stabilization

- » sonnenFlat is a new sonnenCommunity power tariff which guarantees zero electricity bill to customers depending on annual consumption, PV and Storage Size
- » sonnen becomes the first utility to create a VPP business model that integrates residential storage systems for Grid Services
- » The installed sonnenBatteries communicate via the sonnenFlat-Box with local transmission operator and respond to frequency variations
- » Additional revenues from frequency response services cover the customers remaining electricity cost
- » Proven technology enables battery response within seconds and prepares sonnen to participate in various energy markets



Take-aways

- » Energy Storage will enable utilities and grid operators to benefit from numerous business opportunities by providing customer, grid and energy services
- » Customer service business opportunities can only be exploited in connection with a “Behind-The-Meter” residential storage solution. Such storage solutions should be highly integrated, intelligent systems which can be managed and controlled remotely
- » The aggregation of storage systems into a virtual power plant is key to offer energy & grid services. Virtual power plants will decentralize energy production and in return will offer cost savings and business opportunities to utilities and grid operators
- » The Utility of the Future will be built around storage