ENERGIE CONSULTING
ERNEUERBAR ERGEBNISORIENTIERT EFFIZIENT

Development and Perspectives of the German Energy Storage Industry – an Industry Analysis 2021

Online Event: Energy Storage Technology

大成 DENTONS

June 29, 2021

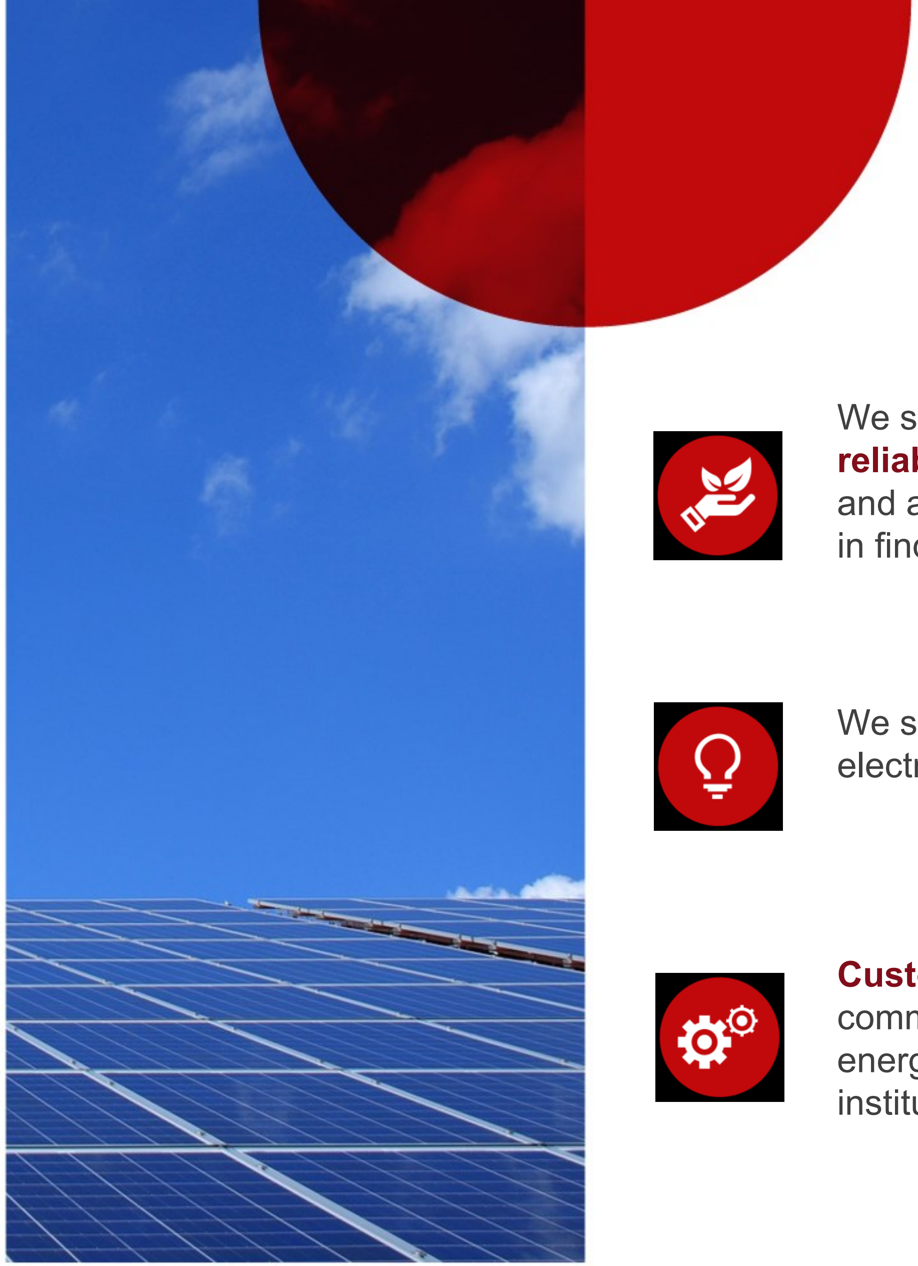
BVES
Bundesverband
Energiespeicher
Systeme e.V.

WHO WE ARE

We see ourselves as a **consulting firm** of the energy industry for strategically operative tasks coming from a strong practical background

2019 foundation of a joint venture with shareholders based in Germany

We have **long track record of industrial experience** in many different areas along the value chain of the energy business and management consultancy



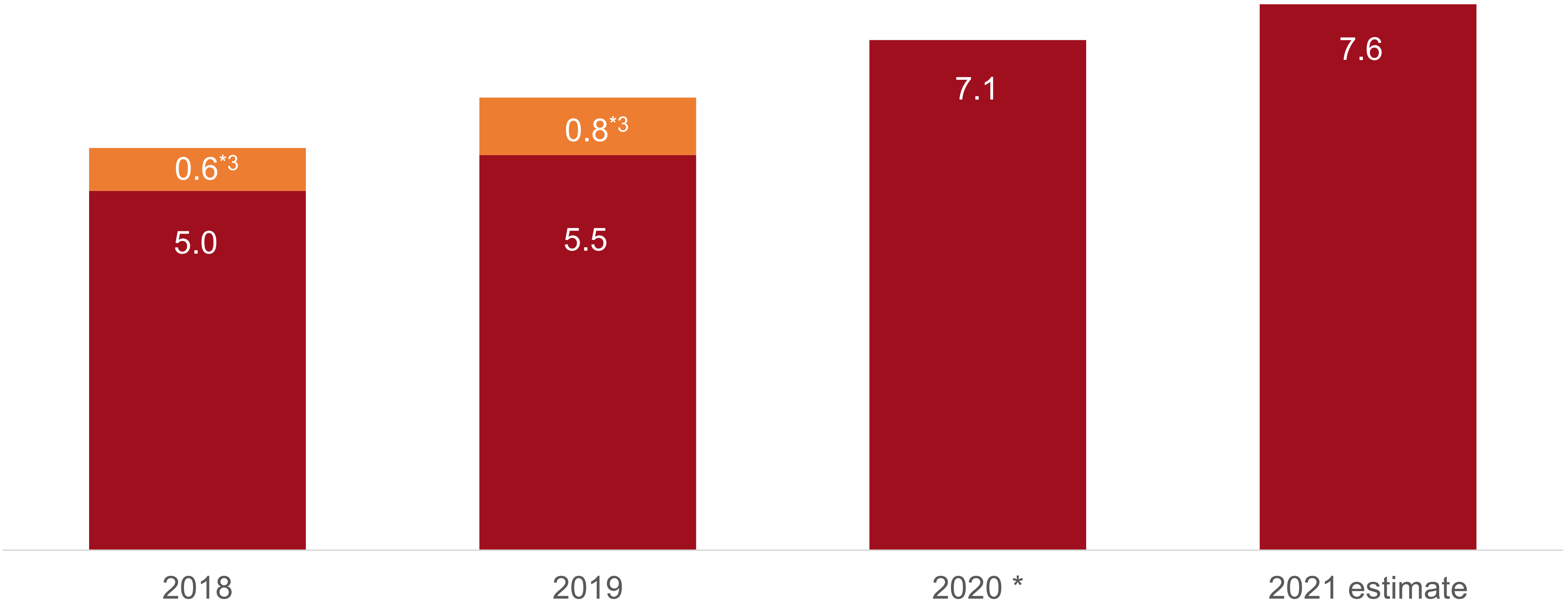
We stand for **values such as reliability, loyalty and sustainability** and are innovative and unconventional in finding solutions for our customers

We see our **tasks** primarily in the electricity and gas industries

Customer basis: industrial and commercial enterprises as well as energy supply companies or public institutions

Growth in Energy Storage despite the Corona Crisis

Turnover of the Energy Storage Industry*2 Germany 2018 - 2021 (in. € Billion)



* provisional
*2 Turnover of companies based in Germany incl. export
*3 Conversion of basis of calculation

Source: Analysis 3Energie Consulting

on behalf of BVES

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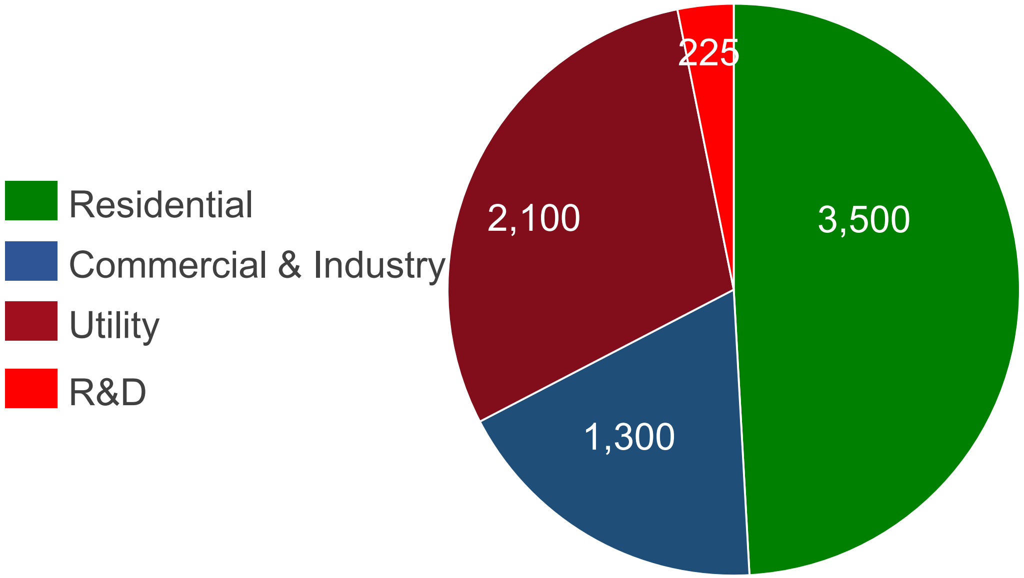
Development of Sectors

Turnover per sector of the Energy Storage Industry* in Germany 2020 (€ Million)



∑ 7.1 Billion EUR *

Source: Analysis 3Energie Consulting

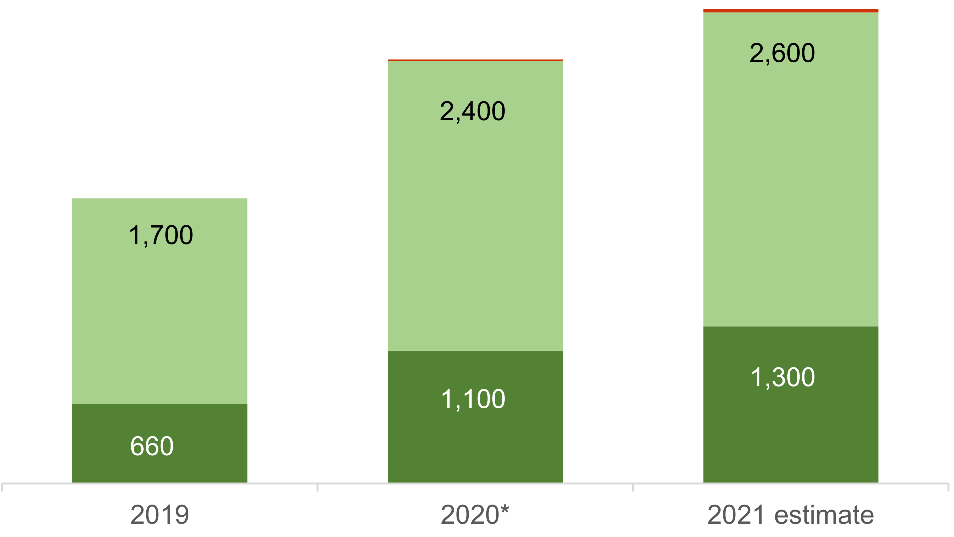
* provisional

Development in 2020

- Residential segment again has the largest market share in the energy storage industry. Increased growth in the area of home batteries and thermal storages
- Utility segment at the stable level of the previous year. Pump storages continue to dominate this segment
- Energy storages for the segment commercial & industry due to the corona pandemic with a significant decline in sales, sales recovery expected in 2021
- First business approaches for hydrogen (integrated into the segments), however, "lighthouse projects" such as real laboratories are still dominant

Residential Segment: The Growth Driver for Energy Storages

Turnover 2020 Residential Segment (Million €)



* provisional

Source: Analysis 3Energie Consulting

Development in 2020

- Corona-related topics such as resilience, self-sufficiency and security of supply are the actual drivers and strengthen the household segment as well as the commercial and retail sector
- Sector coupling is entering the end customer market - first hydrogen-based energy concepts for household applications with increasing growth expected in the years to come

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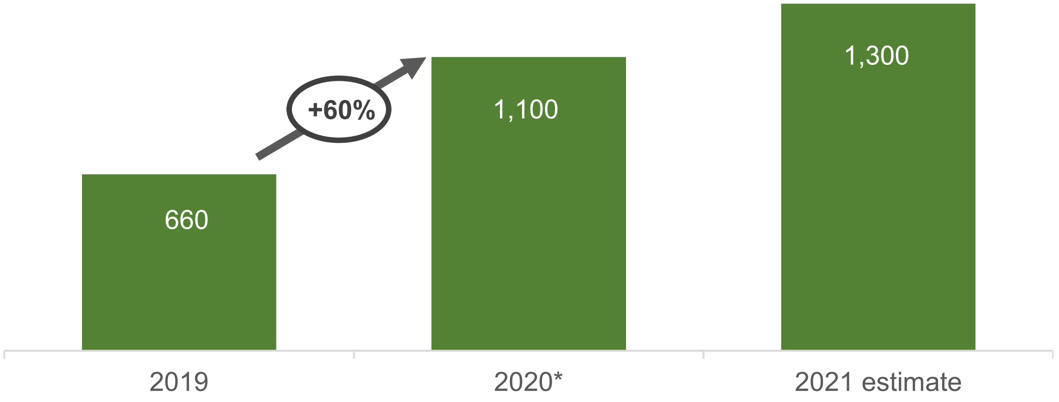
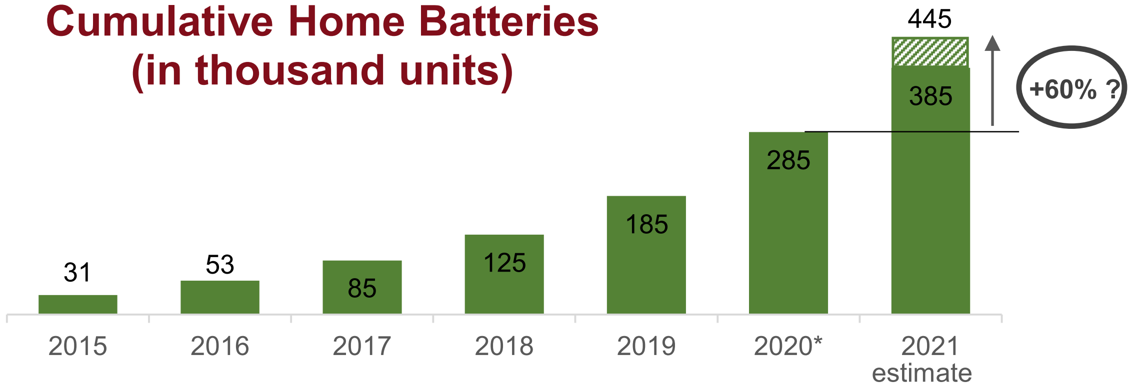
Residential Segment: Home Batteries with rapidly increasing Turnover

Turnover Home Batteries (Million €)



Source: Analysis 3Energie Consulting

Cumulative Home Batteries (in thousand units)



* provisional

Source: Data ISEA RWTH Aachen; Analysis and estimation 3Energie Consulting

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Development in 2020

- The threat of reaching the 52 GW solar subsidy limit and the elimination of this limit has given the PV and home storage market additional impulse
- Almost 70% of the PV systems are built with home storage
- Storage size is growing slowly but steadily (from an average of 8 KWh in 2019 to 8.5 KWh in 2020)
- Strong growth path is also expected for 2021, the drivers being the increasing demand for e-mobility and the PV expansion. This will benefit from the EEG exemption for increased PV power and storage power (30 KWp)
- The market is focused on increasingly larger providers.
- Installed capacity grows to 2.3 GWh by the end of 2020

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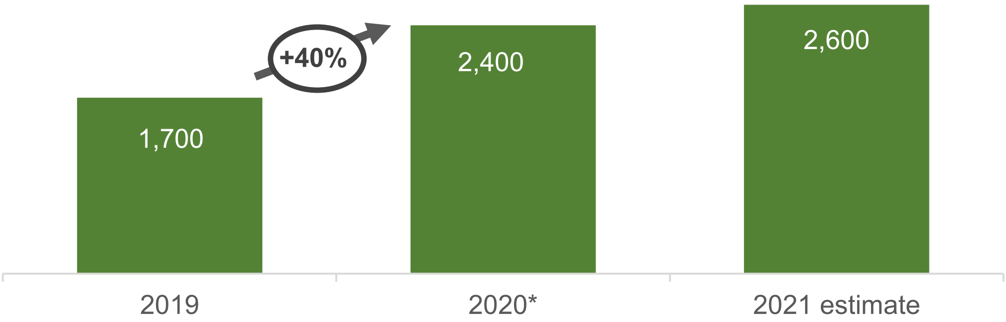
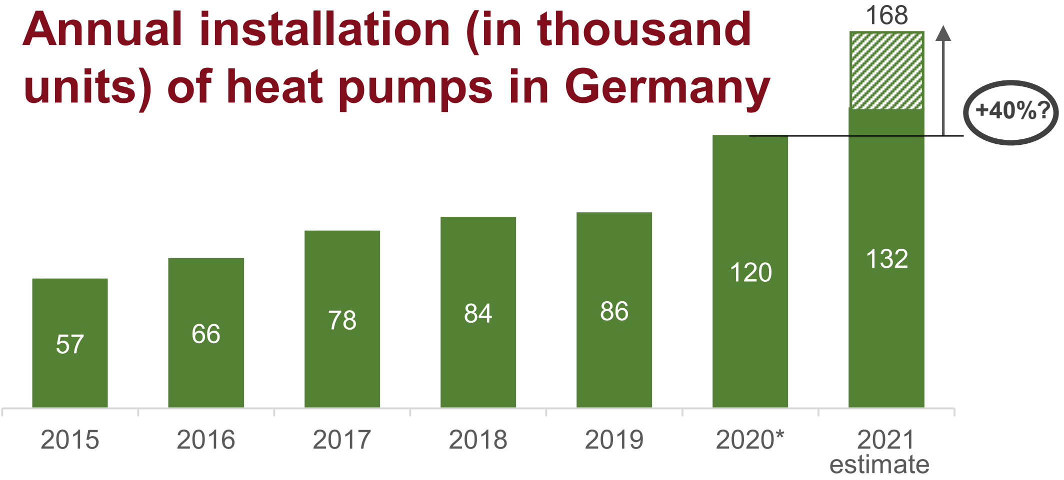
Residential Segment: Strong Growth in Thermal Storages

Turnover of Thermal Storages (Million €)*1



Source: Analysis 3Energie Consulting

Annual installation (in thousand units) of heat pumps in Germany



Source: Data BWP; analysis 3Energie Consulting

Development in 2020

- End of funding for oil heater replacement in 2020 main driver of sales growth; 30% of subsidized heat pumps came from this program
- Trend 2020: The proportion of heat pumps in new buildings is declining, but significantly increasing in existing buildings
- Trend 2021: The introduced CO_2 tax is regarded as an additional driver for an increased expansion of heat pumps
- This development must be strictly considered in the industry and craft segment

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* provisional
*1 incl. Heating pumps

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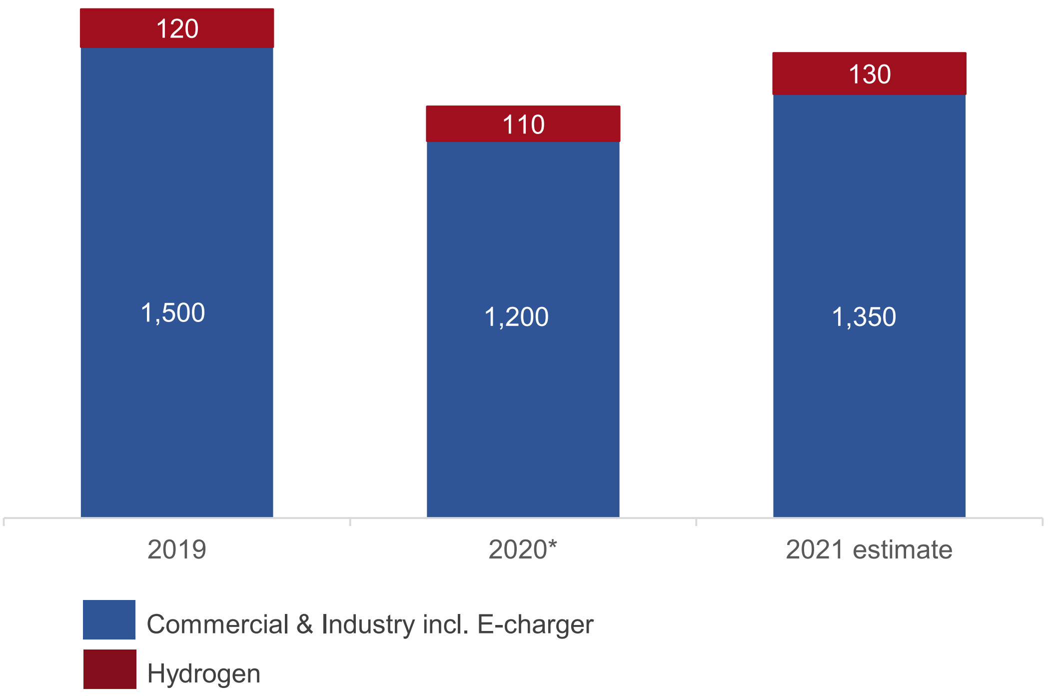
Commercial & Industry: Decline in Sales in 2020

Turnover Energy Storages for Commercial & Industry (Million €)



* provisional

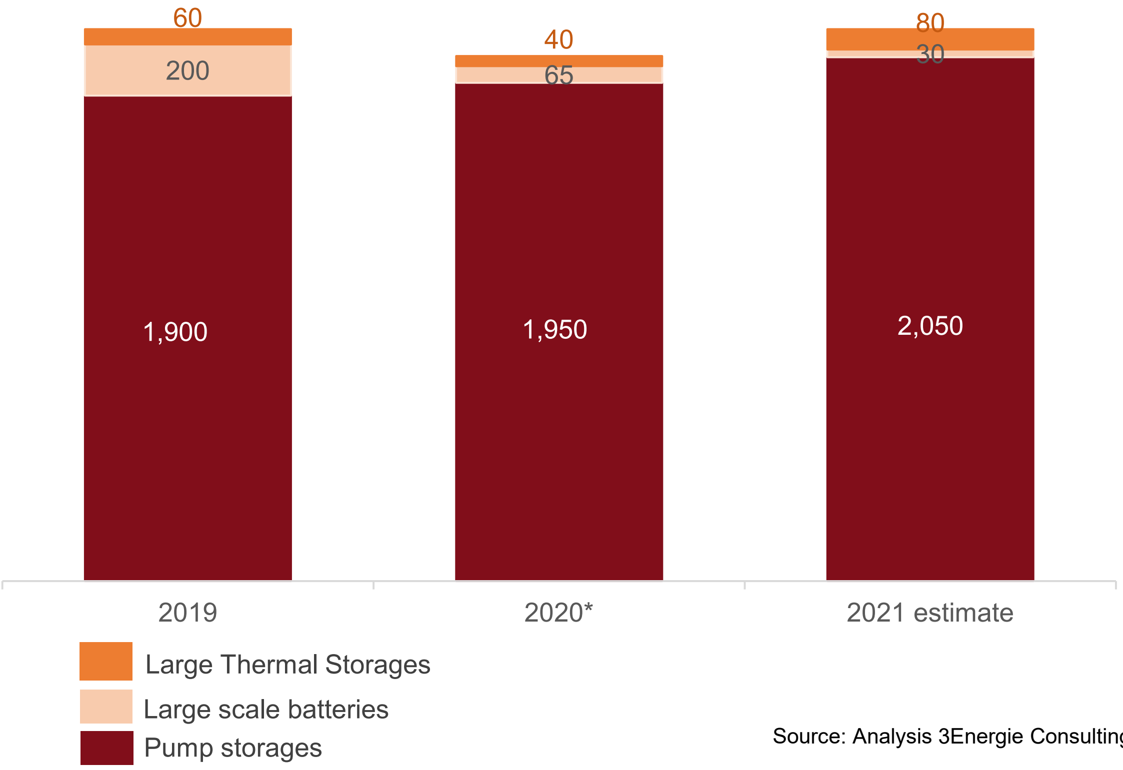
Source: Analysis 3Energie Consulting

Development in 2020

- Around 20% decline in sales due to the Corona crisis, industry has postponed or canceled orders / projects
- A slight increase is expected again for 2021. The main drivers are the e-mobility, the introduced CO_2 price and the obligation to decarbonise the industry
- The targets of the German hydrogen strategy (5 GW generation capacity 2030) will push the demand for electrolysers sharply from 2022+ - Hydrogen is expected to be used in large-scale industry
- Asian market participants are entering the market more strongly, but German companies are also taking advantage of export opportunities
- Industrial and commercial storage systems continue to be used in a variety of ways, from peak shaving to interruptible power supply and emergency power supplies to the optimization of industrial processes and charging infrastructure

Utility: Constant Development in 2020

Turnover of Energy Storages in Utility Segment (Million €)



Source: Analysis 3Energie Consulting

* provisional

Development in 2020

- Pump storage with a slight upward trend due to increasing international business
- Large scale batteries remain on low level of PRL prices. Storage systems from the innovation tender for the integration of RE systems have not yet been taken into account - first systems are expected in 2021. The planned implementation of network boosters will lead to an increase in sales from 2022 onwards
- Large thermal storage depends on major projects and thus fluctuates greatly
- Hydrogen market entry is imminent - conversion to hydrogen caverns has begun or electrolysers are being planned for flexibility in the energy system.

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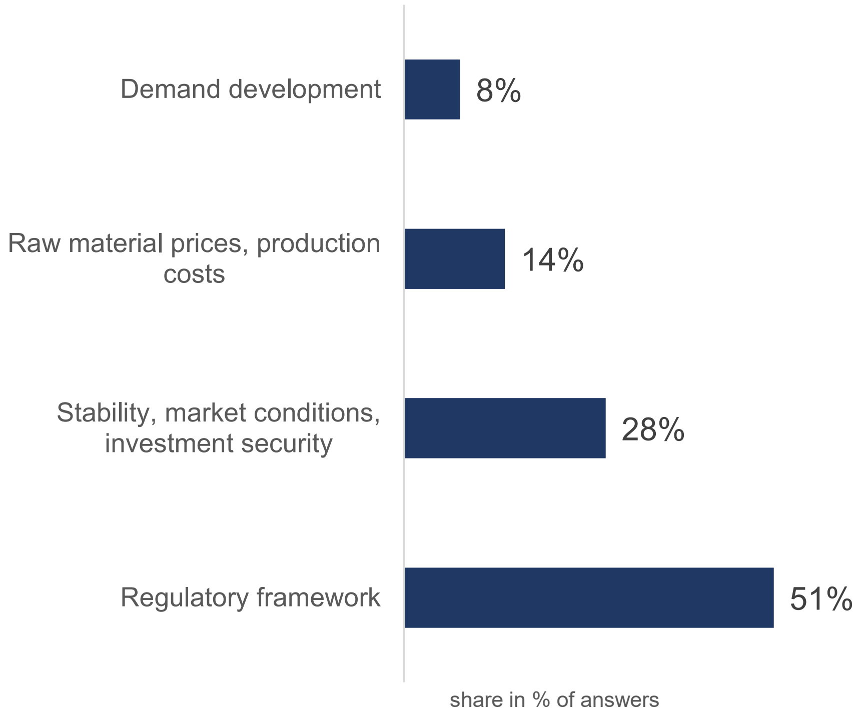
Market Survey: The regulatory framework continues to be the biggest barrier for further sales growth

What are the current market barriers for your business in Germany?



Source: Analysis 3Energie Consulting

- As in previous years, regulatory conditions represent the greatest market obstacles such as:
  - Definition of electricity storage is not clear
  - Lengthy approval process
  - Grid connection conditions with inefficient measurement and billing concepts as well as high BKZ
  - Lack of transparency in the applicable regulations
- Furthermore, the introduction of the CO_2 tax is viewed positively, but the price is still viewed too low
- Constraint for multi-use applications
- Technical “ignorance” of the regulatory institutions

Summary

- The energy storage industry in total continued to grow in 2020, but there are strong variations in the segments. Residential segment with strong growth, Utility segment remain constant and Commercial & Industry with a significant decline in sales.
- The industry expects an increase in sales for all segments in 2021. In addition to economic interests, growth drivers are still the sustainability / decarbonisation of industry and the cost regression of storage technologies and in particular e-mobility and PV expansion.
- Hydrogen has reached all segments, however business cases a still small - but a strong increase is expected in the following years. Nevertheless, major projects in particular are still heavily subsidized.
- As in previous years, the legal and regulatory framework remain the barrier for further growth.

Many thanks

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