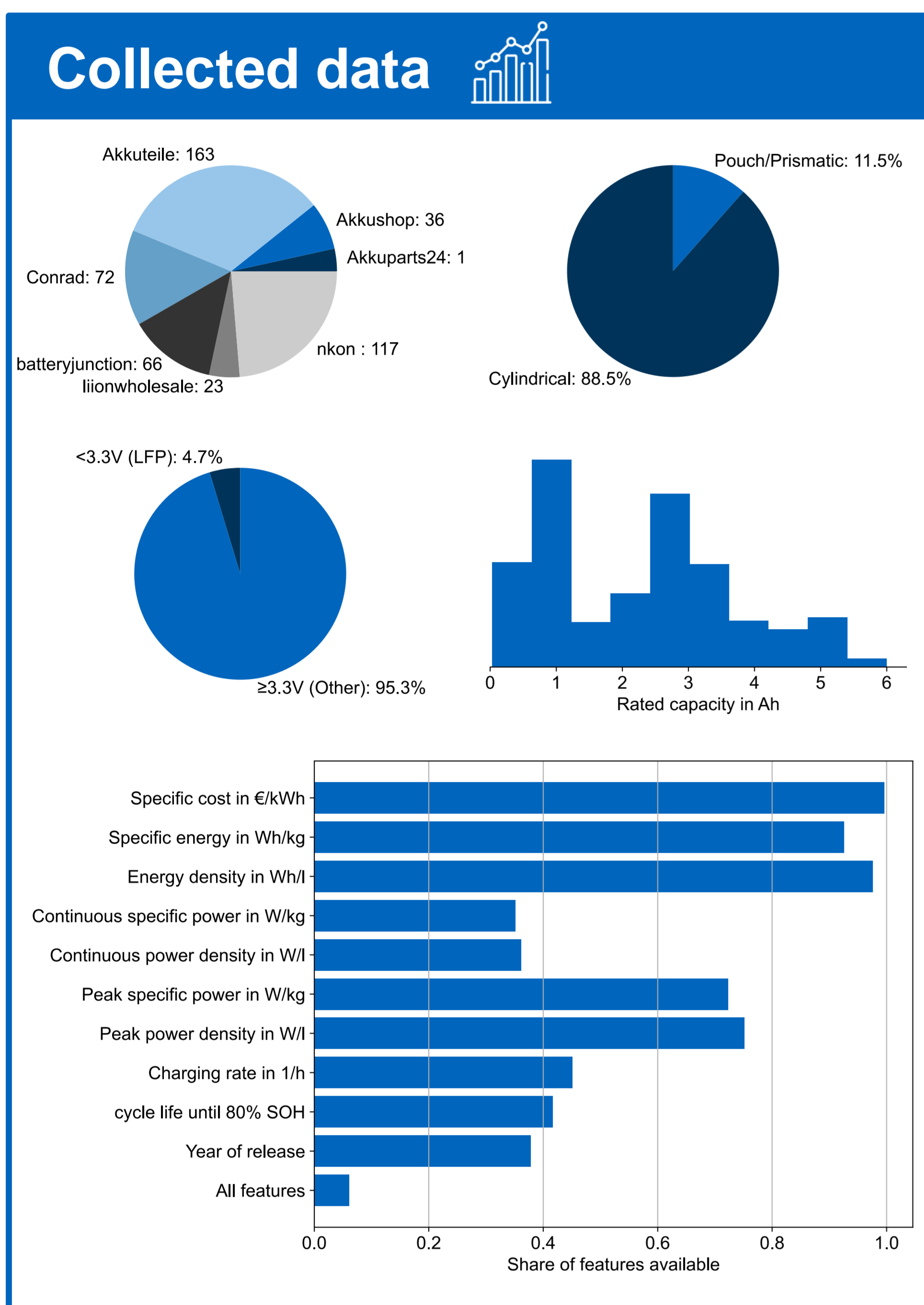


# Substandard?

## Lithium-ion cells available on online marketplaces

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We collected data on 495 unique cells from seven online marketplaces and compared their characteristics to the 2019 status quo defined by the EUCAR consortium [1] and measurements of a VW ID.3 cell [2].



- ### The fingerprint
- Only **original** cells were considered, excluding cells with soldering tabs, additional protection, refurbished cells, or cells from relabeling brands.
  - The price was determined for a **single** cell, ignoring volume discounts. Cell prices in foreign currencies were converted to **euros**. For cells that were sold on multiple platforms, the **lowest price** was used.
  - When the **release date** was not specified on the datasheet, the **document modification** date was used.
  - Cycle life specified to different end-of-life conditions was converted to **80% SOH** using cross-multiplication. When the cycle life was specified for different operating conditions, the highest cycle life was used.
  - All cell parameters were calculated based on the **minimal capacity**. Where only the nominal capacity was provided, the minimal capacity was calculated based on the average ratio between minimal and nominal capacity of cells that provided both.
  - Where a maximum discharge current was provided without specifying whether it refers to the peak or continuous current, we assumed it corresponds to the **peak discharging** current.

- ### Takeaways
- Only 4% of the cells provided **enough data** for a comparison with all EUCAR targets.
  - The cells match the **status quo** for energy density, discharging power and cycle life well, but underperform in specific energy and charging rate
  - The average cell parameters show **no clear improvement** over **time**. Advances have been **stagnant** for a few years for all parameters.
  - The **lowest specific cost** is achieved by cells with a **high energy content**, which is likely caused by the overhead involved in selling individual cells.

