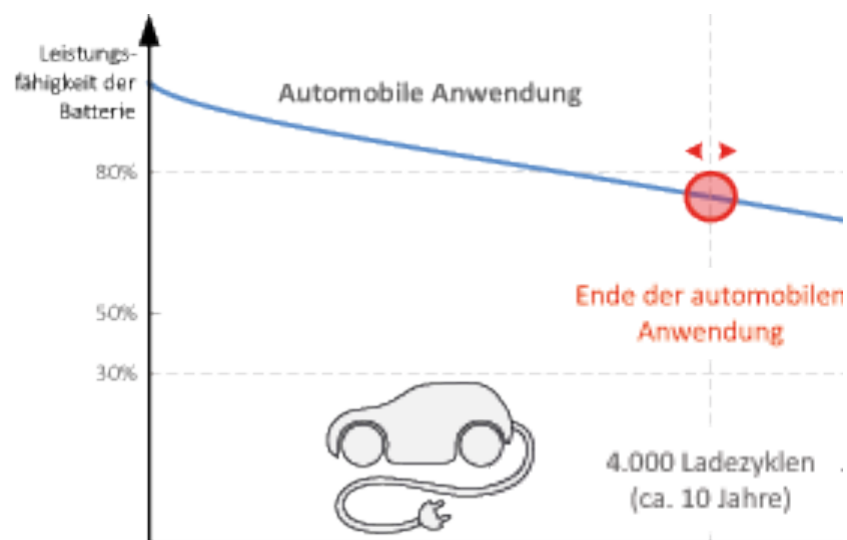


HOW TO CREATE AN OPEN MARKET FOR SECOND LIFE E-MOBILITY BATTERIES IN STATIONARY ENERGY STORAGES



Reinhard Ungerböck

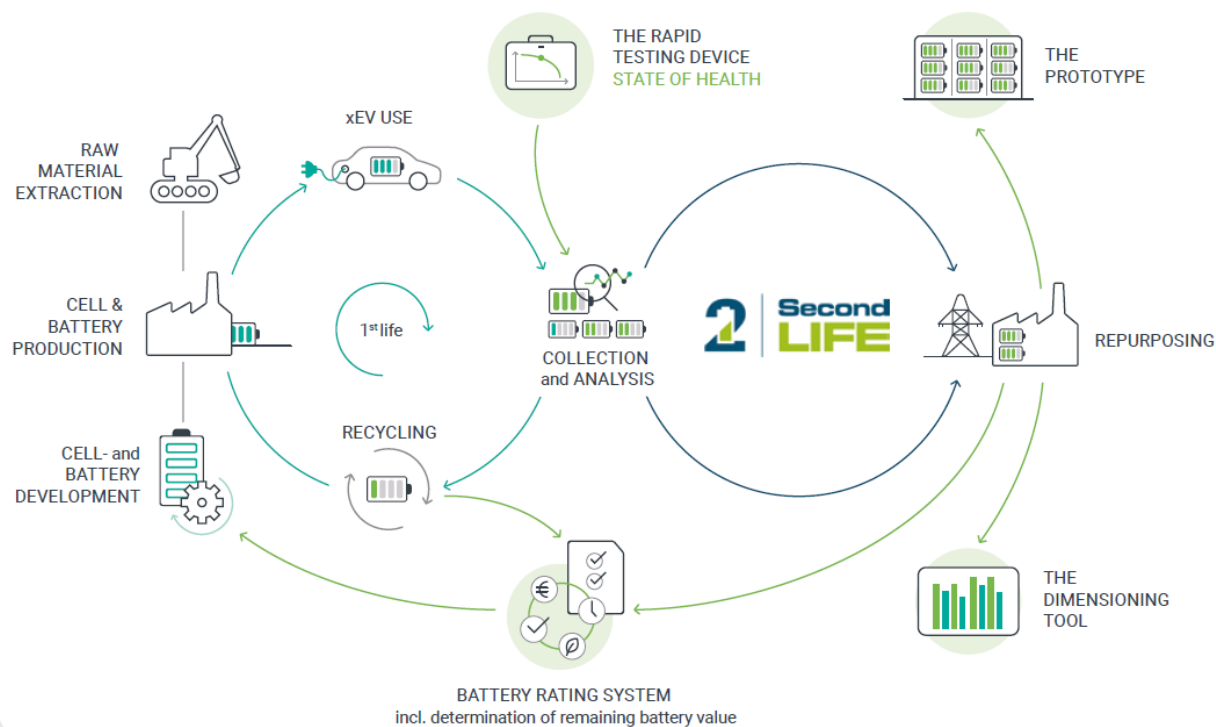
What is Second Life when it comes to batteries?



Why „Second Life Batteries 4 Storage“?

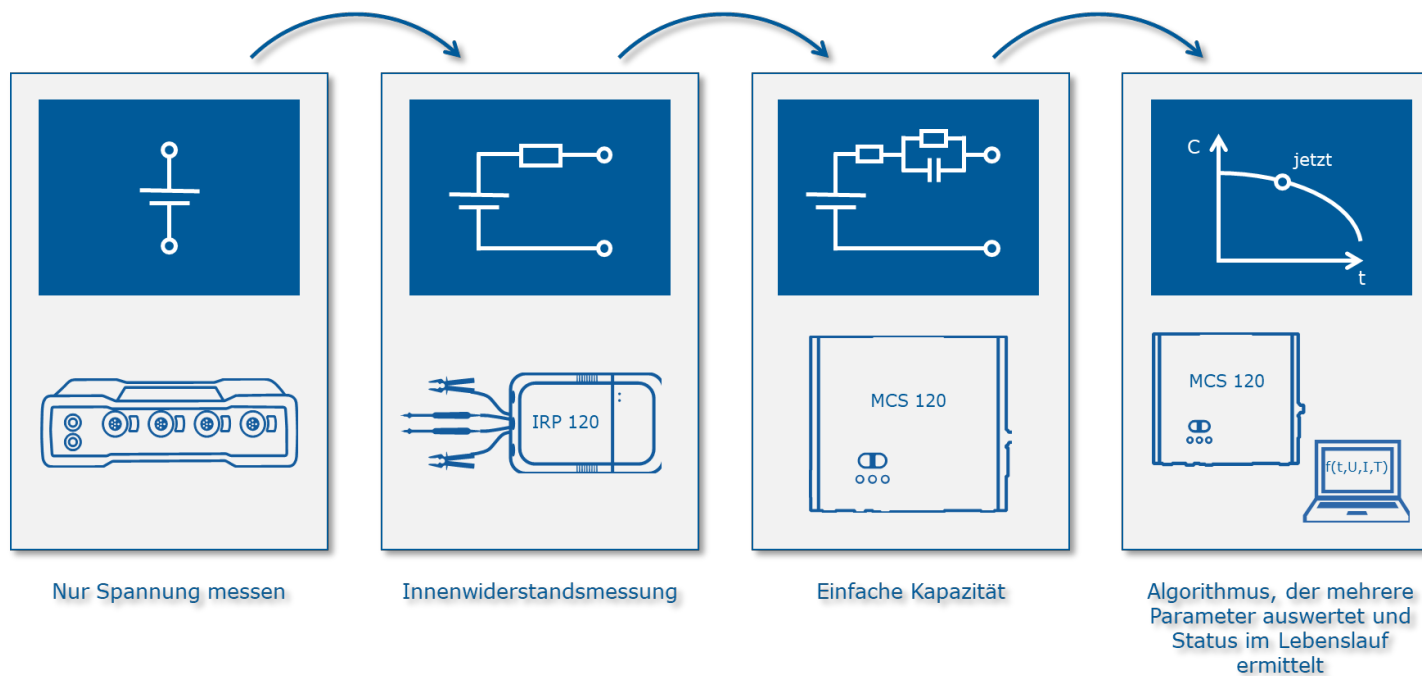
- © **Energy storage systems are becoming increasingly important**
especially in the industrial context:
 - Peak load shaving
 - PV self-consumption optimization
 - Demand-response applications, network operation
- © **Used battery systems from electric mobility will become more frequent**
- © **Gap: how do I assess the **value** and optimal **reuseability** of used batteries?**

A whole environment

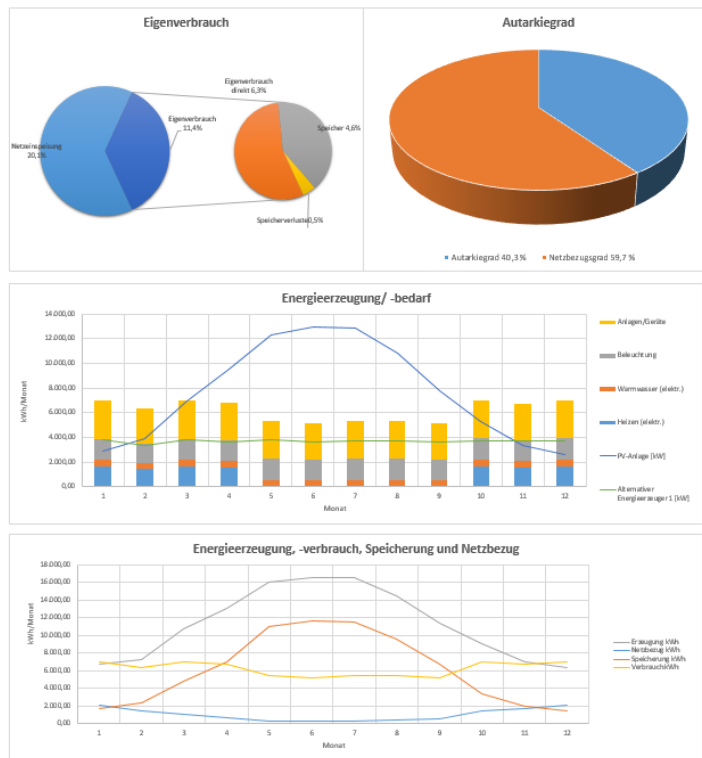


Rapid Testing Device

Sequential procedure for eliminating batteries with gross defects early in the measuring process.



Storage dimensioning with Second Life batteries



Quelle: Grazer Energieagentur

- © **Basis:** 1/4-hourly consumption or power values
- © Both 1st life and 2nd life batteries can be used:
2nd life with data from the quick analysis
- © **Result:** Individually adapted battery system is created, optionally with PV system

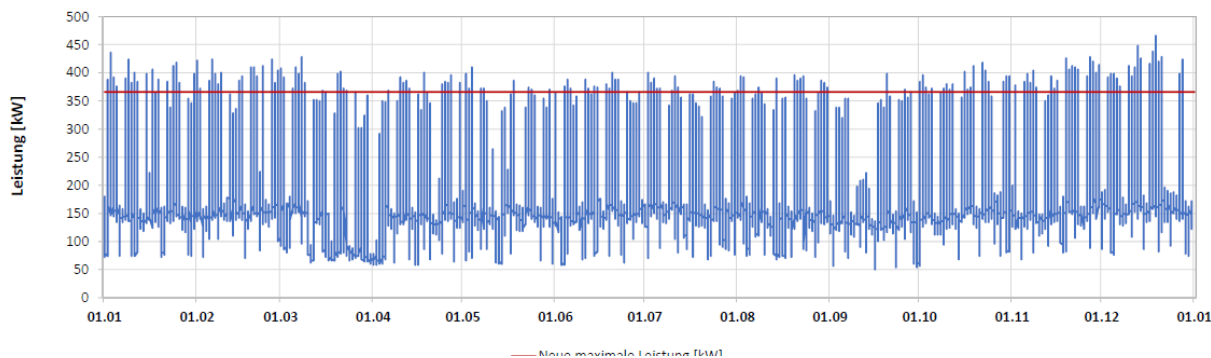
Use Cases for Storage

| <i>actors</i> | Peak-Shaving | PV self-consumption optimization | Grid stabilisation | Blackout backup | Balancing energy market |
|---------------------------------|--------------------------------------|---|--------------------|----------------------------------|-------------------------|
| <i>Companies</i> | x Optimisation of load price | x | | x UPS, emergency power supply | |
| <i>residential</i> | x Alternative to grid expansion | x | | | |
| <i>Grid provider</i> | ↕ x Alternative to grid expansion | ↕ (x) | x | x Relaunch after blackout | |
| <i>E-charge-provider</i> | ↕ x Alternative to grid expansion | | | | |
| <i>ESCo DSM-aggregators</i> | | x | | | x |

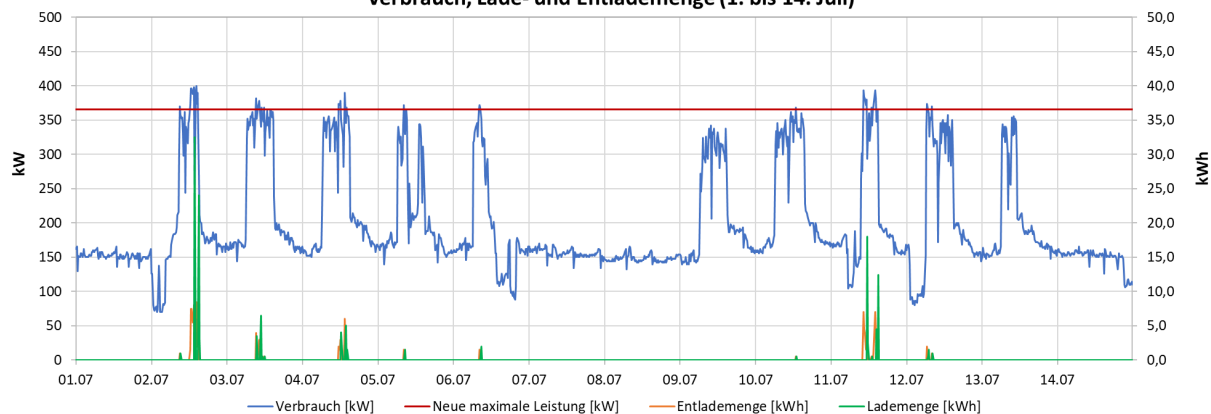
Use case Peak-Shaving



Lastprofil mit Lastspitzenkappung



Verbrauch, Lade- und Entlademenge (1. bis 14. Juli)

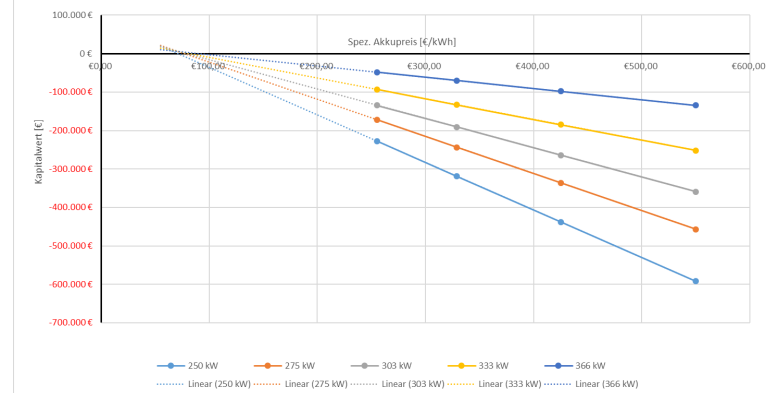


In Austria (currently) not economic

Reasons for poor profitability:

- ⊗ Low power tariff
- ⊗ High battery prices

Kapitalwertentwicklung bei unterschiedlicher neuer Leistungsgrenze



This project is funded by the Climate and Energy Fund and is being implemented as part of the RTI initiative "Vorzeigeregion Energie"

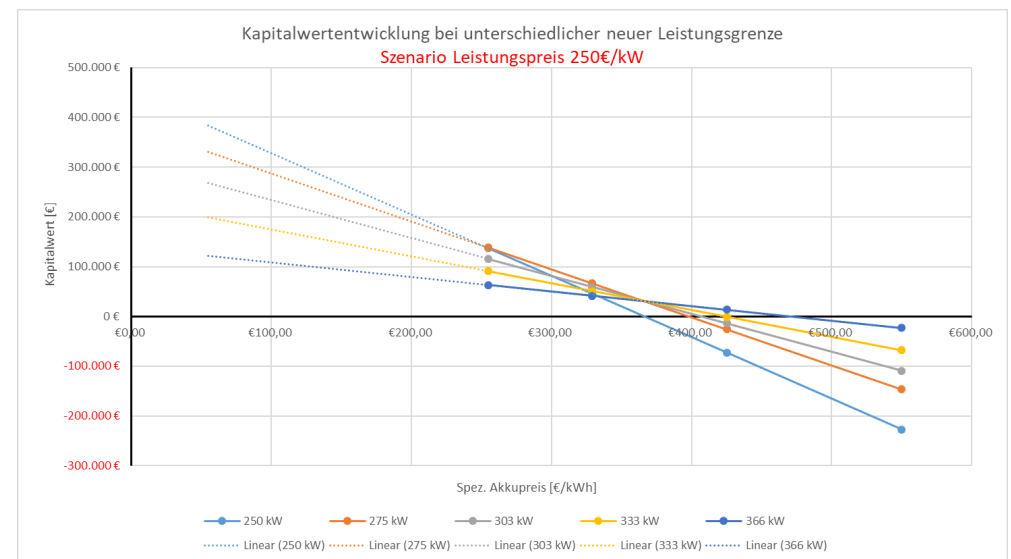
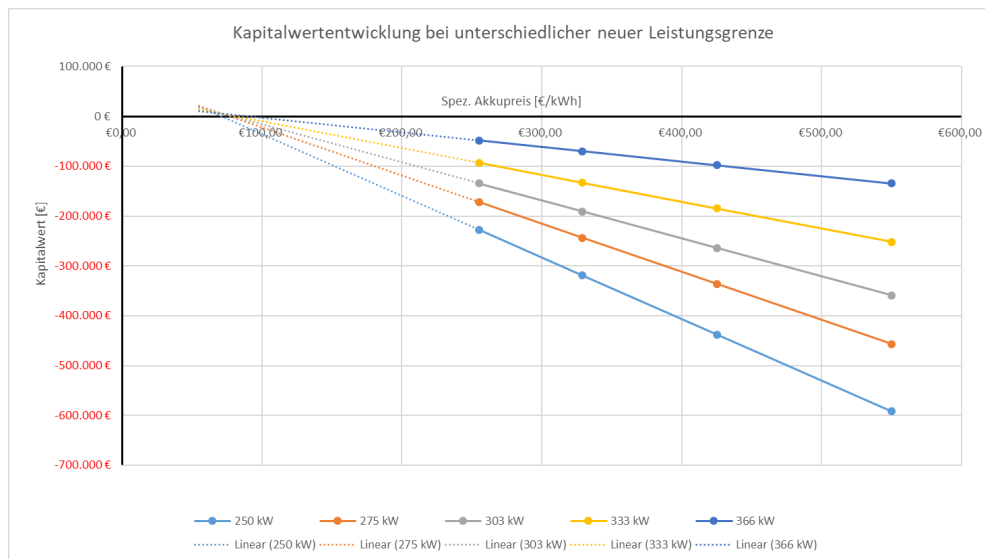


Use case Peak-Shaving

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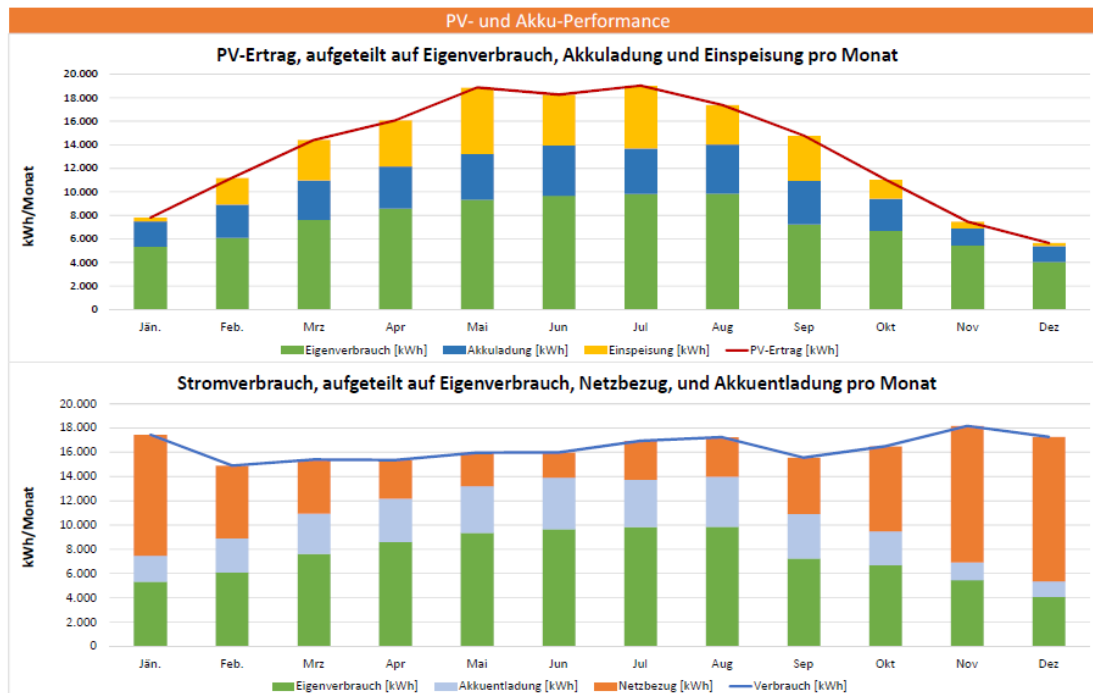
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Use case PV self-consumption optimization



Optimization of the overall system battery + photovoltaic

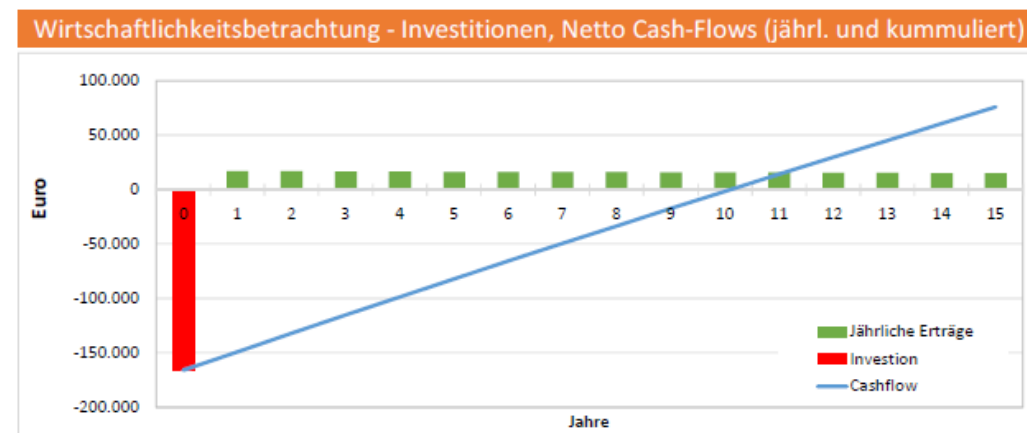
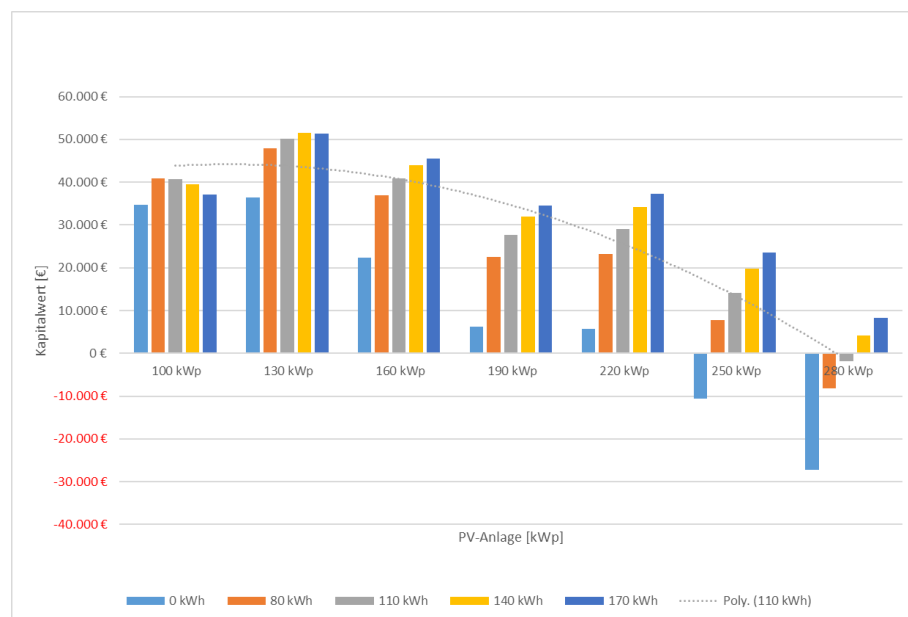


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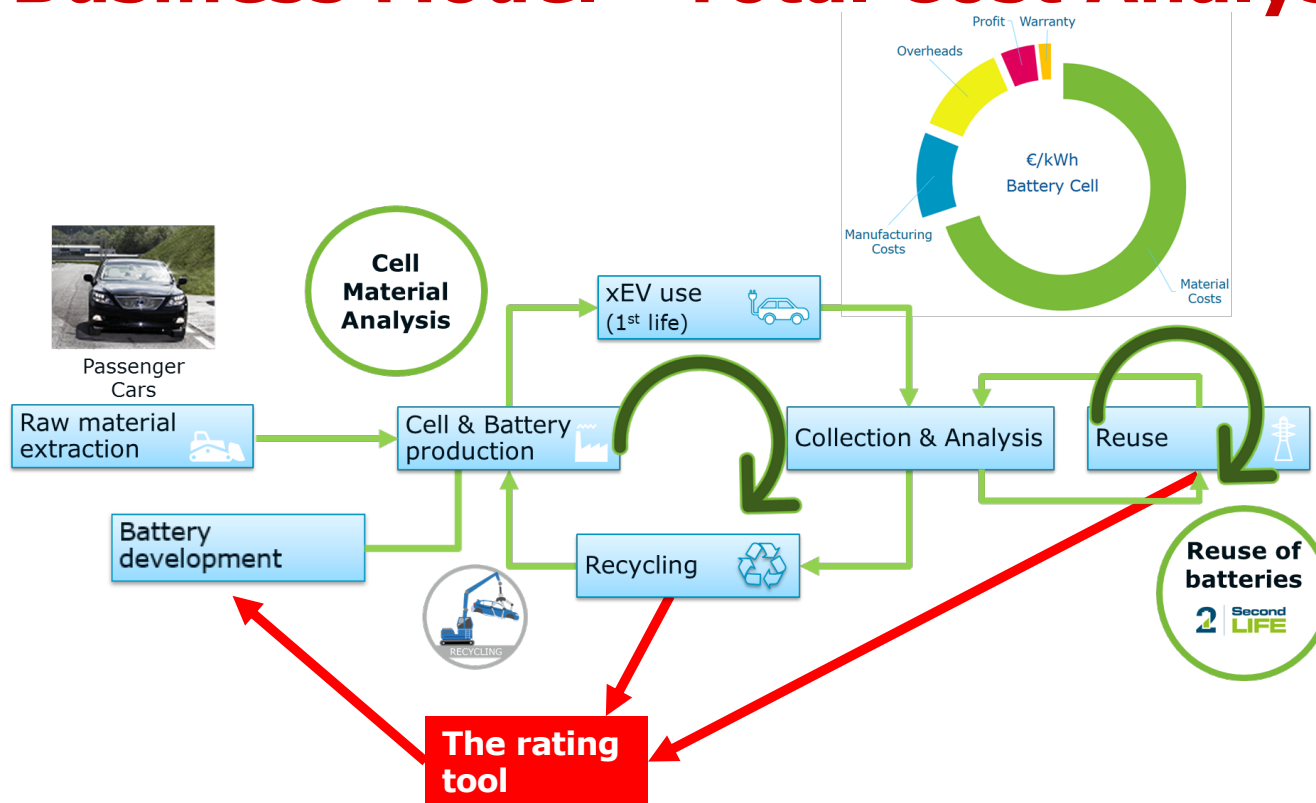


Use case PV self-consumption optimization

Net present value:
comparison of different PV size and battery size



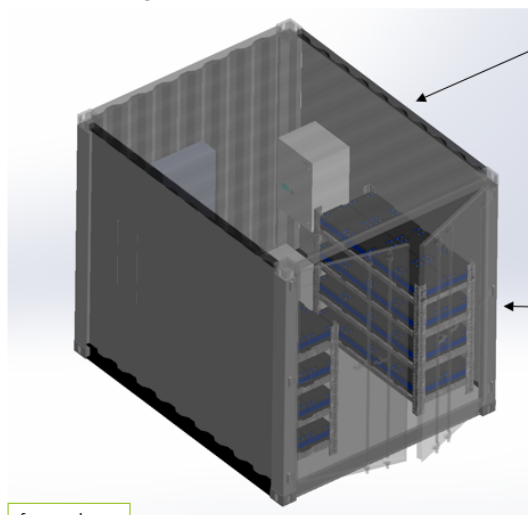
Benchmarking: Reuse Business Model - Total Cost Analysis



Semi-portable storage



Containerlayout



fest verbaut

demontieren
zum Transport



**Semi-portable
storage:**

© 10' container

© 100 kWh (4 pcs.
batteries)

Conclusio



**Second Life should create the
conditions for a free market for used
battery systems**



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Project key data

consortium: Grazer Energieagentur GmbH,
Saubermacher Dienstleistungs AG,
AVL List GmbH,
AVL DiTEST GmbH,
Smart Power GmbH & Co KG,
Energie Steiermark AG

duration: Sep 2018 – Aug 2021

Funding programme: VZR Energie, F&E-Projekt

budget: 2,0 M€



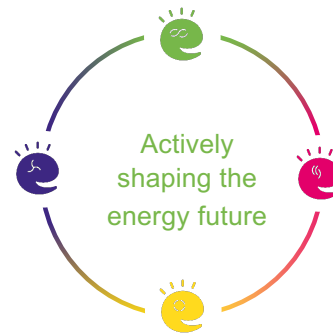
WE CREATE AN INTEGRATED ENERGY SYSTEM FOR A SUSTAINABLE FUTURE WITH CUSTOMER-CENTRIC SOLUTIONS.

WE LOOK FORWARD TO YOUR COURAGEOUS IDEAS FOR THE ENERGY FUTURE AND ACCOMPANY YOU THROUGHOUT THE ENTIRE INNOVATION JOURNEY.



GREEN ENERGY LAB-REGION

With our showcase projects we are creating building blocks for the energy future.



INNOVATOR CIRCLE

Austria's largest innovation laboratory for green energy with more than 100 partners



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In our Open Innovation process we integrate different approaches.



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www.greenenergylab.at




contact



Reinhard Ungerböck
ungerboeck@grazer-ea.at
+43 316/811848-17



Grazer Energieagentur
Kaiserfeldgasse 13/I | 8010 Graz
www.grazer-ea.at
 [@GEnergieAgentur](https://twitter.com/GEnergieAgentur)

