Grazer Energieagentur

BATTERIES FROM E-MOBILITY: SECOND LIFE IN LARGE ENERGY STORAGES

Reinhard Ungerböck, 7.5.2022

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Unsere Mission

„Neue Wege zum Ziel“

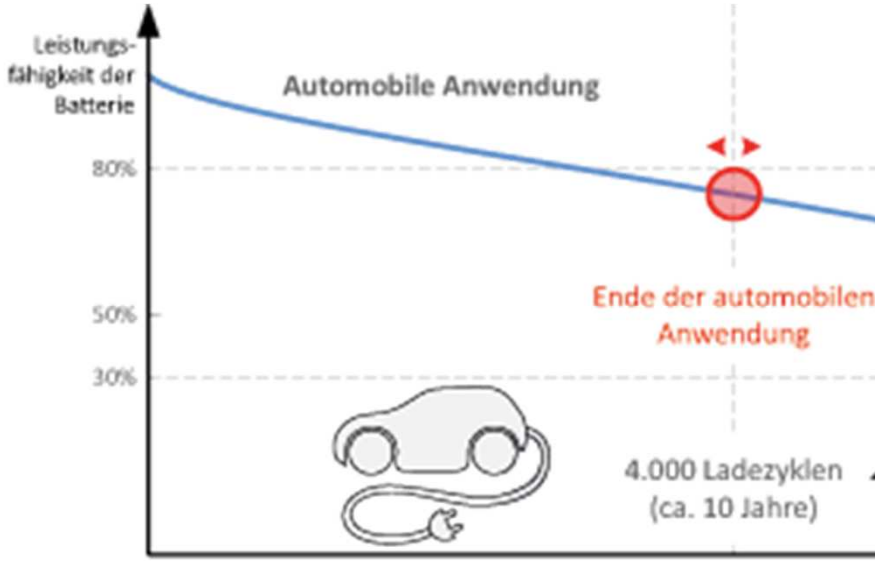
We consult and research on **saving energy**, **increasing energy efficiency** and using **renewable energies.**

Thereby we contribute to **better air quality**, **climate protection** and **economic stimulation.**

Second Life Batteries 4 Storage

How to create an open market for second life e-mobility batteries in stationary energy storages

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 reusability of used batteries?

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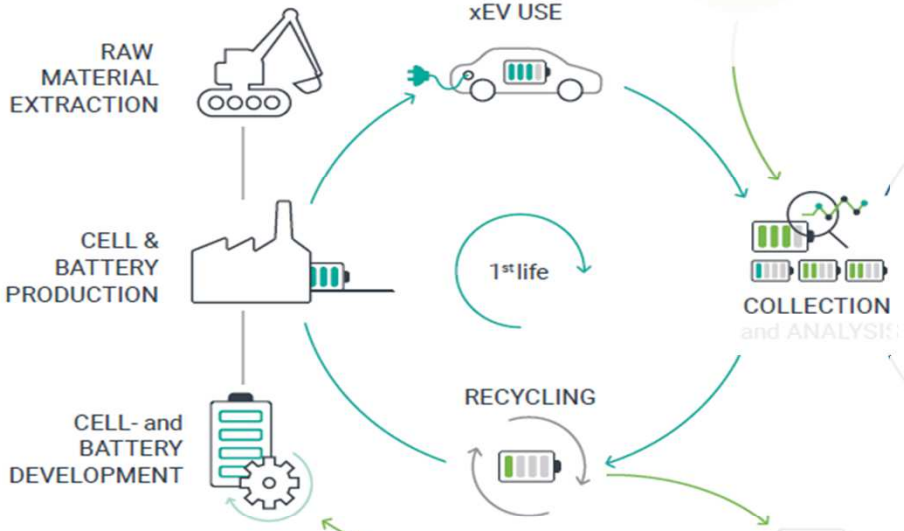
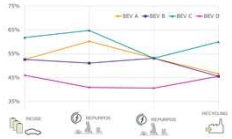
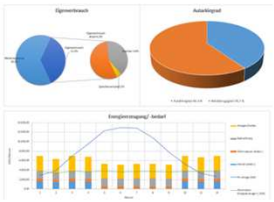
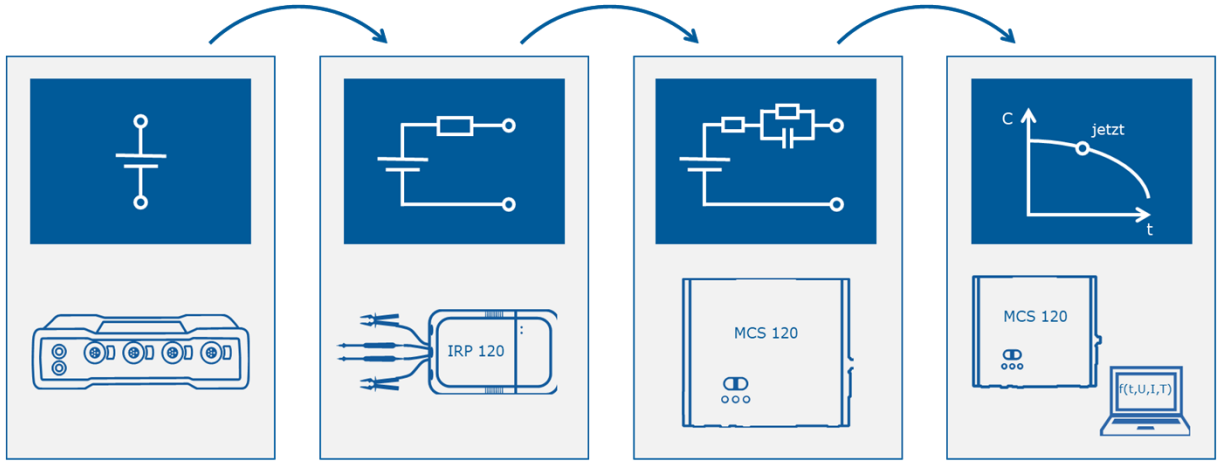






Rapid Testing Device

- Sequential procedure for eliminating batteries with gross defects early in the measuring process.
- Step 1, Step 2: a few minutes
- Step 3, Step 4: 3-10 hours



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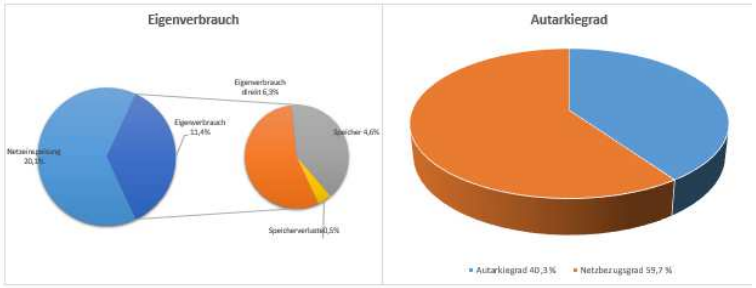
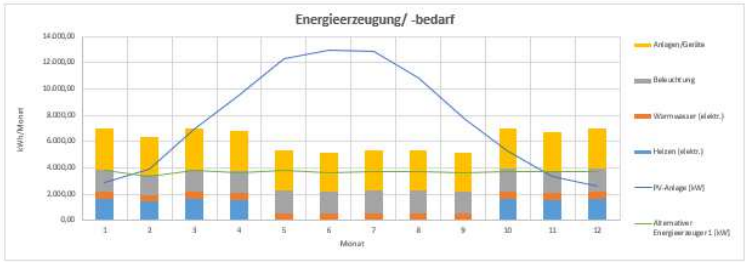
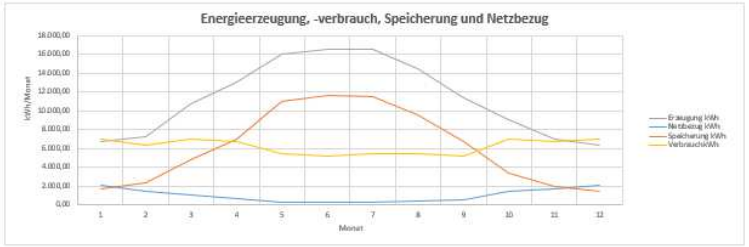
Storage dimensioning with Second Life batteries







Basis: ¼-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

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Use Cases for Storage

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

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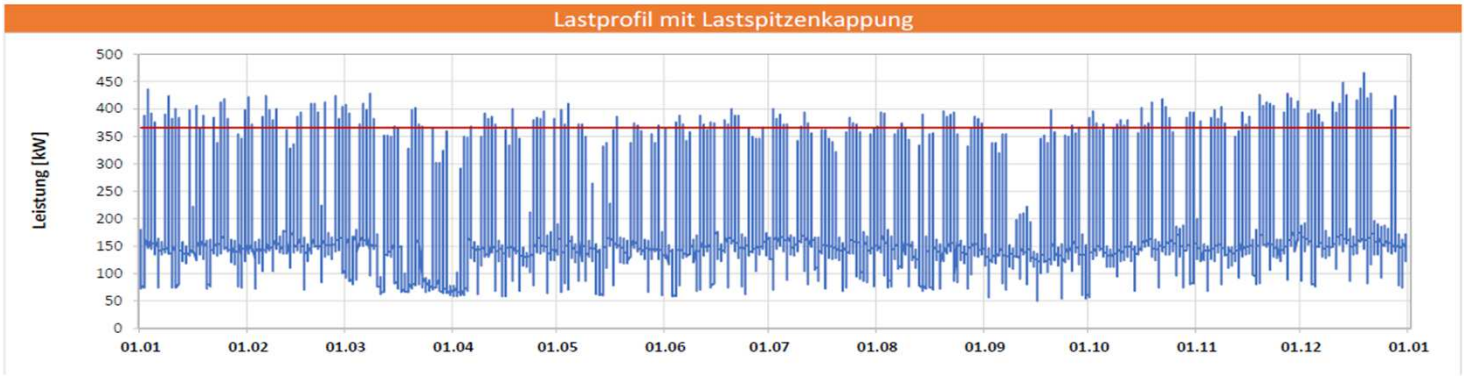
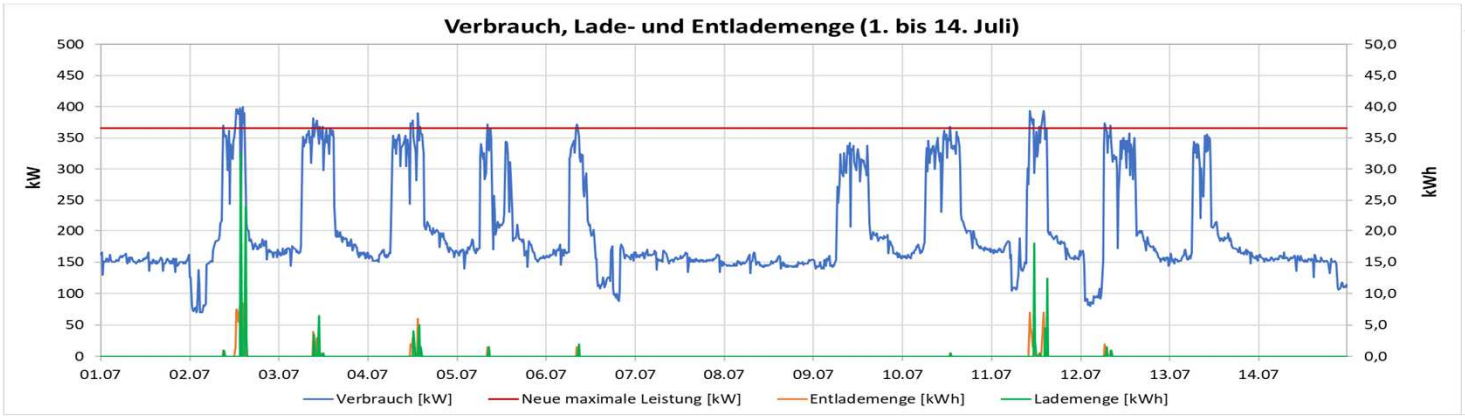
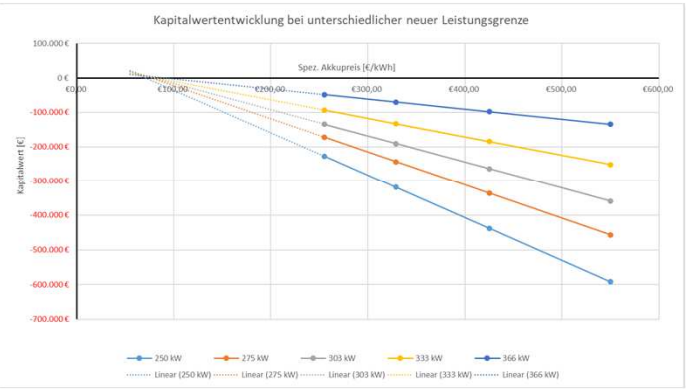
Use case
Peak-Shaving



In Austria (currently) not economic
Reasons for poor profitability:

- Low power tariff
- High battery prices





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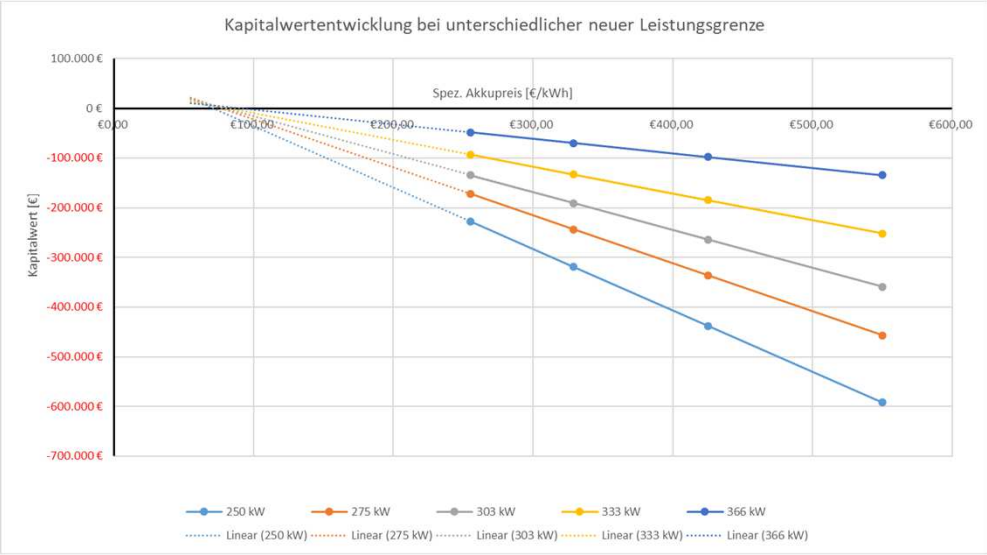
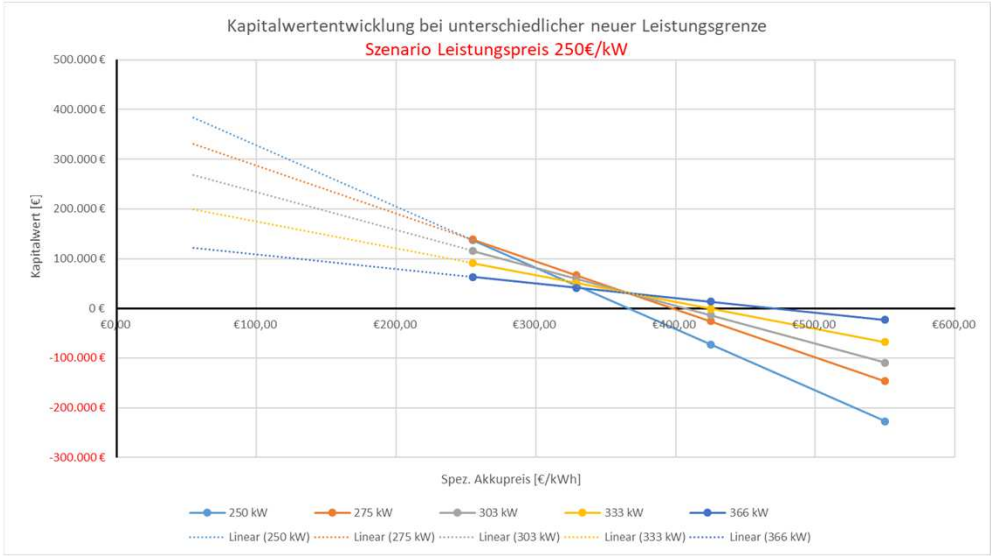
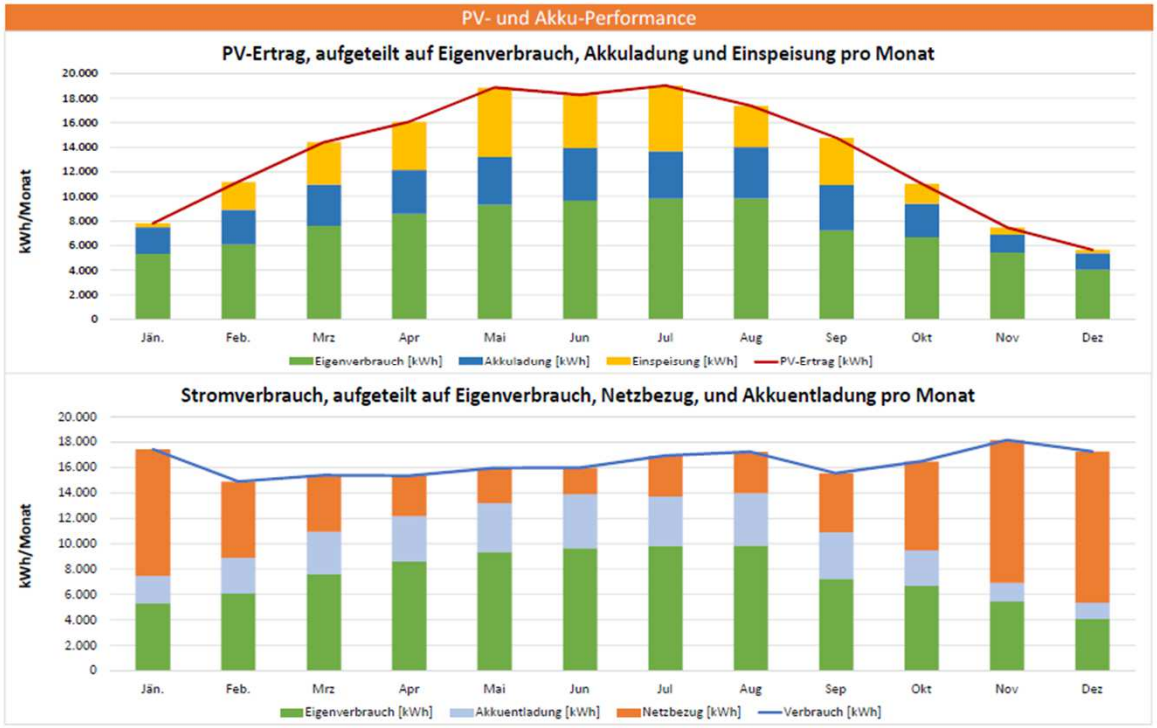




Use case
PV self-consumption optimization

Optimization of the overall system battery + photovoltaic



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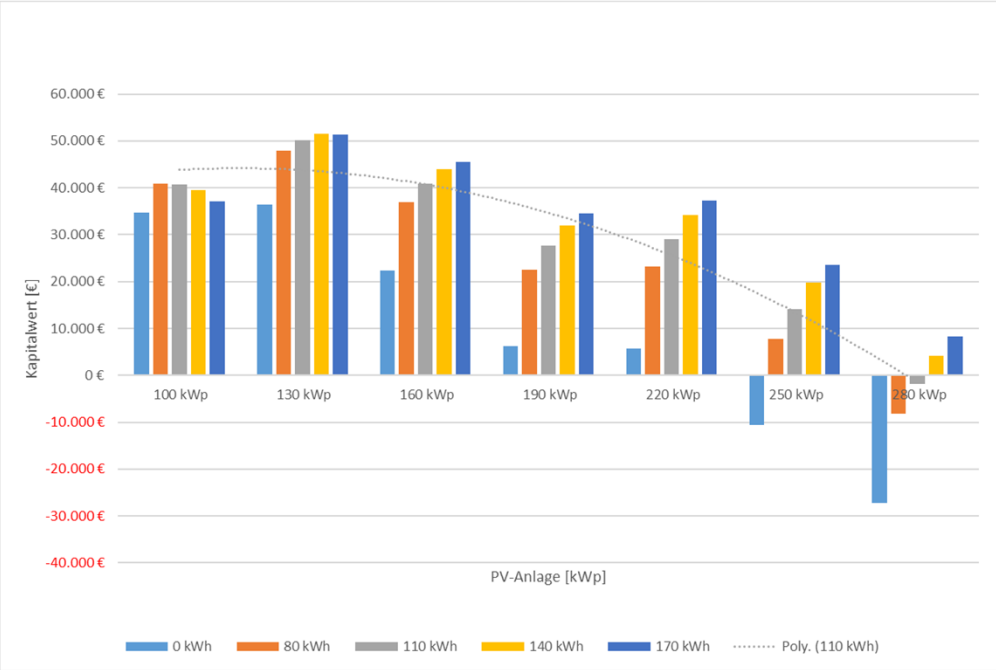
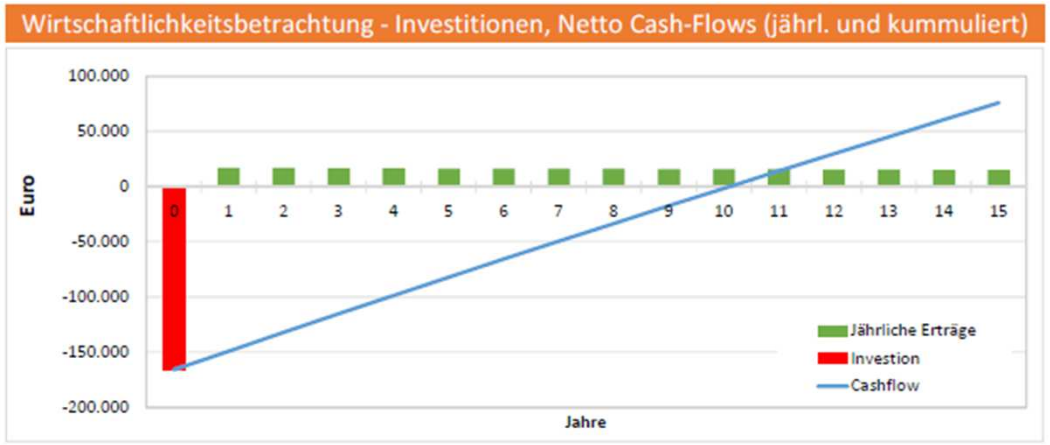
Use case

PV self-consumption optimization

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





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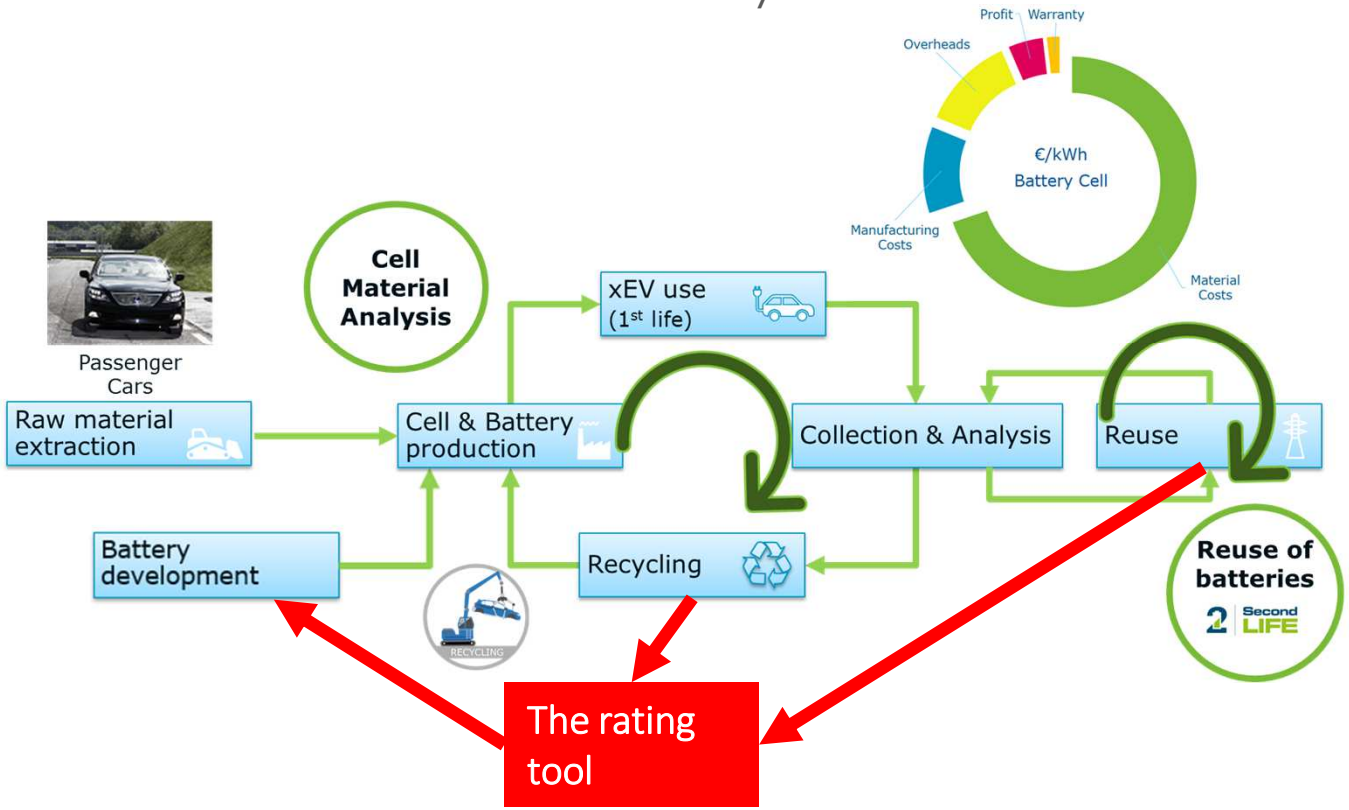
Benchmarking:
Reuse Business Model - Total Cost Analysis



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Semi-portable storage

Semi-portable storage:

10' container

96 kWh

Conclusions

- *Volume of available 2nd life batteries today too small to allow more than a niche market product*
  today: ~200 tons per year
  projection 2030: 10.000 tons per year
- *Unique storage planning very costly ➔ standardization of planning and production processes through mass market*
- *Questions regarding liability and warranty to be answered ➔ insurance topic*
- *Planning and building permissions ➔ authorities have no experience with 2nd life battery storages*
- *1st life batteries vs. 2nd life batteries: price development and availability of batteries will define the future of 2nd life battery storages*

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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 – March 2022
Funding programme:	VZR Energie, F&E-Projekt
budget:	2,0 M€

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How to create an open market for second life e-mobility batteries in stationary energy storages

- 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.

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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

SERVICES & PROZESS

In our Open Innovation process we integrate different approaches.

Contact

Grazer Energieagentur Ges.m.b.H.
Kaiserfeldgasse 13/I, 8010 Graz
Tel.: +43 316 811 848-0
Email: office@grazer-ea.at
Web: www.grazer-ea.at

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