



2nd Life EV Batteries - Their Role in the Energy Storage Landscape

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GEOTAB[®]
management by measurement



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Who we are...



- Connected Energy is an award winning UK company that provides world leading energy storage systems re-using EV battery packs
- We design, manufacture and operate our own unique technology
- We have diverse skills and experience from the automotive and energy sectors
- We are backed by strategic investors Macquarie Bank, Engie New Ventures and Sumitomo Corporation
- Winners of Japan Energy Challenge 2019 



Hardware and software
system integrators



Manufacturing
supply chain
developers



Sales, operation and customer
service providers

Dealing with global issues



Extending the usable life of EV batteries



Increase
security of
supply

Reduce
embedded
CO2 in EVs

**Reuse EV
batteries in
stationary
energy
storage**

Reduce
energy
costs

Reduce cost
of EVs –
increase
uptake

Help
decarbonise
grid



E-STOR – world leading technology



OEM
warranted
2nd life
batteries

OEM
agnostic
Control
software

Power
electronics
&
packaging

Financing
options

Operation
and
services

Low cost
Low impact
stationary
energy
storage



14 systems installed & more on the way



- An E-STOR has been in operation for 4 years
- Systems are in operation in:
 - UK
 - Belgium,
 - Germany
 - Netherlands

A second life for EV batteries – example 1



- 🌐 Location: Dundee, Scotland
- 🌐 Category: EV Charging Hub with PV canopy
- 🌐 E-STOR 60kW/90kWh
- 🌐 Services:
 - 🌐 RES optimisation
 - 🌐 EV Charging
 - 🌐 ToU time shifting





A second life for EV batteries – example 2

- 📍 Location: Rotterdam, NL
- 📍 Category: Virtual Power Plant (VPP)
- 📍 E-STOR 150kW/90kWh
- 📍 Services:
 - 📍 European grid balancing
 - 📍 Dynamic frequency response
 - 📍 Aggregator model





A second life for EV batteries – example 3

- 📍 Location: Brussels, BE
- 📍 Category: Industrial
- 📍 E-STOR 1200kW/720kWh
- 📍 Services:
 - 📍 European grid balancing
 - 📍 Dynamic frequency response
 - 📍 Power quality improvement and back-up



Our customers & collaborators

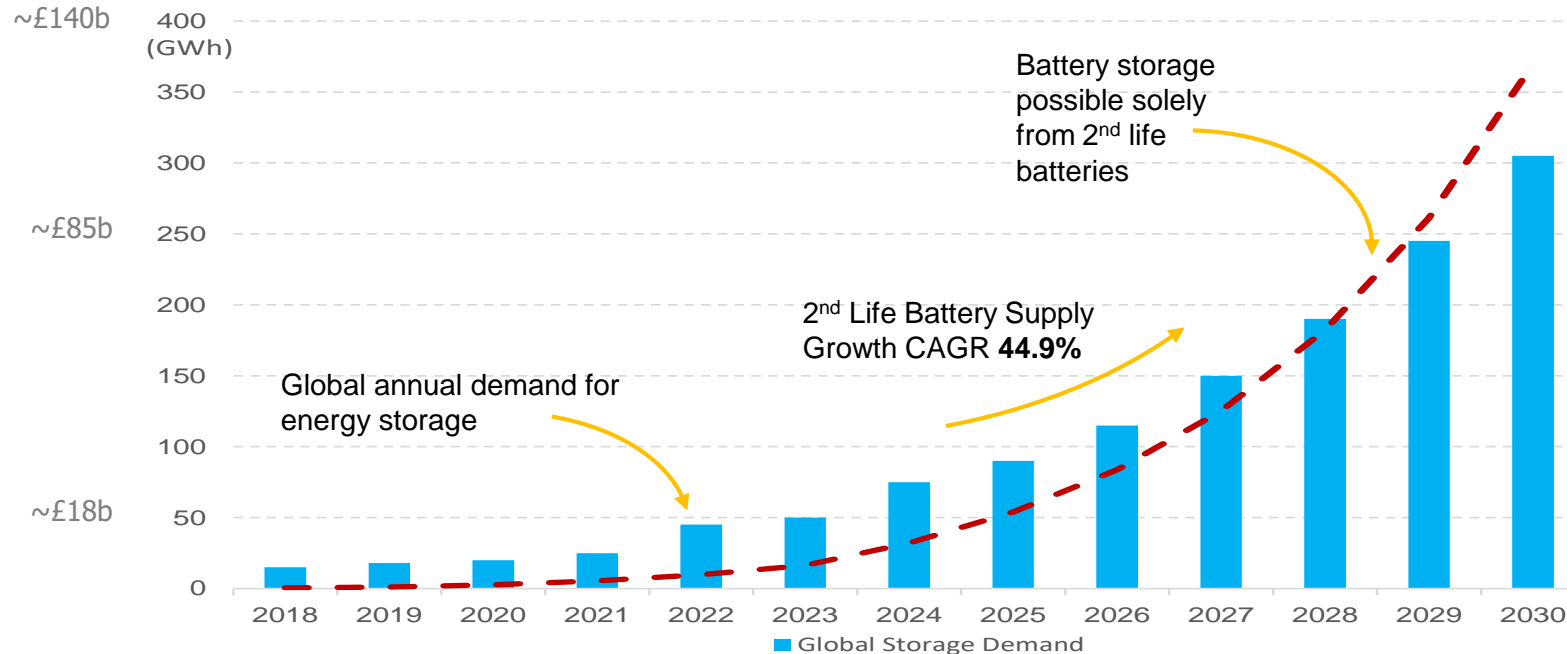


Market opportunity



The benefits of using 2nd life batteries and further harnessing their embedded natural resources is immense when compared with manufacturing new batteries

Projected Energy Storage Growth (GWh)



- £18bn global energy storage market by 2023
- By 2030 the global demand for energy storage could be met by 2nd life EV batteries

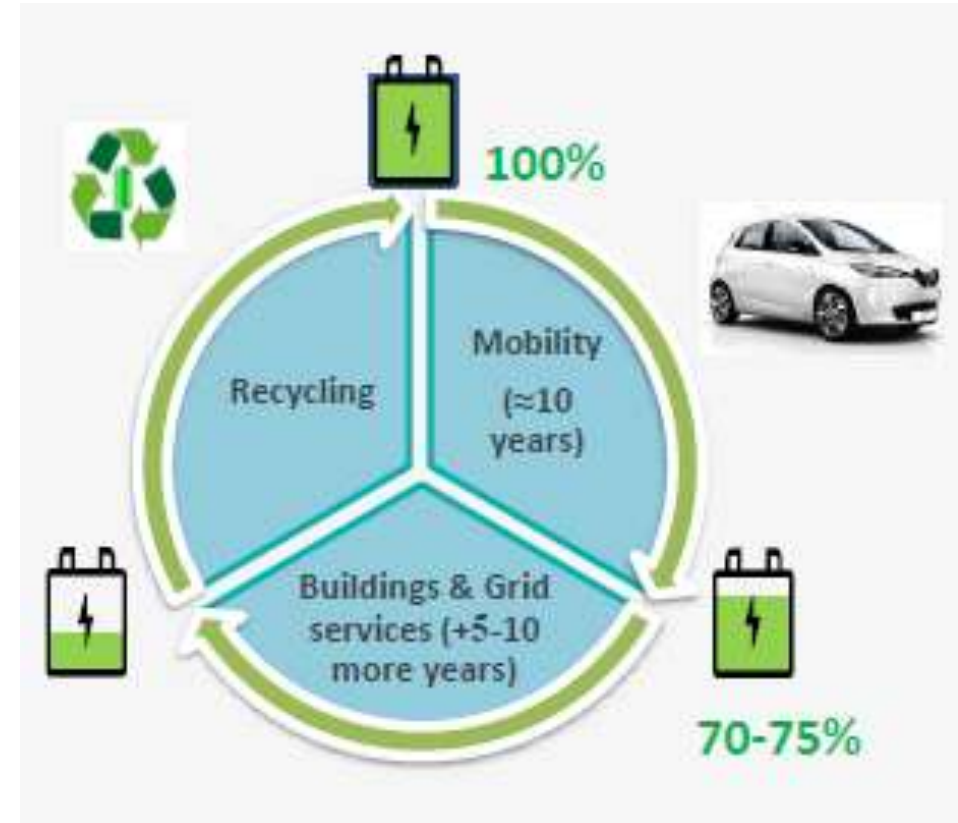
Note 1: Global Storage Demand – BNEF, Nov 2017: <https://about.bnef.com/blog/global-storage-market-double-six-times-2030/>

Note 2: EV battery Forecast – IEA, 2018: <https://lnkd.in/fMaCYwa>

Using EV 2nd life batteries: an attractive solution



- Ⓜ High Safety level
- Ⓜ Technical performance
- Ⓜ Affordable: lower price than a new battery
- Ⓜ Better environmental impact of the EV
- Ⓜ Less use of resources
- Ⓜ Less emissions



Powering the Circular Economy



Connected Energy is the bridge

between large numbers of low cost batteries
and a rapidly expanding energy storage market

And

between EV manufacturers with a 2nd life battery liability
and customers looking for low cost sustainable energy
storage



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