EGVIA REPLY TO THE PUBLIC CONSULTATION ON THE SET-PLAN

ACTION 7 - BECOME COMPETITIVE IN THE GLOBAL BATTERY SECTOR TO DRIVE E-MOBILITY FORWARD

STAGE 1 OF THE CONSULTATION: AGREEMENT ON TARGETS/ PRIORITIES

Do you agree with the targets set in the issue paper?

In general yes, in order to be as clear as possible, specific comments on targets are included here below, directly in the tables.

However, some general comments should also be considered.

A distinction between HEVs and BEVs might be introduced in the document in order to take into account their specific requirements and be as realistic and specific as possible.

The document would also benefit of indications of the conditions under which the targets are set (i.e ambient temperature, time of discharged…).

Even though Li-ion technologies should still be considered in the years to come, as strong emphasize should also be put on post Li-ion technologies, with a focus on basic technology and materials but also on issues such as manufacturability. Indeed, having experimental manufacturing pilot and full plants for "conventional" Li-ion batteries is of paramount importance to gain manufacturing experience towards the next generation storage technologies manufacturing. Other issues such as LCA, second life and recyclability should also be considered during such development, with more intensity as the new storage technologies make progress through the TRL scale. Hybridization of several storage technologies might also be considered as a solution to overcome power density issues

As a conclusion, next generation / post-lithium technologies should not be left behind and not all efforts should be put on Li-ion technologies.

Do you think that the level of ambition is correct?

Globally yes, however, the reference for 2020 seems quite short. The new wave of funded projects to address those topics will start around mid-2018 at the earliest and will leave a very short time to produce results to achieve the targets by 2020.

What are your specific recommendations on prioritising R&I activities on these issues (and building where appropriate on relevant existing initiatives)?

From EGVIA point of view, the following items are seen as highest priority:

- Second life of batteries for cost reduction.
- Battery elements materials for fast charging.
- Investigations on post-lithium technologies.
- Battery packs and systems (also including electronics & management) for solid state battery technologies, considering fast charging as well as hybrids battery systems.
- Next generation of fast charging procedures in combination with automated driving technologies.

Who are the best placed actors to implement the targets/priorities (Industry, EU, Member States, regions, groups of countries/organisations/etc.)?
The best actors to implement the targets / priorities are industry representatives (OEMs and suppliers), as being closer to the market.
However, a strong support from public authorities is also needed to achieve the ambitious targets set in the document.

If possible, to identify possible gaps/barriers & areas of cooperation on the priorities/targets proposed in the issues paper(s).
There are multiple synergies that could be exploited between the stationary and transportation battery technologies. Further investigations on potential advantage for closer cooperation might be launched, to avoid duplication of efforts.

There is also a need for market uptake measurements in order to stimulate the demand-side.

Performance targets:

		Current (2014/2015)	2020	2030
Performance targets for automotive applications				
1	Gravimetric energy density (Wh/kg)			
	Pack level	85-135	~~250~~ 235	~~> 250~~ >235
	Cell level	90-235	~~400~~ 350	~~> 400~~ >350
2	Volumetric energy density (Wh/l)			
	Pack level	95-220	500	> 500
	Cell level	200-630	750	> 750
3	Gravimetric power density (W/kg)			
	Pack level	330-400	470	> 470
	Cell level		700	> 700
4	Volumetric power density (W/l)			
	Pack level	350-550	1000	> 1000
	Cell level		1500	> 1500
5	Fast recharge time (min) 70-80% SOC)	30	15	~~3~~ > 12
6	Battery life time			
	Cycle life to 80% DOD (cycles)		1000	~~5000~~ >2000
	Calendar life (years)	8-10	15	20

- The proposed updated target for “gravimetric energy density” has been updated according to USABC goals for 2020.
- The “fast recharge time” corresponding to 3 minutes corresponds to 5 000 cycles and seems too much.
  Achieving a fast recharge time of less than 12 minutes would offer more flexibility.
- The balance of targets at cell level between Gravimetric and Volumetric Energy Density are extremely difficult to achieve with the current or even advanced Li-ion battery technology. The “Gravimetric Energy Density” seems particularly unrealistic for Li ion technology, where the standard SoA is below 250 Wh/Kg in 2016. On the other hand, “Volumetric Energy Density” might be more easily achievable (750 Wh/l target vs nearly 650 Wh/l today).

- The calendar life of 20 years by 2030 might not be the most critical point at this stage. On the other side, an interesting target might be to increase the storage temperature while keeping the same calendar life (e.g 9 to 10 years at 50°C).

Cost targets:

		Current (2014/2015)	2020	2030
Cost targets for automotive applications				
1	Battery pack cost for automotive application (€/kWh)	180-285	~~90~~ 150	75-100

- The introduction of the concept of "cost per cycle" (i.e. €/KWh-cycle) might also be considered in order to take into account the investment costs through the expected nominal cycle life of the battery - understood as cyclability until 80 % of the original charge capacity – which would allow to include in the scope higher initial storage technologies with very long cyclability, resulting in a competitive Total Cost of Ownership (TCO).

Manufacturing targets:

		Current (2014/2015)	2020	2030
Manufacturing targets				
1	Automotive (Li-ion and next generation post-lithium) battery cell production in the EU (GWh/year)[1] (% supporting EU PHEV+BEV production)	Nearly 0	5 (50%=0,25 M of 20 kWh)	50 (50%=1 M of 50 kWh)
2	Utility storage (Li-ion and next generation post-lithium) battery cell production in EU (GWh/year)		2.2	10
3	Recycling			
	Battery collection rate	45% (Sept 2016)	60%	75%
	Recycling efficiency (by average weight)	50%	50%	50%
	Economy of recycling	Not economically viable	Break even	Economically viable
4	Second life	Not developed	Developed	Fully established

[1] Two assumptions were made when defining this target value, based on projected global sales for PHEV+BEV in 2020 and 2030 of 2.5M and 5 M vehicles respectively: (a) the percentage for EU OEMs production of PHEV+BEVs is assumed to be maintained at the current level of 20% for both 2020 (with an average energy capacity of 20 kWh) and 2030 (with an average energy capacity of 50 kWh); (b) EU battery manufacturers will supply half of the cells needed for the PHEVs+BEVs produced by EU OEMs.