AMPLiFII-2
Building a Cross-sectoral Battery Systems Supply Chain

Future Powertrain Conference
27 February 2019
AMPlfII-2 : ADDITIONAL PROJECT GOALS

Parallel activities include:

- Impact of 800V architecture (high power, fast charging, ...)
- Location-based BMS capability and updates OTA
- Low cost 48V BMS
- Enhanced BMS application layer
- Integration of flexi-harness
- Modular module => modular pack (enclosure, modules, cooling, EDS, BMS)
- LCA
- Digital twin => Delta build facility

Flexibility & modularity are key
Dozens of suppliers engaged, many in the UK
MAINSTREAM AUTOMOTIVE RELATIONSHIPS

SMEs

OEMs
MAINSTREAM AUTOMOTIVE RELATIONSHIPS

Many challenges, including:

- Scale of organisations
- Perspective on problems
- Weight of process & validation requirements
- Tooling vs piece part cost
- How much automotive electrification R&D is actually taking place in the UK?
  
  JLR, Honda, Nissan, Toyota, Ford, Vauxhall, BMW (Mini), Rolls Royce, Bentley, Lotus, Aston Martin, Caterham, Ariel, Morgan, BAC, Ginetta ...

- How to feed manufacturing supply chain?
MAINSTREAM AUTOMOTIVE RELATIONSHIPS
MAINSTREAM AUTOMOTIVE RELATIONSHIPS

Opportunities do exist, but usually low volume ("SVO") and often provision of services rather than volume product ...

Projects of this type allow us to “preview” up-coming OEM challenges

Images courtesy Jaguar Land Rover, Aston Martin / Red Bull, Mercedes / AMG
THE CROSS-SECTORAL OPPORTUNITY

Images courtesy ADL / Arcola, JCB, Torqueedo, Vertical Aerospace, Alstom / Eversholt Rail
THE CROSS-SECTORAL OPPORTUNITY

Wide range of sectors where electrification is necessary (/critical?)

Technical & commercial requirements vary dramatically

• Energy
• Power (= also thermal management)
• Volumes
• Timing
• Legislation – different goals, different rates
• Cost expectations (“Batteries cost $100/kWh according to Elon Musk”)

... but, closer match in scale of organisations (/electrification teams)
OPPORTUNITIES & CHALLENGES

✓ Fantastic supply chain for low volume
✓ Reputation for engineering in UK is (rightly) strong, including academia and SMEs
✓ High proportion of “generalist” engineers
✓ Willingness to collaborate
✓ Faraday Battery Challenge support

✗ Uncertainty – over timing, if not direction
✗ Available UK infrastructure – from testing capability to skills
✗ Lack of coordination & understanding across sectors
✗ Cell supply
✗ Access to production-appropriate equipment for prototyping
  • UK-BIC should help this
OTHER MEASURES – A WORK IN PROGRESS

UK Niche Vehicle Battery Cell Supply Chain – Faraday CR&D

Cross-sector battery systems supply chain group
• Bus, defence, rail, marine, aerospace, niche automotive
• Understand other sectors better & aggregate requirements / volumes / timing

Doing the day job!