

ENERGY STORAGE: EXECUTIVE SUMMARY

- ❑ Driven by the increasing penetration of (intermittent) renewable energy generation and electrification (heat, transport), cost-effective energy storage systems (ESS) promise huge value upside for the electricity sector, via energy arbitrage, ancillary services, reduced CapEx
- ❑ PHS (pumped hydro) dominates ESS installations today, but a host of newer technologies – led by Lithium-ion - are attracting most attention; different applications present opportunities for different technologies
- ❑ More advanced ESS technologies remain expensive today (on MWh & MW bases) and still require long-term (research phase) as well as high risk (demonstration) investment, but can be well suited to specific application needs; grid integration challenges are likely under-estimated
- ❑ Limited government incentives / support for ESS currently (principally grants) leaves burden on private sector to drive ESS innovation and adoption; established utilities are conflicted on the pros/cons of ESS
- ❑ Different regions are following different trajectories and strategies:
 - an over-burdened grid has put the US at the vanguard of ESS deployments; this momentum is being impacted by the emergence of cheap shale gas (peaker plants)
 - ESS rollout in the EU is relatively slow but EU-wide regulatory measures may be introduced 2013-14; Germany is leading the way (2013 PV)
- ❑ Besides electric vehicles (EV), a wide range of ESS business models are likely to emerge over time
- ❑ Like other cleantech/renewables subsectors, ESS has had its fair share of casualties in recent times (Ener1, Beacon Power, A123 Systems ...), with few successful exits; investors are sceptical
- ❑ At this stage, estimating the long-term potential for ESS is challenging; Pike Research estimates ~US\$120bn back-loaded ESS spend 2011-21