

Technologies, beyond Li-ion, have valuable attributes for grid applications in developing countries but their limited track record can hamper its widespread deployment.

READ THE NEW ENERGY STORAGE PARTNERSHIP REPORT NOW

www.esmap.org/report-warranties-for-battery-energy-storage-systems-in-dev

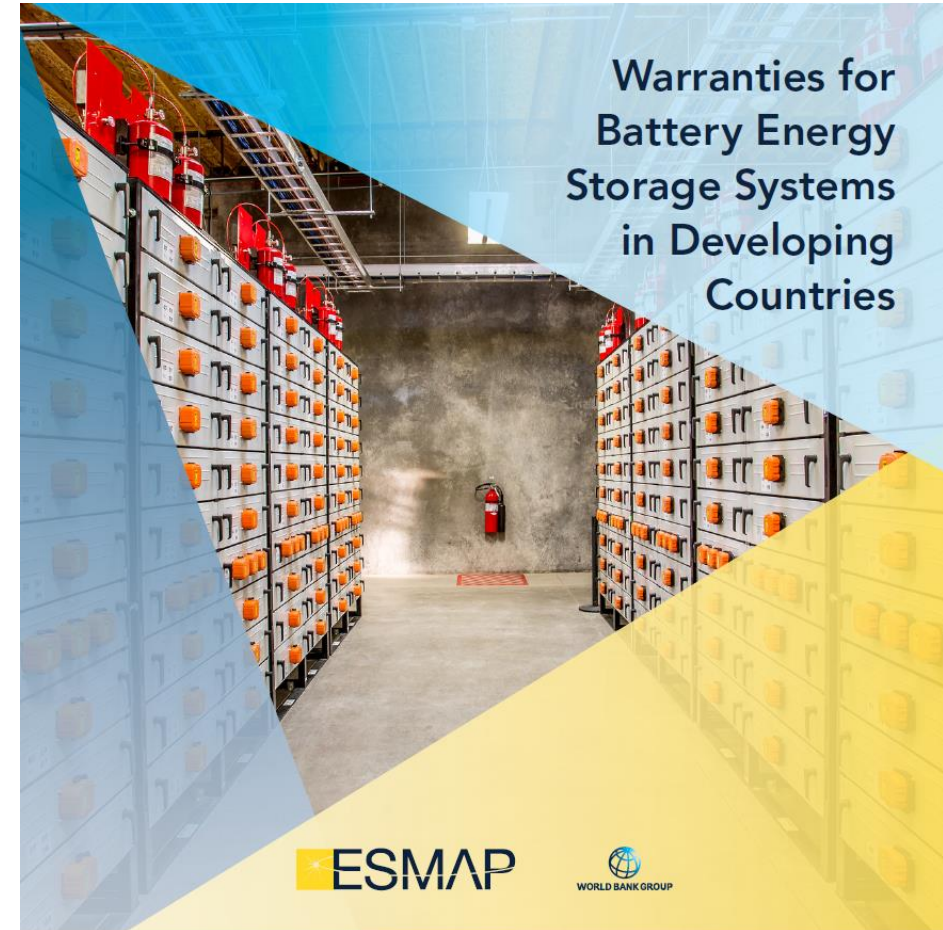


WARRANTIES FOR BESS IN DEVELOPING COUNTRIES

REPORT OF THE ENERGY STORAGE PARTNERSHIP

DELIVERABLE FROM THE ENERGY STORAGE PARTNERSHIP

- Prepared by ESMAP under the umbrella of the Energy Storage Partnership.
- It provides guidance on BESS warranties for typical applications in developing countries, considering local conditions:
 - BESS warranty coverage
 - BESS typical structure
 - Checklist for developing countries
 - Good practices for BESS warranty design



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WARRANTIES ARE KEY TO ENSURE THE BANKABILITY OF BESS PROJECTS

Free from defects

- Guarantee the quality of BESS components and that the overall system will **meet manufacturers' specifications**.
- In the case of new manufacturers with a short track record, warranties can be backed by insurance companies or other creditworthy entities.

Performance

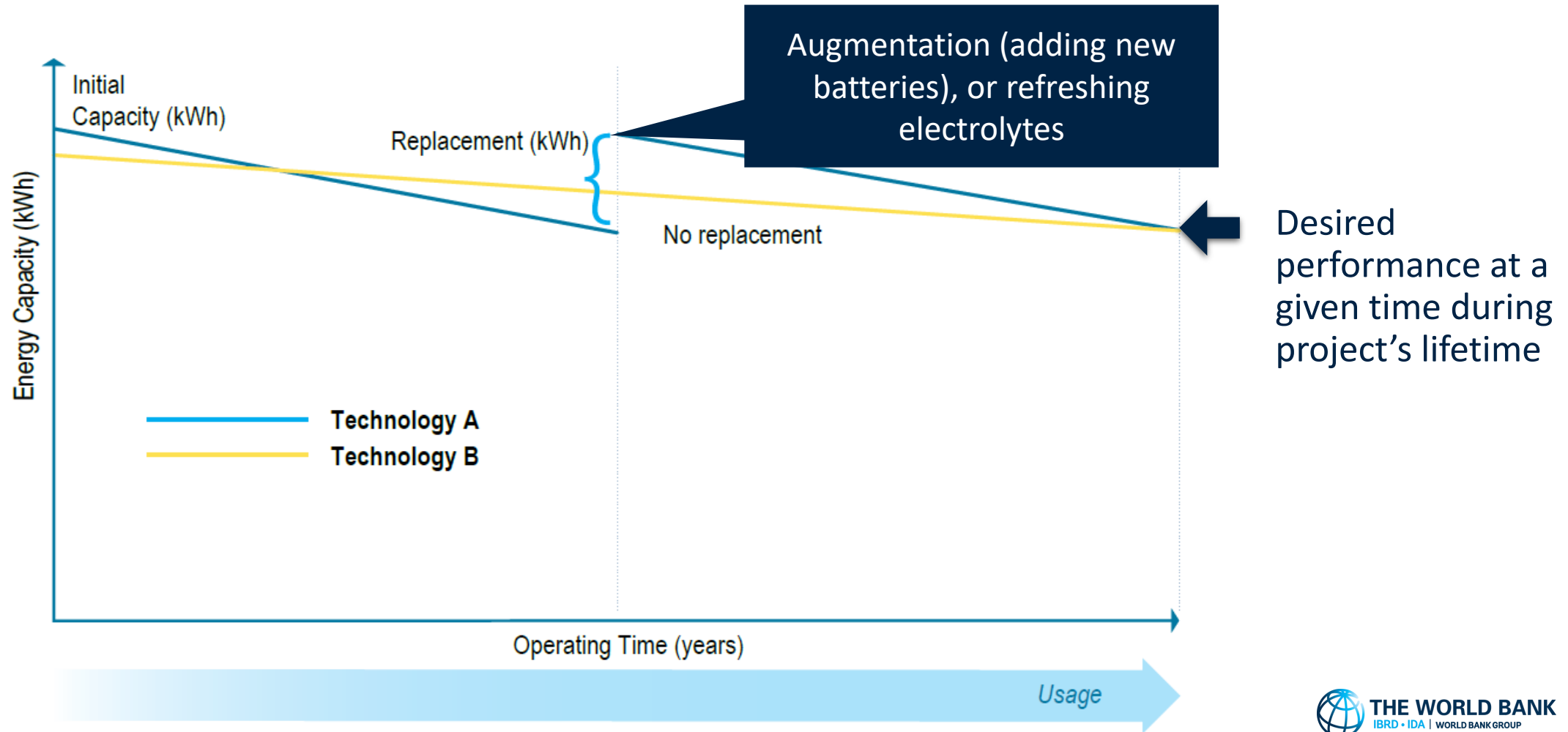
- Guarantee systems ensure minimum **performance levels for predefined applications**.
- Common performance metric: energy capacity (MWh).
 - Other less common metrics are: duration, power capacity (MW), efficiency (%) and availability.

provided that certain operating and environmental conditions are met over the course of the warranty period



BESS PERFORMANCE AND DEGRADATION MANAGEMENT

Depending on the technology, BESS performance decreases over time due to degradation (naturally occurring wear and tear)

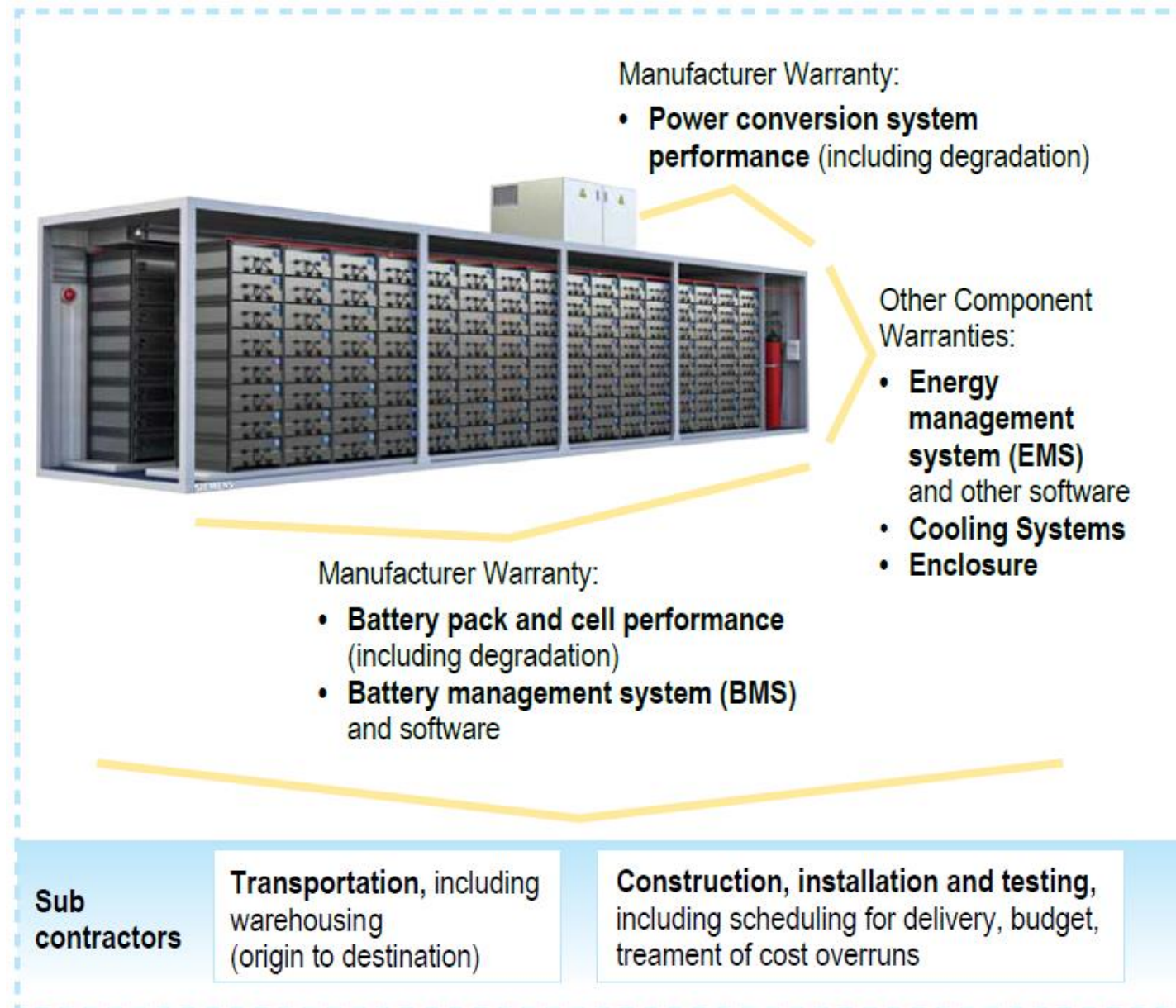


BESS WARRANTIES FOR DEVELOPING COUNTRIES

Conditions found in some developing countries may present extra operational challenges:

- High temperature and humidity
- Limited internet access, data transfer and/or remote monitoring capabilities
- Too few skilled local workers available for BESS installation, maintenance and repairs
- Remote and difficult to access areas (transportation and storage)
- Need to operate flexibly and outside the predefined application
- Poor power quality in local grid

BESS WARRANTIES STRUCTURE AND COSTS



Consider:

- Wrapped warranty, single point of contact
- Financial strength behind the warranty
- Balance affordability against scope and length coverage

CHECKLIST: ELEMENTS IN A WARRANTY FOR BESS

- ✓ Power (kW) and energy (kWh);
- ✓ System round trip efficiency;
- ✓ Lifecycle and the warranted calendar life of the battery;
- ✓ Intended application(s) and allowed duty cycle;
- ✓ Start of the warranty and warranty extension;
- ✓ Cost of the warranty and any required or related Long-Term Service Agreement (LTSA) contract;
- ✓ Terms and conditions, including operating and environmental requirements, procedures that must be followed;
- ✓ Monitoring performance and how non-performance is established;
- ✓ Scope of service associated with software updates as well as replacement or repair of the equipment;
- ✓ Responsibility for cybersecurity issues;
- ✓ Estimated time to complete repairs or replacements;
- ✓ Compensation in case of breach of warranty by the user;
- ✓ Serial loss clause (e.g., recall for recurrent problems);

WARRANTIES FOR BESS IN DEVELOPING COUNTRIES, SUMMARY



Help create a level playing field for all battery chemistries, to include those with valuable attributes for developing countries.



Tailor the warranties to typical applications in developing countries, offering flexibility of operation suited to projected duty cycles.



Make terms and conditions of BESS warranties clear and easy to implement. Define the environmental and operational limits that can void the warranty.



Ensure correct operation and maintenance of the BESS, so that the warranty remains valid. Long Term Service Agreement may be required.

THANK YOU

Questions or comments: please contact Sandra
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