



IEA Technology Collaboration Programme

New Task Proposal

Large-Scale, Medium-Duration Energy Storage

2021, November

Task Scope: (Large-scale Medium-Duration E. S.)

- **Medium-duration storage (from ~4hrs to ~200hrs)**

This is the band where a reasonable compromise between cost per unit power (\$/MW) and cost per unit of energy output capacity (\$/MWh) must be struck. Lithium-ion batteries are unlikely to be suited here because of the relatively high costs per unit energy storage capacity (with existing chemistries). Turnaround efficiency must be reasonable (65% and upward probably suffices in most contexts). The relevant measure of system lifetime is in years rather than charge-discharge cycles. Most of the viable options in this band are (thermo-)mechanical systems where energy is stored in the form of heat/coldness/compressed-air/liquefied-air/gravitational-potential – or combinations of these forms.

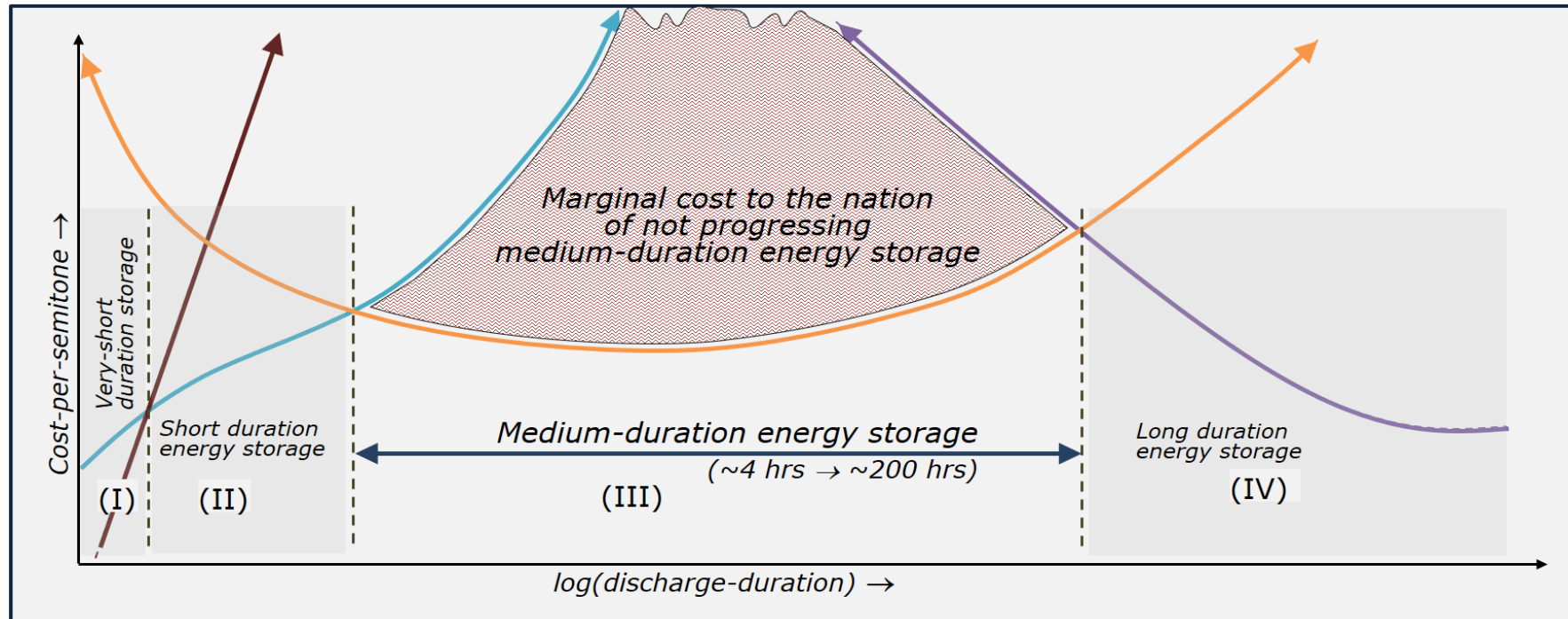


Figure 1.
The four main durations of energy storage.

Proposed Subtask Structure

IEA Energy Storage Task: Large-Scale Medium-Duration Energy Storage

Subtask 1
Definitions and Taxonomy

Subtask 2
Review of existing plant in
the (LS-)MDES category

Subtask 3
Review of what systems
could exist in the
(LS-)MDES category and
what might be their costs
and performance metrics

Subtask 4
Modelling to inform what
roles might be performed
by MDES systems in the
future

Subtask 5
Tracking medium-duration
storage of energy services

Subtask 6
Assessing the geographical
resources supporting
MDES

Subtask 7
Understanding the
potential for GIES systems
to provide MDES

Subtask 8
Examining what policy and
financial frameworks can
succeed