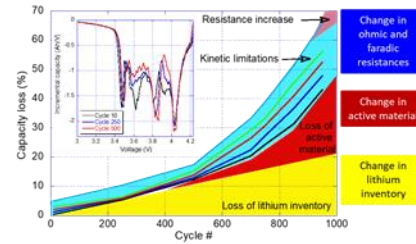


Hawaii Natural Energy Institute Battery activity 2018

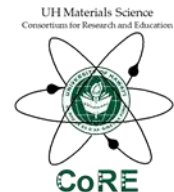
Matthieu Dubarry

matthieu.dubarry@gmail.com



1680 East West Road, POST 109, Honolulu, HI 96822

Ph: (808) 956-2349 • Fax: (808) 956-2336

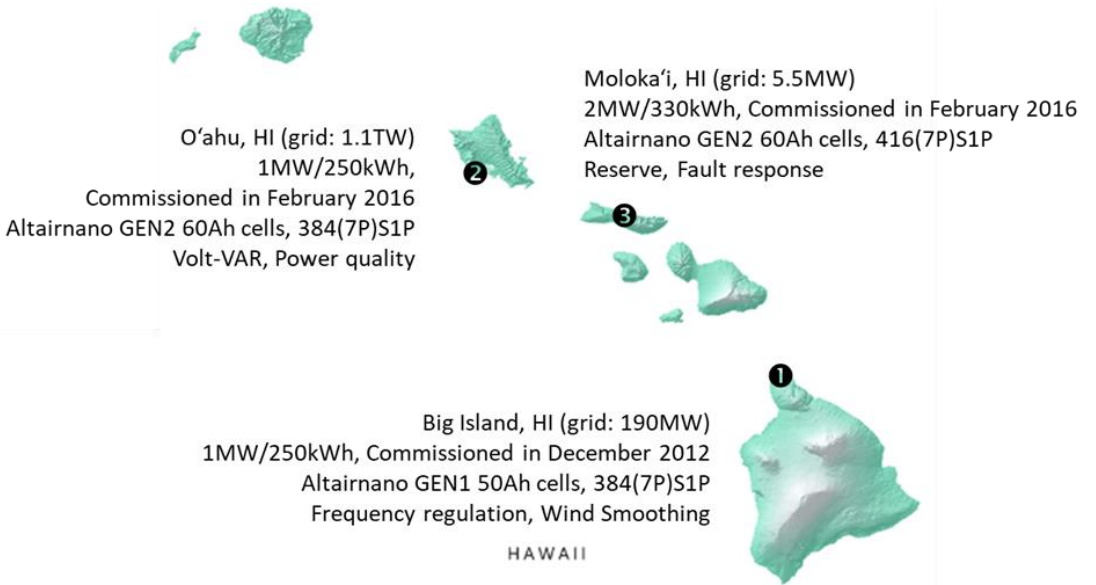


HNEI battery testing laboratory

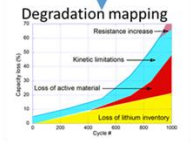
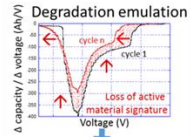
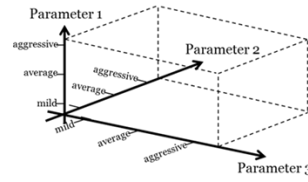
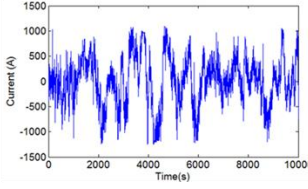
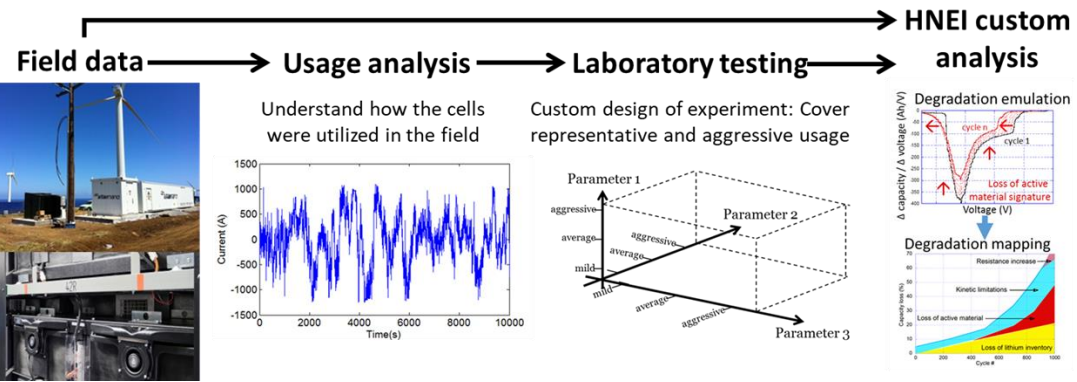
Recent focus on batteries for storage, grid-tied

Grid-tied Storage

Monitoring of 3 grid-tied systems
(≥ 1MW)



Laboratory testing of single cells
(similar to the one in large batteries)
> 80 battery tested under different conditions



HNEI battery testing laboratory

Recent focus on batteries for storage, grid-tied or in vehicles

Grid-tied Storage

Monitoring of 3 grid-tied systems
 ($\geq 1\text{MW}$)



Laboratory testing of single cells
 (similar to the one in large batteries)
> 80 battery tested under different conditions



Vehicle Storage

Study impact of vehicle to grid
 usage on EV battery degradation



Laboratory testing of single cells
 (similar to the one in EVs)
> 80 battery tested under different conditions



The complexity of battery diagnosis

Path dependence of the degradation

Traffic



Road type



Driving habits



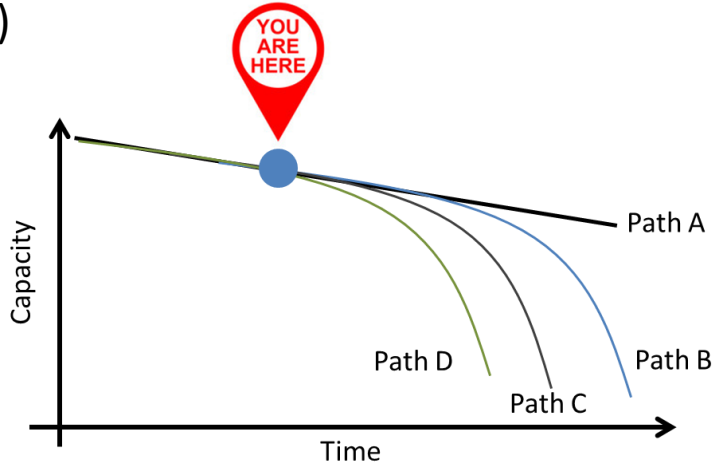
Charging habits



Temperature



Grid ties (V2G / G2V)



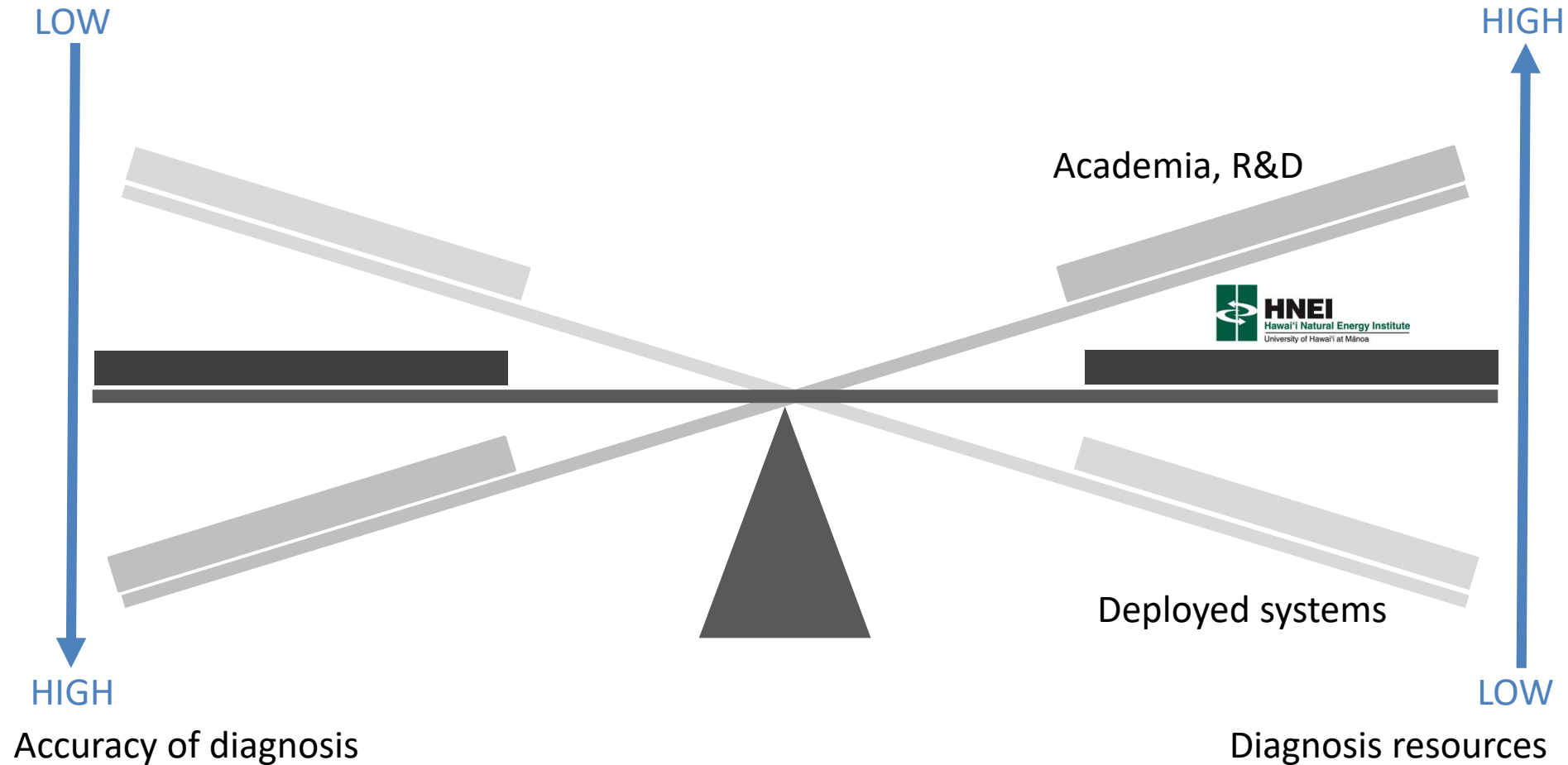
Different paths will lead to different degradation

Every battery is different

HNEI developed accurate diagnosis using onboard parameters

The complexity of battery diagnosis

Complex balance



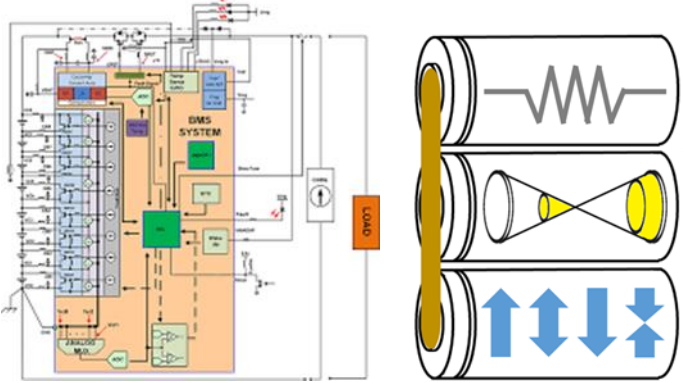
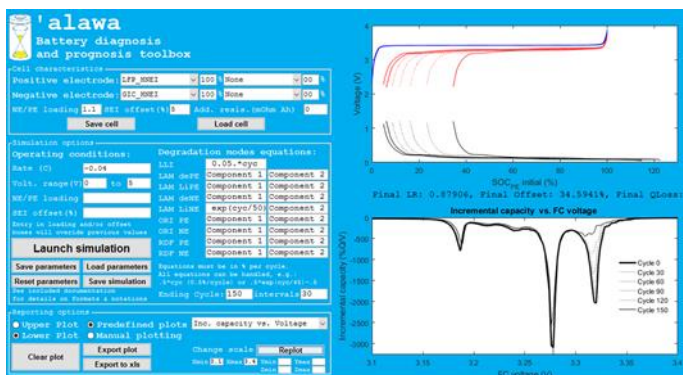
HNEI battery testing laboratory

Testing following rigorous protocols
 Well defined performance metrics
 Experience in experimental design
 Operando Diagnosis and prognosis
 Non destructive analysis

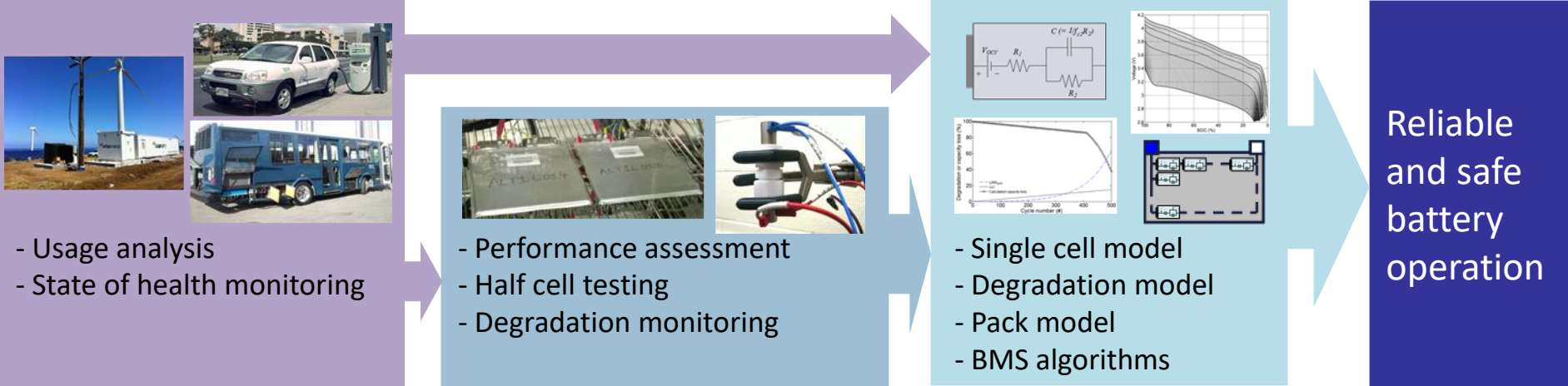
Online SOC and SOH monitoring
 New methodologies for deployed systems

BESS modeling
 Account for cell-to-cell variations
 Transfer knowledge from single cell to packs

Applications to commercial batteries
 BESS
 V2X / X2V
 Second use, Recycling (To be started)



HNEI Battery activity



Field Testing

Laboratory Testing

Modeling

Funding



Collaborations

