



**NANYANG
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Smart Multi-Energy System – SMES

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Energy Smart & Research Innovation

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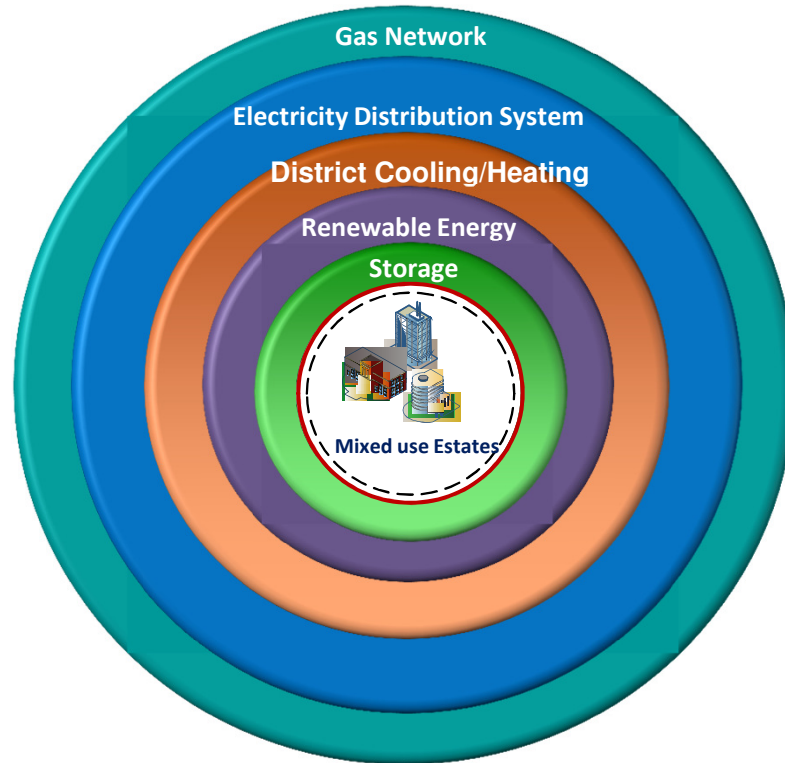
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Multi-use-multi-energy estates present opportunities for further optimisation



Under Optimized
Mixed Use Multi
Energy Estates

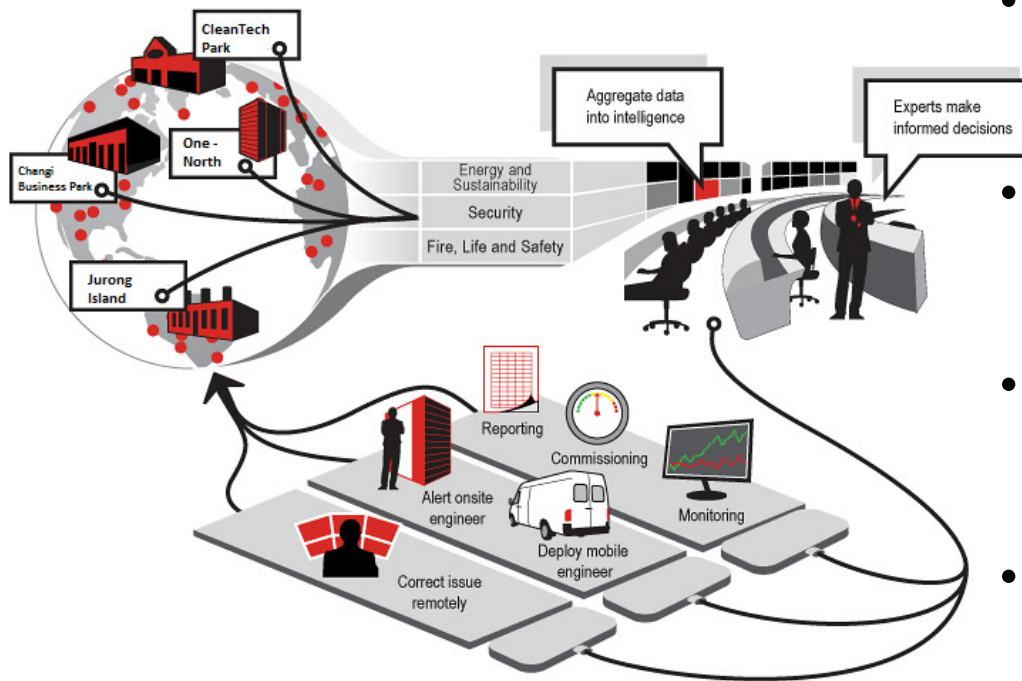
Problem Statement and Opportunity

- Conventional gas and electricity systems are decoupled resulting **low optimisation, under utilisation of assets, energy losses and over design**
- District cooling/heating systems can provide greater efficiency within the district but are also **decoupled** from other energy systems
 - Increased distributed renewable energy systems coupled with energy storage whilst addressing intermittency challenges have **limited controllability** and can result in **network instability**
 - **Opportunity** to deliver energy efficiency, cost savings, better utilisation of assets with greater system level optimisation and resilience enabled by smart grid functionalities in an intelligent system

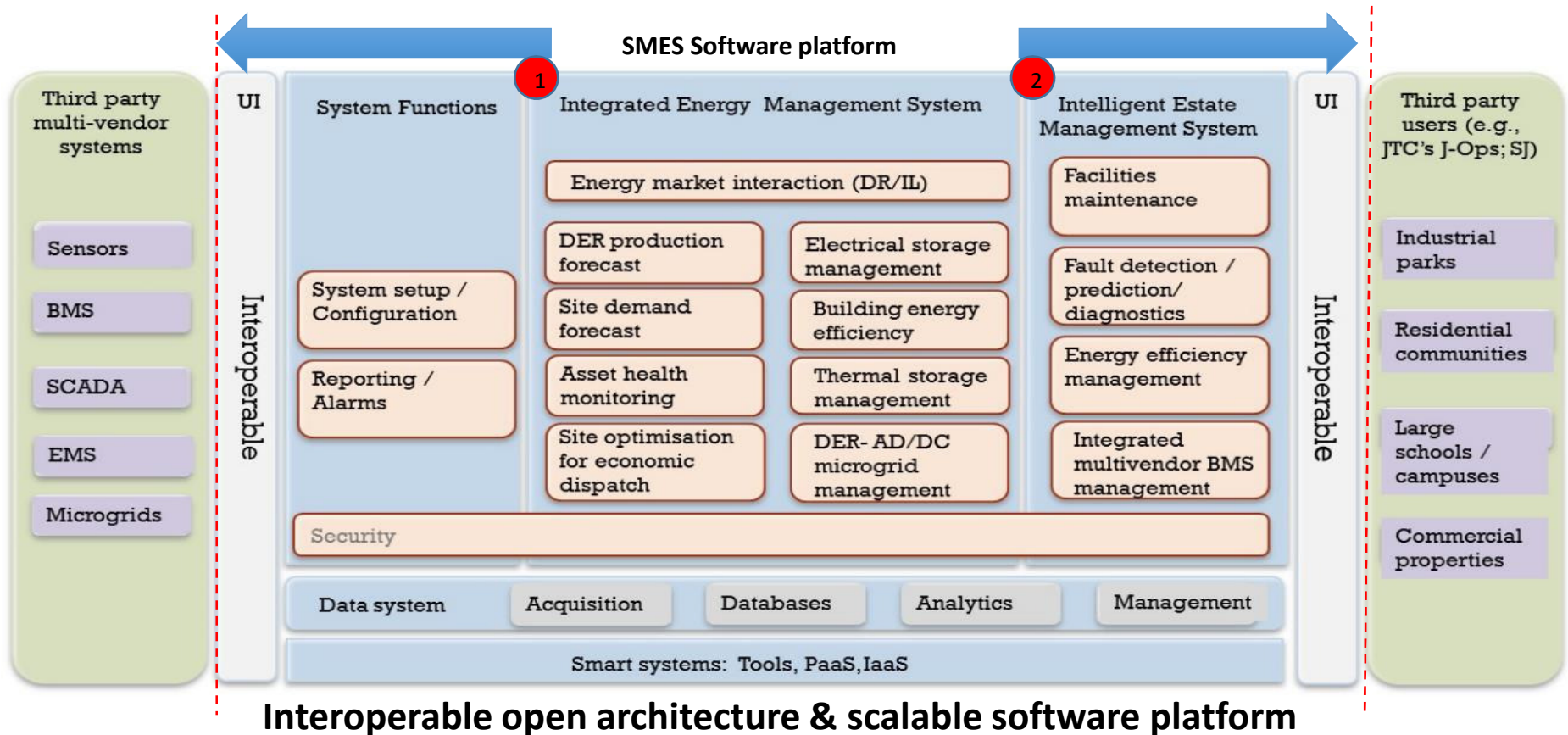
Estate and facility management system have limited capability to generate insights for effective operational decision making

Key challenges

- Big data not smart data coupled with operational insights
- Monitoring of assets performance with limited optimisation
- Asset level optimisation not estate or facility level optimisation
- Reactive to failures not pro-active to limit impact of failures
- Act as a consumer and not partner in system level resilience

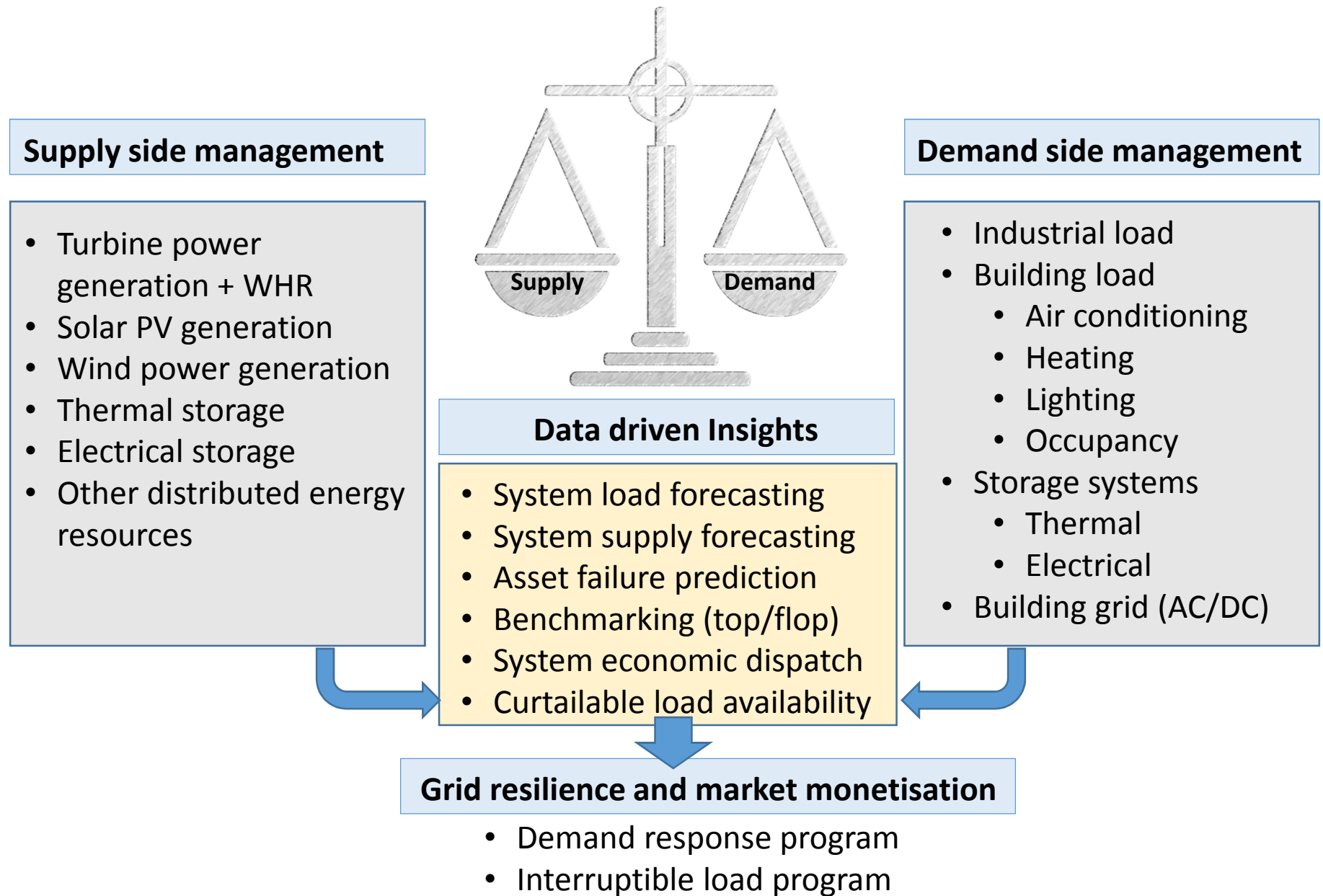


SMES provides operational insights through algorithms to drive energy efficiency, cost reduction and system resiliency

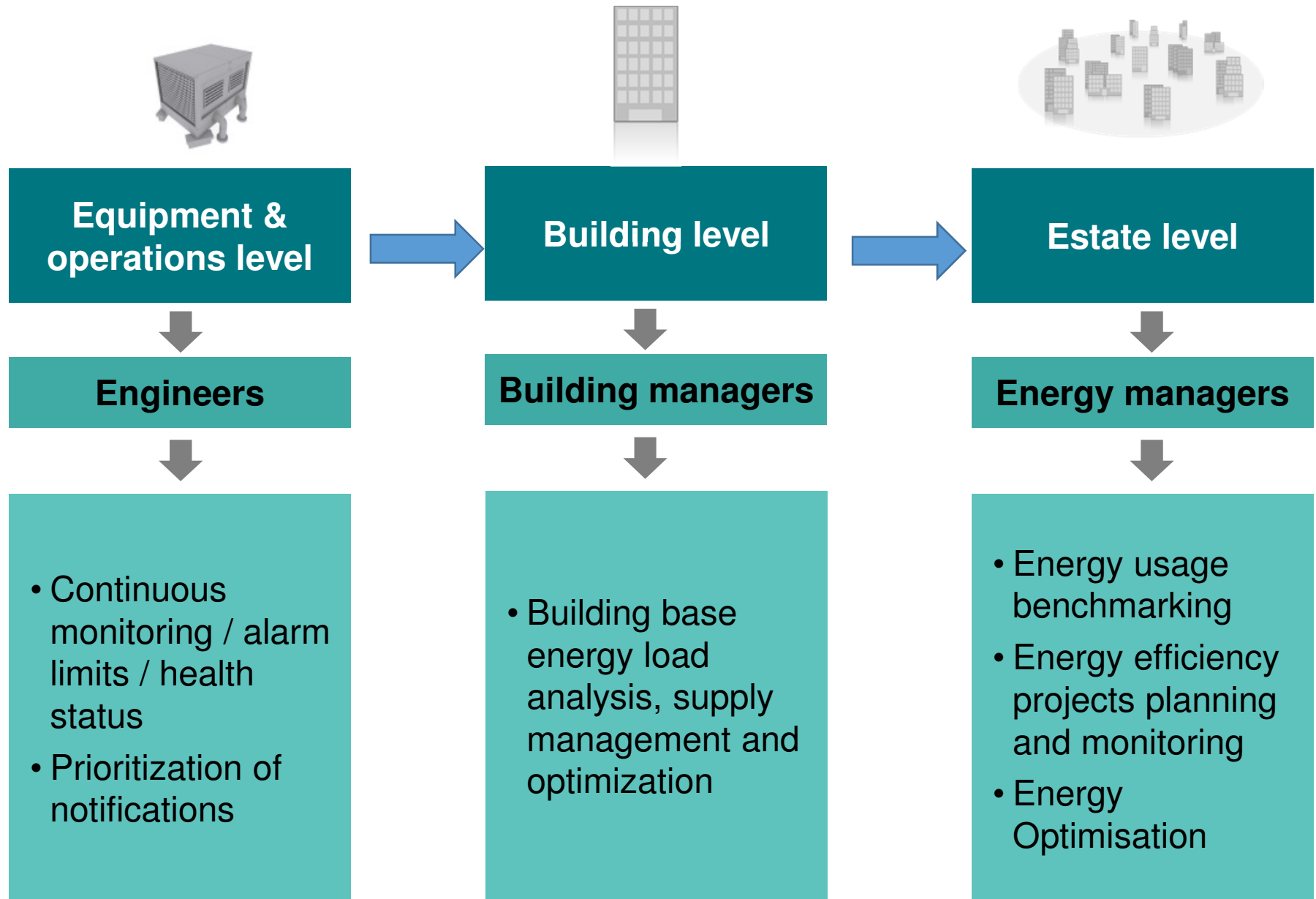


SMES software platform serves as a central command center enabling smart grid functionalities across two key management systems

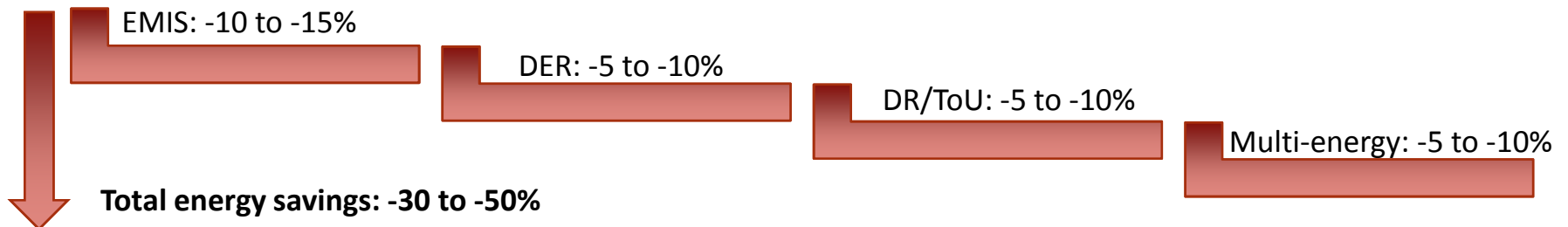
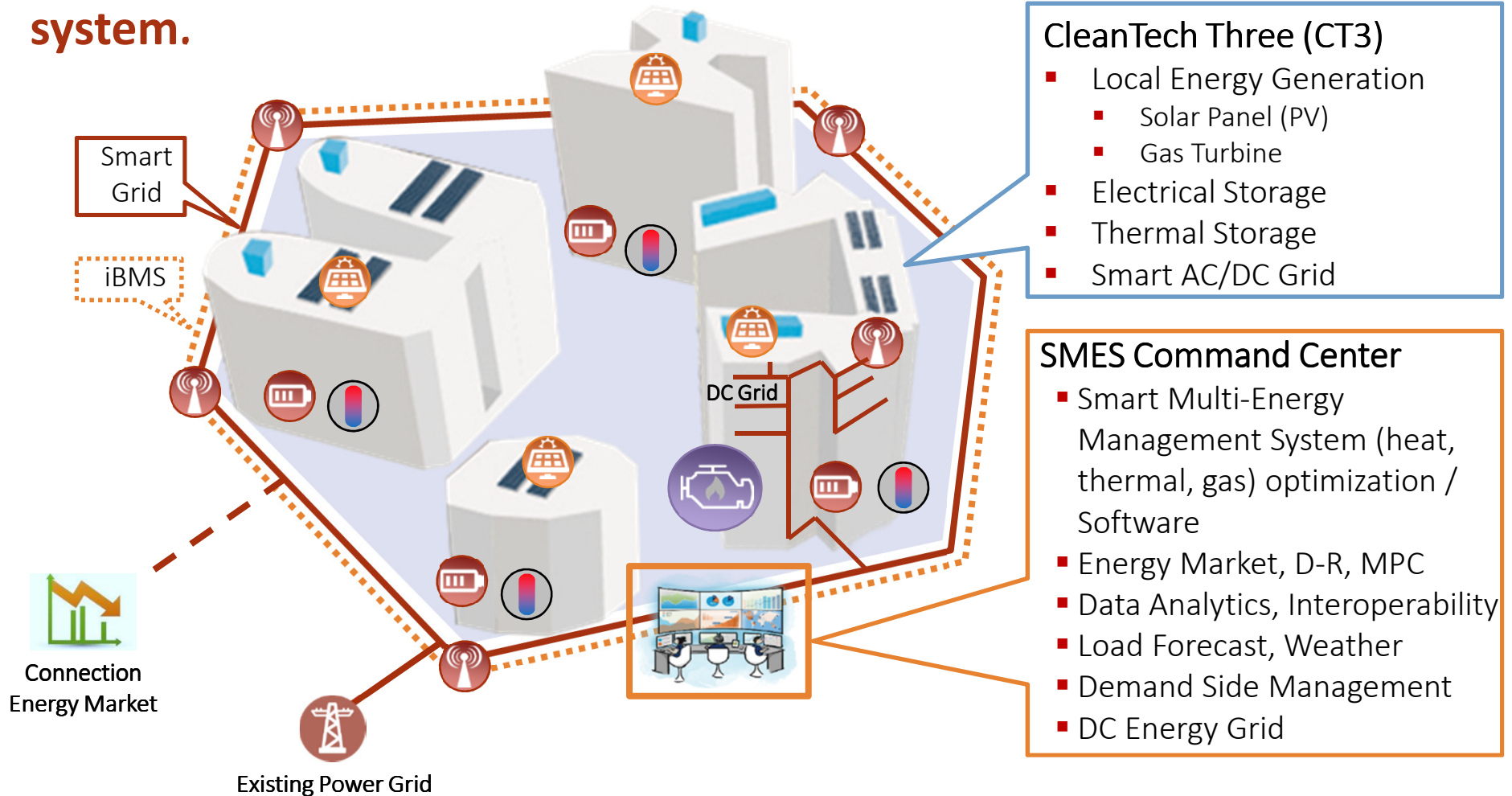
SMES's in house developed software solution key features to help operators of facility and estate management

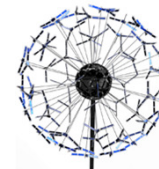
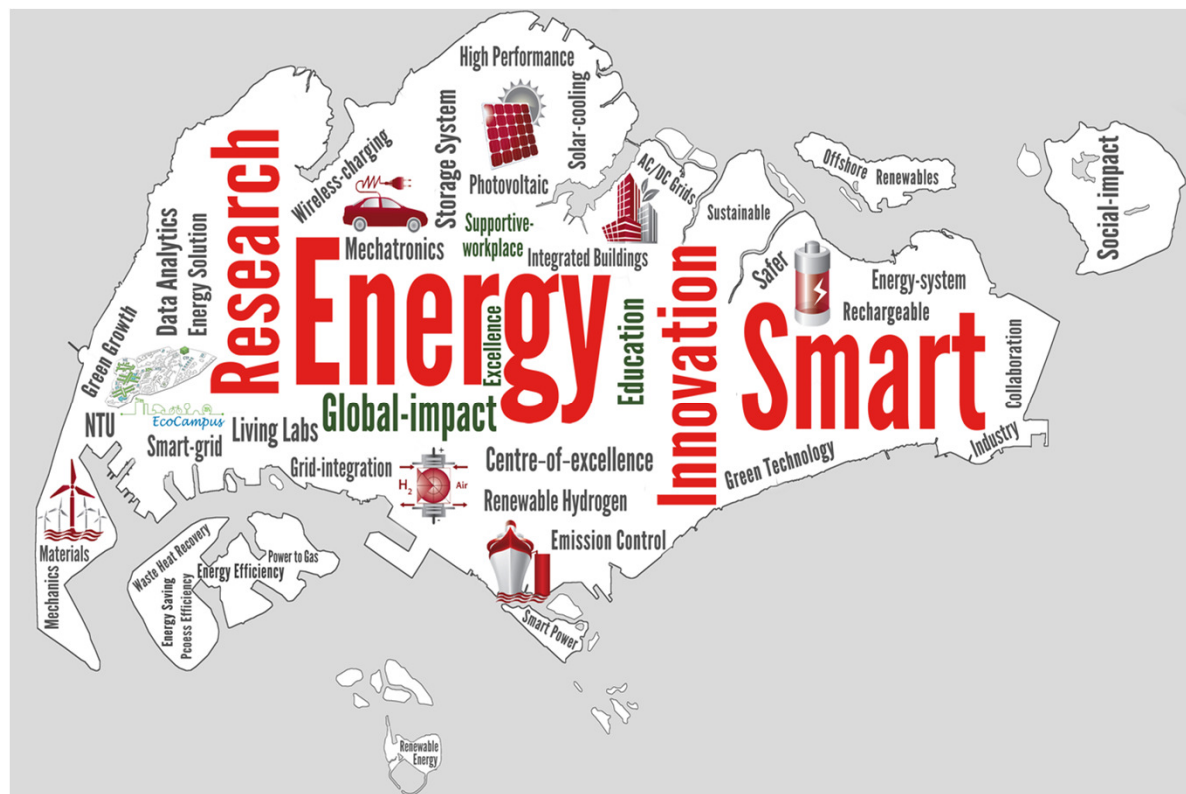
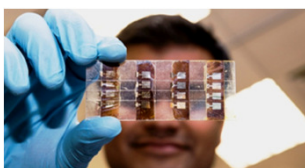


System of system level optimization using a bottoms up strategy moving from the equipment to the building to the estate



SMES's project will demonstrate the benefits of an integrated system.





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