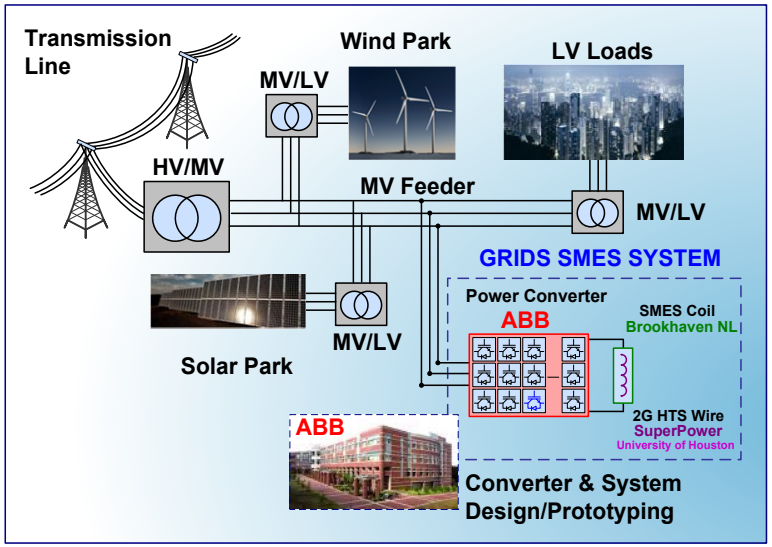
# Superconducting Magnet Energy Storage System with Direct Power Electronics Interface

## Project Goal

- Competitive, fast response, grid-scale MWh superconducting magnet energy storage (SMES) system
  - Demonstrated through a small scale prototype, (20 kW, 2.5 MJ) and direct connection power electronics converter (with Si-based devices)




## Project Update

- Issues related to SMES system integration being addressed
- Project slightly behind schedule; on budget
- Fabricated pancakes for magnet inner structure, enough for a 1.7 MJ SMES demonstration device
- Successfully constructed and tested a SMES coil demonstrating field strength > 10 T
- Developed and successfully tested a RF assisted fast superconducting switch
- A partially integrated SMES system was demonstrated; controllable charge/discharge up to 80% of $J_c$
- ~6.7 km of 12 mm wide tape with $I_c$ > 350 A delivered
- Installation of Enhanced MOCVD system was finalized and test runs were initiated
- A Modular, Multichannel, Multilevel, Interleaved structure designed to interface with grid and coil
- Thermal design verified on AC/DC and DC/DC converter modules; module level short circuit protection function successfully tested

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