Novel Compressed Air Approach for Off-Shore Wind Energy Storage
Perry Li (PI), Terry Simon, Jim Van de Ven, Eric Loth*, Steven Crane**, U. of Minnesota, U of Virginia*, and Lightsail Energy Inc**.

Motivation:
- Wind supply / power demand mismatched
- Intermittent and unpredictable
- Turbines have low (40%) capacity factor

Benefits of Storage:
- Even out supply/demand variation
- Down-size components at demand level

Compressed air storage:
- Reasonable energy density
  - ~ 500m$^3$ for 8*3MWhr
- Cost effective
- Efficient if isothermal
- Turned on/off quickly
- Used anywhere

Multi-disciplinary Research:
- Heat Transfer
- Fluid Mechanics
- Machine Design
- Systems & Control

NSF ERFI-1038294