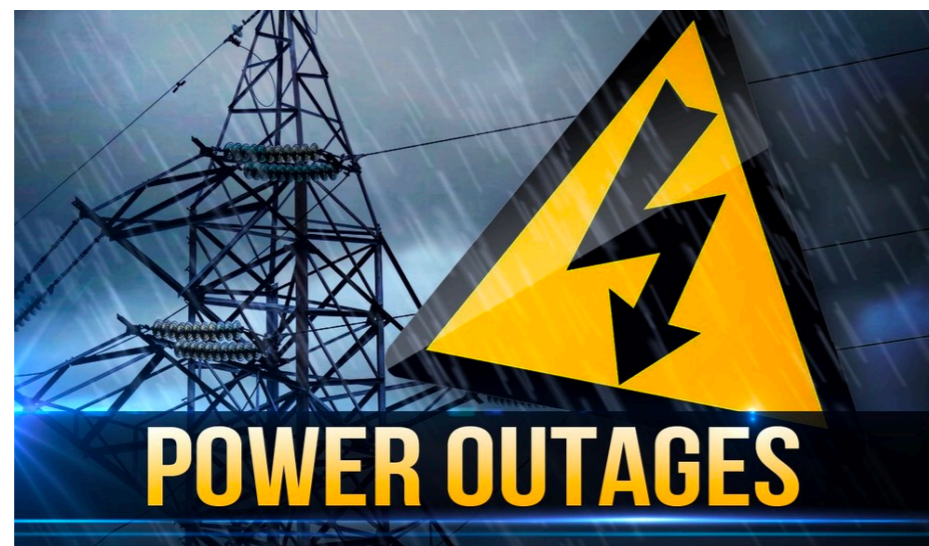
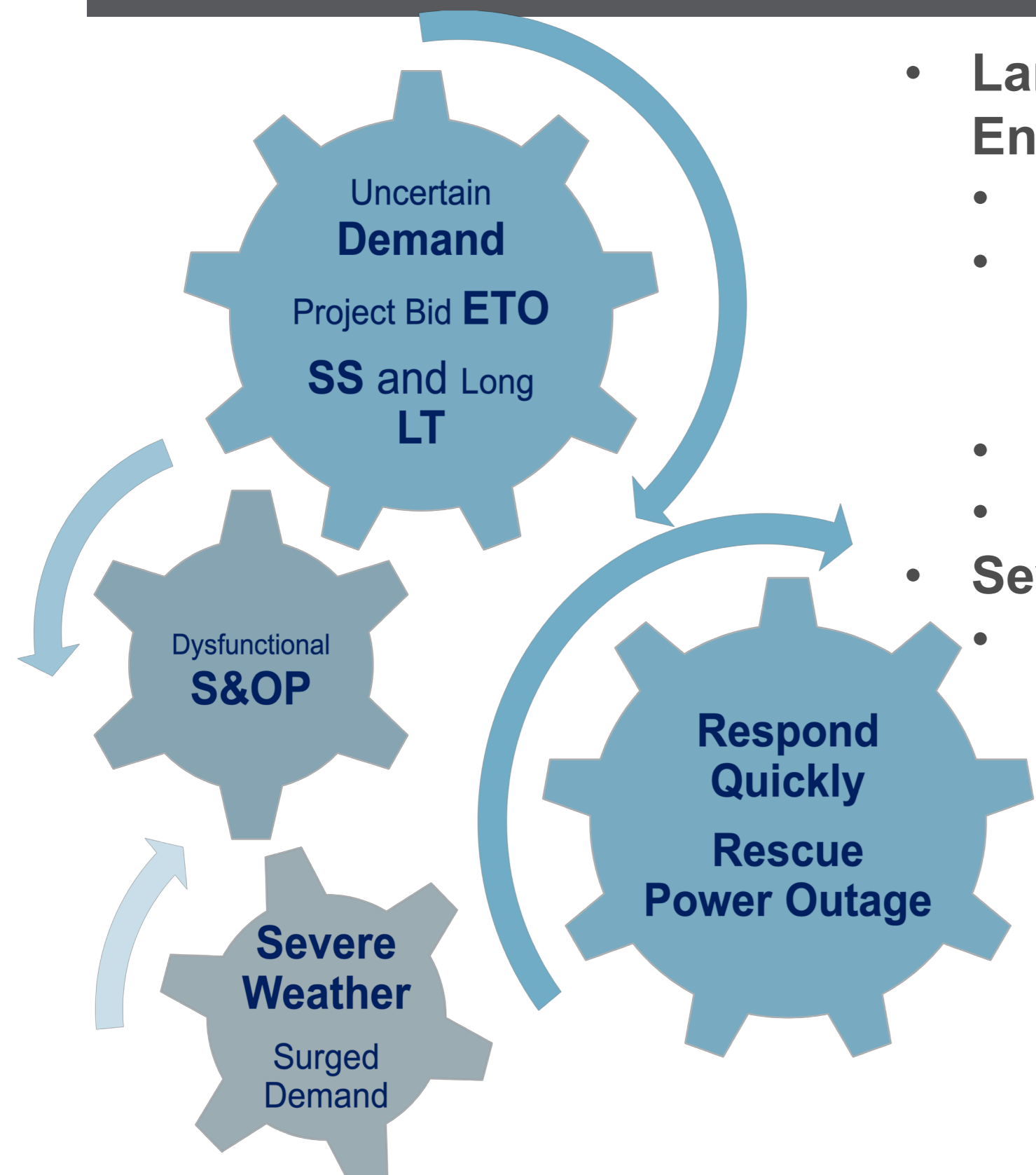


Student: Don Guo, SCM 2019  
 Advisor: Nima Kazemi, PhD  
 Advisor: Josué C. Velázquez Martínez, PhD  
 Sponsor: Valmont Industries, Inc

# Supply Chain Resilience in Engineer-To-Order (ETO) Industry

## Motivation / Background

- Large project-bidding-based Engineer-to-Order (ETO)
  - Uncertain demand
  - No inventory and safety stock policy for demand surge period
  - Long LT (6-9 m)
  - Vulnerable forecasting
- Severe weather
  - Hurricanes, Storms, Tornadoes

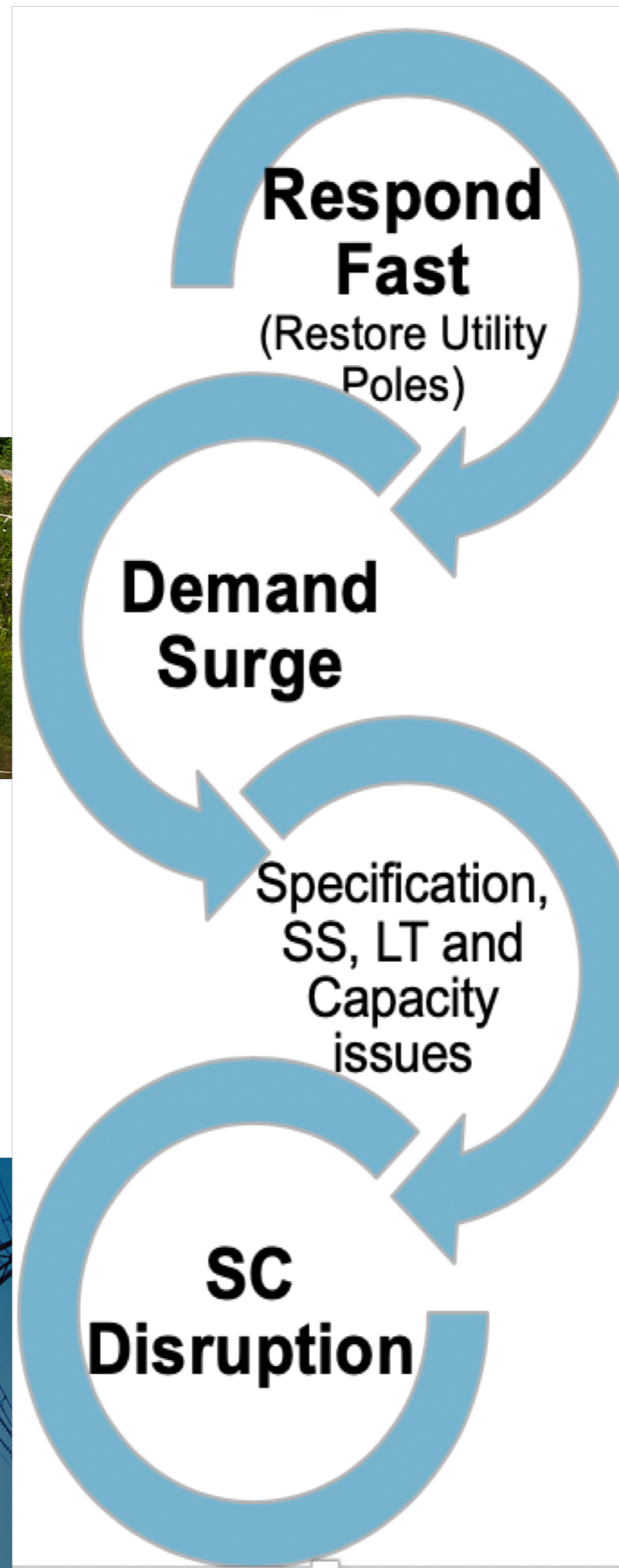
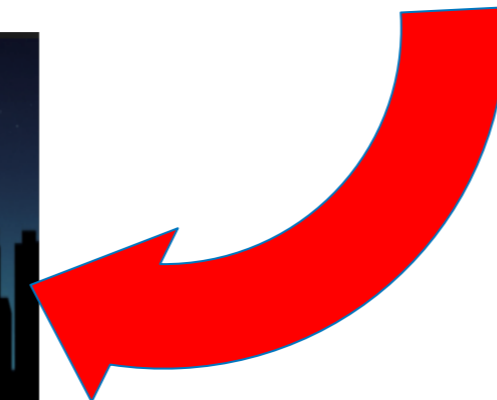
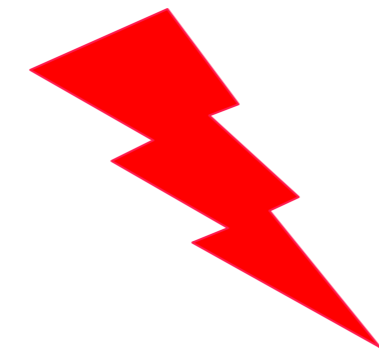
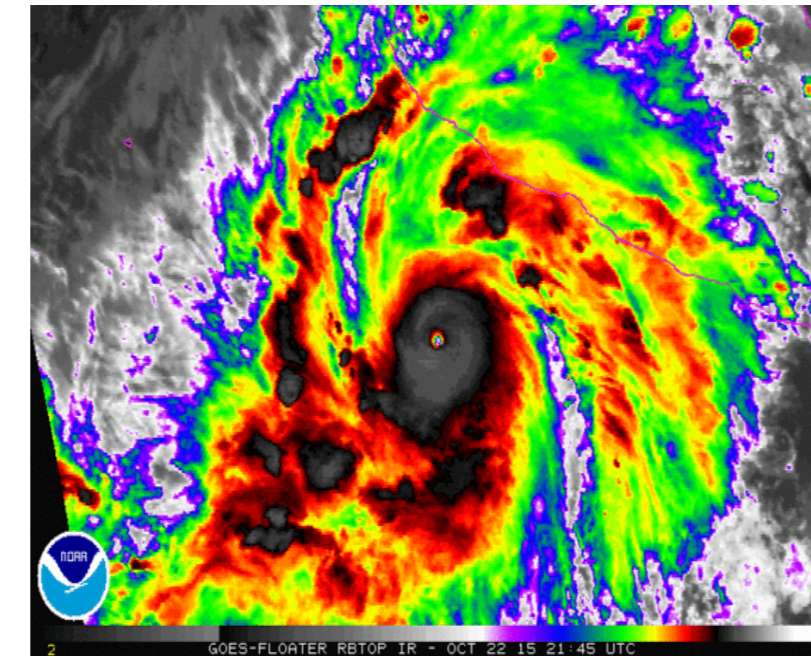


## Key Questions

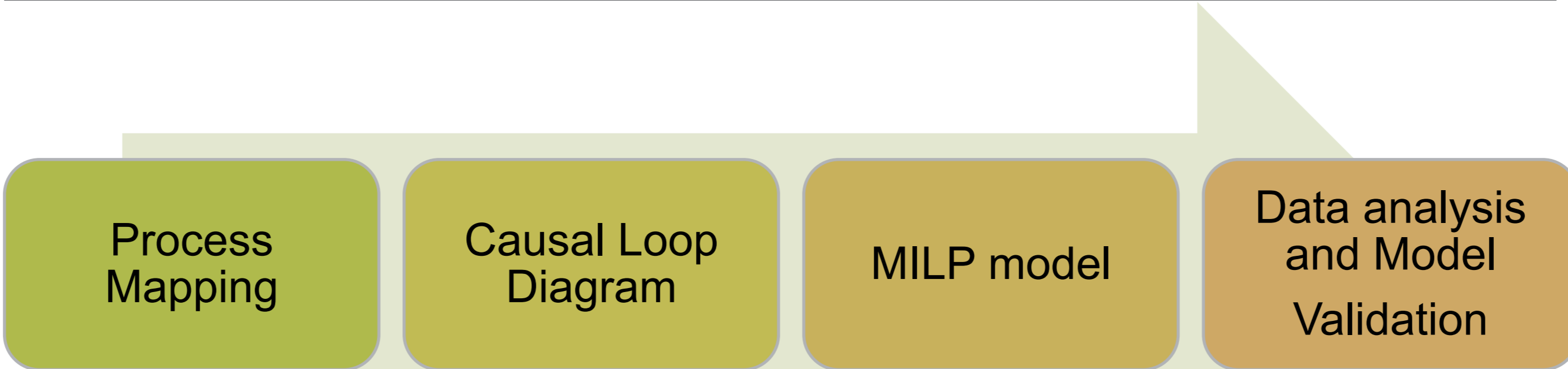
- Is there a better forecasting mechanism during the severe weather uncertain demand period?
- What is the optimal inventory policy of the case company under the uncertain/stochastic demand pattern?

## Relevant Literature

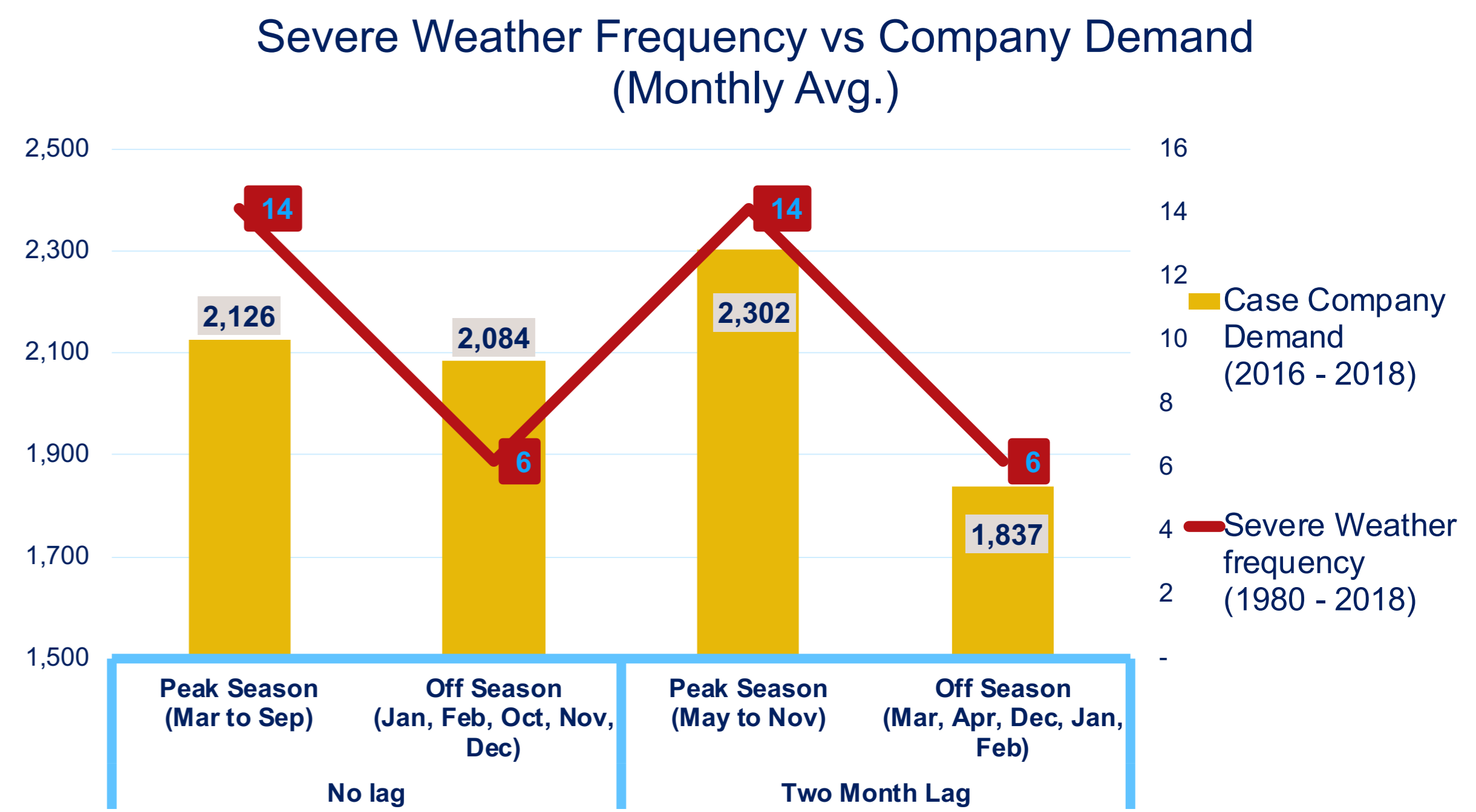
- Uncertain demand, safety stock and lead time  
 Boute, Robert N., Stephen M. Disney, Marc R. Lambrecht, and Benny Van Houdt. 2014. "Coordinating Lead Times and Safety Stocks under Autocorrelated Demand."
- Severe weather impact the power outage → surged demand  
 Kenward, Alyson, and Urooj Raja. n.d. "BLACKOUT: EXTREME WEATHER, CLIMATE CHANGE AND POWER OUTAGES,"
- Forecasting model: Weather forecasting vs SC Forecasting



## Methodology



## Initial Results



- Severe weather, storm, hurricane and tornado caused nearly 90% of all weather-related power outage.
- The peak season of the severe weathers is from Mar to Sep each year.
- The case company shows a 2 months lag responding to the severe weather demand surge from May to Dec each year.

## Expected Contribution

- Suggest a better demand forecasting method for the case company
- Design an optimal solution to help the case company determine a proper level of safety stock, and inventory policy

Don Guo

