

# Smart Control and Protection Scheme Solution to Improve Security of Supply in Hawke's Bay

Tiantian Xiao, Power System Engineer  
Aug 2018



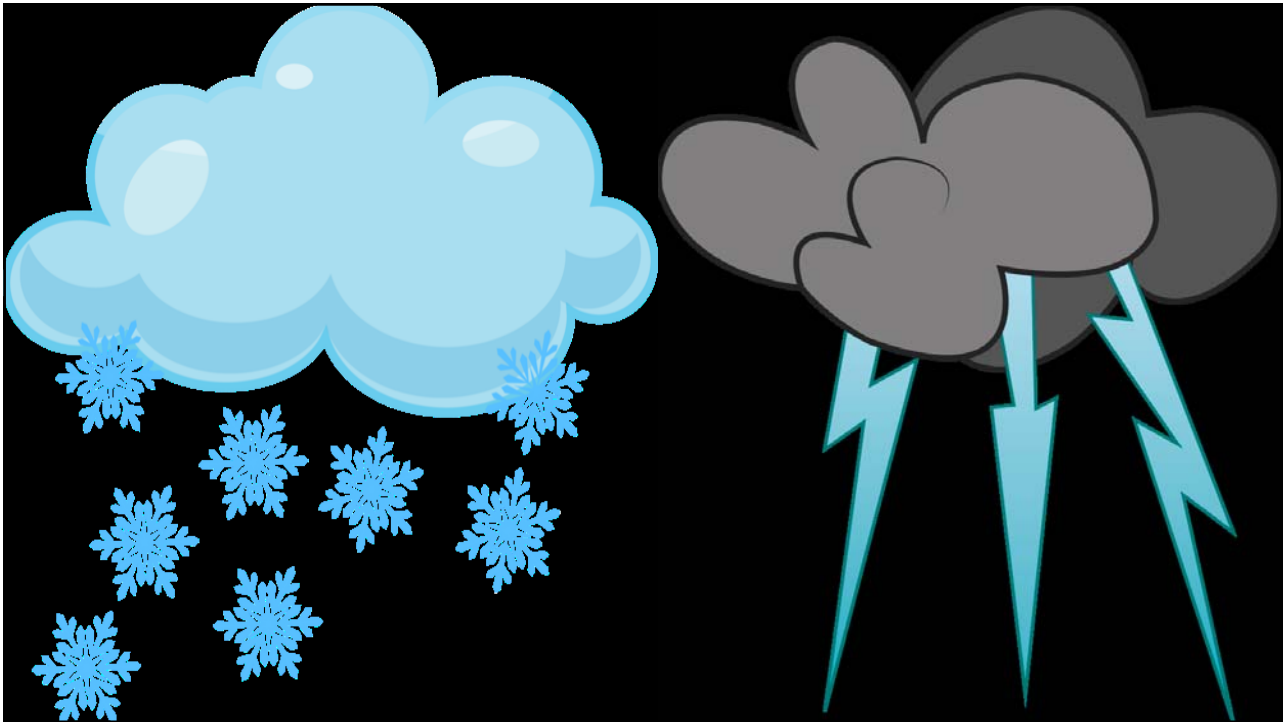
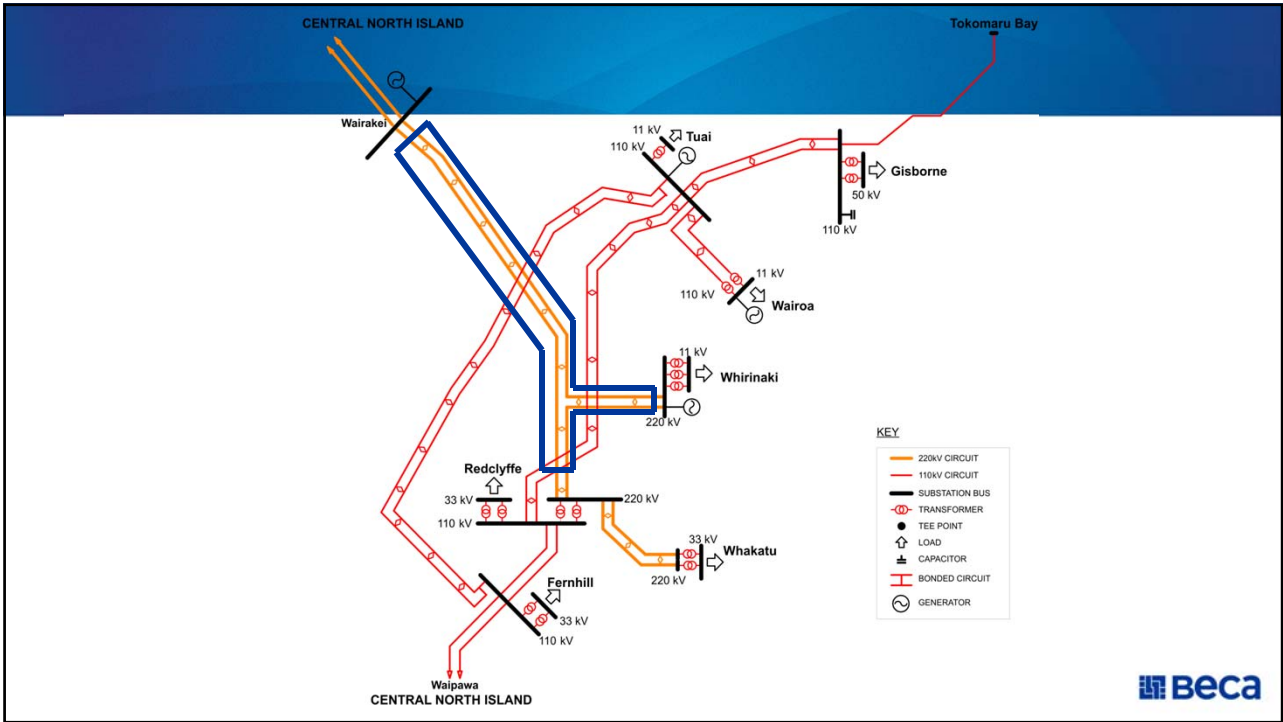
## Hawke's Bay Projects

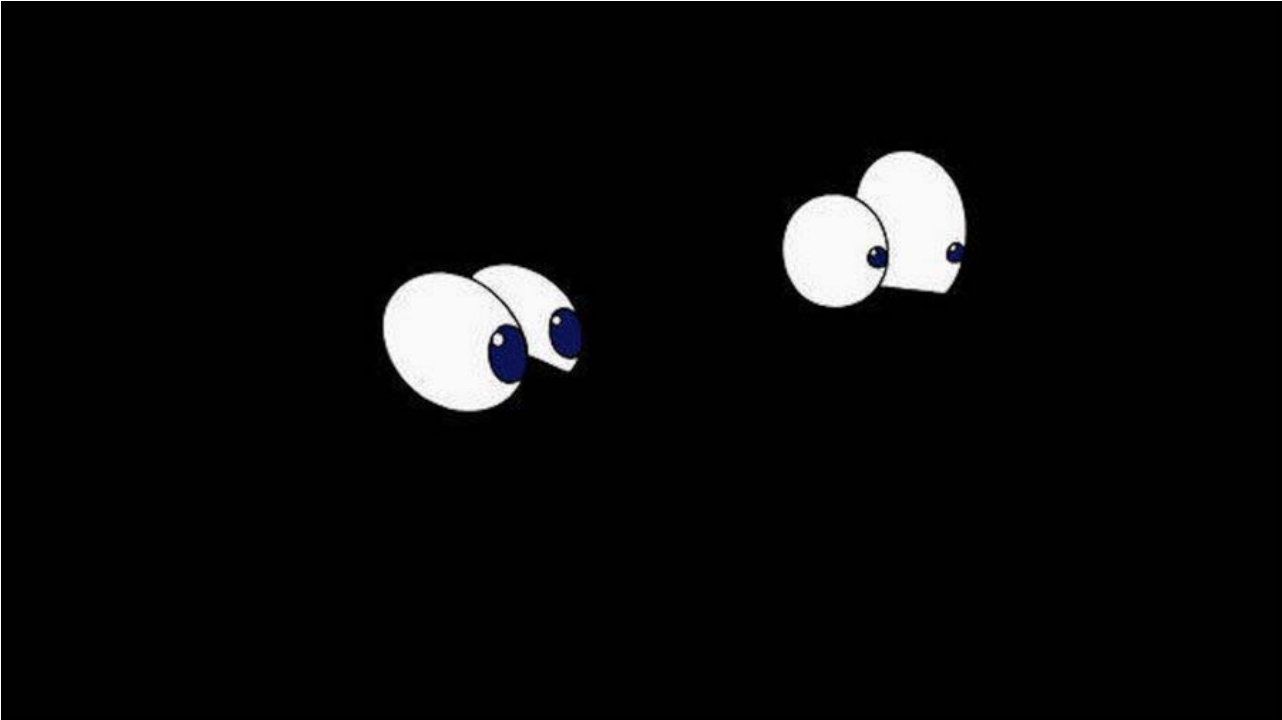
- Big thanks to Transpower!!
- Beca has completed a number of projects for Hawke's Bay Projects, includes SCADA upgrade, line protection upgrade, transformer protection upgrade, and many more!

**TRANSPOWER**



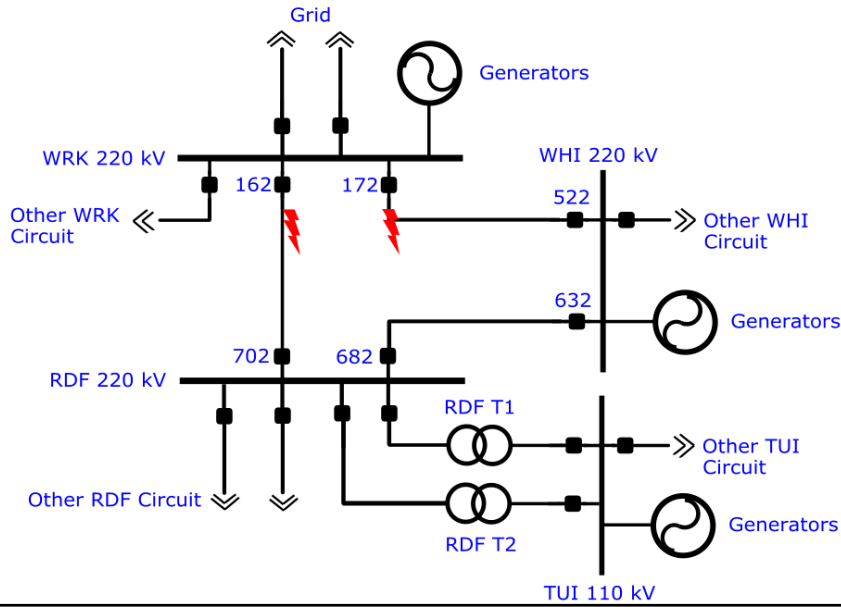




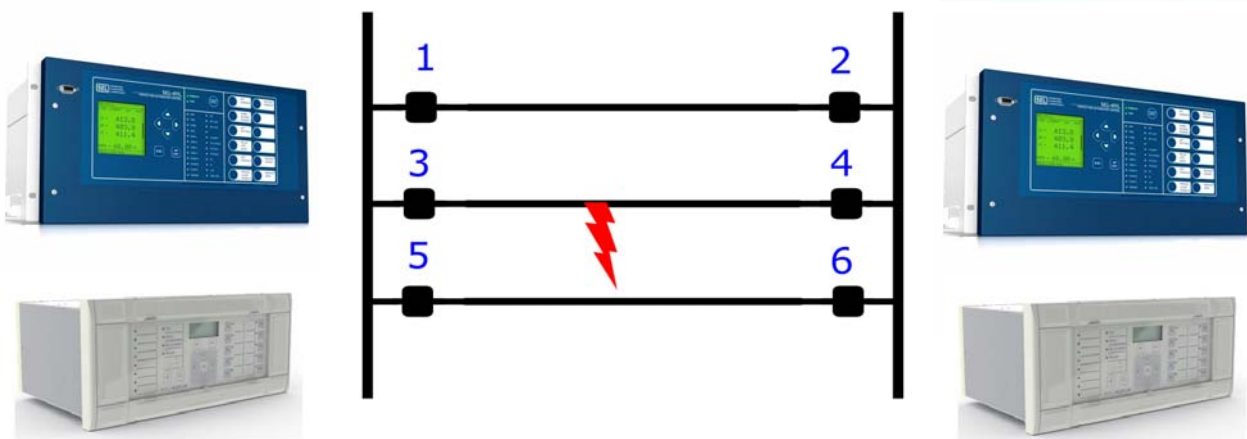


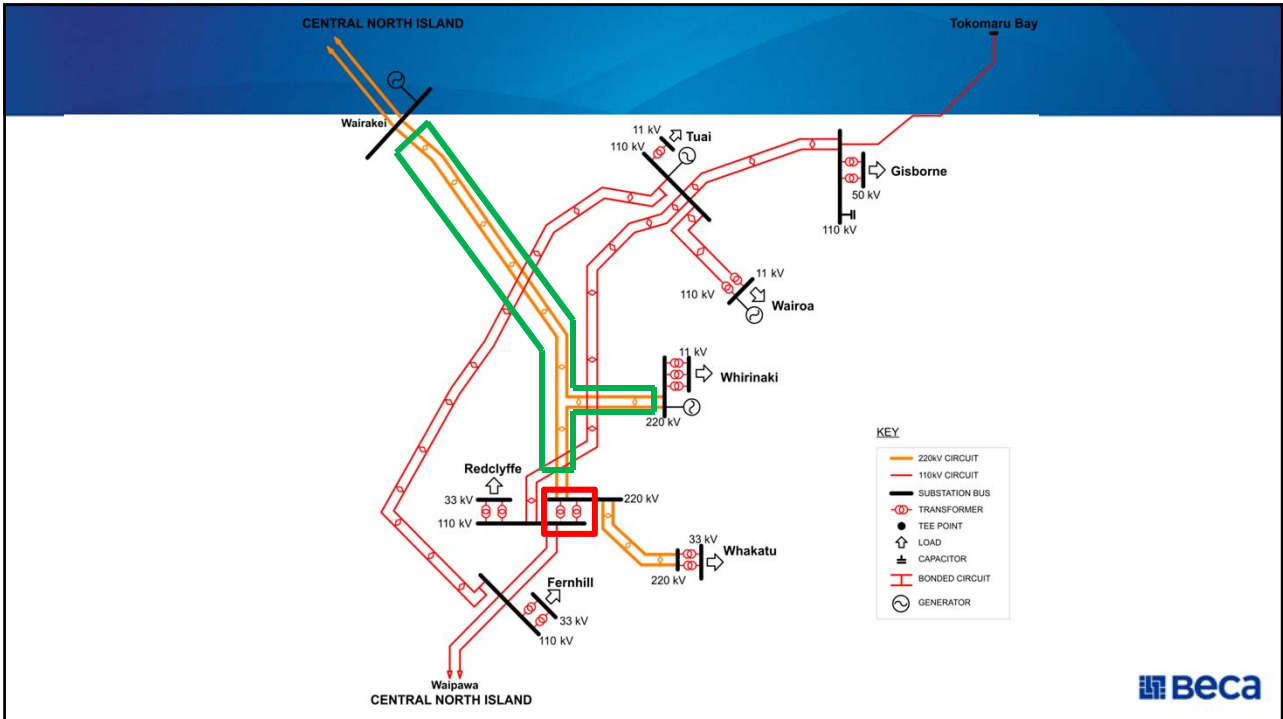
Event Date	Load Disrupted	Event Description
25-26 Sep 2000	449 MWh	Snow storm resulted in double circuit outage of the WRK WHI A line. Multiple interruptions to Hawke's Bay and Gisborne.
8 Feb 2014	97 MWh	Lightning tripped both circuits of the WRK-WHI A line. One of the two-line protections on the Redclyffe-Whirinaki- circuit did not correctly discriminate the fault direction, causing an unwanted trip, and the Wairakei-Whirinaki circuit was blocked from reclosing by the synchronism check scheme at the Whirinaki end. Supply was lost at Whirinaki.
10 Apr 2014	365 MWh	Lightning strike resulted in double circuit tripping of the WRK WHI A line. Automatic reclosing at the Whirinaki and Redclyffe ends was blocked by the synchronism check scheme. Total loss of supply to Hawke's Bay and Gisborne.
6 August 2016	163 MWh (first event) 198 MWh (second event)	Snow storm resulted in double circuit outage of the WRK WHI A line. Following the first event, only the Wairakei-Whirinaki-circuit 1 was able to be reclosed. A second fault on the Wairakei-Whirinaki circuit 1 later on in the day resulted in a second LOS to Hawke's Bay and Gisborne.

## 220kV Autoreclose



## 220kV Autoreclose



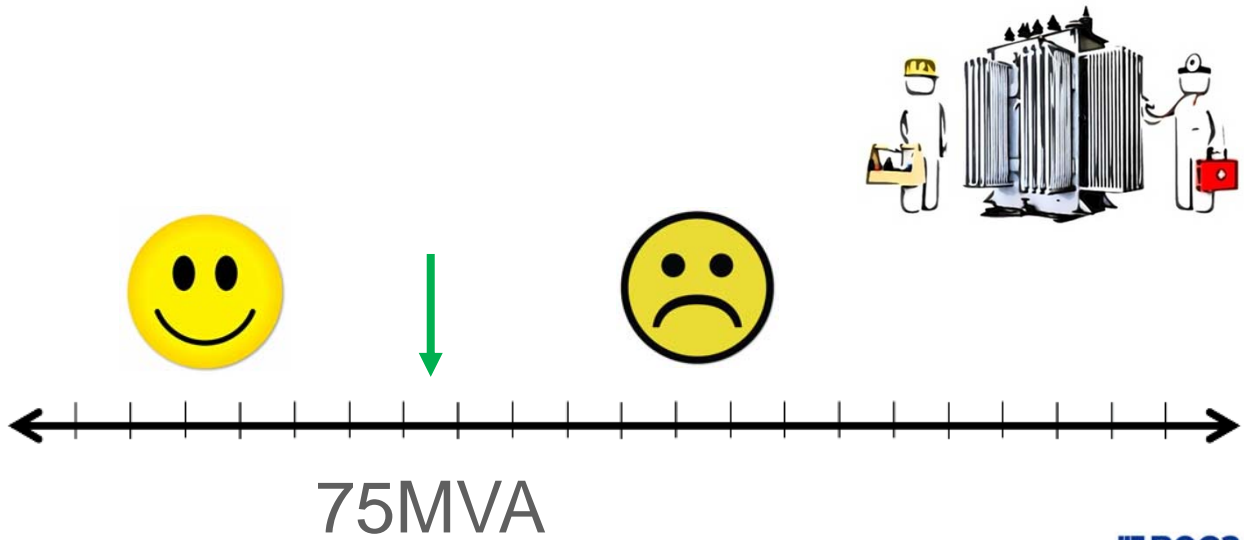


# TOPS – Transformer Overload Protection Scheme





### Pump Failed – Transformer no cooling



# Transformer Pump OK



98MVA



# Transformer Pump OK

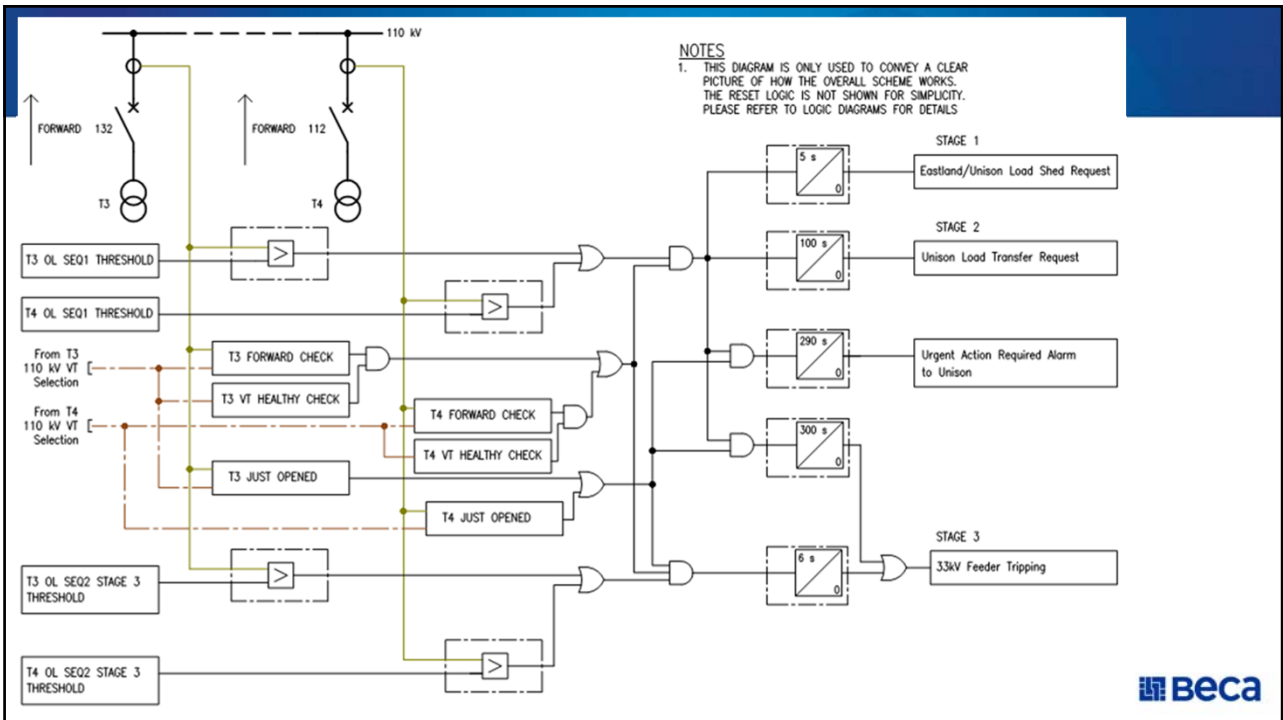
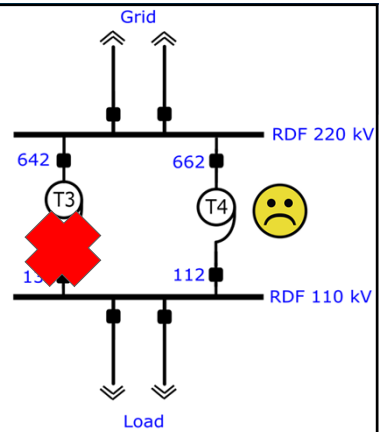
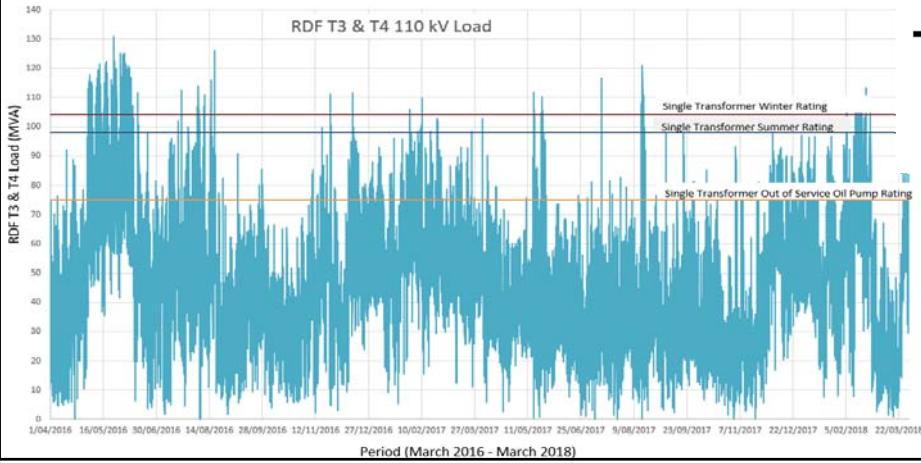


104MVA

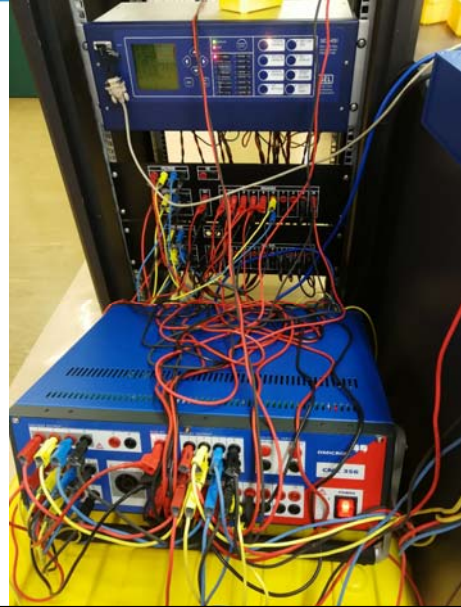




# Potential Overload



## Bench Testing



 Beca

## Conclusion

- A lot of very interesting projects
- Working with Broadspectrum, Unison and Transpower

 Beca

# Any Questions?

