

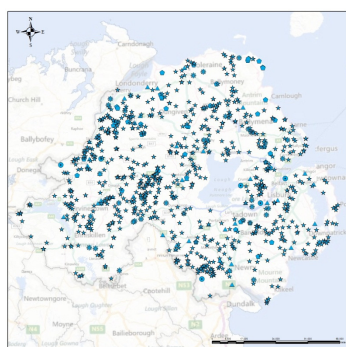
## Mullan Grid Consulting

- Electrical engineering consultancy specialising in grid connections for renewable generator installations
- On-going projects in Ireland and Northern Ireland
- Technical Advisor for approx 1500MW of wind generation projects and multiple biomass, marine and hydro projects
- Experience of due diligence on grid connections of over 2000MW of wind generation
- Represented on IWEA Council, IWEA & NIRIG Grid Committees and Gate 3 liaison group
- Services to Small Renewables in NI
  - Feasibility Studies
  - Connection Applications
  - Connection Offer Reviews
  - Technical Advisor
  - Due Diligence



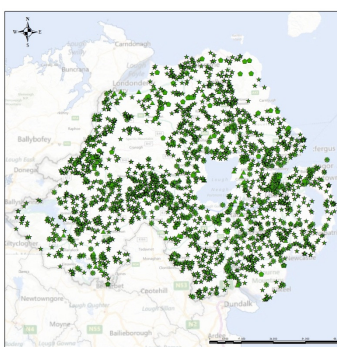
## Small Renewable Projects in NI

### Projects in planning



Type of Generator	No. of Generators in planning
Wind Turbine	811
AD Plant	42
Hydro	42
Solar PV	50
Other	7

### Planning with planning

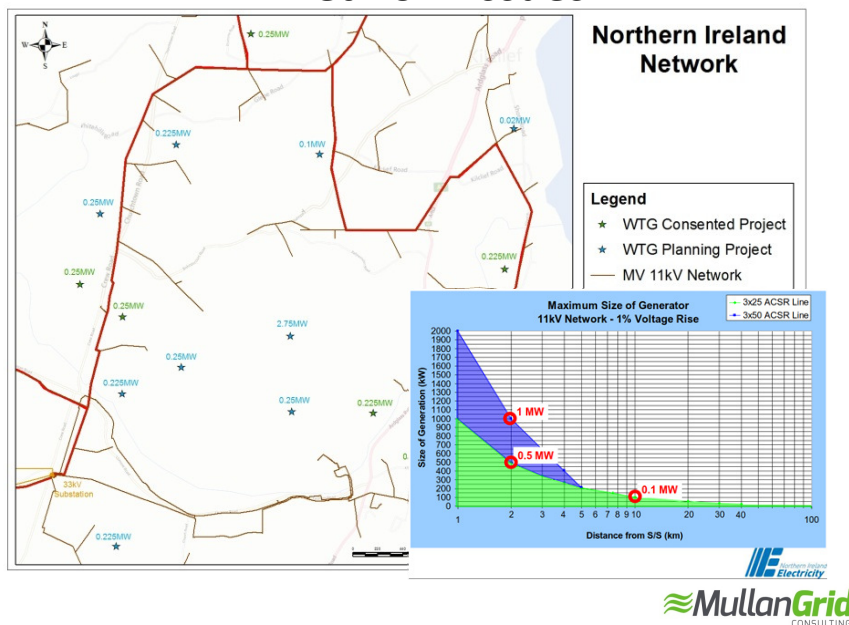


Type of Generator	No. of Generators with planning
Wind Turbine	1713
AD Plant	96
Hydro	54
Solar PV	332
Other	3

\*Info based on the NI Planning Portal July 2013



## 11 V Network Issues



## Summary Of Grid Issues

- Saturation of some 11kV networks resulting in very high connection costs (> £400k)
- NIE kicking off studies into potential ‘smart grid’ solutions for 11kV issues
- 33 kV substations:
  - Have become or will become saturated in most rural areas.
  - NIE have requested funding from the Utility Regulator for upgrade works
  - “Conditional” Offers issued in the interim by NIE
  - Appears likely that a solutions could be found in the next 6 months
- Some 33kV overhead lines have become saturated, in particular in areas where large windfarms have connected into the local 33kV network - upgrades will be extensive (£Millions) so less clear if Utility Regulator will approve works

### Recommendations on areas for Industry to Lobby

- Greater resources within NIE - currently in “fire fighting” mode
- Utility Regulator to make a timely decision on 33kV works
- DETI to provide greater certainty on future of tariffs to allow NIE to plan