

Turning Policy into Projects & Projects into a Sustainable Business

National Bioenergy Conference

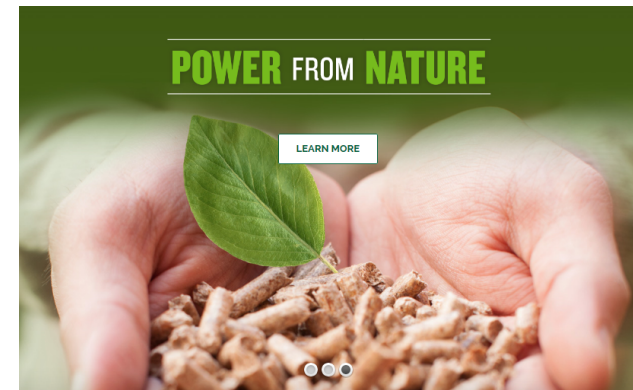
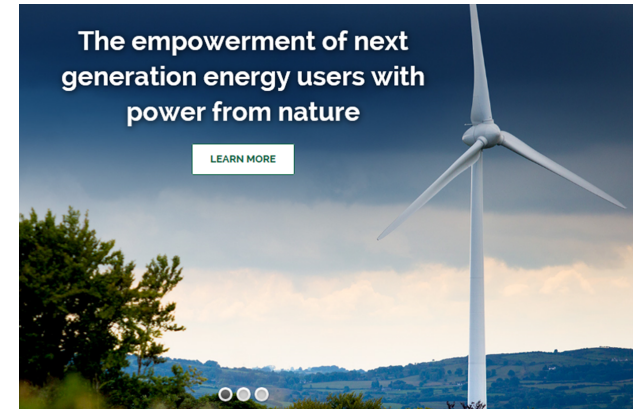
February 3, 2016



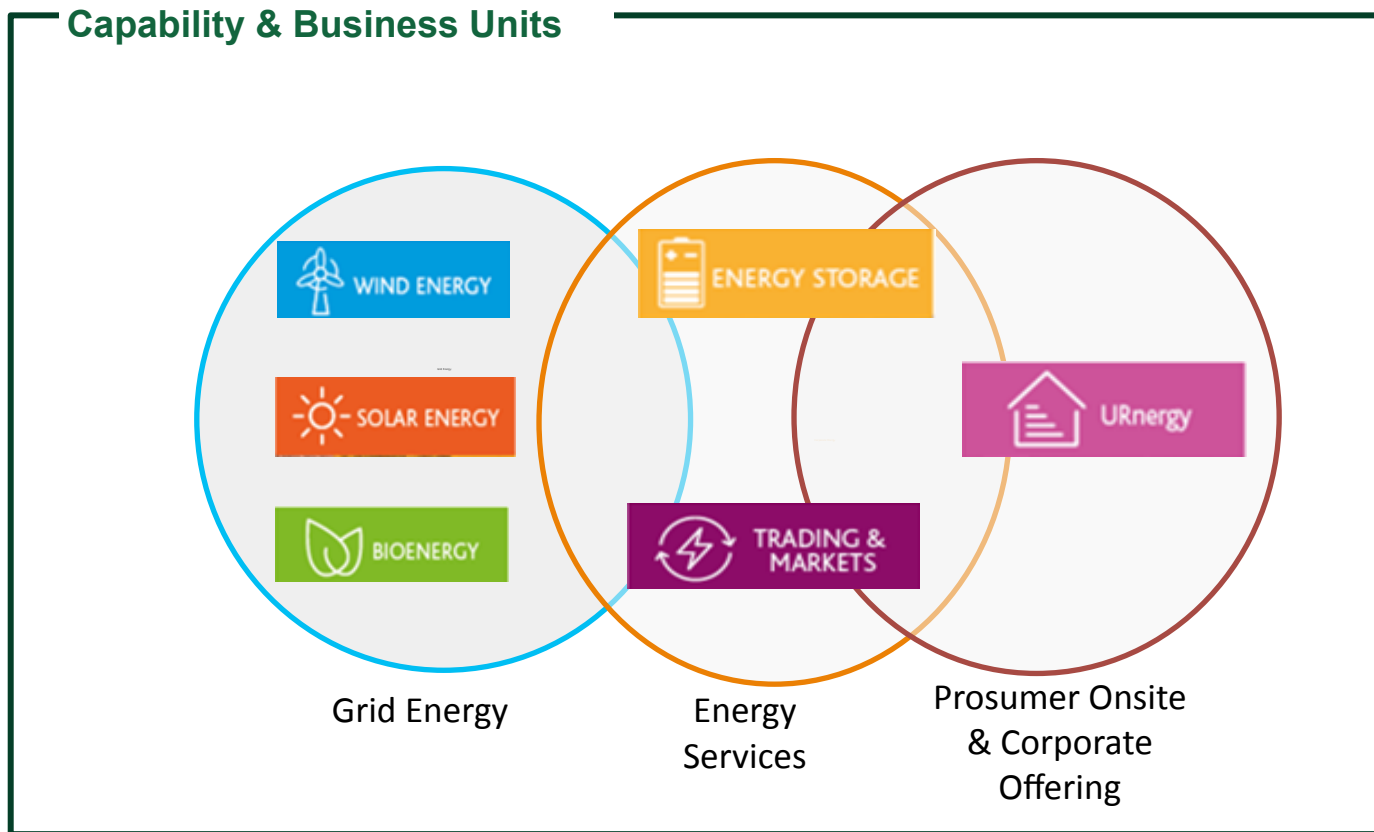

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Power from Nature

Gaelectric's Mission

- The empowerment of next generation energy users, through the development and deployment of sustainable energy solutions and services.
- 6 business units focused on sustainable energy generation & storage at both grid and prosumer levels (URenergy Division).
- The Trading & Markets Division facilitates the provision a new kind of independent service in wholesale & corporate offtake markets.

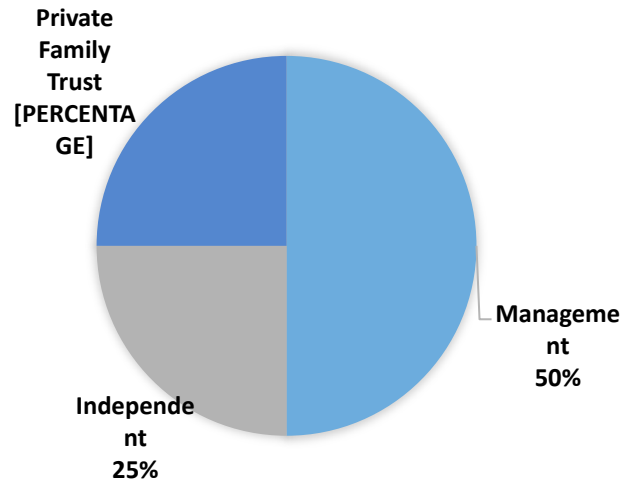


Our Focus - Reflecting the Trends in Energy Markets

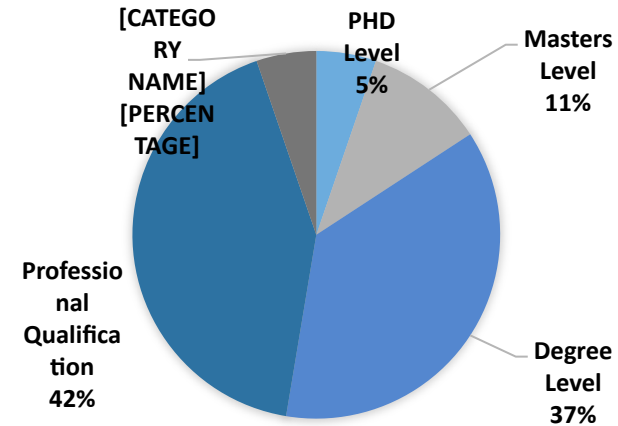


Our Background - overnight success after 12 years!

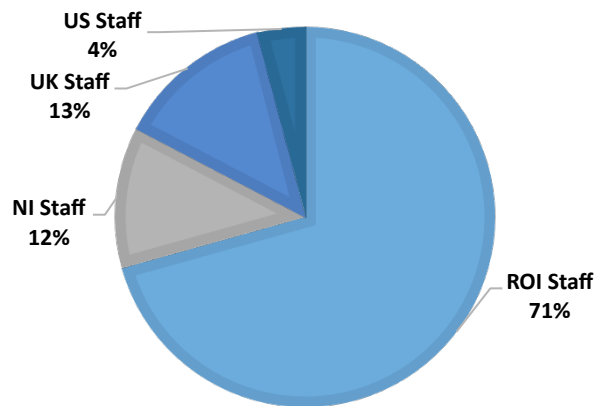
Shareholder Makeup



Staff Qualification Makeup



Staff Geographic Spread



Strong Belief in the Value of Partnerships

Our Partners

DRESSER-RAND

 **ENERCON**
ENERGY FOR THE WORLD


TESLA

Stobart Group

SIEMENS


BlueBay
Asset Management

PROVENTUS

NORD/LB

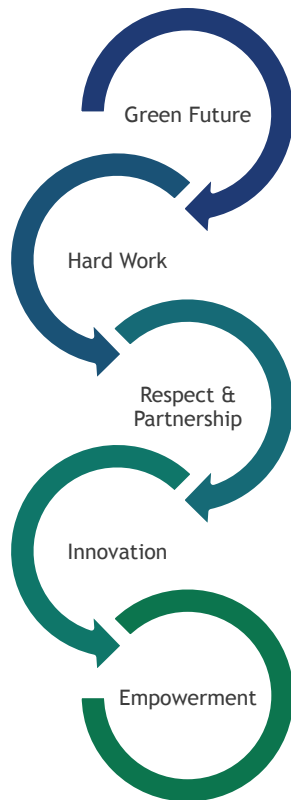


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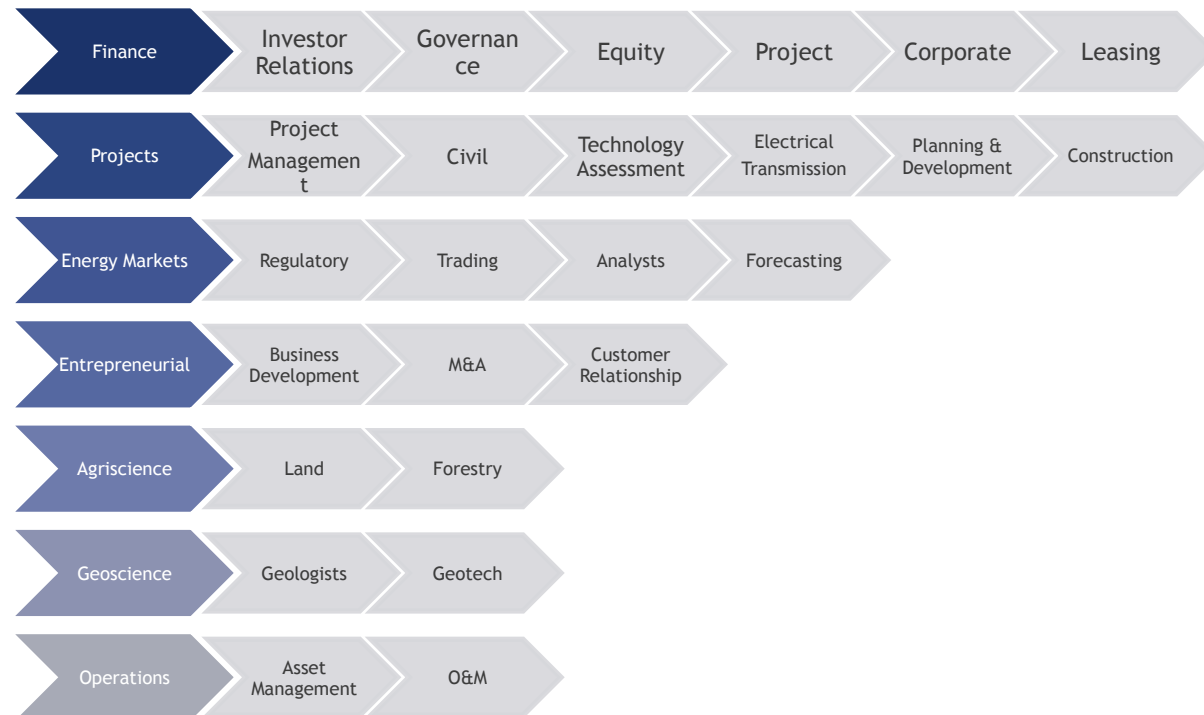


Our Competency, Our Culture

Our Ethos



Our Professional Disciplines



Our Wind Energy Platform Overview



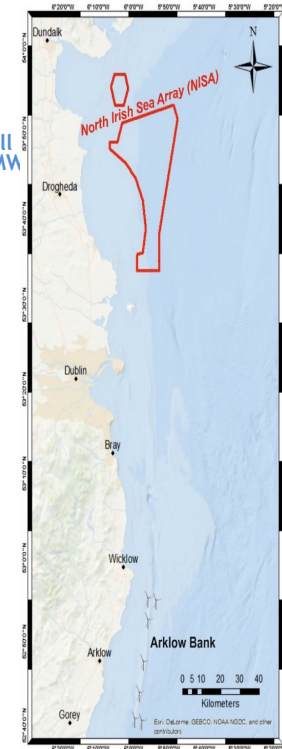
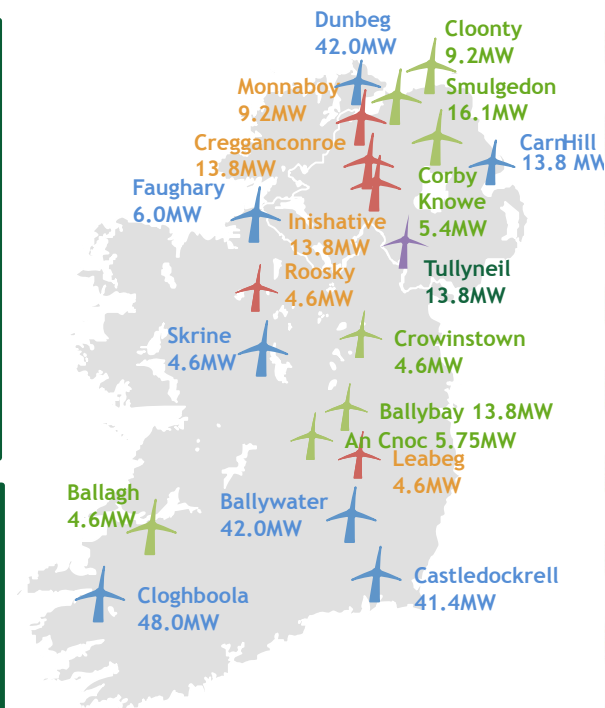
Gaelectric's First Renewable Energy Platform

Wind Energy Highlights

- Largest Independent Developer in Ireland
- 15% Renewable Market Share
- 400MW owned by 2017 – 363MW spinning
- Growth through organic development & acquisition
- 100MW Development Pipeline
- **€500m Senior / Junior /Equity Raised**
- In house Energy Trading Team –capturing market value

Offshore Wind

- Irish Sea Foreshore Licence sought – North Irish Sea Array
- Significant subsea geotech studies completed (UCC, SEAI, MI, GSI)
- MOU with Oriel Windfarm completed – 15MW demonstration project & expanded array up to 870MW pending



Map of the Irish east coast. Marked in red is the extent of the proposed NISA Project



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Future - Energy Storage



Energy Storage Highlights

- Founded in 2006 - a first for an Irish Renewable Developer
- Focused on Compressed Air Energy Storage (CAES), Battery & Flywheel technology
- **Complete understanding of various storage technologies application and needs in the energy market**
- Fully prepared for the impending Storage reality

CAES Details

- 330MW CAES Larne - All island grid support
- Planning expected Q2 2016
- Siemens acquired current technology partner (Dresser Rand)
- EU designated "Project of Common Interest" (PCI) €6.5m grant funded for studies.
- Major EU pipeline opportunity - finalising MOU with EU Salt Mining Organisation.

Battery Details

- 80MW pipeline of Irish grid scale projects identified
- First MOU's with signed with TESLA – Two further supplier MOU's currently under negotiation.
- 1MW grid scale battery to be deployed by Q2 2016 – proof of concept in Ireland
- US Battery Storage Potential JV identified



Fig 1 Depiction of CAES Larne

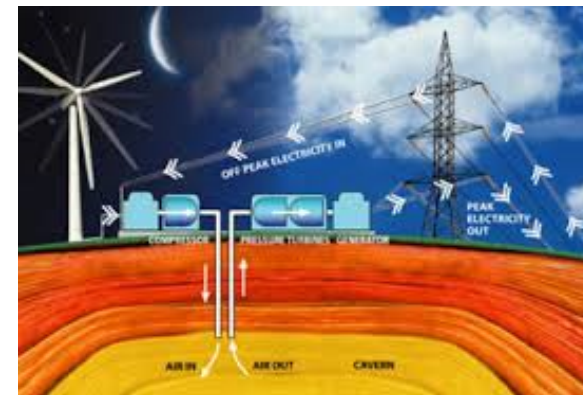
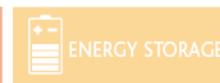


Fig 2 Depiction of CAES Operation Process



Solar Pipeline

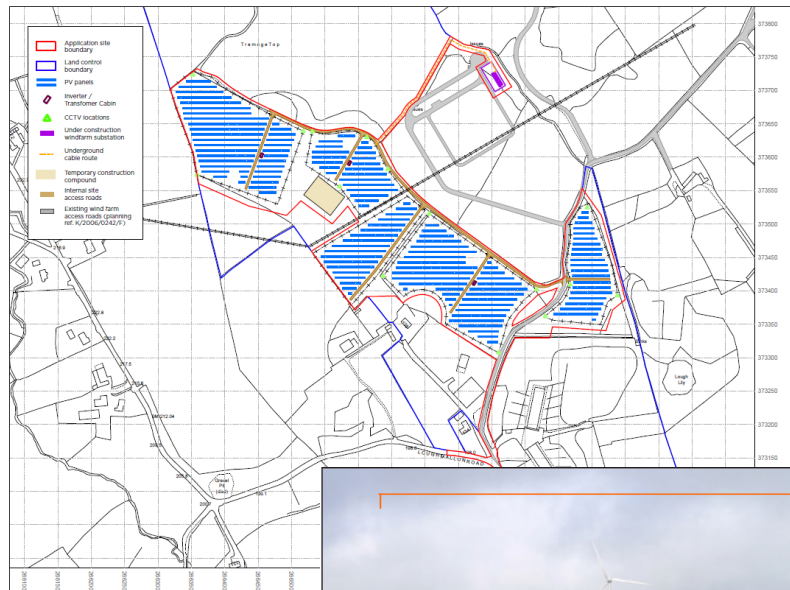
- An industry driven by technology cost reductions:
 - The cost for solar fell by 80% between 2008 and 2013 (KPMG, 2015)
 - The Solar Trade Association suggest that costs should fall by an additional 33% to 2020 (STA, 2014).
- **Technology improvements** driving irradiation levels in the UK / Ireland to be increasingly viable
- Interesting benchmark for Bioenergy - where are the cost reductions and technology improvements coming from in Bioenergy?

Gaelectric Solar in Republic of Ireland:

- Pipeline of >100 MW of projects in the Republic of Ireland
- Land exclusivity agreements signed on 30 projects with 18 grid connection applications submitted to date.



Pioneers of Co-Location



- 4.0 - 4.99MWp
- Existing windfarm
- Grid connection under construction
- Co-location maximise grid infrastructure
- **Enables least cost development**



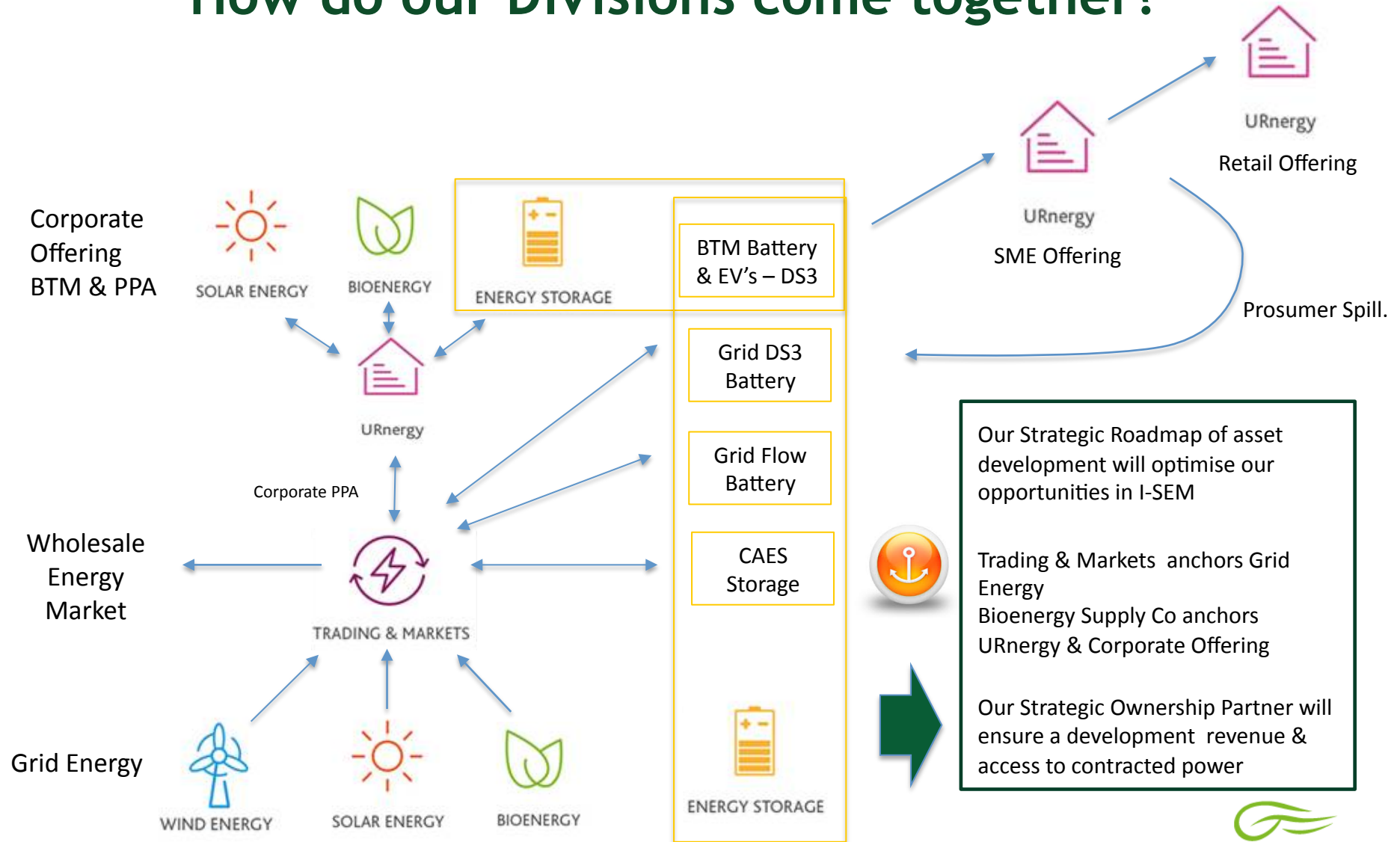
Energy Trading



Create
Market
Value

- 210MW Wholly owned Wind - SEM Ops & Balancing
- Third Party Wind Balancing Service (target 300MW)
- Supplier-lite services to biomass industry
- I/C Trading Moyle & Commenced in December 2015
- GB Physical Market Entry by July 2016.

How do our Divisions come together?



Organic, M&A, Repower and Contracted Power (Aggregation of Independents)



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- Acquired Imperative Energy in 2014
- Proven biomass team that has delivered over 85 projects across the UK and Ireland in the last 5 years
- Deep knowledge of biomass technology and biomass supply chains
- Energy Services Contracting (ESCo) experience – Prosumer
- Strategic Partnerships with Stobart Group (UK) , AW Jenkinsons (UK) and Green Belt Ltd (Ireland)
- Heat only or Combined Heat and Power (CHP) capabilities
- Mobilising the private forest industry in Ireland by aggregating the resource into a bankable SupplyCo
- Targeting growth through new build and acquisition



Wholesale Nursery

- Pole Green Nursery, Chorley, Lancashire
- Locally sourced, low grade wood chip (compost oversized)
- £400,000 Cap Ex
- 900kW UTSR Boiler
- Displacing old coal boiler
- 80,000 litre hot water storage
- Less than 2 year payback due to RHI
- Significant improvement in air quality/emissions




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WIND ENERGY



BIOENERGY



SOLAR ENERGY



ENERGY STORAGE



TRADING & MARKETS



URenergy

Whiskey Distillery



1MW 7 bar biomass steam boiler

1.2t/h Steam accumulator

Underground fuel store

New build distillery

Sole source of steam for process



Government Buildings



Boiler: UTSK 2000 kW MTHW

Fuel: Wood Pellets

Moisture: 10%

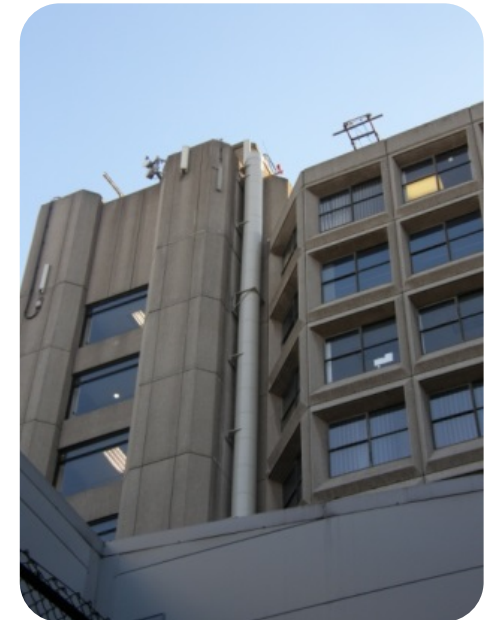
Grate: Underfeed Stoker

Fuel Store: Moving Floor

Medium: MTHW 130 °C

Buildings heated:

- Dail Eireann
- Seaned Eireann
- National Gallery
- National History Museum
- Depts. of Agriculture, Enterprise, Finance,
- An Taoiseach



Biomass Policy Needs to Optimise Growth



Legacy Issues

- Forestry programme
 - Significant State investment (€2 billion)
 - Only reaps dividend if resource fully mobilised - currently a stranded asset
 - Biomass can create the necessary market pull
- State's Historic Energy Involvement
 - ESB, ESB Networks, Eirgrid, BnM, Coillte, Bord Gais
 - Necessarily hands on at a point in time

Future Energy Market

- Decentralised, 100% Sustainable
 - Multi-technology with Storage
 - Consumer-led solutions, Community Participation
 - Optimising existing energy infrastructure
 - Smart meters/Smart Grids
 - Electric Vehicles
-
- State's role in this market?
 - Enabling rather than implementing
 - ISIF's role
 - Ervia role in District Heating
 - Appropriate Policy Changes



Current Policy Summary

- Currently, the only payment scheme for the Public Services provided by Bioenergy is REFIT 3, which is effectively closed to new applications.
- So, future growth depends on outcome from ongoing consultations on
 - RHI
 - “REFIT 4”
- Forestry Programme supports are welcomed but are not a short term stimulus for bioenergy projects
- Supports for each form of renewable energy are too isolated from each other
- The future will be consumer, not generator led - policy needs to reflect this and allow for flexible projects

Global Trend for RE Supports

- In General:
 - Competitive Bidding for FITs/CfDs
 - Focus on protecting the energy consumer in terms of pricing
- Biomass Specific:
 - Use of Sustainable Biomass
 - Proven Chain of Custody

Policy Challenge

- Developing Projects is Difficult and Risks = Costs
 - Planning
 - Permitting
 - Grid
 - Heat offtake (credit worthiness)
 - Fuel supply
 - EPC
 - O&M
 - Finance
- Policy framework needs to address risks if energy costs are to be kept to a minimum

Policy Needs - Supply Chain

- Biomass Supply Chain
 - Competitive supply chain essential to cost effective industry development
 - Counter balance needed to State dominance
 - Competition drives innovation
 - Importation is a reality, biomass is a globally traded commodity
- Policy Need: Clearly defined sustainability and quality criteria to qualify for public support

Policy Needs - Payments for Public Services

- Payment for Public Services
 - Sector doesn't need “subsidisation” it needs to be paid a fair price for the public services it delivers
 - Energy independence
 - GHG Emissions Reductions
 - Rural development
- Policy Need: RHI and next round of electricity payments needs to reward biomass on its merits, not benchmarked with other, intermittent technologies

Policy Needs - Energy Category

- Definition of CHP
 - Extremely challenging to find suitable CHP sites
 - “power only” is supported for co-firing, why not for new build
- Policy Need: Electricity and Heat from Biomass need independent payments. Suggest base price on power with “top up” for High Efficient CHP (similar to 0.5ROC uplift in UK)

Conclusion



Conclusion

- Biomass essential to delivering the “distributed energy” future
- Biomass regional by its nature
 - Regional jobs
 - Local Economic Activity
- FDI is now renewable energy led - key to host country selection
- Multinationals have 100% RE target, well in excess of Government targets

Conclusion

- Gaelectric is 100% dedicated to sustainable forms of energy
- Projects have to morph into viable businesses - aggregation in biomass sector inevitable, as has happened in wind and will happen in solar
- To ensure sector success, energy costs needs to be kept to a minimum for consumers
- Competition fuelled Innovation will be key to achieving this goal
- Future supports for the sector should focus on removing barriers to developing innovative, multiple technology projects
- Within the renewable energy mix, bioenergy's key strength are in producing:
 - heat for commercial and industrial clients
 - dispatchable electricity



Thank You

Questions?



WIND ENERGY



BIOENERGY



SOLAR ENERGY



ENERGY STORAGE



TRADING &
MARKETS



URenergy

