scottish renewables

ONSHORE WIND CONFERENCE & EXHIBITION

20 JUNE 2017 **GLASGOW**

res powering change

Green Investment Bank

INVICTA PUBLIC AFFAIRS

FINDING A ROUTE TO MARKET

CHAIR AND WELCOME

NIALL STUART

SCOTTISH RENEWABLES

PETER SHERRY

SENIOR MANAGER

BARINGA PARTNERS

Could onshore wind be delivered via CfDs without subsidy?

Scottish Renewables conference

Glasgow, 20 June 2017

Agenda

Introduction to Baringa

Overview of our report

Key questions

An overview of Baringa Partners

Baringa

Baringa is dedicated to being a consultancy with a difference. We aim to be the consulting partner of choice for our clients, based on our flexible approach, deep industry knowledge and excellent people

Our history

- Baringa was founded in the UK in 2000, we have over 550+ employees and a market turnover of approximately €130m
- Baringa is a market-leading consulting company with a focus on energy and utilities, commodities, financial services and telecoms
- Baringa Partners' end-to-end consulting capability is unique in the Energy consulting space, with market leading expertise in governmental policy and regulation, corporate, commercial and operational strategy, and the delivery of operational change (through organisation, process and IT)

Our people and culture

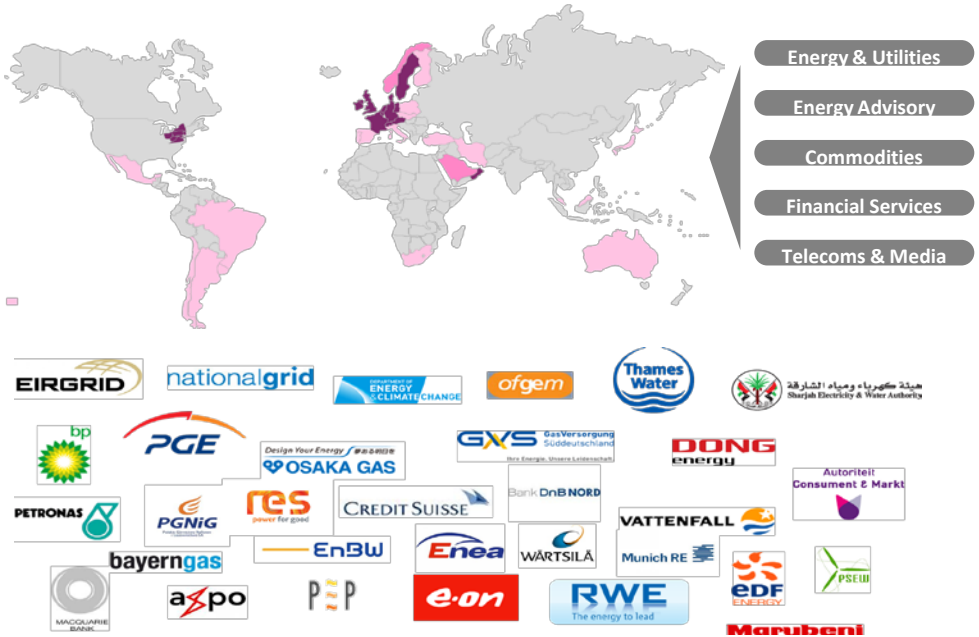
- We attract top talent due to our culture, business model (ten years in the top 10 – UK's Great Place to Work) and the quality and nature of our client work

GREAT PLACE TO WORK Best Workplaces 2015 Category: Medium United Kingdom

GREAT PLACE TO WORK Best Workplaces 2014 United Kingdom

GREAT PLACE TO WORK Best Workplaces 2013 United Kingdom

Global footprint



Our Energy Services

Within our Energy & Resources sector, we work with leading energy and trading commodity firms to adapt and transform their businesses across a number of areas

GENERATION

- Developing Generation Strategies
- Due Diligence / Transaction Advice
- Market Analysis and Market Design
- Asset Optimisation

TRADING

- Trading & IT Business Model Definition / Optimization
- Regulatory Advisory & Risk Management
- Physical Operations (Nomination / Dispatching)
- Selection and Implementation of Trading, Treasury & Finance Technology

INFRASTRUCTURE

- Economic Analysis & Valuations
- Commercial & Supply Chain optimisation
- Investment assurance and risk management
- Programme & Project governance, risk & control
- Data & Technology
- People, Organisation and Operating Models

NETWORKS

- Optimising Network Service
- Development of Network Charges
- Smart Systems Strategy
- Optimising Market Processes

RETAIL

- New Business Models / Market Entry
- Margin Optimization / Reduction Cost-to-Serve
- Optimising IT Landscape and Market Processes
- Procurement Optimization / Portfolio Management

Our Energy Markets and Analytics practice

We support our clients in key areas of strategy ranging from investments and business models for energy companies and technology firms, to market design for government and regulators

Our Energy Markets and Analytics practice, formed out of our through the merger with Redpoint Energy in Spring 2012, offers our clients an unparalleled combination of energy market expertise and commercial insight. We are proud to work with some of Europe's foremost policymakers, regulators, investors, developers, lenders and energy companies operating across the energy supply chain.

- Expertise in assisting clients design and execute business strategy, focusing on realising growth opportunities
- Extensive experience in Performance Improvement
- Implementation of cost reduction and efficiency programmes in leading companies
- Customised solutions in various areas of the value chain

- Expertise in investment strategy, valuation and Due Diligence
- Experience with transactions throughout Europe both in the power and in the gas market
- Supporting private equity firms and institutional investors

- Supporting our clients on regulatory issues, especially in strategy development
- Experience in the dialogue with regulators.
- Our clients are international energy and water suppliers

Our experience in this area

Our work in this area has come off the back of the Electricity Market Reform (EMR) in the UK, which introduced competitive auctions for the first time

Baringa

Reputation built on results

Viewpoint

Insights and opinions from Baringa Partners

UK CfD auctions: a triumph for competition?

An in-depth look into the results of the inaugural UK CfD auction

Credential: multiple developers

UK CfD auction simulation model (incl. strategic bidding)

Timing: 2014-15

Client requirement

Our role

Credential: European wind developer

UK onshore wind CfD auction simulation model and portfolio analysis

Timing: 2015

Client requirement

Our role

Credential: European wind farm developer

Developing bidding strategies for participation in the Turkish wind power auctions

Timing: October 2015

Client requirement

Benefits delivered

Our role

Credential: Investment fund

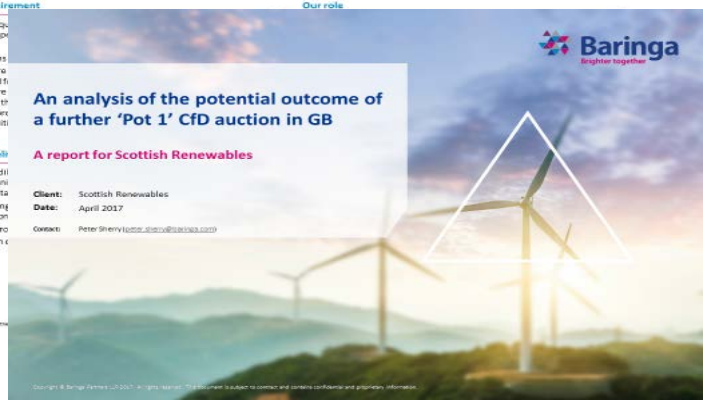
UK offshore wind merit order and auction simulation

Timing: 2015

Client requirement

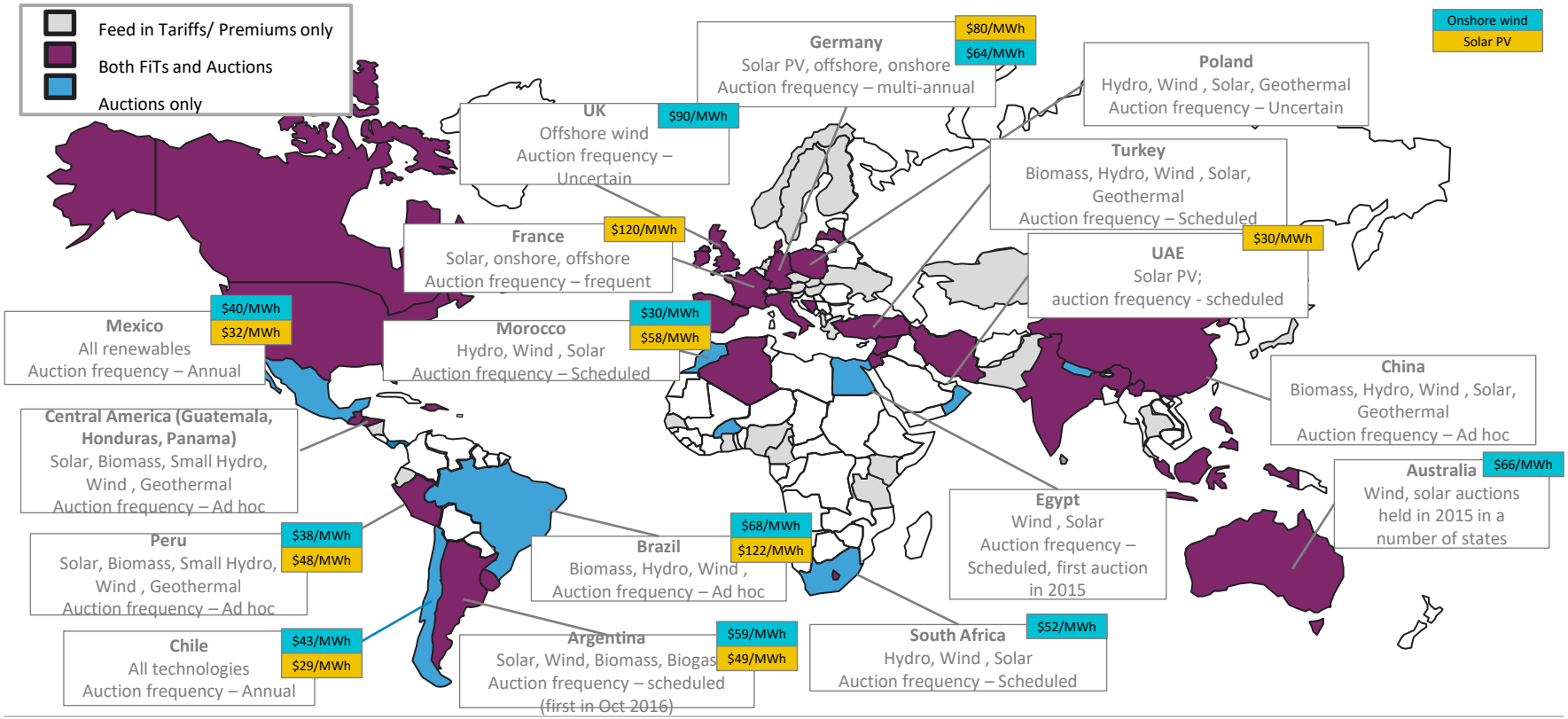
Our role

Benefits deli



Auctions are driving lower prices globally

Renewable auction prices are reducing globally, and these inform our cost input assumptions



Source: Baringa analysis; IRENA (https://www.irena.org/DocumentDownloads/Publications/IRENA_Renewable_energy_auctions_in_developing_countries.pdf); all prices are stated in USD

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Our brief

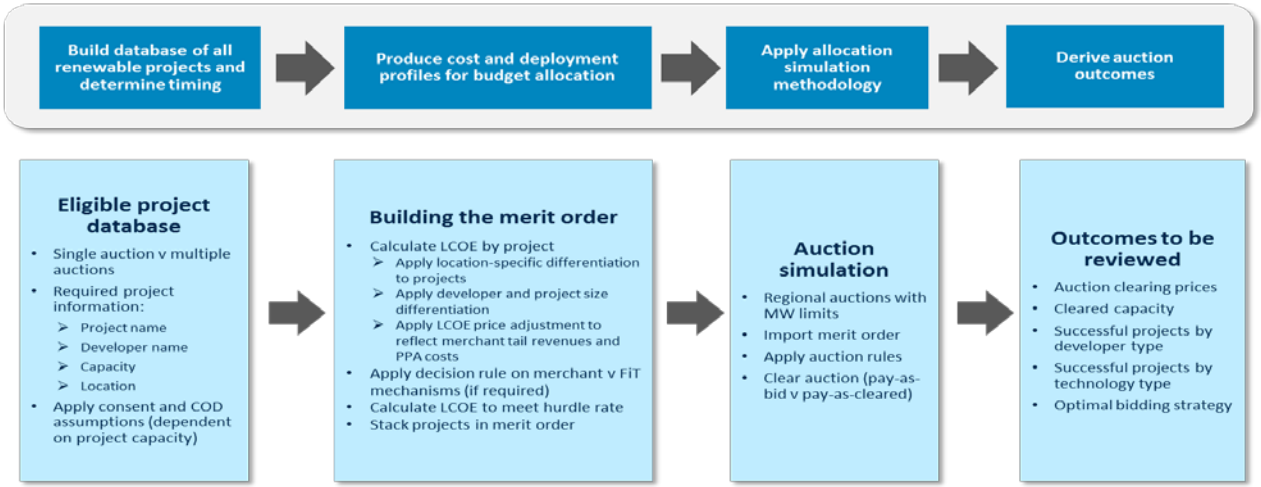
We were asked to simulate a hypothetical ‘Pot 1’ CfD auction, to assess the costs of procuring an additional 1 GW of capacity

- We used our internal Excel-based tool to simulate a hypothetical auction for Pot 1 capacity, including, **which includes onshore wind and solar PV**
- Our target procurement was for 1 GW of capacity
- The auction is assumed to take place in 2018/19, with the **projects reaching Final Investment Decision (FID) in 2020, and the capacity coming online in the period between 2021 and 2023**
- The commissioned capacity would be contracted under the CfD for the first 15 years after their commissioning, with an assumed **economic life of 25 years**
- For simplicity, we were asked to ignore the impact of expected revenues in the post-CfD period (the ‘merchant tail’)
- The key outputs of interest relate to the **auction clearing price**, and the estimated **budget draw** under the Levy Control Framework (LCF), both in absolute and in NPV terms
- To calculate the expected LCF budget draw, we used the **Baringa Reference Case price projections**, which we provide to our clients on a subscription basis

Our auction modelling methodology

We have a tried and tested auction simulation tool that can be adapted across multiple markets

- We used an internal pipeline of **consented** projects, with around 5 GW of eligible capacity (note: 70% of onshore wind projects are located in Scotland)
- We assume that developers bid their **Levelised Cost of Energy ('LCOE')** into the auction, which we calculate at a project level using the most recent data available for capital costs, operating costs and hurdle rates of renewables projects in GB
- The **merit order** is then created to reflect underlying project differentials – by location, developer type and grid connection voltage



Key cost assumptions

We have a tried and tested auction simulation tool that can be adapted across multiple markets

- Our current cost assumptions take into account the latest market intel from auctions around the world, and supplemented with Baringa's GB-specific cost items (such as grid connection costs, BOP, FOM)
- Below, we show the project cost projections (real 2017) for a plant reaching a Final Investment Decision (FID) in 2020, with a range by developer type:

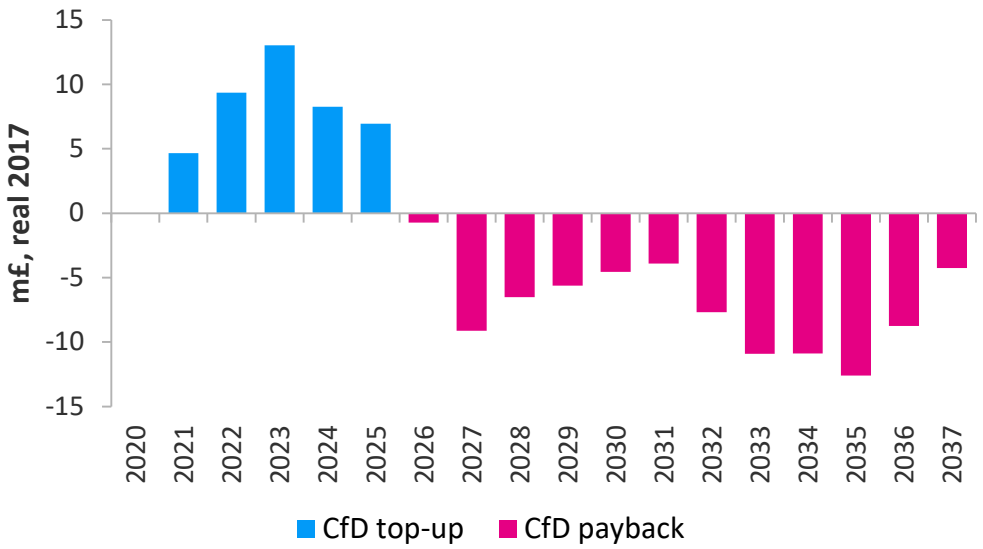
Technology	WACC (pre-tax real)	Capex -total (£/kW)	Fixed Opex (£/kW/year)	Variable Opex (£/MWh)	Embedded benefits (£/MWh)	PPA discount (£/MWh)
Wind Onshore	4.3 – 5.9%	960 – 1080	40	2	0 – 4	4
Solar Photovoltaics	4.5 – 5.5%	640 – 680	20	0	0 – 4	4

- **Load factors** vary by location: onshore wind load factors average 31% (range of 19-46%), and solar load factors average 10% (range of 9-12%).
- Pre-tax real **WACC** rates assume a cost of debt of around 4%, equity hurdle rates of 10-14% and a gearing ratio of 60-80% (varying by developer type)
- **PPA costs** are assumed to be 8% of the average captured price for wind, and 7% for solar PV.
- For all transmission connected projects we have added **TNUoS charges** based on the TNUoS zone and Baringa's long-term projections, and locational pricing for **transmission losses** (based P350 modification)
- For all distribution-connected projects we have added **embedded benefits** of £4/MWh on average (for avoided BSUoS, losses and AAHEDC)

Estimated budget draw

The LCCC would have to provide top-up for the first five years after commissioning, then it would actually gain revenues as wholesale prices are projected to rise above the auction clearing price

- In our Reference Case, we project the wholesale price to increase from its current level of ~£50/MWh, mainly due to commodity price increases
- 'Capture price' (GWA) for onshore wind will be around 10-20% lower due to 'cannibalisation' caused by highly correlated wind output across GB
- Key results:
  - First 5 years, total net top-up of £42m undiscounted (average payment of £8m pa).
  - For the remaining years, total net payback of £85m undiscounted (average payback of £7m pa).
  - Over the horizon, the LCCC would receive a net payback of £43m undiscounted (in real 2017 terms).
- **On a present value basis, using a public sector WACC discount rate of 3.5%, the LCCC would receive a payback of £18m (in real 2017 terms).**

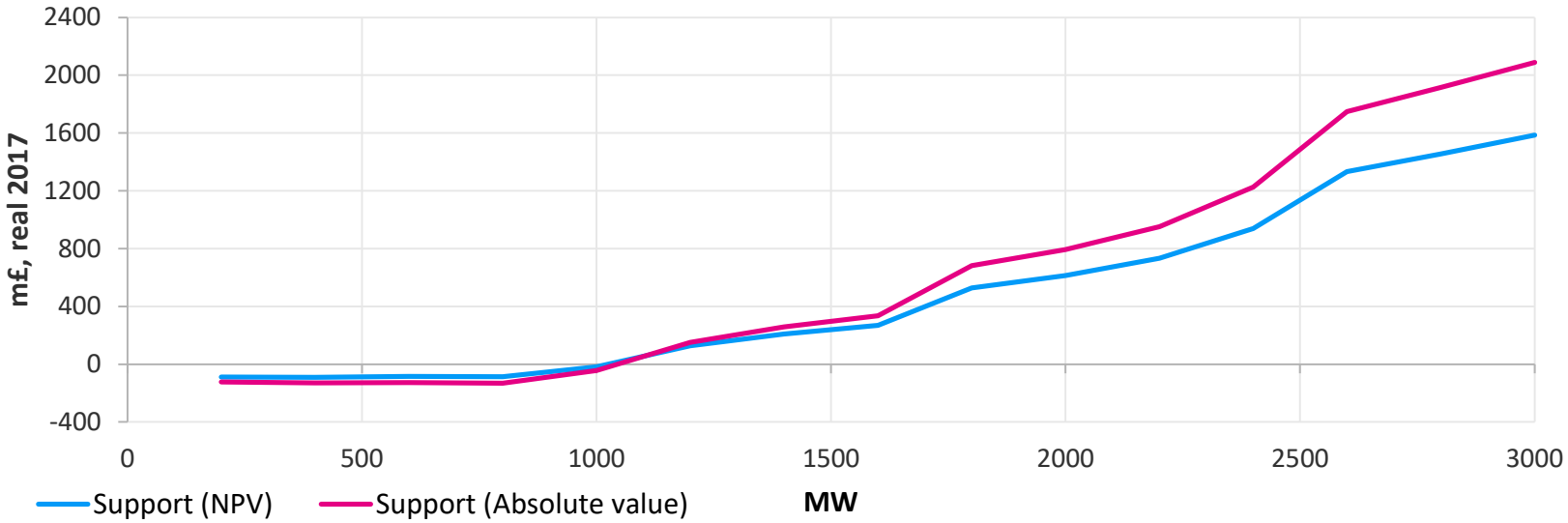


** In this study, we have used prices at NBP basis: including BSUoS charges and transmission losses*

Sensitivity on auction volume

Budget draw for different auction capacity target assumptions

- An increase in capacity accepted in the auction increases the clearing price and in turn the budget draw
- For a low capacity target of 1 GW, the clearing price is lower than the average captured price and therefore the LCCC receives a net payback on the CfDs
- The break-even point to ensure net zero support from LCCC is just above 1 GW in NPV terms



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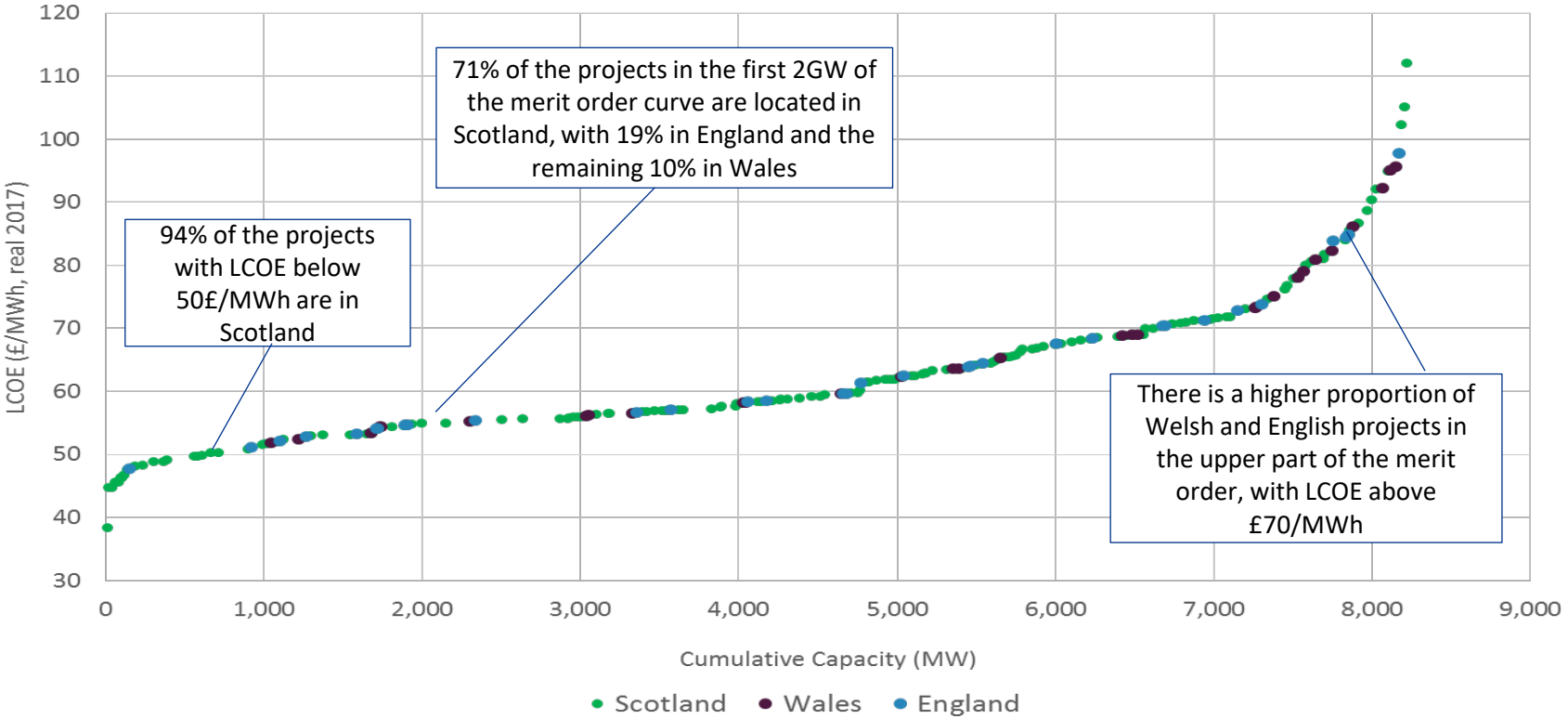
How much capacity could come forward?

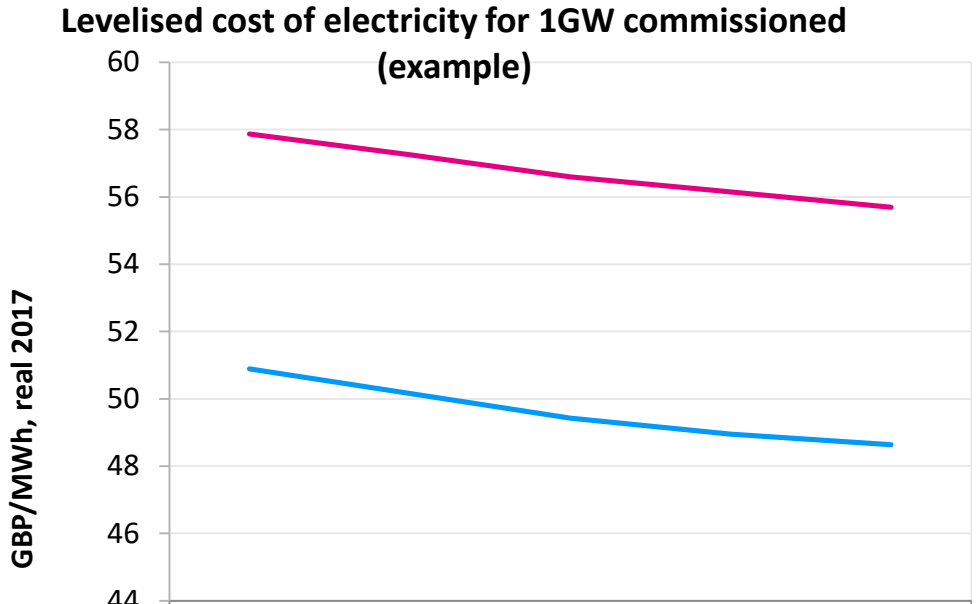
Our latest database suggests a total of 5 GW of capacity either consented or in the planning system with an estimated LCOE below £60/MWh (based on current ownership)



Is a CfD even required?

Even with zero or limited subsidy required, the government can still play a role in delivering at least cost

- Our assumed pre-tax WACC for projects under CfD is between 4.3 – 5.9%
- If those projects were to be commissioned without the certainty of a 15 year government-backed CfD, the cost of capital would be assumed to increase materially
- In the extreme, for a 'merchant' project, we would estimate an increase of between 2% and 2.5%, driven by lower gearing, higher debt costs and a higher cost of equity.
- In our modelling, this increases the LCOE by around £7/MWh on average
- While some of the very best projects could still proceed, many of these relatively cheap onshore wind farms would not be built
- Government can still therefore play an important role, even if subsidy is not required



	2018	2019	2020	2021	2022
With CfD	50.9	50.2	49.4	48.9	48.6
Merchant	57.9	57.2	56.6	56.1	55.7

Contact

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FIONA HEPPLEWHITE

POLICY MANAGER

SCOTTISHPOWER RENEWABLES

SCOTTISHPOWER RENEWABLES

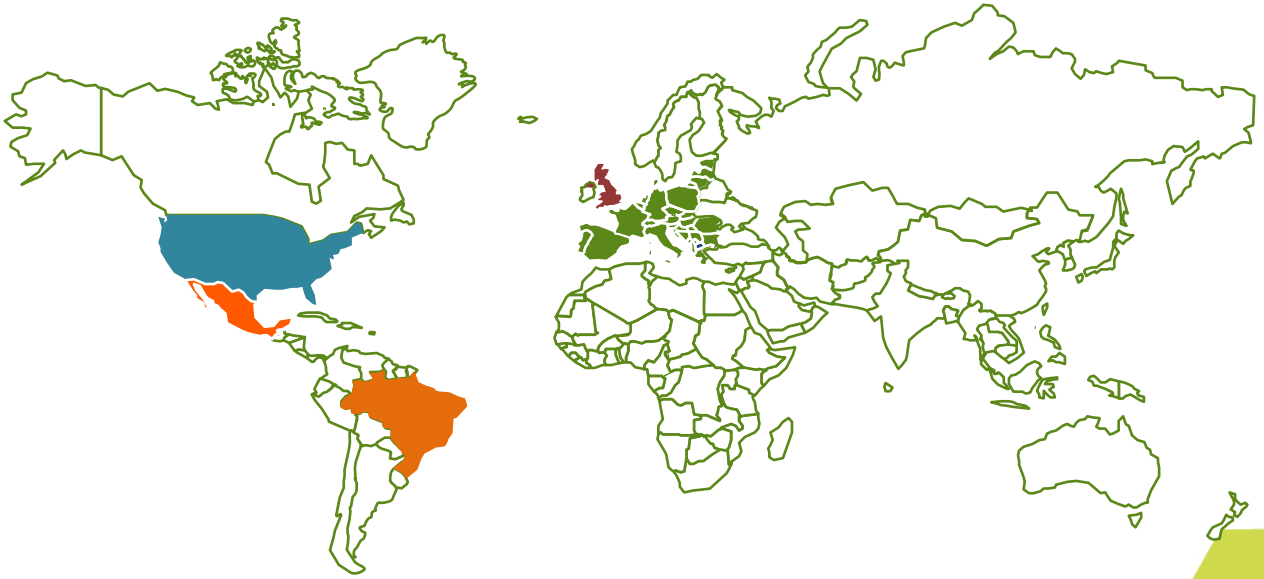
Scottish Renewables:
Onshore Wind Conference
20 June 2017

Onshore Wind – Finding a Route to Market

Iberdrola: Europe's largest integrated utility

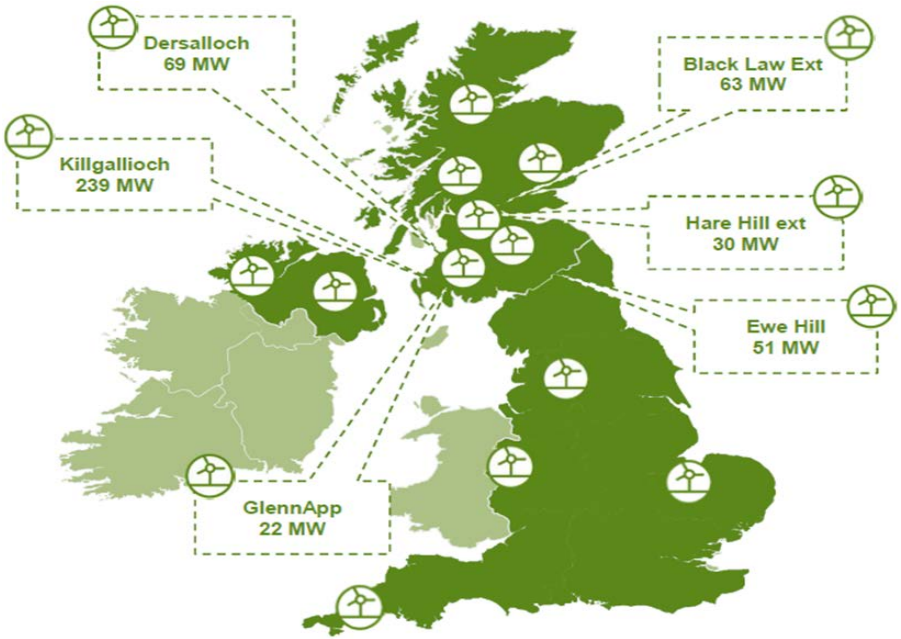
One of the largest global utilities, with operations in Spain, UK, US, Brazil and Mexico

- Global No.1 in renewables with 15GW of wind
- Diverse portfolio of gas, renewables and nuclear
- Iberdrola to reduce CO_2 emissions by 50% by 2030, and carbon neutral by 2050



Investment - £1.3 billion each year to 2020

UK's leading wind operator with >1,850MW operational



1.85 GW wind, with
261 MW under construction

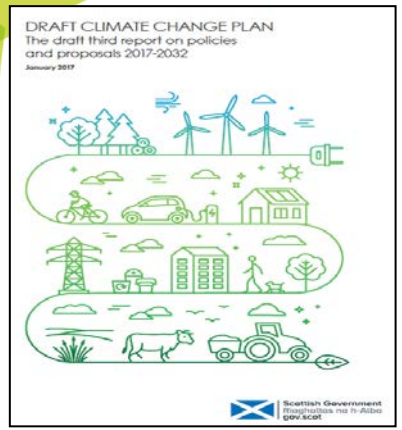
Industry leading Control Centre supporting +1,200 turbines

"Best in class" performance with availability >97%

Producing enough energy for +740,000 homes

+£19m paid to communities in voluntary benefits

Wider Context – decarbonisation targets



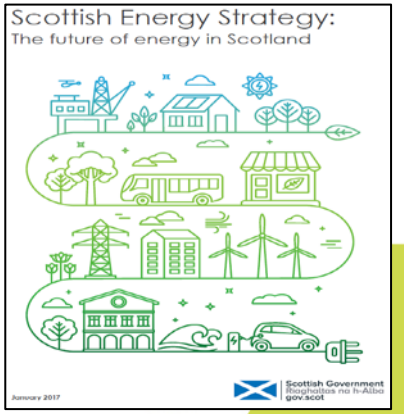
"By 2030 Scotland's electricity system will be wholly decarbonised and supply a growing share of Scotland's energy needs"

"Electricity will be increasingly important as a power source for heat and transport"

Dec 2016, 8.6 GW installed renewable capacity in Scotland - 6.2GW of wind

"Between 11 and 17GW of installed renewable capacity will be required by 2030"

"Scottish Government will continue to support further development of onshore wind in order to achieve targets at lowest cost"



Drivers to deliver low carbon energy at least cost

Energy Policy
- Clean Growth Plan
- Energy Costs review
- CfDs & market stabilisation

Industrial Strategy
- Energy: two key pillars
- Minimising energy costs
- Low carbon needs renewables

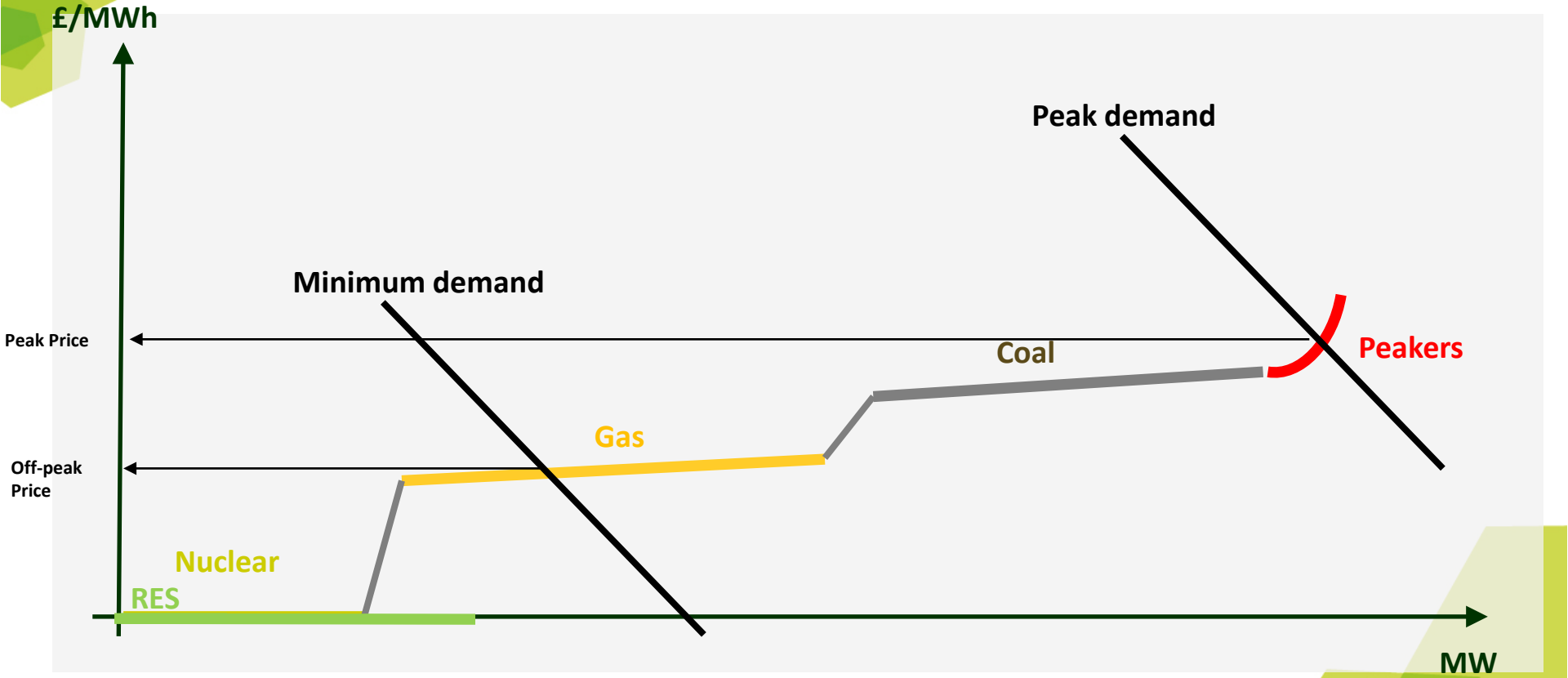
Planning Policy
- Smarter Planning
- Repower, Life Extn, New sites
- Engaging with communities

Innovation
- Cost reduction
- Flexibility and resilience
- Technology shift

Markets & Regulation
- Ancillary Service evolution
- Corporate PPAs
- Capacity Market reform

Consumers
- Energy bills – industry's role
- Customer's interaction with market: Smart roll-out

Theory of Power Markets



Onshore Wind: Route to Market

Competitively allocated market stabilisation mechanism (based on CfD) offers most effective route to market and would enable further cost-effective decarbonisation.

- Competitive auction ensures only the most cost-effective projects are successful.
- Two-way nature of the contract protects the consumer.

Onshore Wind: Driving Down Costs

Optimising the planning framework

- Recognition of need for taller, higher output turbines
- Facilitate repowering and life extensions
- Guidance on co-location of storage

Conclusion

Lowest cost decarbonisation must include a route to market for onshore wind

CfD is proven price discovery mechanism to lower costs

Planning framework and innovation can help drive down costs

SCOTTISHPOWER RENEWABLES

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DIRECTOR OF DISTRIBUTED ENERGY & ONSHORE RENEWABLES

GREEN INVESTMENT BANK

Green Investment Bank

Scottish Renewables

Onshore Wind: Finding A Route to Market

GIB – Macquarie: a compelling transaction logic

The world's first green investment bank is joining forces with the world's largest infrastructure investor creating a clear market leader in green energy investment

Green Investment Bank

MACQUARIE

- Led over **£15 billion** of investment into **UK green infrastructure**
- Invested in **60%** of the **UK's offshore wind generation capacity**
- Invested in **over 30 waste & biomass projects**
- Financed over **1.8GW of solar projects**
- Installed over **2 million smart meters**
- Advising on the development of **850MW of tidal projects**

Scottish renewables a strategic priority

Attractive market opportunity

Significant opportunity

- Scale
- Supportive macro factors and strong wind resources
- Scotland on leading edge for merchant renewables

Requiring innovation

- Sophisticated trading off-take strategies required in order to attract capital

Financing gap

- Limited familiarity with these structures
- Opportunity for forward thinking investors to unlock value

GIB approach and USPs

1

Engage early

- Appetite to engage early to structure financeable projects
- Have successfully backed developers with strong pipelines

2

Structure offtake

- Track record structuring fixed volume hedges in the US
- Pioneering same approach in the Nordics

3

Bring deep industry partnerships

- OEMs, Trading entities & Corporate Offtake
- Deep relationships with institutional investors

End users are key to unlocking the opportunity…

We are looking to finance projects with an off-take solution that …….

Locks out ~40%-50% of revenues by value → **…enabling ~55-60% leverage….** → **…and delivering "early double digit" levered equity returns**

End users are the only entities able to take long term view that delivers this revenue profile

Source		Current appetite
Utilities / VIUs		• Historically active • Balance sheet pressures
Financials		• No appetite beyond forward curve • Potential for longer exposure with proxy hedge in gas market
End users		• Growing appetite with corporate PPAs • Complex and expensive to implement • Broader market needs to be unlocked by offering upfront saving and simplifying product

…however we need to innovate to simplify / de-risk offering for corporates

	"Base case" / BAU	Variants	Key considerations
Volume	✓ 100% / Pay-as-produced	✓ Fixed Volume – Base load / seasonal ✓ Multiple Buyers	✓ Volume risk ✓ Shape risk ✓ Imbalance risk
Minimum Tenor	✓ ~ 15 years	✓ 10 years	✓ Debt solution comfortable merchant tail
Counterparty credit	✓ Investment grade	✓ Innovative credit enhancement ✓ Diversified credit where multiple buyers	✓ Corporate access to LC (and cost) ✓ Understanding size and resilience of energy use
Pricing structure	✓ Fixed price	✓ Collar, stepped, shaped	✓ Corporate preference ✓ Need to show day one savings
Type	✓ Physical / sleeved	✓ Virtual PPA	✓ Index choice ✓ Derivative accounting

Summary messages

- Significant potential in Scottish onshore wind market for unsubsidised renewables
- End-users are most natural parties to take long-term view on power
- Significant innovation and simplification required to broaden pool of likely buyers

Q & A

scottish renewables

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Green Investment Bank

INVICTA PUBLIC AFFAIRS

IMPROVING THE NETWORK

CHAIR

SIMON GILL

SCOTTISH GOVERNMENT

RACHAEL TALJAARD

TECHNICAL CONSULTANT

SMARTER GRID SOLUTIONS

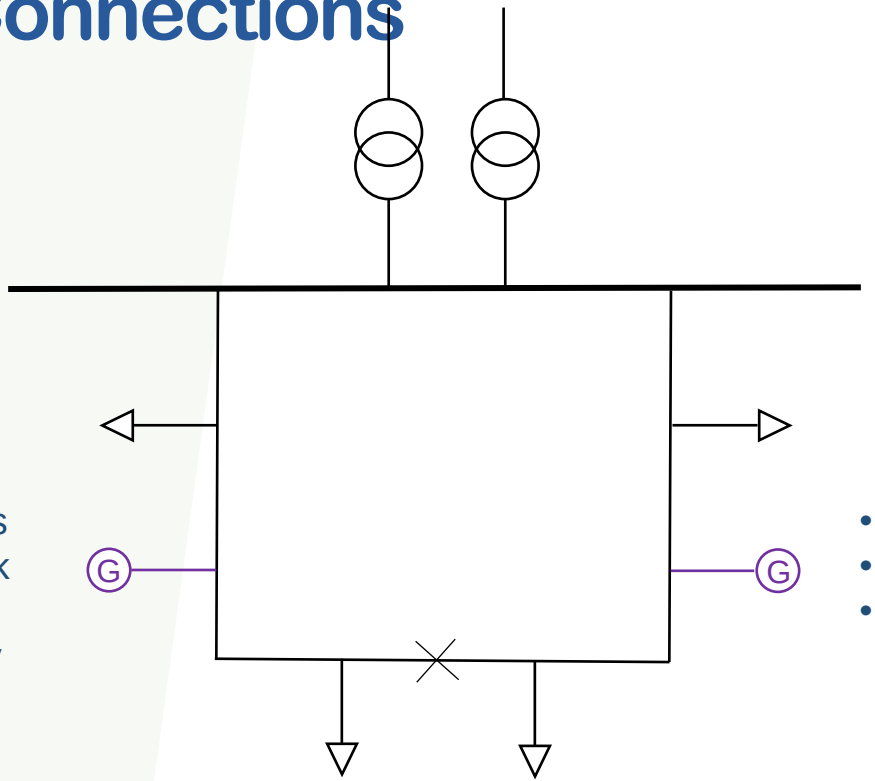
smarter grid solutions

Improving the Network: Managed Connections

Dr Rachael Taljaard

www.smartergridsolutions.com

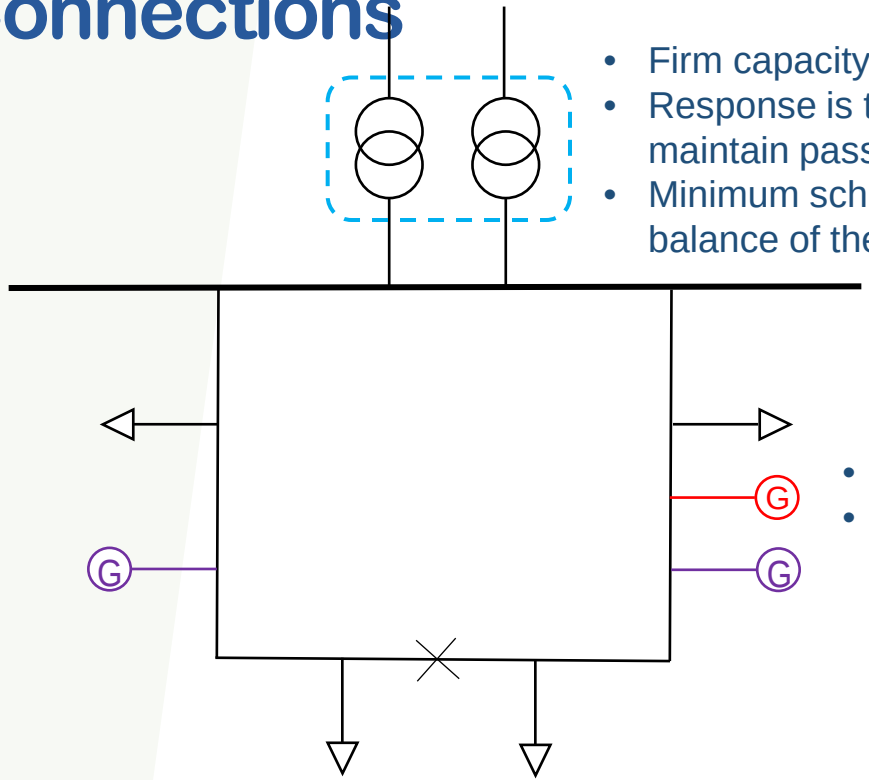
Network Connections



- Second generator applies
- Spare capacity in network
- Connects with sole use assets and minimal delay

- New generator applies
- Spare capacity in network
- Connects with sole use assets and minimal delay

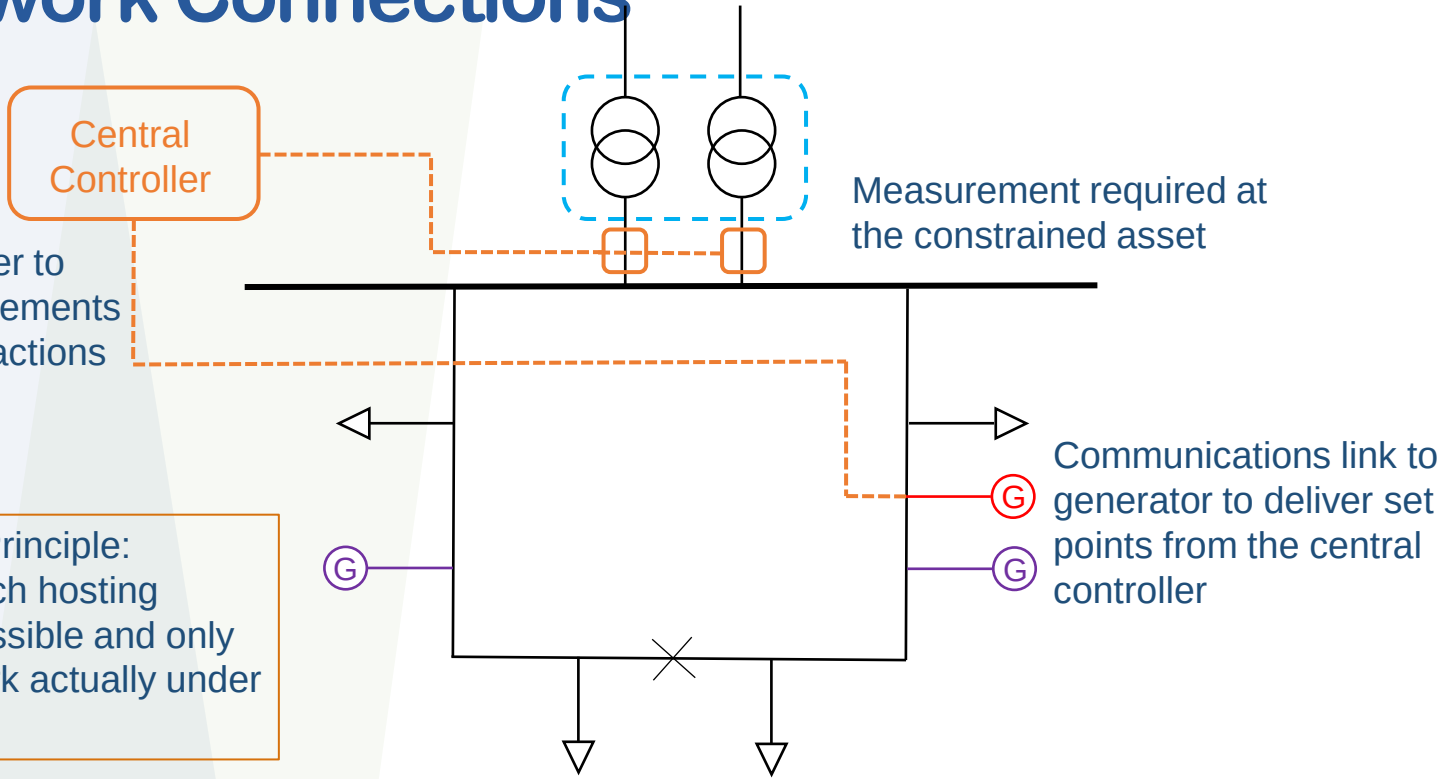
Network Connections



- Firm capacity of transformers exceeded
- Response is to trigger upgrades to maintain passive operation
- Minimum scheme means DNO funds the balance of the capacity

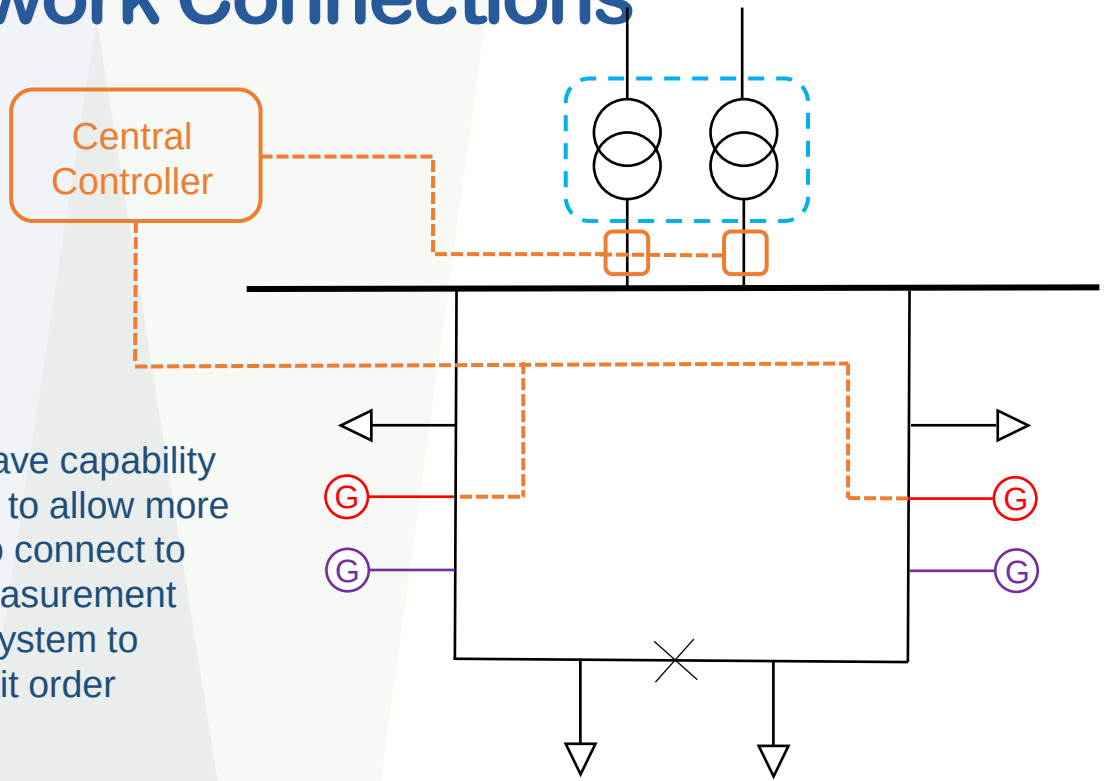
- Third generator applies
- Breaks the rules!

Network Connections



Fundamental Principle: Provide as much hosting capacity as possible and only curtail if network actually under stress

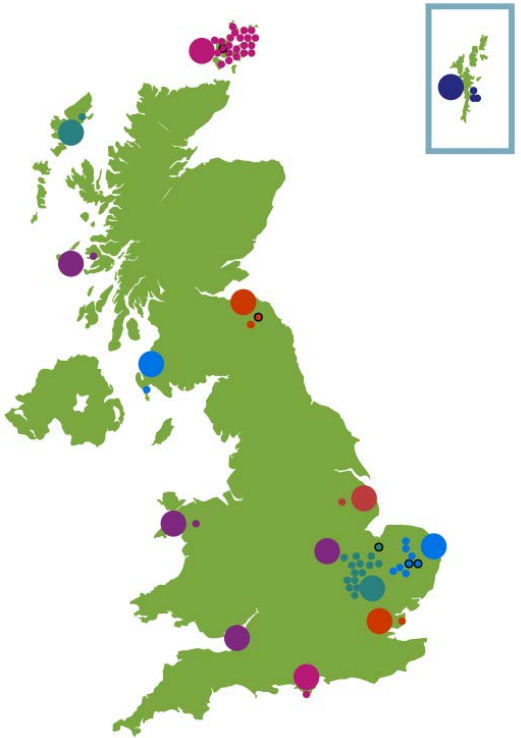
Network Connections



DNO must have capability of expanding to allow more generators to connect to the same measurement and control system to maintain merit order

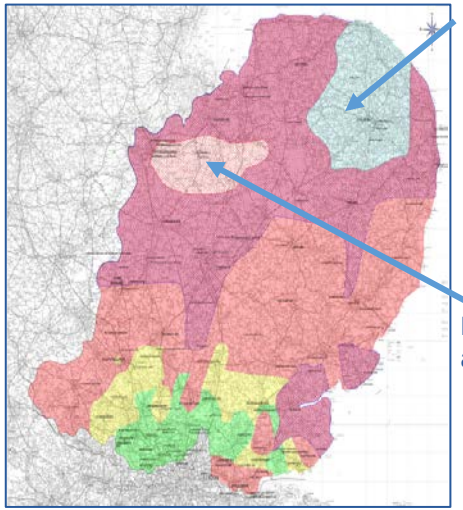
Active Network Management: BaU Adoption

- 288MW under ANM control
  - Mix of wind, PV, tidal, battery storage
- 63 generators connected to ANM systems
- 14 operational systems
  - SP Energy Networks
  - Scottish and Southern Electricity Networks
  - UK Power Networks
  - Western Power Distribution



ANM Connection Case Study

- UK Power Networks: Flexible Plug and Play (FPP)
  - To enable cheaper and faster connections compared with traditional business-as-usual offers
  - Thermal and Voltage constraints limiting DG connections
  - Combination of Last-In First-Off and Pro-Rata principles of access
  - Minimum saving of 45%, with over half of issued offers providing a saving of 90%

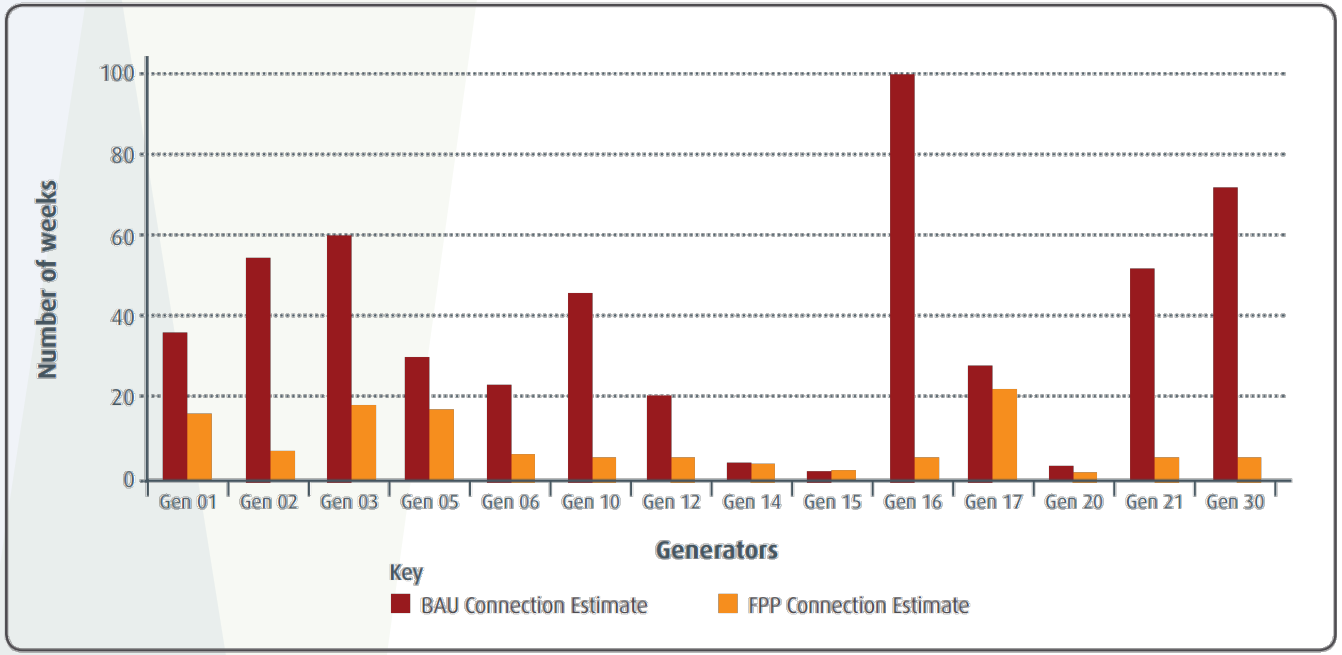


More information available at:
http://innovation.ukpowernetworks.co.uk/innovation/en/Projects/tier-2-projects/Flexible-Plug-and-Play-(FPP)/

Benefits Case for Developers: Cost

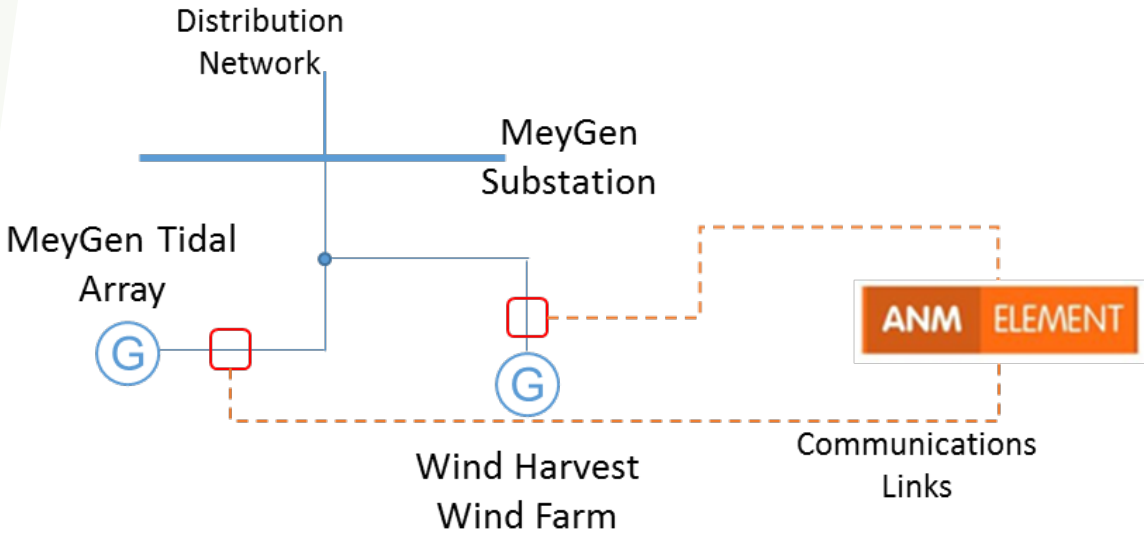
CONNECTION OFFERS					CURTAILMENT		
Capacity	Type	Firm BAU	Interruptible FPP	Saving	% Curtailment	MWh/yr	£/yr
8 MW	Wind	£3.5 m	£881 k	75%	2.7%	704	£32k/yr
10 MW	Wind	£4.8 m	£590 k	88%	5.33%	1,402	£63k/yr
0.5 MW	Wind	£0.8 m	£157 k	81%	5.33%	70	£13k/yr
0.5 MW	CHP	£2.5 m	£117 k	95%	1.73%	76	£13k/yr
6.6 MW	PV	£9.0 m	£1,734 k	81%	2.57%	166	£12k/yr
10.25 MW	Wind	£5.2 m	£1,584 k	70%	5.33%	1,437	£65k/yr
0.5 MW	Wind	£1.8 m	£234 k	88%	5.33%	70	£13k/yr
1.5 MW	Wind	£1.9 m	£157 k	92%	5.33%	210	£20k/yr
0.5 MW	Wind	£3.5 m	£881 k	75%	5.33%	70	£13k/yr

Benefits Case for Developers: Time



Behind-the-Meter ANM

- Behind-the-meter ANM system
- Two generators sharing the same connection
- First of its kind in the UK
- Monitors tidal array and wind farm
- Controls wind farm to keep export within tidal array's firm capacity



Common Challenges: Project Feasibility and Funding

- ANM reflects interruptible network connections with prospect of energy curtailment
  - Interruptible nature of connection means need for impact forecasts
  - Curtailment assessments must be performed to determine impact of ANM under different network conditions
- To date, estimation of energy curtailment has been provided in connection offer
  - Analysis described in varying degrees of detail
  - Lack of consistency in methodology or modelling assumptions across network operators
- Types of alternative connection are new to investors and financiers
  - New terms of connection offer
- Additional analysis is often sought
  - Different modelling assumptions
  - Scenarios to study sensitivity to network developments
  - Improve understanding of terms of ANM/alternative connection.

Help & Information Available

- ENA Active Network Management Good Practice Guide
  - All DNOs were involved
  - Outlines what ANM is, when and how it should be used, the deployment of ANM, etc.
  - Also considers future developments of the technology

http://www.energynetworks.org/news/publications/reports.html

smarter grid solutions

Contact

rtaljaard@smartergridsolutions.com

www.smartergridsolutions.com

CATHERINE CLEARY

PRINCIPAL CONSULTANT

TNEI

tnei

A specialist energy consultancy

Improving the Network

Catherine Cleary

21st June 2017

tneigroup.com

Contents

The Key Issues

- Physical Network Capacity

  The **majority** of new generation connections in Scotland will face distribution or transmission constraints which will require active management or costly reinforcement.

- Network Security

  Need to deliver the same security of supply to customers, but distributed renewable generators don't currently provide the same system support services as the larger generators they have displaced.

- Network Flexibility

  Network operators looking for the flexibility to meet changing but uncertain requirements, but often faced with long term decisions.

1. Network Capacity

Active Network Management already applied successfully to onshore wind in areas of network capacity constraint:

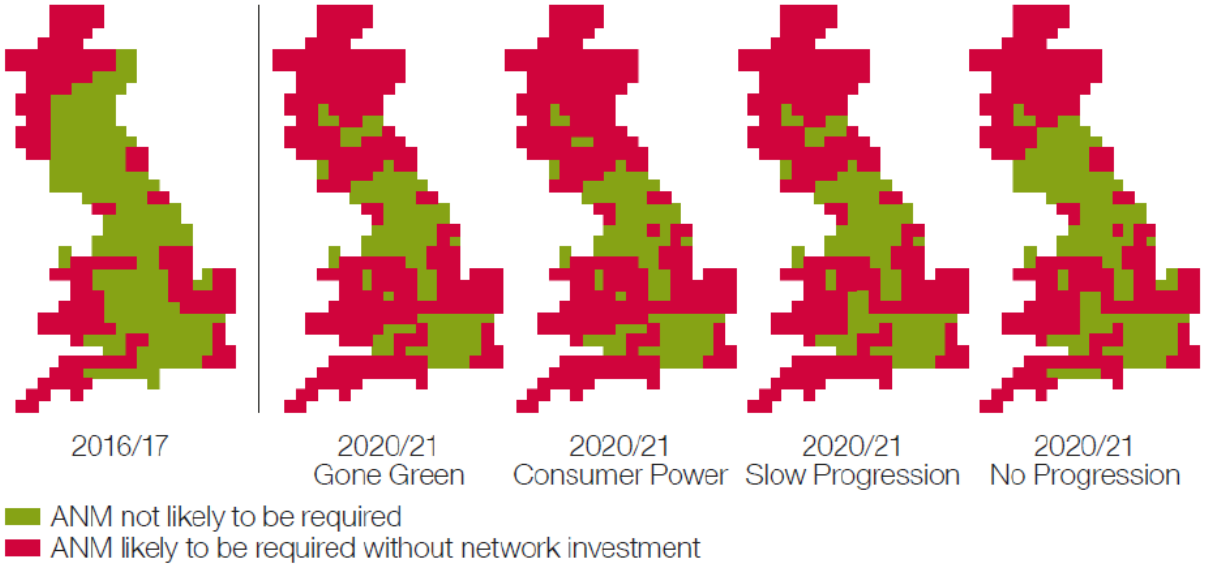
- ARC - SP Energy Networks
- Orkney ANM – SSE
- Single Generator ANM (SGANM) - SSE
- Restricted Available Access – National Grid

Wind Generator = Flexible Customer

Works best in areas with generation diversity

Network Capacity

Widespread adoption of active network management likely – transition to “DSO” within 5 years..?



2. Network Security

Large Scale Wind already has the technical capability to provide key System Balancing Services including

- Frequency Regulation (downward)
- Reactive power
- Transmission Constraint (Inter-trips)

Wind Generator = Flexible Provider

Addition of co-located storage would add to this list!

But work is needed on the procurement models for these services, to incentivise renewables to participate

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Network Security

More ancillary services aimed at resolving local network issues (DSO level)

- Network Reinforcement Deferral
- Phase Balancing
- Power Flow Optimisation
- Dynamic voltage control

Simplification of National Grid Balancing Services going on at the moment:

- Frequency Response
  - Pre-Fault
  - Post-Fault
  - Margin
- Voltage Services
- System Security Services

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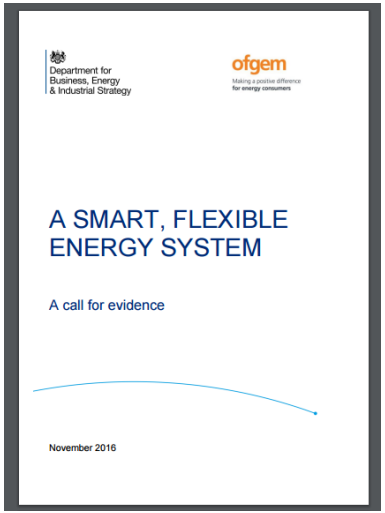
3. Network Flexibility

Ofgem Definition of "**Flexibility**":

"modifying generation and/or consumption patterns in reaction to an external signal (such as a change in price) to provide a service within the energy system"



- Renewable Generators traditionally **Inflexible**
- Balancing responsibility was picked up by suppliers

- **Ofgem want to encourage participation of a wider number of parties in enabling a flexible energy system**

- Adoption of ANM turned wind into a **Flexible Customer**
- Next step - **Flexible Provider**?

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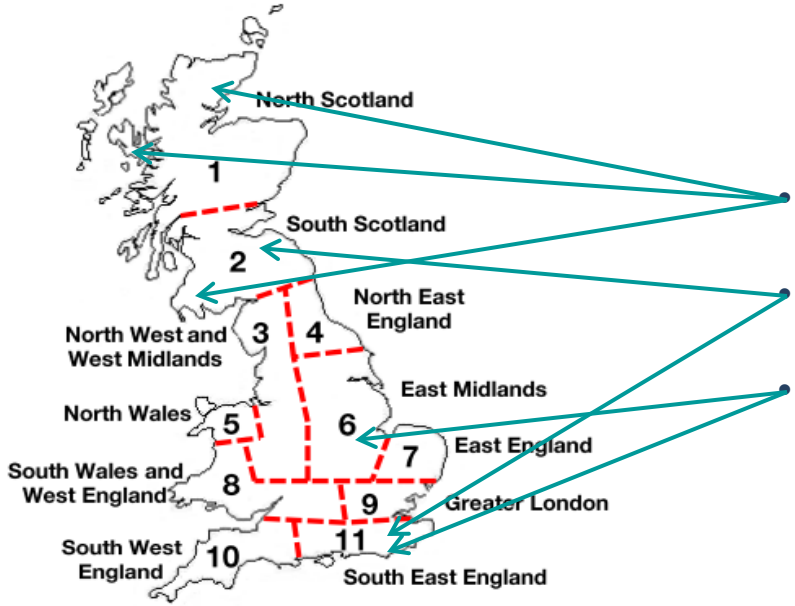
The Role of Onshore Wind?

Could existing onshore wind generators provide the flexibility needed?

Strong geographic correlation between network service requirements and location of Renewables



Transmission constraint management

DNO reinforcement deferral

Voltage Control / System Strength

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Onshore Wind as a Flexible Services Provider?

Service	Type	Procured by	Wind – Technical Capability?	Currently Provided by Wind?
EFR	Balancing Service	National Grid	**Possibly** if speed of response can be confirmed	
FFR	Balancing Service	National Grid	**Yes** – All large wind generators tested for Frequency response	
Constraint management	Balancing Service	National Grid	**Yes –** transmission inter-trips	✓
Reactive Power	Balancing Service	National Grid	**Yes -** All large wind generators tested for reactive power capability	
DNO Reinforcement deferral	**(Future DNO service?)**	DNO	**Yes**	

Conclusions

1. Improvements to the network mean changes to system operation, not just more copper in the ground

2. Onshore wind can be more than just a flexible customer...

3. Stay involved & engaged

http://www2.nationalgrid.com/UK/Services/Balancing-services/Future-of-balancing-services/

https://www.spenergynetworks.co.uk/userfiles/file/SPEN%20DSO%20Vision%20210116.pdf

https://www.ofgem.gov.uk/electricity/retail-market/market-review-and-reform/smarter-markets-programme/electricity-system-flexibility

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DAN THOMAS

GRID AND OPERATIONS MANAGER

BANKS RENEWABLES

BANKS Renewables
development with care

Improving the Network

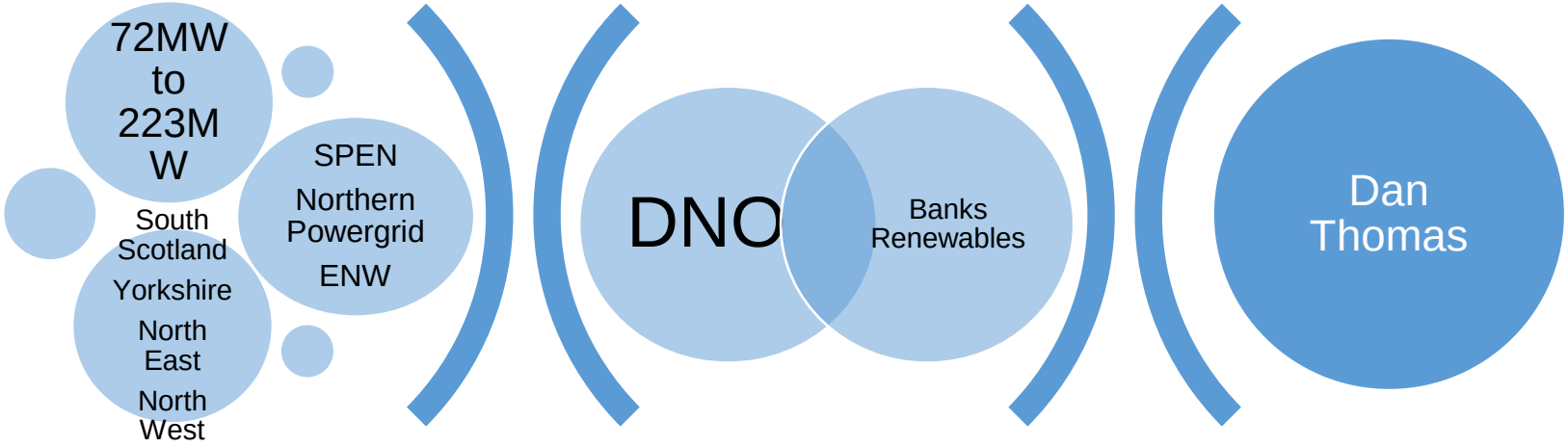
Scottish Renewables Onshore Wind Conference 20 June 2017

Dan Thomas
Grid and Operations Manager

1976 - 2016 40 YEARS

BANKS

My Perspective

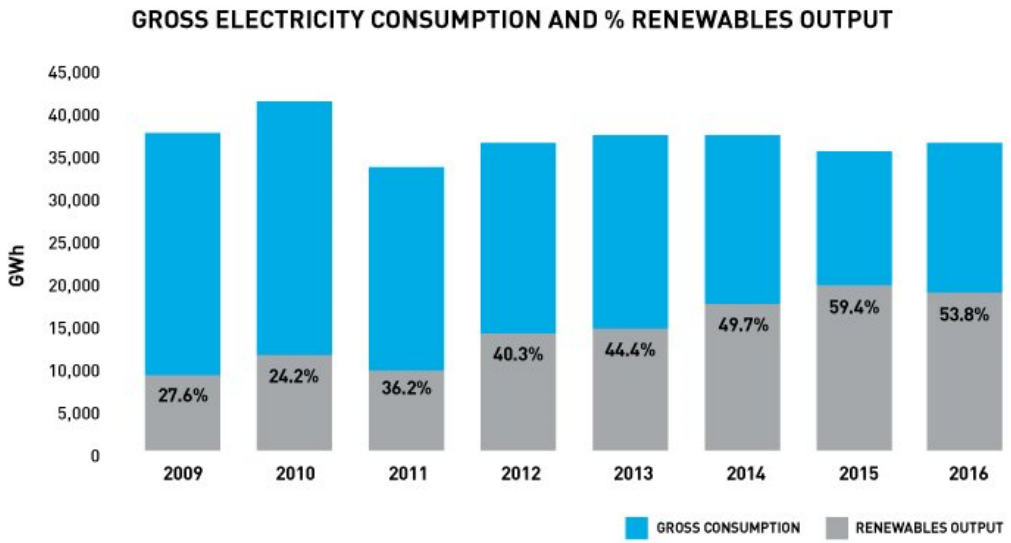


Distribution to Transmission

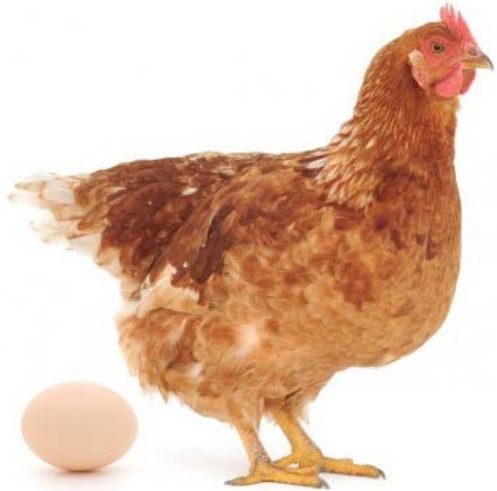
DNO to Developer

Look how far we have come?

- National Grid's data at lunchtime on Wednesday showed that solar panels produced around 7.6GW of electricity while wind farms generated 9.5GW of power.
- In addition, the UK burnt 2GW of renewable biomass, made from waste wood, and produced a modest amount of hydro electricity to help squeeze traditional power plants off the system.
- [Jillian Ambrose - telegraph on line]
- [Scottish Government –Energy Stats summary]



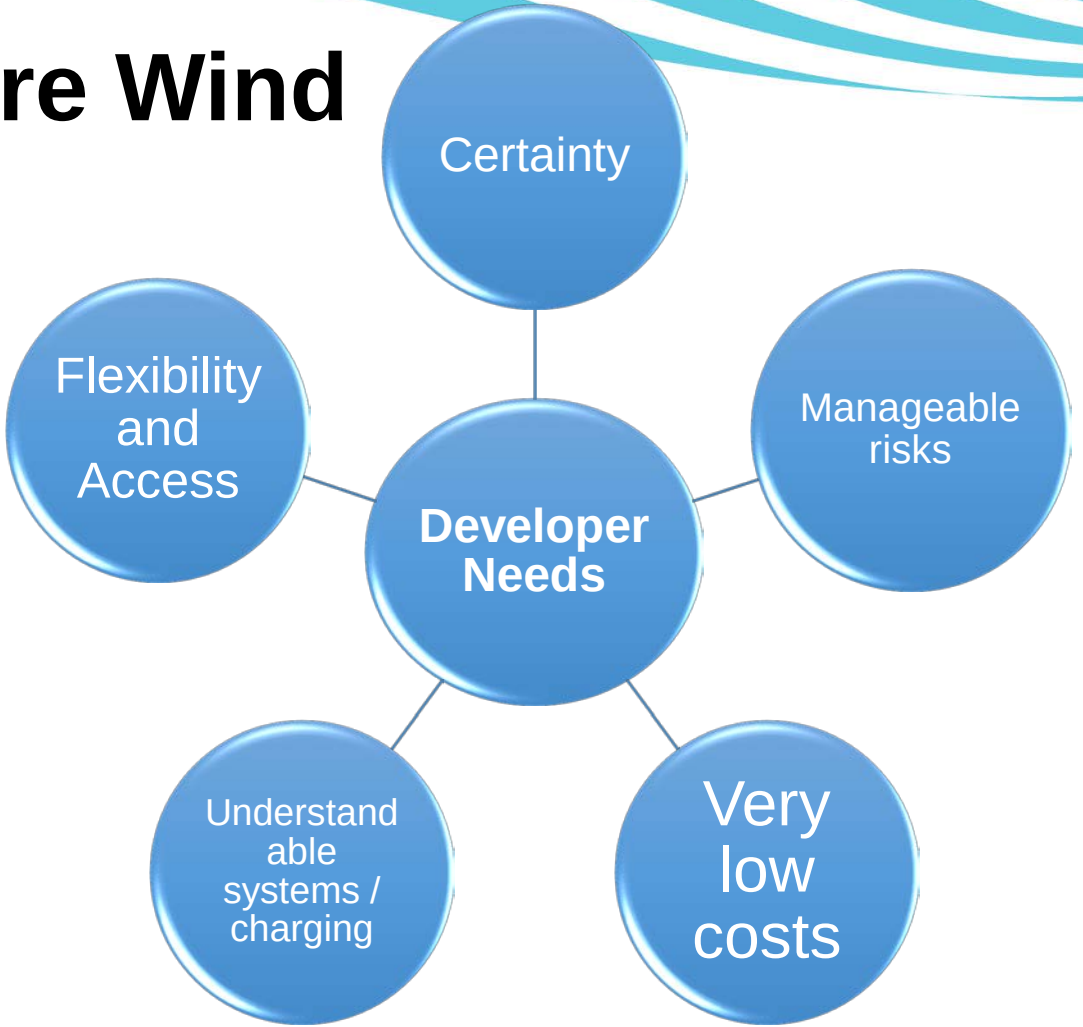
Involved or Committed?



To my breakfast

Future Onshore Wind

Banks Renewables
51MW consented
150MW in planning
Storage ?




Uncertainty
Flexibility and Access
Risks more difficult to manage
Present Position
Complex systems / charging
Increasing costs

Examples Re: Grid Charging

Change	Summary	Happening	Impact
CMP 264/265	Embedded Benefits charging change	Yes	- 1 to 4%
Exporting GSPs / Gross charging for BSUoS	Embedded Benefits charging change	Not sure	?
Fluctuations in Zonal TNUoS from forecast	Forecast vs Actual	Yes – NGET improving?	Uncertainty
Locational Transmission Losses	CMA action on transmission losses charging BSC P350	Yes	- 0.5 to 4%
BSUoS increases	Market moving with increased services	Not sure – seems to be accepted	?
Targeted Charging Review	Allocation of residuals at Transmission and Distribution	In consultation	??
Small Generator Discount	Scottish benefit – end date unclear		?
Transmission / Distribution interface	Work on levelling the playing field T vs D	Project underway	?
Brexit	Implication of cap on generation TNUoS	Not sure	??

Trends

- Less use of the transmission system
- No less cost
- Remaining users pay more
- Difficult for those with a fuel that can’t move
- More negative wholesale prices
- Ancillary Services markets grow – OPPORTUNITY
- DNO to DSO move – New Market ? - OPPORTUNITY
- More disconnect between yesterday’s regulation and today’s use
- Electric cars
- Electric heating ?

Can We?


Be really careful when changing charging post investment
Ensure Governments understand our fuel can't move
Ensure Governments understand Grid costs affect viability
Sell more ancillary services from wind farms
Have objectives: to support investment certainty and carbon free generation
Simplify the grid charging system pre investment
Not make narrow or piecemeal changes to charging - Do a broad review
Consider regional markets (DSO?)

Even if you are just involved

Think like you are committed

Q & A

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MINISTER FOR BUSINESS, INNOVATION AND ENERGY

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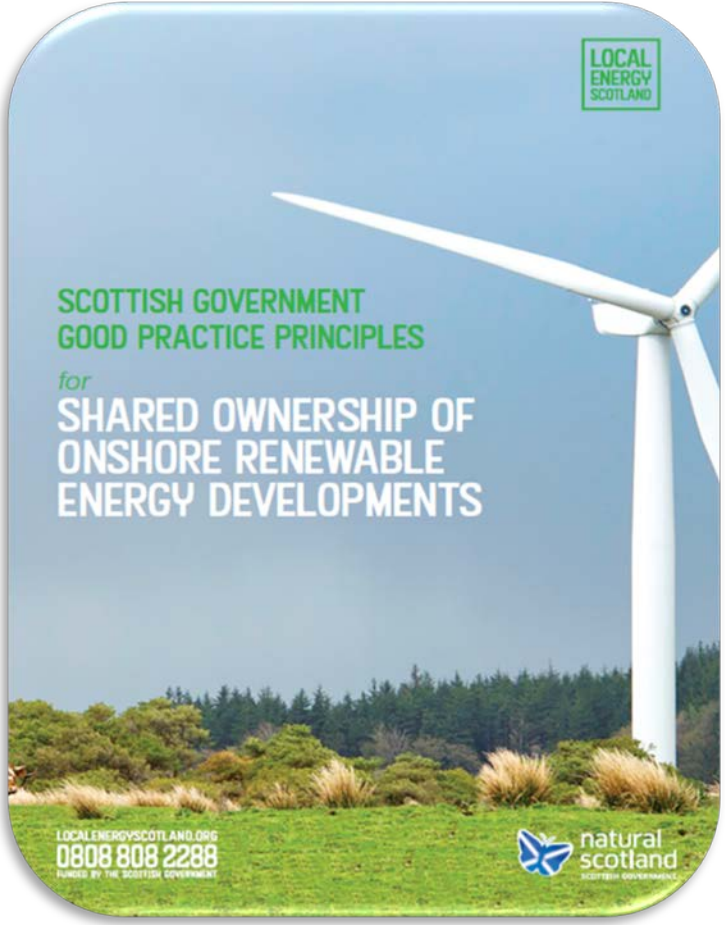
LAURA NICOLSON

SHARED OWNERSHIP DEVELOPMENT MANAGER

LOCAL ENERGY SCOTLAND



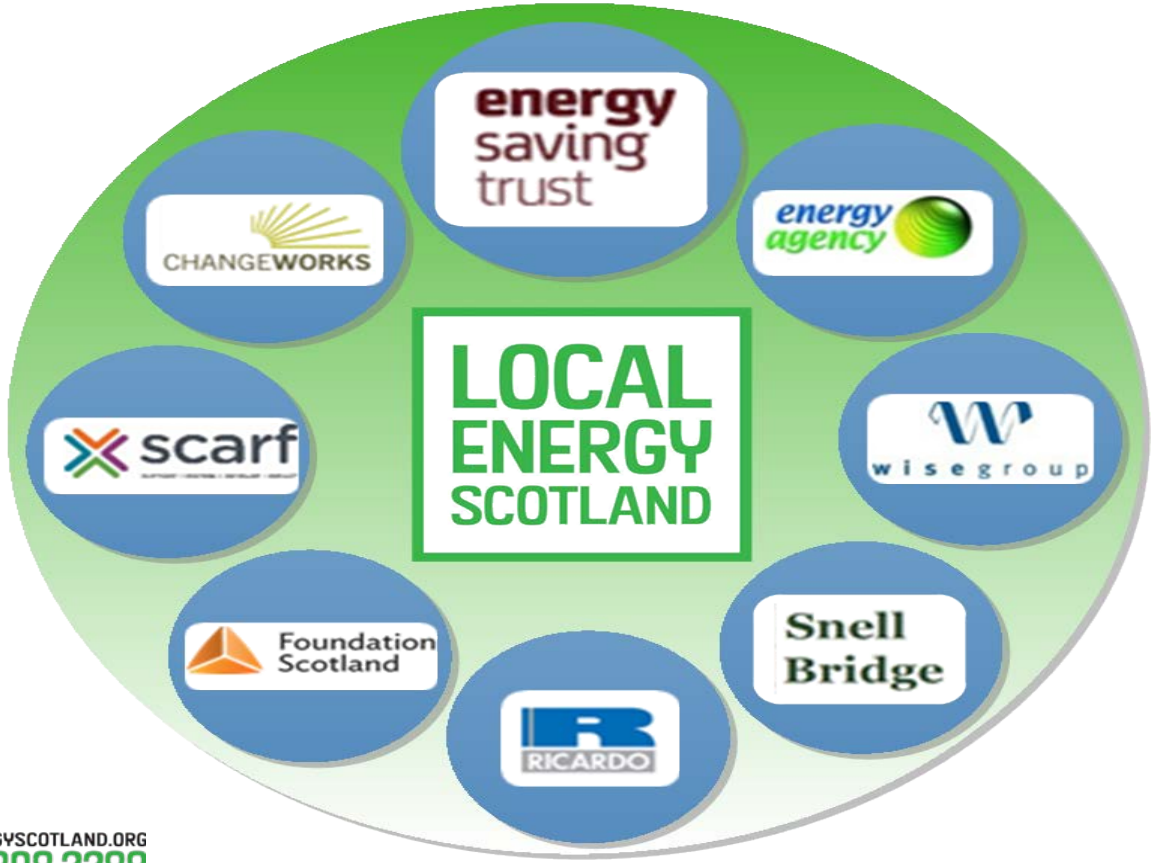
Scottish Renewables Onshore Wind Conference

Shared Ownership

Laura Nicolson

Local Energy Scotland

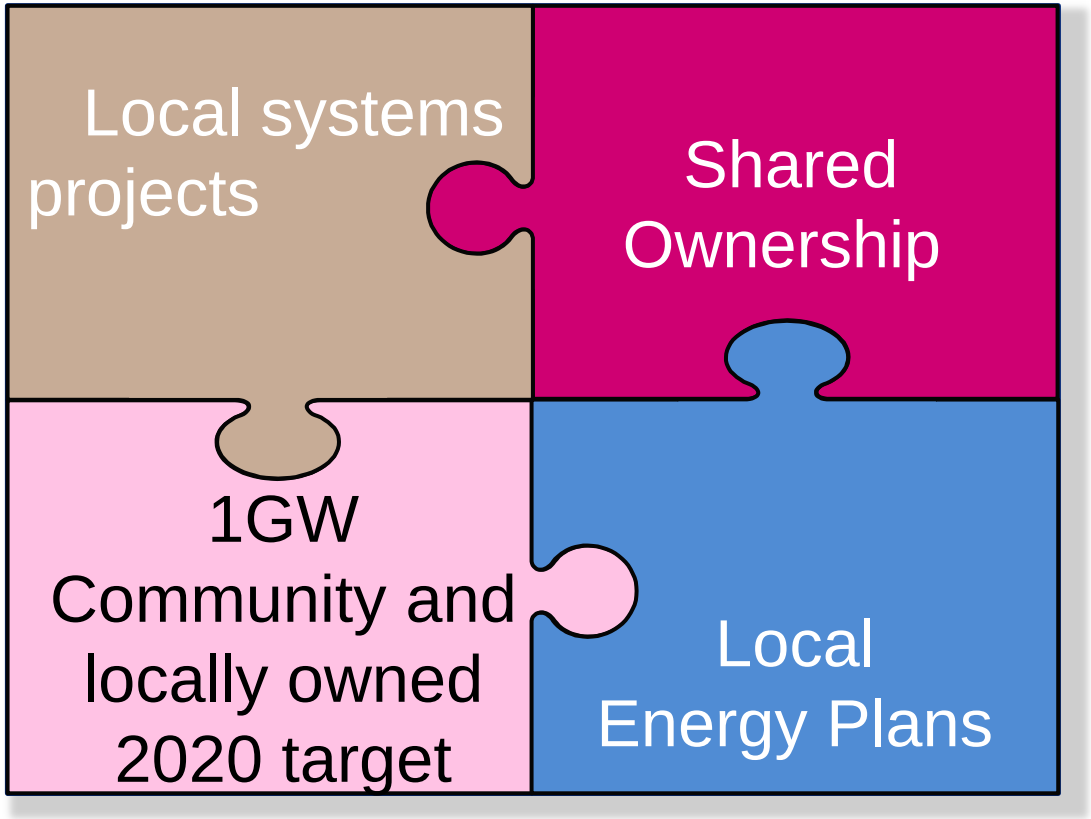
Who we are



Delivers the Scottish Government's

Community and Renewable Energy Scheme (CARES)

Priorities


Local systems projects
Shared Ownership
1GW Community and locally owned 2020 target
Local Energy Plans

Shared ownership

is any structure which involves a community group as a meaningful financial partner in a renewable energy project.

Shared Ownership
Where are we now?

- 18MW of community ownership in operational Shared Ownership projects
- 5MW in construction
- Up to 400MW consented but not built
- Up to 60MW in planning
- Up to 10MW in scoping

Where do we want to go?

"We will ensure that by 2020, **at least half** of newly consented renewable energy projects will have an element of shared ownership."

Why Shared Ownership?

- Community engagement
- Long term revenue stream for community organisations
- Communities more resilient
- Business rates relief
- Local Net Economic Benefit increased
- Access to local expertise and knowledge
- Uncertainties shared for developers and communities

Shared Ownership

Net economic benefit earned from shared ownership may be a material consideration in the planning system.

- Context
- What has been done
- Key discussions
- What happens next
- What to do if you have a planning application now?
- How Local Energy Scotland can help

Where are we going?

- Shared ownership is the industry standard for Onshore Wind
- Extensions
- Refinancing
- Repowering
- Innovative finance for and with communities

Cares Support

- Partnership Portal
- Framework of contractors –
  Legal, Financial and Project Management
- CARES Toolkit: Shared Ownership Module
- Financial Model
- Training for planners
- Support for Developers

Financial Support

CARES

- Early **grants** up to £25,000
- **Loan** to support communities' share of development costs up to £150,000 with write-off facility

REIF

- Capital investment for communities investing in shared ownership

CARES Support

Our local Development Officers are here to help

LOCALENERGYSCOTLAND.ORG
0808 808 2288
FUNDED BY THE SCOTTISH GOVERNMENT

Greener Scotland
Scottish Government

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CALLUM WHITEFORD

COMMUNITY RELATIONS MANAGER

RES

power for good

Renewable Energy Systems

Scottish Renewables Onshore Wind Conference

Planning and Communities

20 June 2017

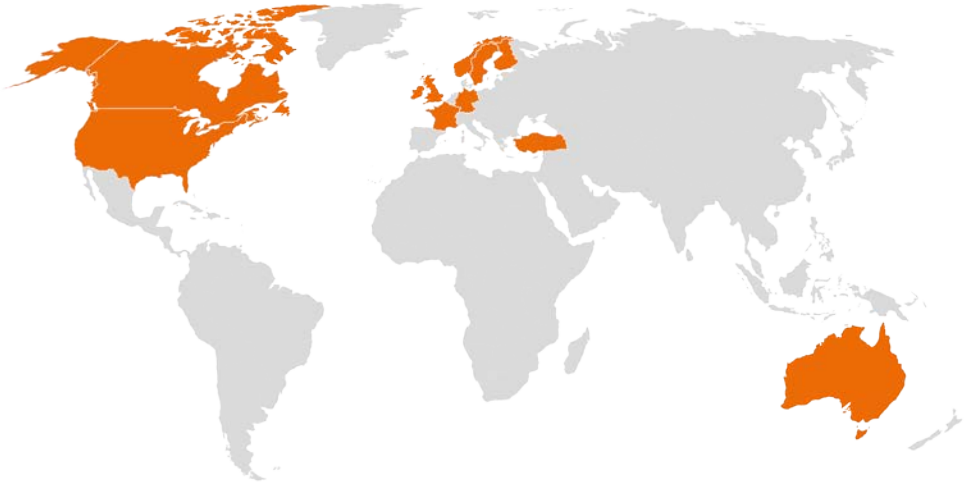
The world’s largest independent renewable energy company

12
GIGAWATTS PROJECT PORTFOLIO

35
YEARS OF EXPERIENCE

2.8
GIGAWATTS OF RENEWABLE PROJECTS SUPPORTED

1,400
EMPLOYEES



ACTIVITIES

DEVELOPMENT

CONSTRUCTION

SUPPORT SERVICES

TECHNOLOGIES

WIND

SOLAR

STORAGE

TRANSMISSION & DISTRIBUTION

Context

- Collective drive from industry to reduce costs for the benefit of consumers and businesses
- Industry challenged to deliver the UKs first subsidy free onshore wind farm
- Delivering projects without a subsidy requires significant cost reduction

- £906M GVA to the UK economy by onshore wind
- £2.06 million per MW invested in UK by average onshore wind farm

(Onshore Wind: Economic Impacts in 2014, Renewable UK)

Freasdail Wind Farm - Kintyre

£6.34 million invested in the Argyll and Bute economy

85 people employed on-site at the height of construction

Breakdown of investment

Local Contractors £4.21m

Local Materials £1.56m

Supplies / Services £0.36m

Local Accommodation £0.21m

TOTAL £6.34m

Furnace Quarry

Donald McLean Contractors

McFadgens Transport

A&L McCrae – Civils

Cowal Survey

Mellex Plant & Construction

Campbeltown Harbour

AMAC Harvesting

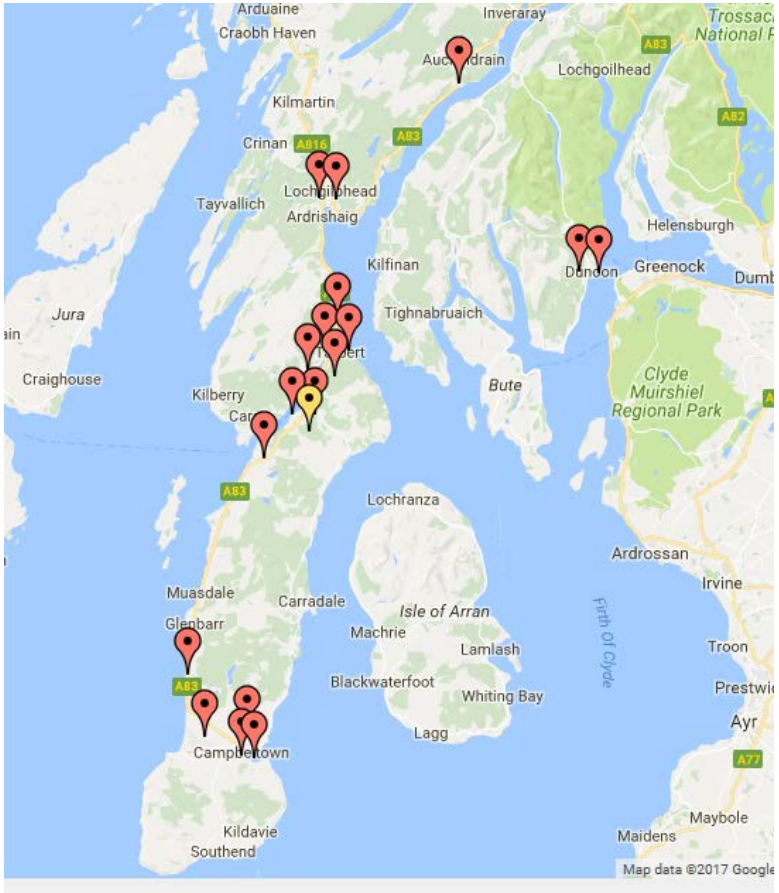
D Mcnair & Son Ltd

McKerral Transport

Clachan Filling Station

W K Soudan Ltd - Fencing

GM Geomatics



Glenchamber Wind Farm – D&G

Glenchamber Wind Farm

- 45 local people employed throughout construction
- More than £8 million invested in the local economy
- Upskilling of local business and workforce

Shared Ownership in Planning

- RES supports the principal of shared ownership and its laudable ambitions
- However, investments are riskier and less financially rewarding than they may have been in the past
- Requires large investment of time and effort by communities and developers
- Net economic impact must be measured on the outcomes it can deliver and not on the mechanisms of that delivery

The Renewables Infrastructure Group (TRIG) is listed on the London Stock Exchange and owns a large portfolio of renewable projects, with many located in Scotland.

- **Onshore wind portfolio = 554MW**
- **62% of which is made up of Scottish onshore wind farms**

Summary

- Significant ‘unseen’ net economic benefits of onshore wind should be better communicated by renewables industry
- Outcomes must be assessed by the planning system – not the mechanisms by which we get there
- More realistic ambitions for onshore wind industry if we are to deliver the UKs first subsidy free wind farms
- There needs to be a level playing field across all technologies

Thank you.

Callum Whiteford

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ONSHORE WIND POLICY OFFICER

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Scottish Renewables Onshore Wind Conference

Topics

- Review of Planning
- Planning Policy
- Material Considerations
- Draft Onshore Wind Policy Statement
- Manifesto Commitments

Review of Planning - Proposals

- Local Place Plan and development plan status
- Strengthened role for community councils
- Local Development Plan to be more map focused
- Regional Partnership working
- National Planning Framework and Scottish Planning Policy to have development plan status

Position statement and analysis report to be published this summer

Planning Practice/Policy/law

Practice

- Planning operates in the public interest

Policy

- Review anticipated after the Planning Bill
- Published in 2014
- Longstanding commitment to renewables/wind

Law

- Determination in accordance with the development plan unless material considerations indicate otherwise

Perpetuity

- Scottish Planning Policy paragraph 170
- About providing clarity for those living with wind farms
- Recognising intergenerational nature of the development

Community Benefit

- Scottish Planning Policy Paragraph 173
- Proposal acceptable in land use terms first
- Allows planning authorities to have a role in community benefit in line with good practice principles guidance
- Community benefit payments don’t affect the land use consideration

Material Considerations

- Circular 3/2013 ‘Development Management Procedures’

2 tests:

- Serve or be related to the purpose of planning, therefore relate to the development and use of land
- Relate to the particular application

- Validity is for the decision maker/courts

X – Voluntary payments

X – Ownership

Y – Net Economic Benefit

Draft Onshore Wind Statement

- Around 85 responses.
- The strategy had 250 responses.
- The onshore wind question regarding development without subsidy in energy strategy had 103 responses.

Conservative Manifesto commitment

- *While we do not believe that more large-scale onshore wind power is right for England, we will maintain our position as a global leader in offshore wind and support the development of wind projects in the remote islands of Scotland, where they will directly benefit local communities.*

Thank You

Q & A

CLOSING REMARKS

JENNY HOGAN

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scottish renewables

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