

Is Wind Worth It?

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RenewableUK – Who we are

- UK's foremost renewable energy trade association
- Represents wind, wave & tidal power
- Over 700 members, including utilities, small-scale developers, and academic bodies.



Wind industry in UK

- Employs nearly 10,000 people
- 5739MW of capacity, onshore and offshore
- 3,414 wind turbines built
- Generated 10183 GWh (10.1TWh) of electricity last year, enough for 2.1 million homes.
- 2.6% of total electricity supply

Wind in 2020

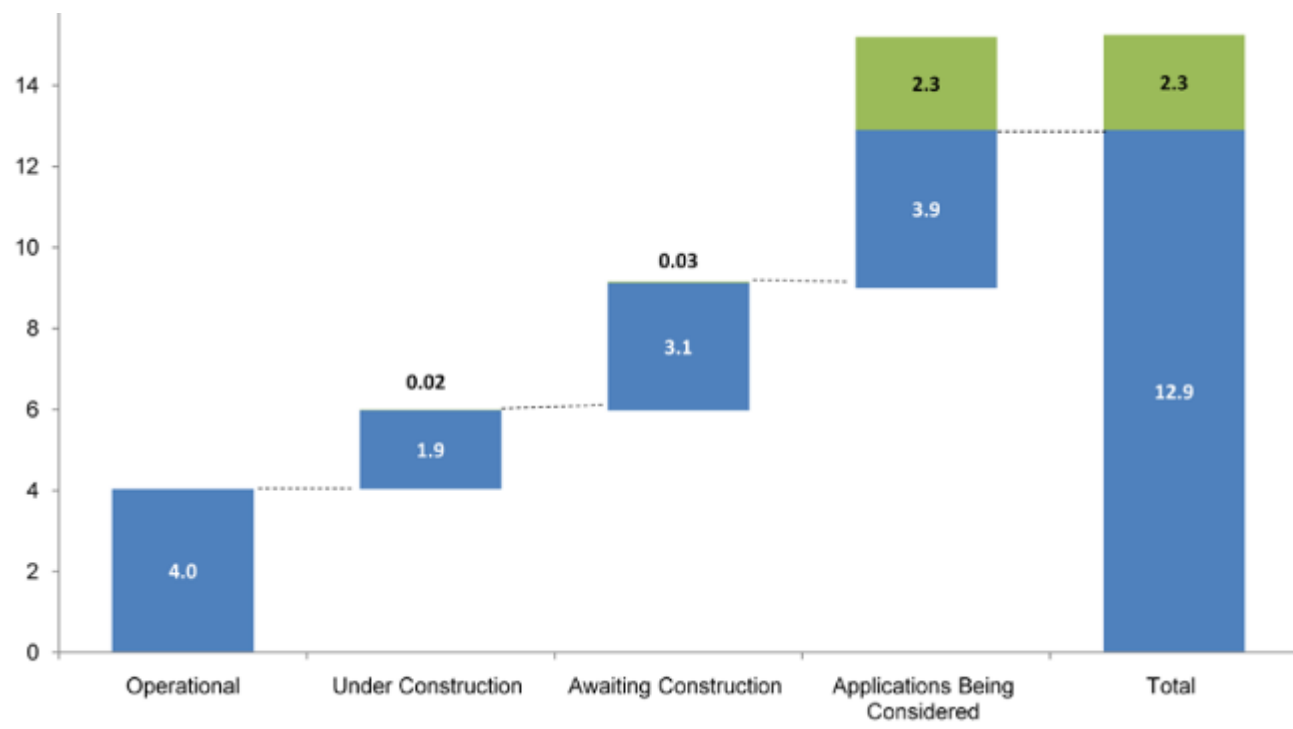
Government's Renewable Energy Roadmap calls for:

- Onshore wind to be producing 24-32 TWh
- Offshore wind to be producing 33-58 TWh



What does this actually mean?

- Building about 9GW of new onshore wind – about 4,500 new wind turbines.
- Most of these projects already in the planning system:



Why are we doing this?



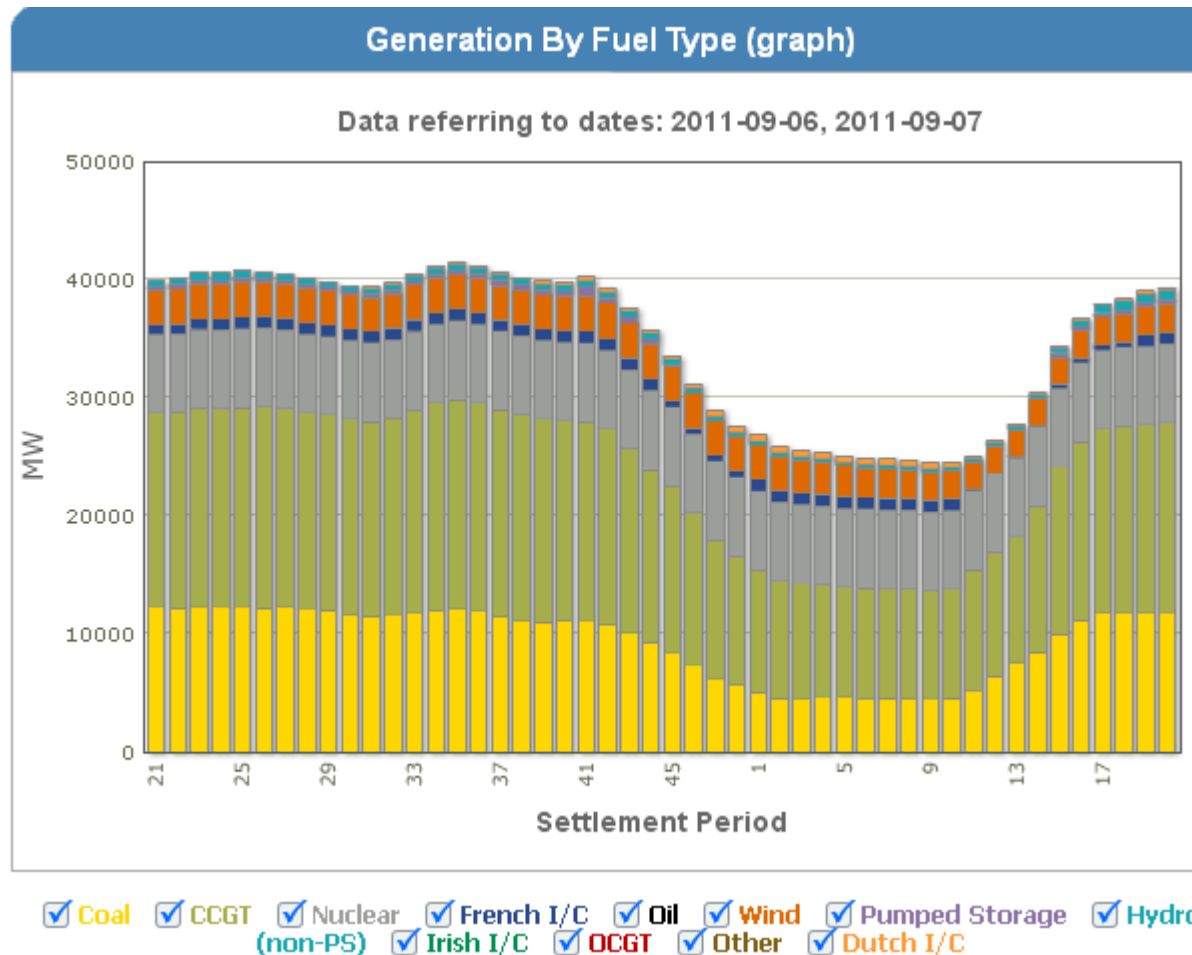
To keep the lights on.

- A quarter of our old generation capacity is shutting down over the course of the decade.
- Old Magnox nuclear reactors are reaching the end of their useful life
- Older coal plants are shutting down under the EU's Large Combustion Plant Directive
- We will need to build new power plants and new grid infrastructure to connect them to the National Grid

What are the options?



What do they have to deliver?



Source: BM Reports website

New Coal

- Most carbon-intensive – 960kgCO_{2e}/MWh
- High costs - £104.5/MWh
- Little political support
- Moderately flexible



Kingsnorth Power Station

New Combined-Cycle Gas Turbines

- Less carbon-intensive:
443kgCO_{2e}/MWh
- Cheapest option: £80/MWh
- Quick to build
- Very flexible



Connah's Quay Power Station

New nuclear

- Low carbon: $66\text{kgCO}_{2e}/\text{MWh}$
- High costs: £100/MWh
- Will take at least seven years to build
- Inflexible – must be always on



Sizewell B

Wind power

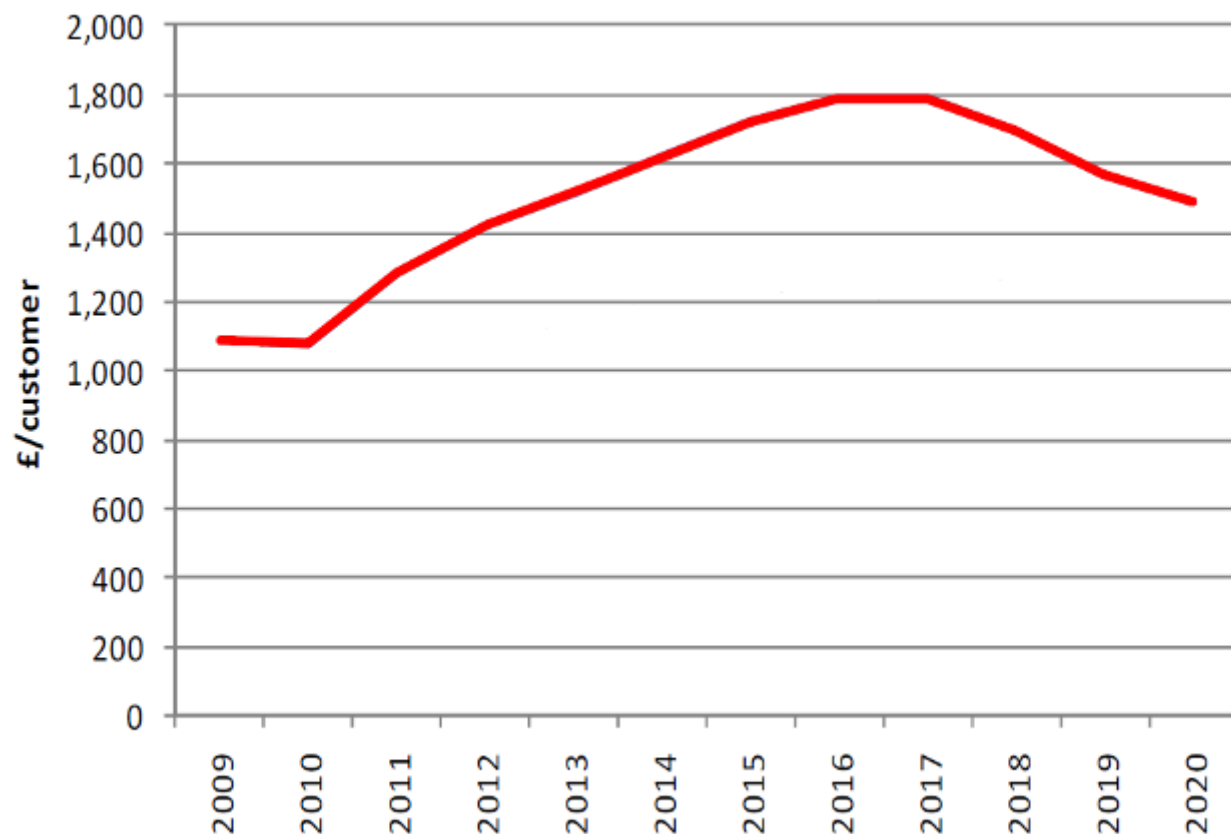
- Very low carbon:
10kgCO_{2e}/MWh
- Onshore wind is cheap:
£94MWh
- Offshore wind is more expensive: £157MWh
- Both can be deployed quickly
- Can be switched off easily, but requires wind to generate



Whitelee Wind Farm

What happens if we go for gas?

Average domestic consumer billⁱ

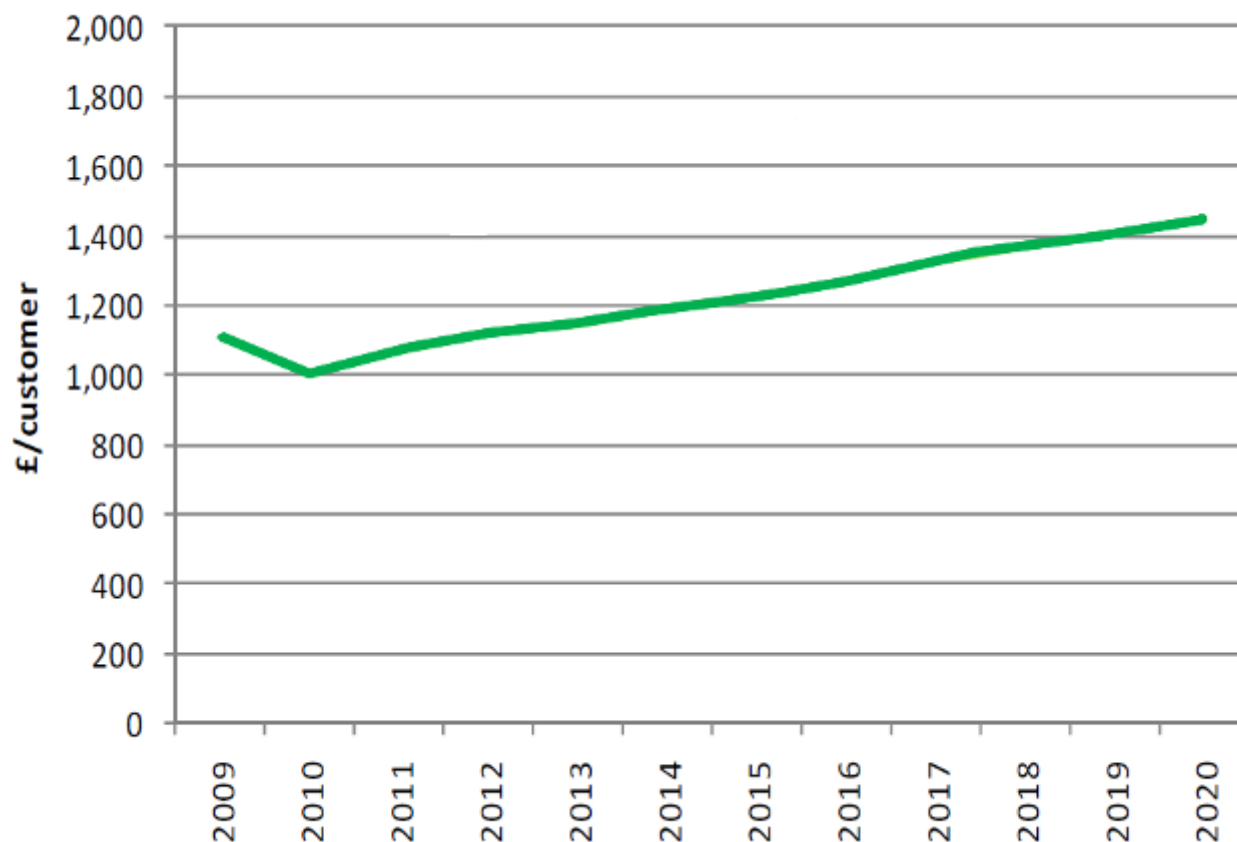


ⁱ Based on 3300 kWh electricity and 700 th gas, reducing with energy efficiency measures

Ofgem 'Dash
for Gas'
scenario

Using wind to supplement gas

Average domestic consumer billⁱ



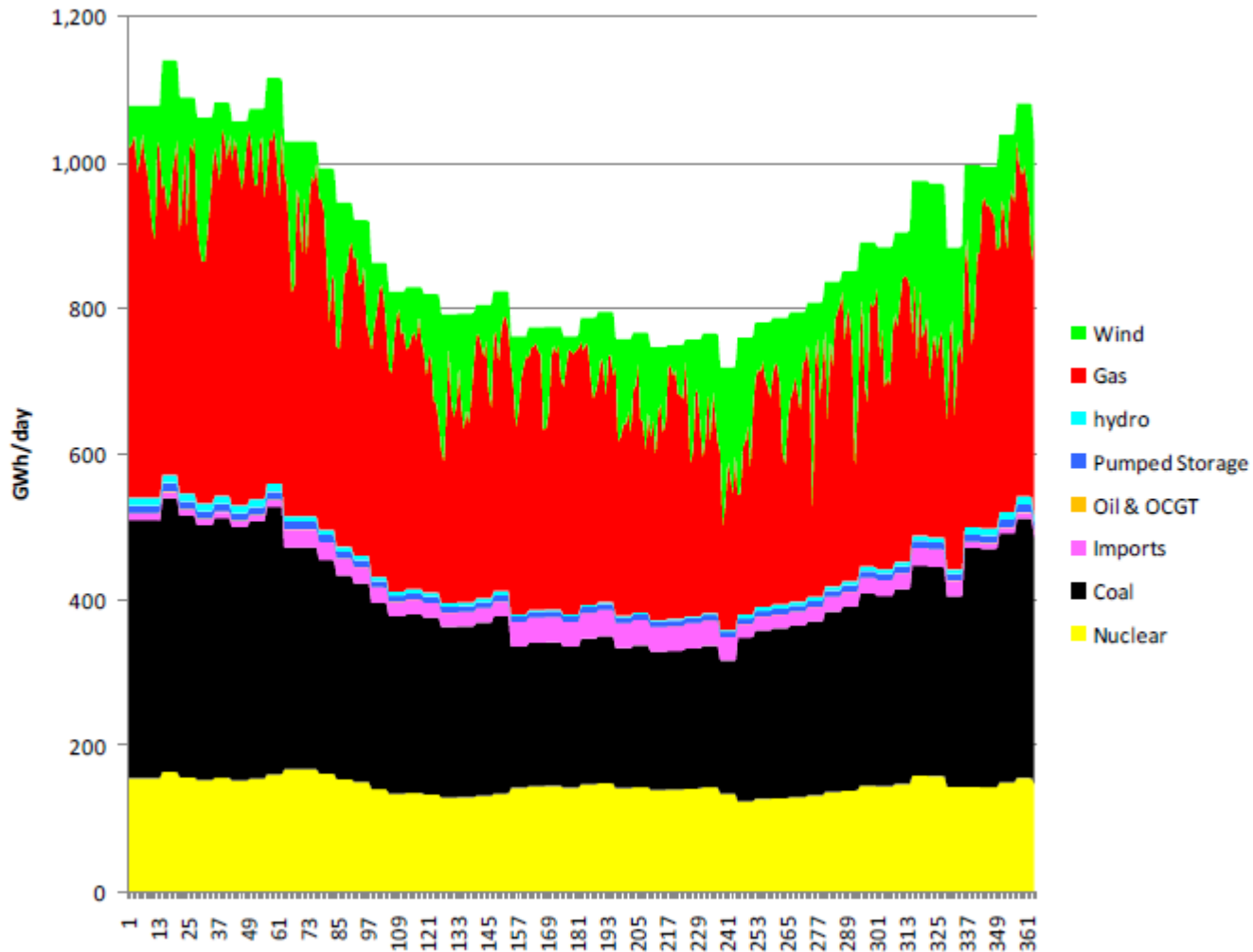
ⁱ Based on 3300 kWh electricity and 700 th gas, reducing with energy efficiency measures

Ofgem 'Green
Transition'
scenario

Saving expensive fuel

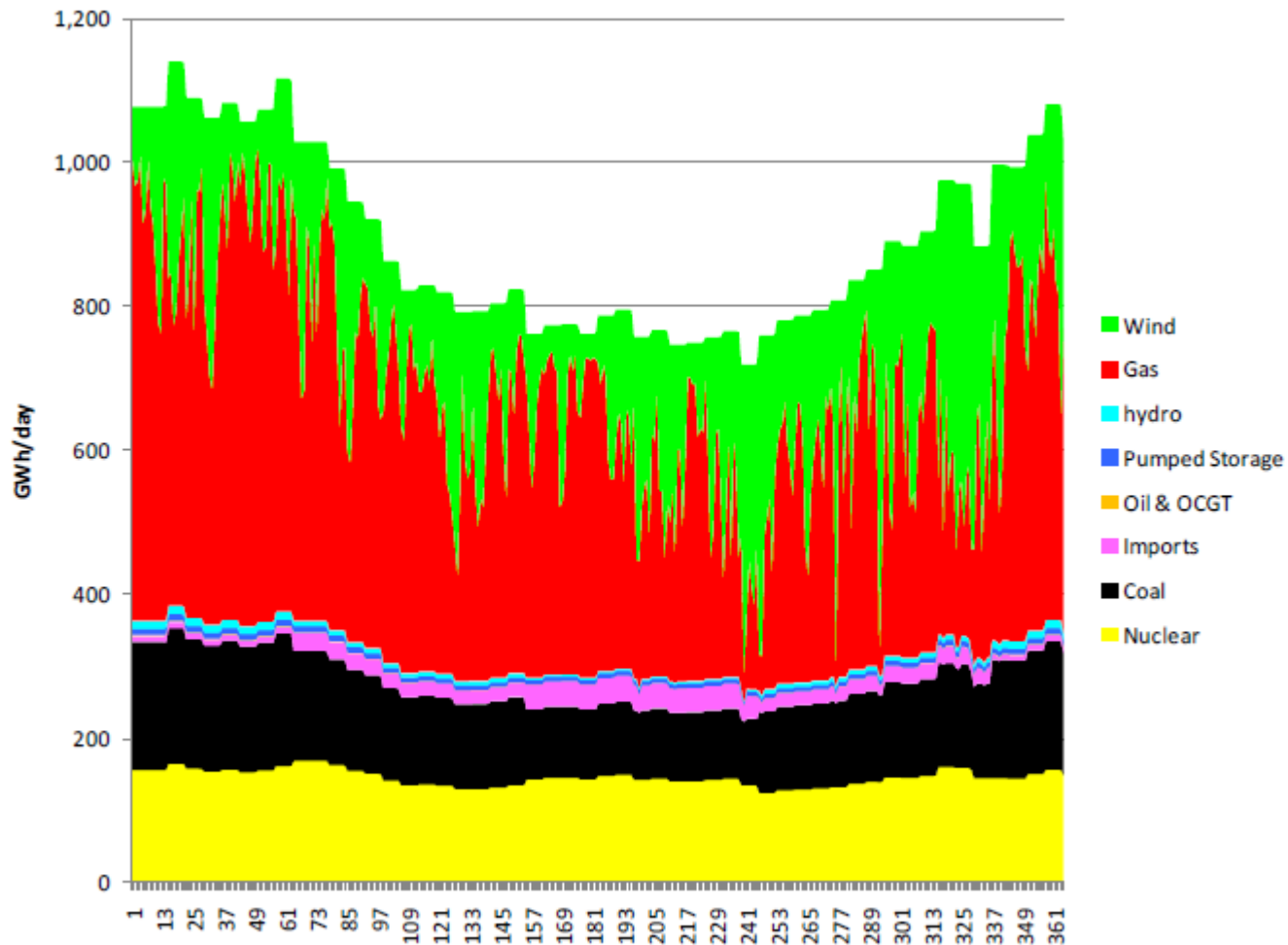
£ (real 2009 prices)	2010	2020	
		With a \$80 barrel of oil cost	With a \$150 barrel of oil cost
Average bill without green policies	£1060	£1226	£1699
Average bill with green policies	£1103	£1239	£1612
Difference	£43	£13	£-87

With 15GW of wind....



Source : 'The Impact of Import Dependency and Wind Generation on UK Gas Demand and Security of Supply to 2025', 2011, Howard Rogers, Oxford Institute for Energy Studies

With 28GW of wind...



Source : 'The Impact of Import Dependency and Wind Generation on UK Gas Demand and Security of Supply to 2025', 2011, Howard Rogers, Oxford Institute for Energy Studies

The pessimists say...

	Power Generated from Gas		Power Generated from Wind		Gas Demand in
	TWh	% of Total	TWh	% of Total	Power*
2009	147.7	45%	9.3	3%	27.7
2015	125.5	39%	37.0	11%	23.5
2020	140.5	43%	70.5	22%	26.3
2025	130.7	40%	106.9	33%	24.5

* 50% efficiency assumed

Shale won't save us

- Little impact before 2020
- Post 2020, impact will be in areas with substantial reserves – not across Europe
- UK has 1.5-5.6 years' worth of reserve – not enough to make a difference

Is Wind Worth It?



Load Factors

	2006	2007	2008	2009	2010
Onshore wind	27.2	27.5	27.0	27.4	21.7
Offshore wind	28.7	25.6	30.4	26.0	30.5
All Plant	52.7	52.7	50.0	47.5r	46.1

The worst performer

- Green Park Wind Turbine – 210th out of 218 in REF survey
- Load Factor: 16.8%
- Paid back carbon used in its manufacture and installation in two years
- Lifetime of 25 years
- Powers over 600 homes



Sources : 'Renewables Obligation Generators', REF

Wind Works

- Wind power can reduce the cost – both environmental and financial – of keeping the lights on
- Even the worst-performing wind turbines make a real contribution
- Visit a wind farm to see for yourself!



Thank you!

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