

The role of biomass in the decarbonisation of the UK energy system

Matthew Rivers

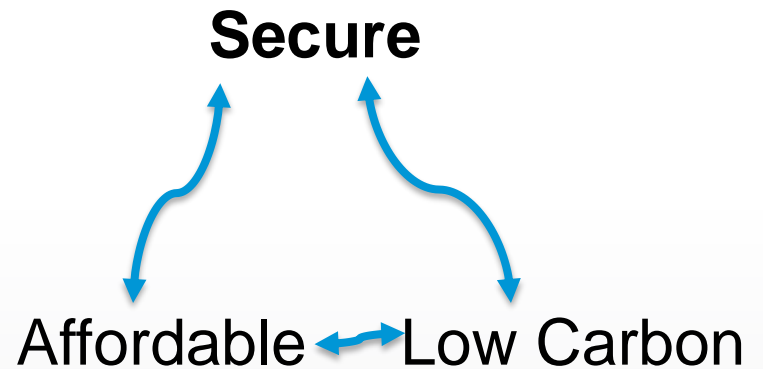
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Structure

- The challenge
- Context
- Where and why
- It is possible
- What are the obstacles
- Where next

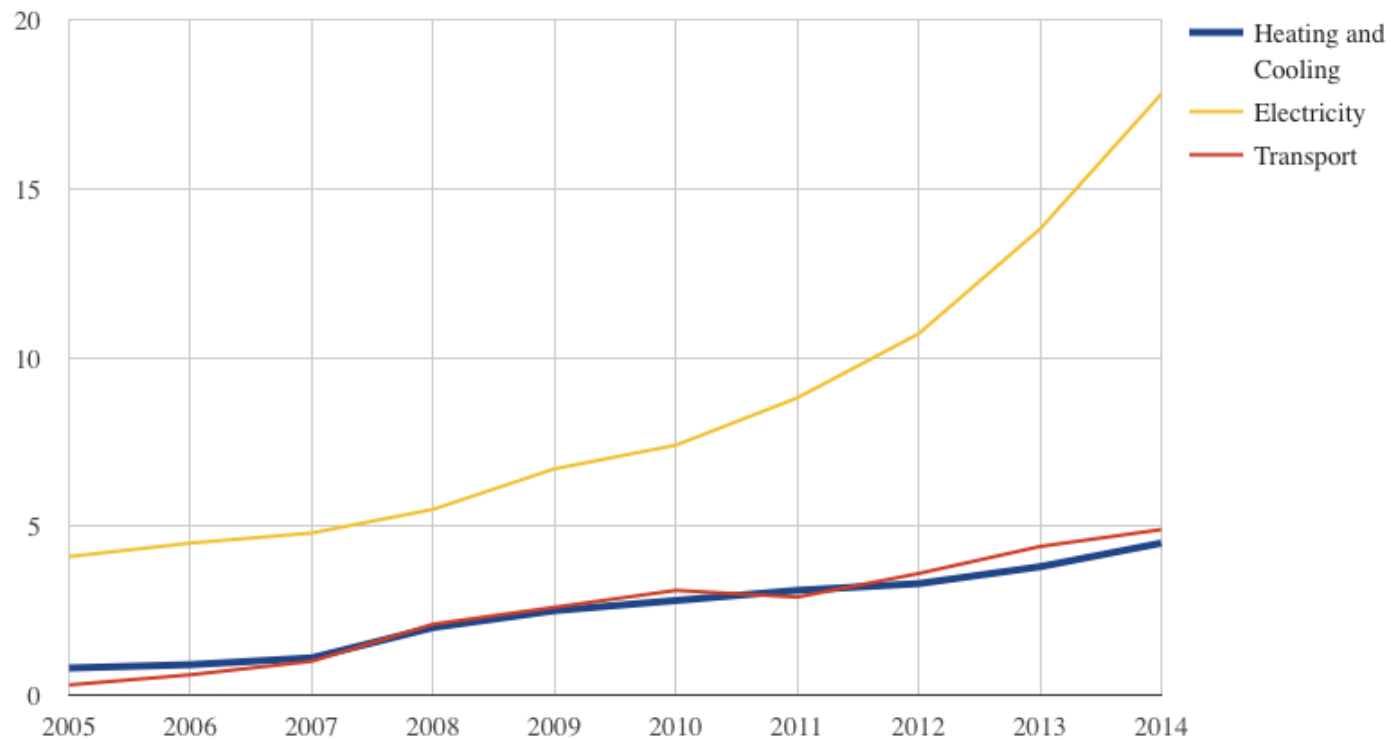
The inconvenient truth – that forestry supply chains are not the planets biggest challenge!



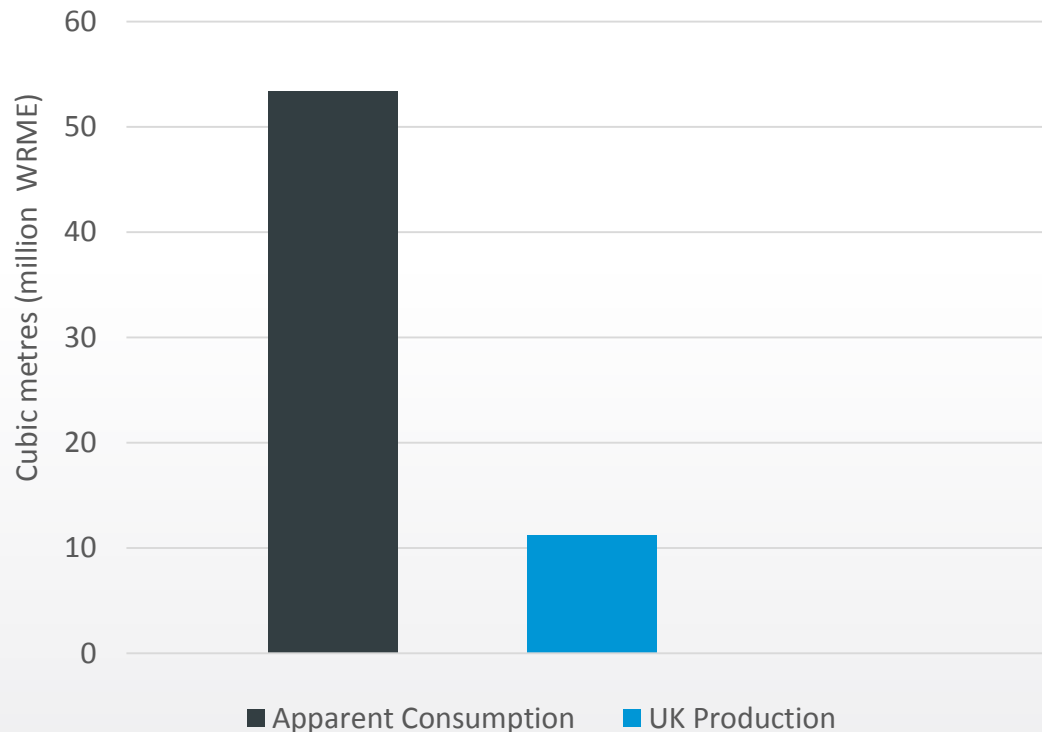
The UK energy trilemma challenge

Challenge comprises three elements – electricity notably better success to date ; heat comprises 1/3rd of UK emissions and hence critical to address

Share of renewables in UK energy consumption (%)



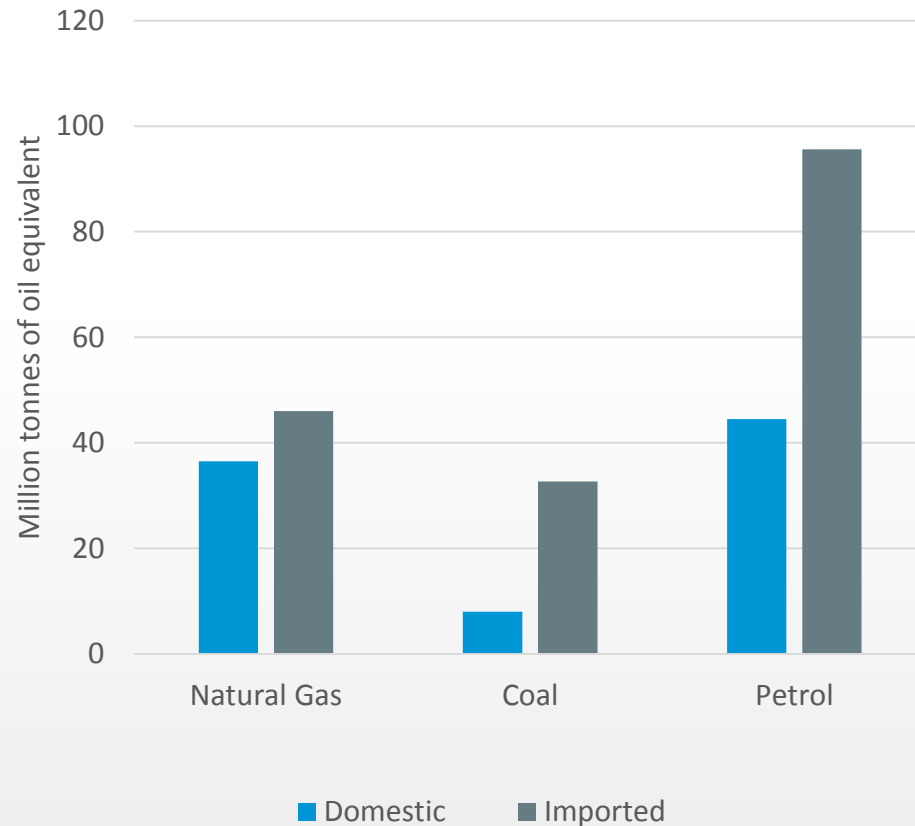
Context - as this audience knows better than any ... UK is heavily import dependent for many wood products – solid wood, pulp, paper, tissue



WRME = wood raw material equivalent

Source: UK wood, Forestry Commission. 2014

But the UK relies just as heavily on imported fossil fuels – including 25M tonnes of coal in 2015 - from some interesting geographies.

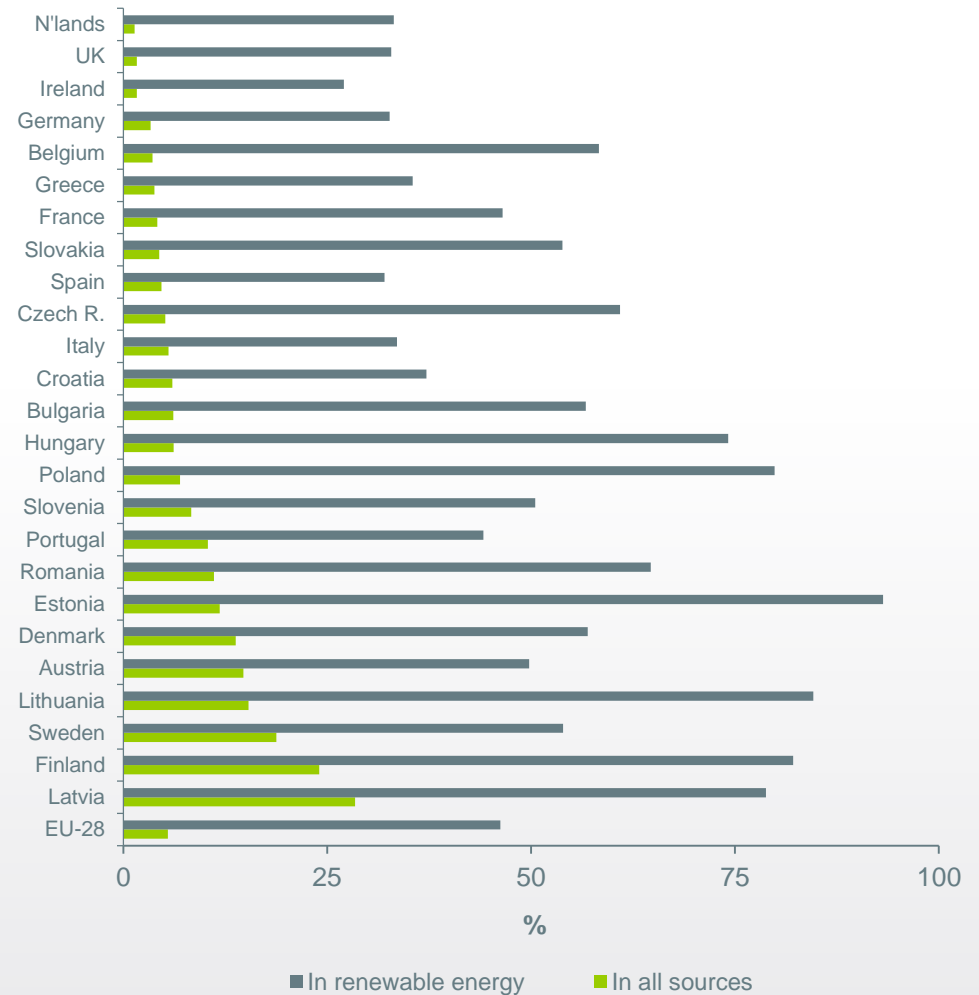


Source: Graph - Energy data, DECC. 2013

Source : Coallmp

And UK overall use of wood for energy ranks us very poorly

Wood as a Source of Energy



Source: Eurostat (2013)

Where and why use woody biomass ?

Renewable Heat Incentive – from 2014

- Widely acknowledged as innovative and addressing difficult to decarbonise sector
 - 12% target for renewable heat in 2020
 - 4 million homes (15%) off gas grid, using fossil fuels and older property
- Good adoption (alternatives heat pumps and solar thermal)
 - Non-domestic 86% of heat delivered by biomass
 - Domestic 25% of applications for biomass
- FC Woodfuel 2011-2014 implementation plan, “the RHI has the potential to stimulate demand for several million tonnes of biomass from a variety of sources including wood from existing, currently undermanaged, woodlands in England”.
- Yet current consultation appears destined to choke off further material adoption – except for biomass CHP under the CfD funding

Where and why use woody biomass ?

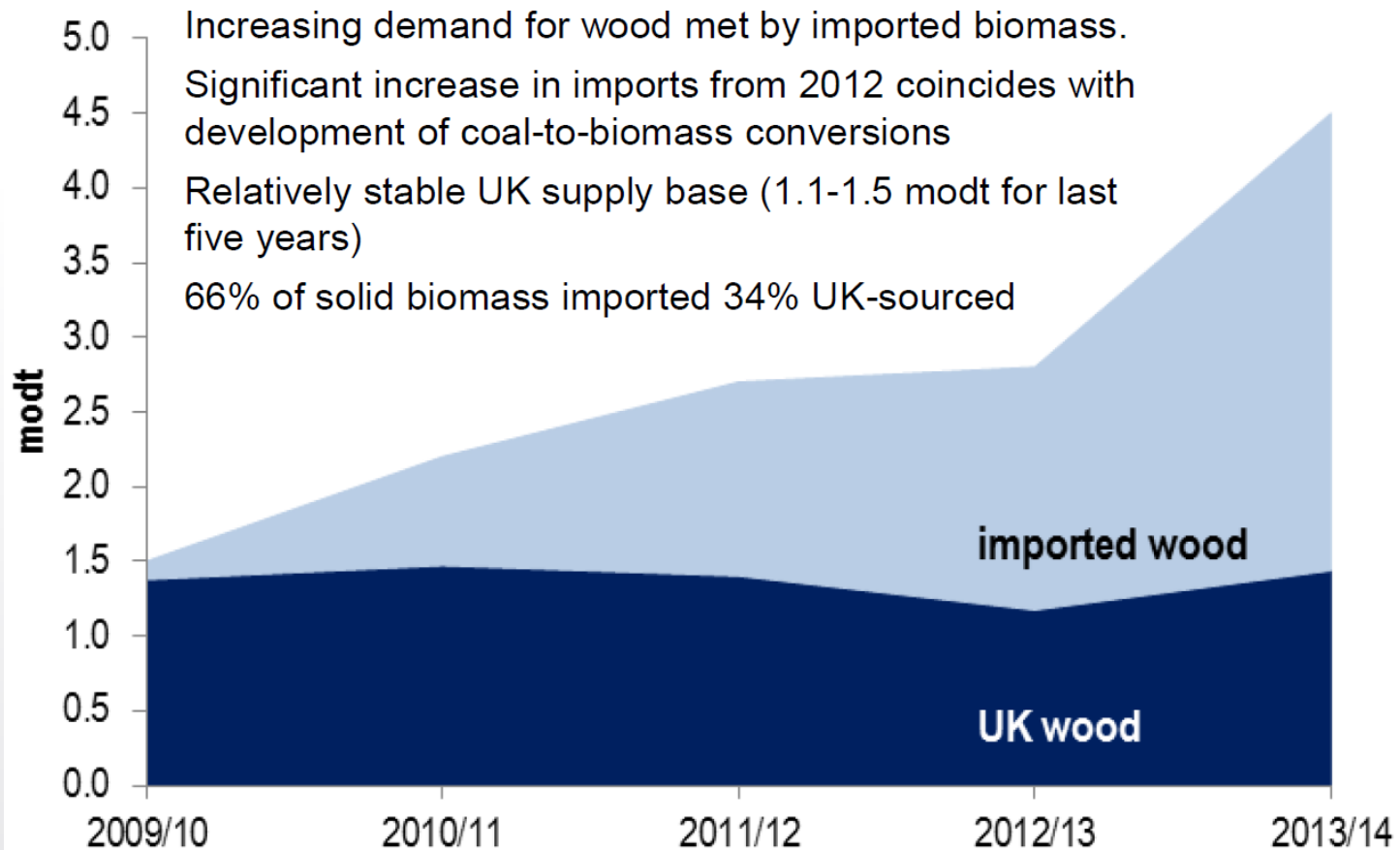
Early adopters and often associated with wood processing

– but static UK demand

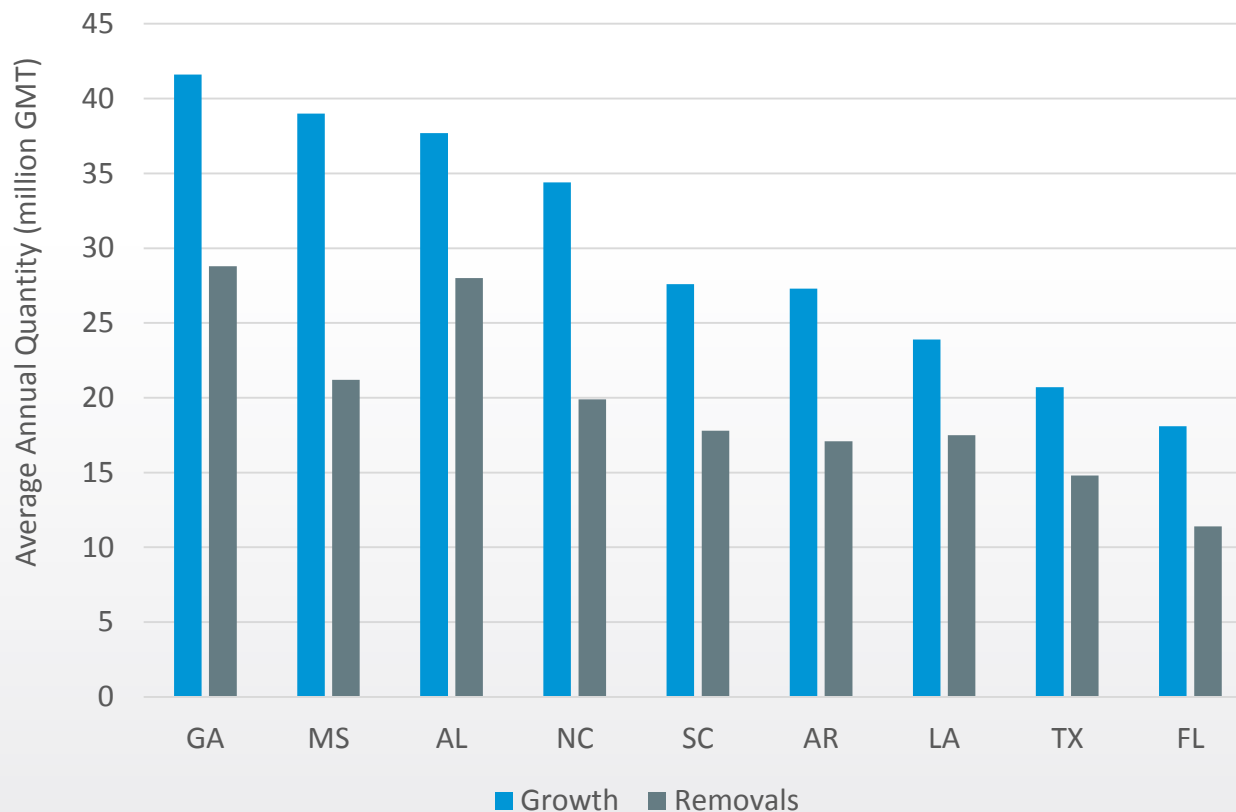


Department
of Energy &
Climate Change

Wood use in the RO



Supply considerations should not constrain thinking to UK alone - because there is lots elsewhere – and it can be mobilised responsibly. In the US South - every single state has as surplus of average annual growth over removals ; adding up to 92 M tpa



- USA generally has increasing use of gas
- Declining historic demand - forest owners seek new markets

Drax has mobilised the opportunity through substantial investments in an international supply chain

UK Ports

Investments enabled at
Immingham, Hull, Tyne and
Liverpool

UK Rail

200 bespoke rail wagons

British made, owned by Drax

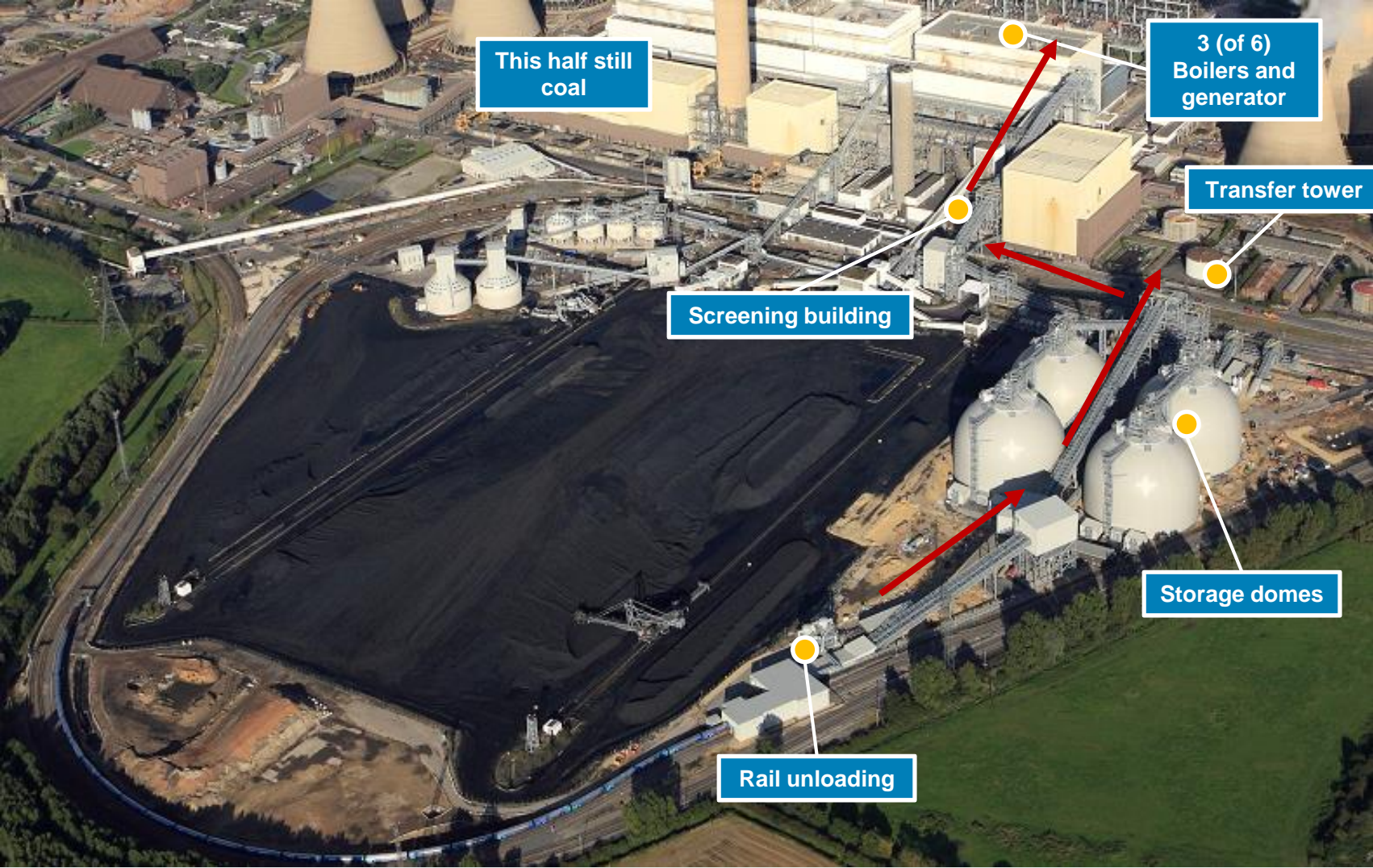
Pellet Mills

Two Drax owned in USA
Many long term offtake
contracts

US Ports

Drax owned facility
in Baton Rouge

And addressed the fact that the station was the second biggest single site GHG emitter in the EU with a technology transformation



The challenges to effective deployment can be characterised as ; Confidence, Complexity, Sustainable limits


- the political climate, policy preferences, consistency and cost evolution



Source: Hawkins Wright

The challenges to effective deployment can be characterised as ; Confidence, Complexity, Sustainable limits

There has been a lot of wheel re-invention



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Biomass suppliers list update

Introduction

- The current contract expires at the end of March 16

Performance

- The BSL has over 7,100 listed fuels to date, of which:
 - 4691 are commercial fuels, and
 - 2497 are self-suppliers
- At the end of year 1 the BSL approved 1,900 fuels
- In year 2, the BSL has already approved 5,200 fuels
- While the market shows no signs of slowing down we probably don't expect the rate of growth to stay the same
- Options for reducing Government costs are being considered and also how industry can collaborate with DECC to shape the future of the BSL

18 IAG - 27 November 2015 (future delivery of the BSL)

The challenges to effective deployment can be characterised as ; Confidence, Complexity, Sustainable limits

- The sustainable global forest resource is finite
- There is a benefit to fully deploy this renewable resource
- But the challenge to optimise between competing, evolving, demands
- There is no universally accepted and sufficiently widely adopted mechanism to prevent over-exploitation at an international scale – although the UK leads the way

But the prize is substantial - at Drax alone we are having a very significant impact on the UK's and EU's CO₂ emissions – using only imported woody biomass

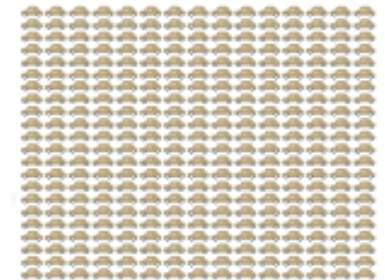
- An 86% reduction in greenhouse gas emissions relative to coal
- 12 million tonnes of CO₂ saved every year with three units converted
- Lower NO_x & SO_x emissions
- Reliable and flexible renewable generation which balances the intermittency of wind and solar

Equivalent too...



...turning Luxembourg zero-carbon.

...taking more than 8m cars off the UK's roads.



...decarbonising the UK's entire industrial and manufacturing sector.

What's next – Carbon Capture and Storage and then..... If fed with biomass....we can deliver the ambition of the Committee on Climate Change

Oxyfuel Combustion Process

