

Identifying the sustainability of biomass - assuring stakeholders of the sustainability of their supplies

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- Introduction to Drax Power Ltd
- Sustainability in Policy
- Sustainability – Stakeholder Concerns
- Biomass Feedstock
- Practical Sustainability and Assurance

Drax Power Limited: A Unique Asset in UK Generation Mix

Drax Power Station is owned by Drax Group plc, a FTSE 250 company

- Drax is the newest and most efficient coal-fires power station in the UK
- Located in Yorkshire, UK
- 6 units; 4000 MW capacity; 7-8% of total UK power production
- Supply business (Haven, Ipswich) focus on SME/I&C
- Consume 10 Mt solid fuel per annum
- 1.2 million tonnes biomass up to 2012
- Largest CO₂ emitter in UK



Transformation of the company

The single biggest challenge facing coal-fired generation is environmental

- Drax has a clear strategic goal of reducing its carbon footprint
- UK requirement to reduce CO₂ emissions by 80% from 1990 to 2050

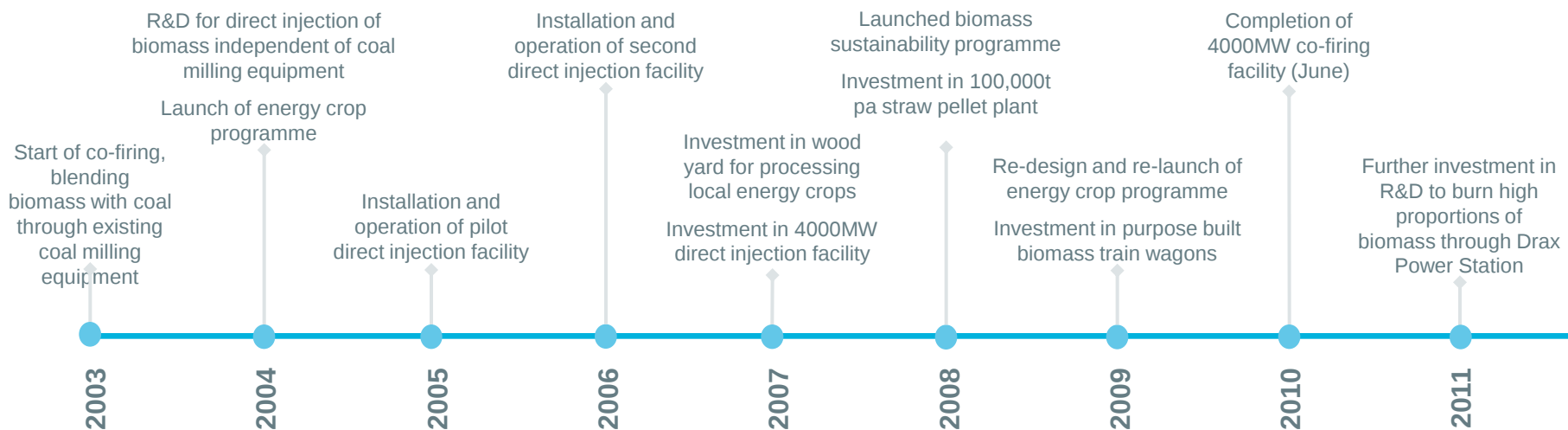
Drax role in this transition to reduce CO₂ emissions

- Aim to convert 3 units to 100% biomass by 2016
- Investment in biomass infrastructure and facilities is an economic means of transitioning to low carbon whilst retaining security of supply
- CCS (including biomass) is longer-term objective



Biomass Evolution

At Drax, electricity generation from biomass has evolved over the last ten years:



Current Status 2013

- Biggest changes yet – looking at complete conversion of 3 boiler units
- R&D on-going into potential for higher throughputs and to address technical specification of different biomass types
- Wide range of internationally procured fuels burnt
- **Up to 7 million tonnes biomass**
- On-going alignment with UK and EU policy developments and sourcing of sustainable biomass

UK Supply Chain Investment – Straw Pelleting

- ▶ 100k tonnes capacity to process locally grown straw



UK Supply Chain Investment – Port & Rail

- ▶ New biomass port terminal developed at Port of Tyne
 - ▶ Biomass rail loading facility
 - ▶ 70k tonnes storage
- ▶ Additional port access for smaller vessels through Hull and Goole



- ▶ Investment in rail wagon modifications – automatic covers
- ▶ Fully automated loading and discharge facilities at Port of Tyne and Drax

Biomass supply chain - logistics

**Dedicated
unloading**



**Dedicated
Rail
wagons**



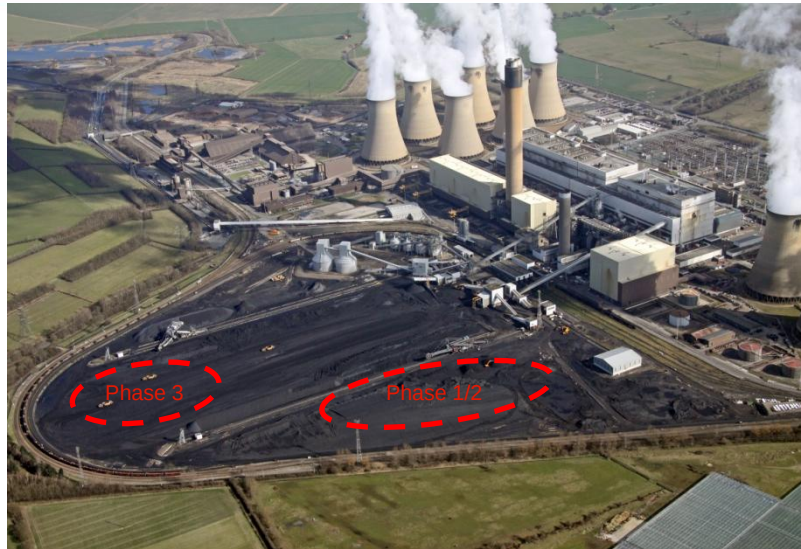
Biomass processing



Processing tower – biomass pellets are processed into 'dust' before injection into boilers for combustion



Storage – Eco-Store



Biomass Power – Current Position

- Biomass provides a valuable source of economic, flexible, reliable power with a significant reduction in overall carbon emissions compared to coal
- Bright future for use of significant volumes of biomass for bioenergy
- Needs to be demonstrated as sustainable for regulatory authorities (Ofgem in UK) and stakeholders
- Legislation emerging in various countries – potentially mandatory in EU ... by 20??
- Recent industry initiatives to set the framework for certification of sustainability
- Need to work with NGOs, Governments, European Commission to introduce workable standards acceptable and demonstrable to the spectrum of stakeholders



Sustainability is the pre-requisite for the further growth of biomass for bioenergy

Sustainability – Current position

- High future volumes of biomass throughput requires that long term sources of fuel must be
 - Available in adequate volumes
 - Sustainable against Government/Stakeholder definitions
- Availability
 - Embryonic industry with much potential currently unrealised
 - Considerable number of positive assessments in biomass availability from bioenergy
- Sustainability
 - Perceptions that biomass (production and use) is environmentally negative will only be effectively mitigated by the introduction of strict sustainability standards which are comprehensive, legally binding, independently verified and well implemented



- Sustainability in Policy

Sustainability in Policy - UK Regulation

- Renewables Obligation (RO), 2002 / Renewables Obligation Order (ROO), 2011
 - incentivises electricity generation from renewable sources
 - obligated parties must meet renewable targets
 - supports biomass and bioliquids to bioenergy production
 - reporting carbon (GHG) and prior land use supports issuance of Renewables Obligation Certificates (ROCs)
 - mandatory reporting of sustainability credentials by 2013
- Sustainability has various components – UK policy expectations changing rapidly
 - 2009 reporting against basic fuel requirements
 - 2011 additional reporting against GHG and land criteria
 - 2013 (October) reporting on GHG and land criteria mandatory for ROCs
 - Current consultation 2013 (October) reporting on GHG and adherence to UK Government's Timber Procurement Policy
 - Consultation on grandfathering GHG until 2020 (2025 standards?)

UK Regulation – changes to reporting requirements

- Sustainability criteria to be expanded from Oct 2013
 - Propose that biomass sourced from forestry will be required to meet the UK Government's public procurement policy for wood in order to demonstrate meeting land criteria
 - GHG for coal to biomass conversion remains at 285.12 kg CO₂eq/MWh to April 2020 moving to 240 kg CO₂eq/MWh from April 2020 to April 2025
- UK Government's Timber Procurement Policy
 - Requirements detailed on Central Point for Expertise for Timber Procurement (CPET) webpage
<http://www.cpet.org.uk/>
 - Requires that all timber or wood-derived products must be from
 - Independently verifiable legal and sustainable sources OR
 - FLEGT (Forest Law Enforcement, Governance and Trade) -licensed timber or equivalent sources

Evidence of compliance with Timber Procurement Policy

Evidence of legality and sustainability can come in 2 forms (<http://www.cpet.org.uk/>)

- **Category A evidence** - independent certification of timber and timber products by any forest certification scheme that meets the policy requirements (e.g. FSC , PEFC)



PEFC endorses national schemes such as the Sustainable Forestry Initiative, American Tree Farm and Canadian Standards Association scheme

- **Category B evidence** – alternative documentary evidence providing assurance that the source is legal and sustainable – various types of evidence can be put forward but compliance on a case-by-case basis – may require independent verification

The ‘forms of evidence’ can be combined BUT Category A and Category B feedstock types can’t be..

Sustainability in Policy – European Commission

- European Commission (EC) introduced sustainability legislation for bioliquids under the Renewable Energy Directive (RED) but to date has only provided guidance on biomass(2010)
- Currently based on similar sustainability principles and criteria as liquid transport fuels
- No harmonised scheme at present (due to the range of biomass sources anticipated)
- Developing proposals Q1/Q2 2013 for implementation in 2014
 - for internal market
 - based on RED criteria? Or modified to suit forestry feedstock base?
 - demonstrating sustainability through certification? Sustainable forest management plans?
 - addressing carbon stock of forest (through this policy mechanism or land industry emissions through EU ETS?) – the link between carbon stored in forests and carbon stored or released as the result of harvested products is subject of 18 month study commissioned by EC
 - EC approach still uncertain

However, other regulations also apply to wood pellets brought onto EU market e.g. EU Timber Regulation (EUTR)

- aims to prohibit trade in illegal timber (Regulation (EU) No 995/2010)
- comes into force 3rd March 2013

- Sustainability – Stakeholder Concerns

Sustainability – Stakeholder Concerns

- Non Governmental Organisations (NGOs) and environmental groups instrumental in publicising negative impacts of the biofuel industry
- NGOs main concern for biomass is its potential scale and lack of adequate controls which might result in deforestation, increased illegal logging, loss of biodiversity (due to loss of natural forests and increased mono-culture plantation) and loss of wider reaching ecosystem services
- Socio-economic concerns particularly in developing countries (food vs. fuel; land-grabbing; displacement of people)
- NGOs mounting major campaigns
 - Against carbon 'neutrality' of biomass
 - The use of 'Whole trees' and 'Roundwood' for biomass
 - Focusing on bioenergy (same pressures have been applied to paper/pulp/timber industries in the past – forest certification schemes have resulted)
 - Using academic modelling and assumptions to promote the concept of 'carbon debt'

Sustainability – Stakeholder Pressures

UK-based power companies are using the myth that biomass is 'carbon neutral' to continue their emissions and greenwash their polluting activities permitted under the EU Emissions Trading System and other EU legislation. This deceptive accounting undermines analysis that places emissions from biomass on a par with fossil fuels. This British biomass boom is set to benefit polluters and cause widespread environmental destruction through land grabs and deforestation.

Nothing Neutral Here: Large-scale biomass subsidies in the UK and the role of the EU ETS



CARBON TRADE WATCH

May 2011

Dirtier than coal?

Why Government plans to subsidise burning trees are bad news for the planet



GREENPEACE

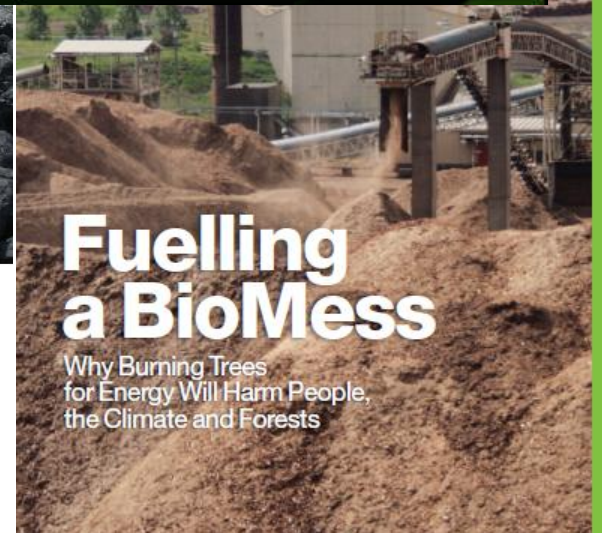
Bioenergy

a carbon accounting time bomb



Fuelling a BioMess

Why Burning Trees for Energy Will Harm People, the Climate and Forests



GREENPEACE

www.greenpeace.ca

Potential outcome: Limitations
imposed for biomass for bioenergy?

- Biomass Feedstock – Knowing the supply chain

What's your Feedstock?

- Biomass is defined as *'the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste'*.

EU Renewable Energy Directive(RED) (Directive 2009/28/EC)

- Biomass can be considered as low value fractions from
 - Agricultural industry e.g. straw, husks and other residues
 - Forestry industry using residues from existing operations e.g. forest residues (thinnings, tops and limbs) or process residues (sawdust, shavings, bark)
- Biomass can be sourced from almost any geographical location
- Biomass can be in the form of chips, briquettes, pellets



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Where does it come from?

- Forest or Agricultural Residue? Field or Process Residue?
- Geographical location
- Land Use Classification
- Forestry type: management system e.g. 'plantation'; 'managed natural'; Biome e.g. 'boreal'; 'temperate'; 'tropical'/sub-tropical

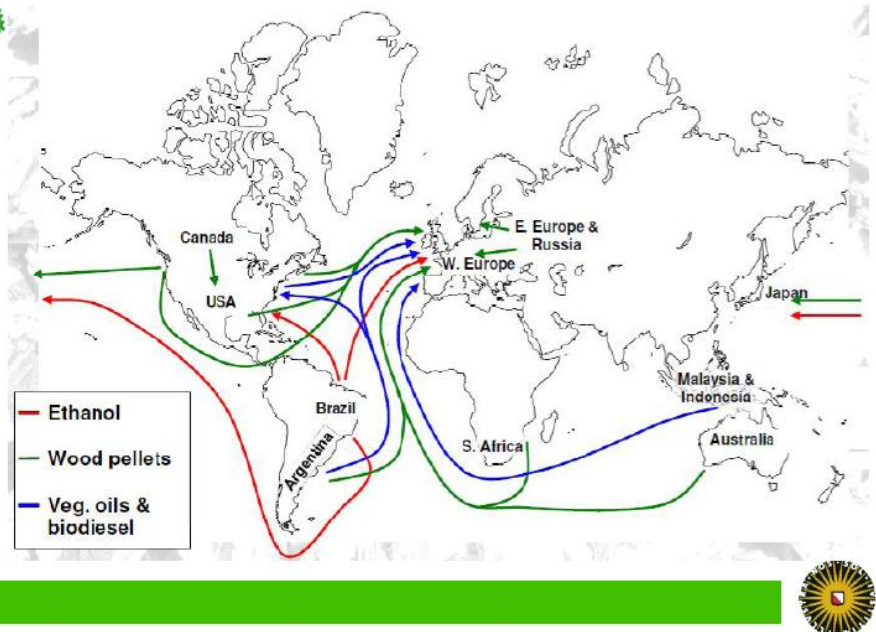
Currently under RED

'sustainability related to biomass production concerns *inter alia* the protection of highly biodiverse ecosystems and of carbon stocks, such as those in forests'.

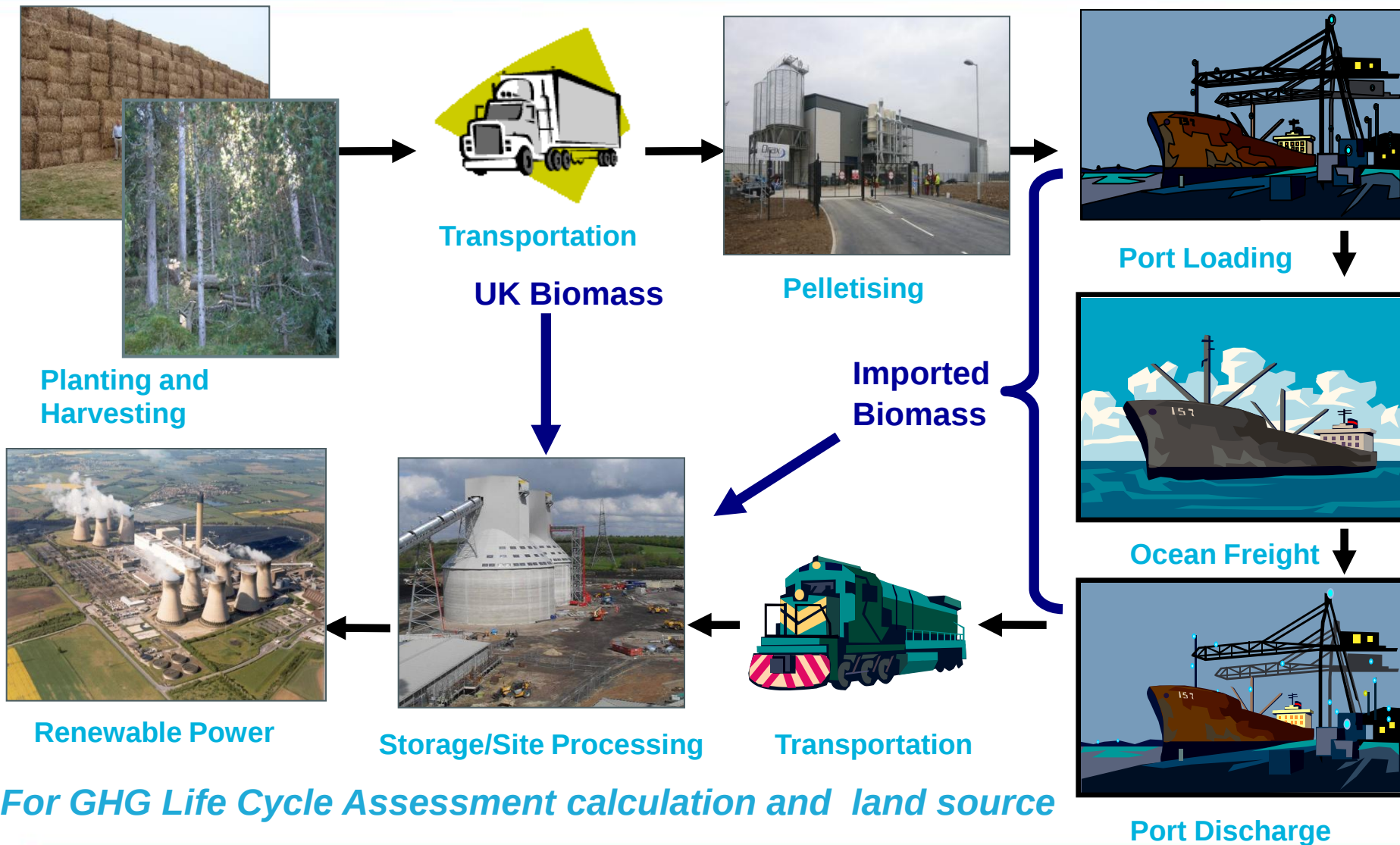
For UK Regs – trace back to source to demonstrate no change in land use

EUBIONET3

Global wood pellet trade

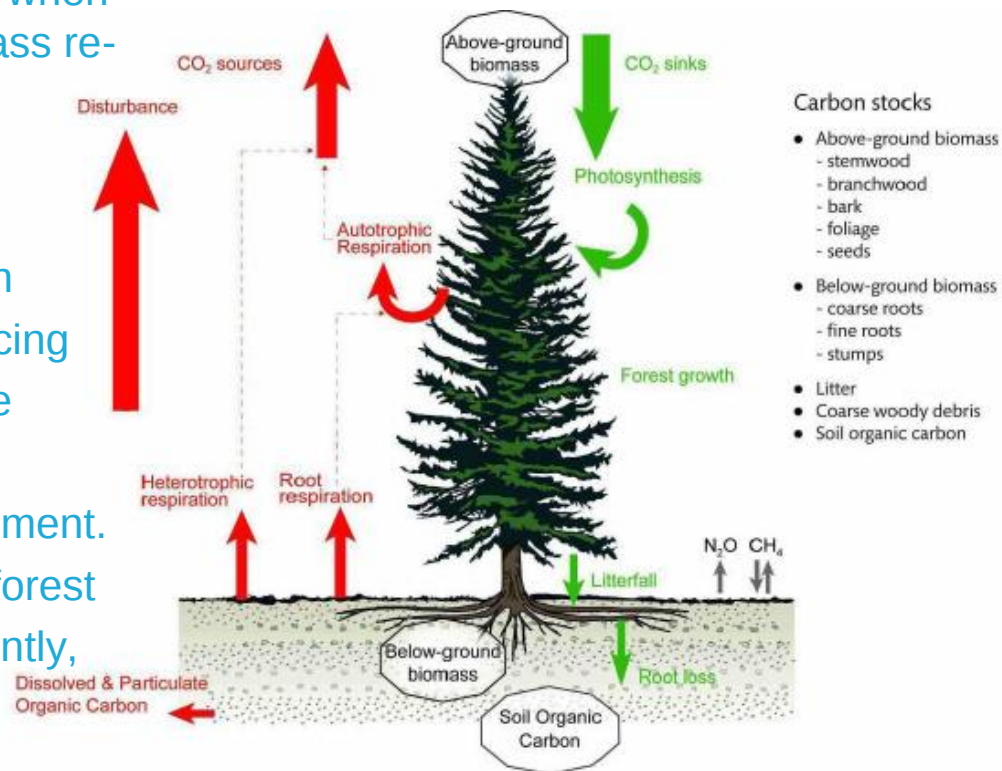


Know the Supply Chain



Understanding the issues – carbon accounting

- The current GHG LCA accounting methodology under the RED assumes that CO₂ emitted when biomass is burned is replaced when biomass re-grows i.e. it is carbon neutral
- It is debated that this is not the case if the *time* for the CO₂ to be re-absorbed is taken into account, given the timeframe for reducing GHG emissions to address climate change
- This is a major debate in the EC at the moment. One way to address this is to ensure that forest carbon stocks are being replaced consistently, through replanting or natural re-generation of the forest following the principles of Sustainable Forest Management



**Diagrams from DECC report in support of Bioenergy Strategy, April 2012*



NORTH ENERGY

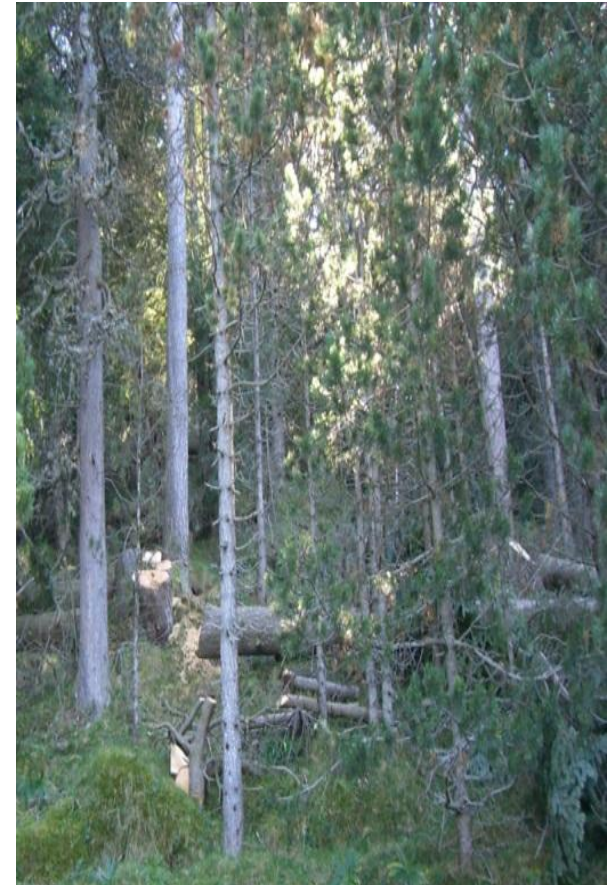


Forest Research

Sustainable Forest Management

SUSTAINABLE FOREST MANAGEMENT (SFM) aims to ensure that the goods and services derived from the forest meet present-day needs, while at the same time securing their continued availability and contribution to long-term development. In its broadest sense, forest management encompasses the administrative, legal, technical, economic, social and environmental aspects of the conservation and use of forests. It implies various degrees of deliberate human intervention, ranging from actions aimed at safeguarding and maintaining the forest ecosystem and its functions, to favouring specific socially or economically valuable species or groups of species for the improved production of goods and services

(FAO, 2011 <http://www.fao.org/forestry/sfm/en/>)



**Over 50 forestry certification schemes to address SFM!*

- Practical Sustainability and Assurance

Drax's Sustainability Principles

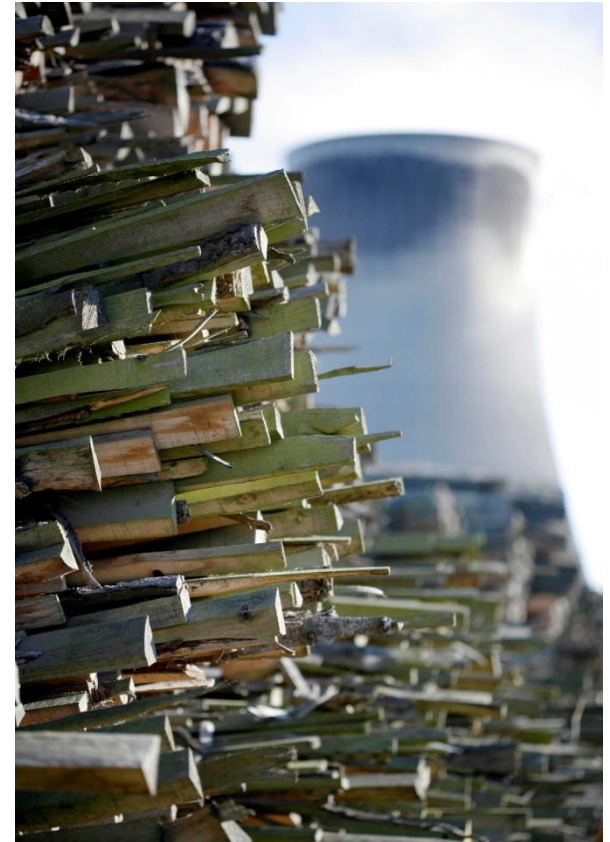
Our procurement process is designed to ensure that the production and delivery of our biomass will:

- Significantly reduce greenhouse gas emissions compared with coal-fired generation and give preference to biomass sources that maximise this benefit.
- Not result in a net release of carbon from the vegetation and soil of either forests or agricultural lands.
- Not endanger food supply or communities where the use of biomass is essential for subsistence (for example, heat, medicines, building materials).
- Not adversely affect protected or vulnerable biodiversity and where possible we will give preference to biomass production that strengthens biodiversity.
- Deploy good practices to protect and/or improve soil, water (both ground and surface) and air quality.
- Contribute to local prosperity in the area of supply chain management and biomass production.
- Contribute to the social well being of employees and the local population in the area of the biomass production.

Sustainable Supply Chain

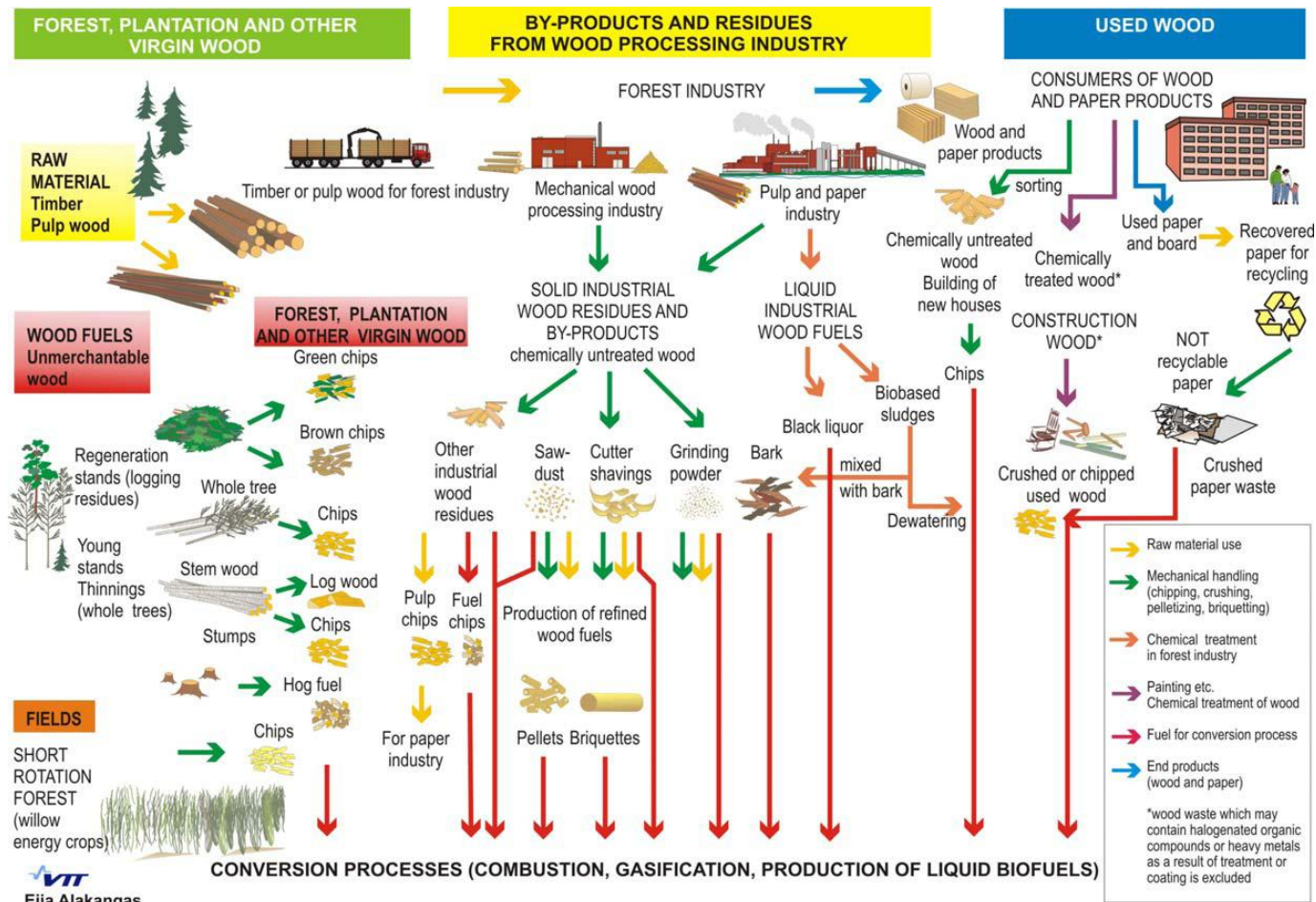
Over-riding need for robust, demonstrable standards for sustainability to address stakeholder concerns

- The Drax procurement programme incorporates
 - Rejection of all non-sustainable biomass
 - All supply chain stages are investigated - cultivation and harvesting, transforming, processing and transportation.
 - Minimum standards on life cycle GHG savings
 - Compliance with policy written in to contracts
 - Extensive data gathering and assessment through a programme of information exchange and an improvement programme backed by independent 3rd party audit
 - 'headroom' between policy and compliance



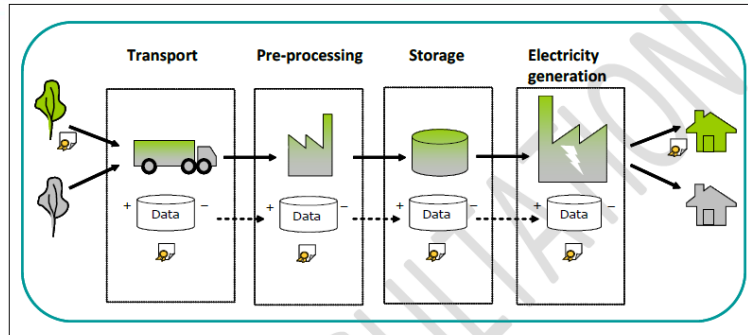
Supply Chain complexity – feedstock definitions

Forestry or Agricultural Residue OR Process Residue

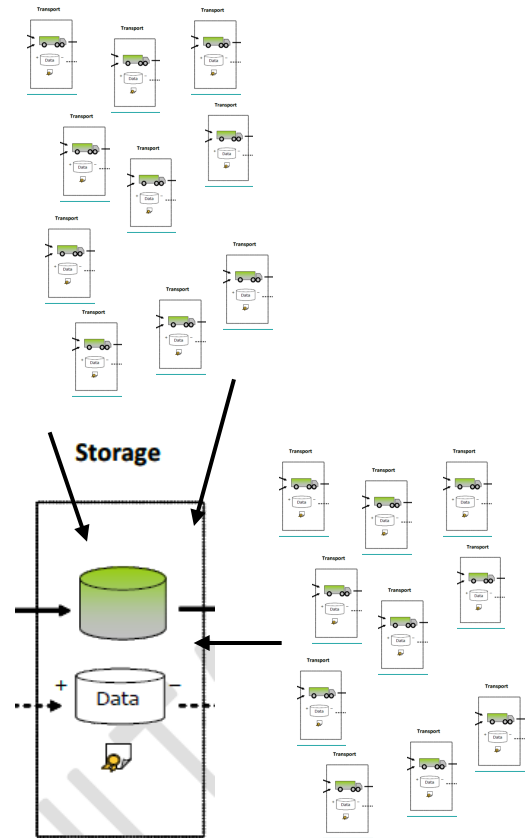
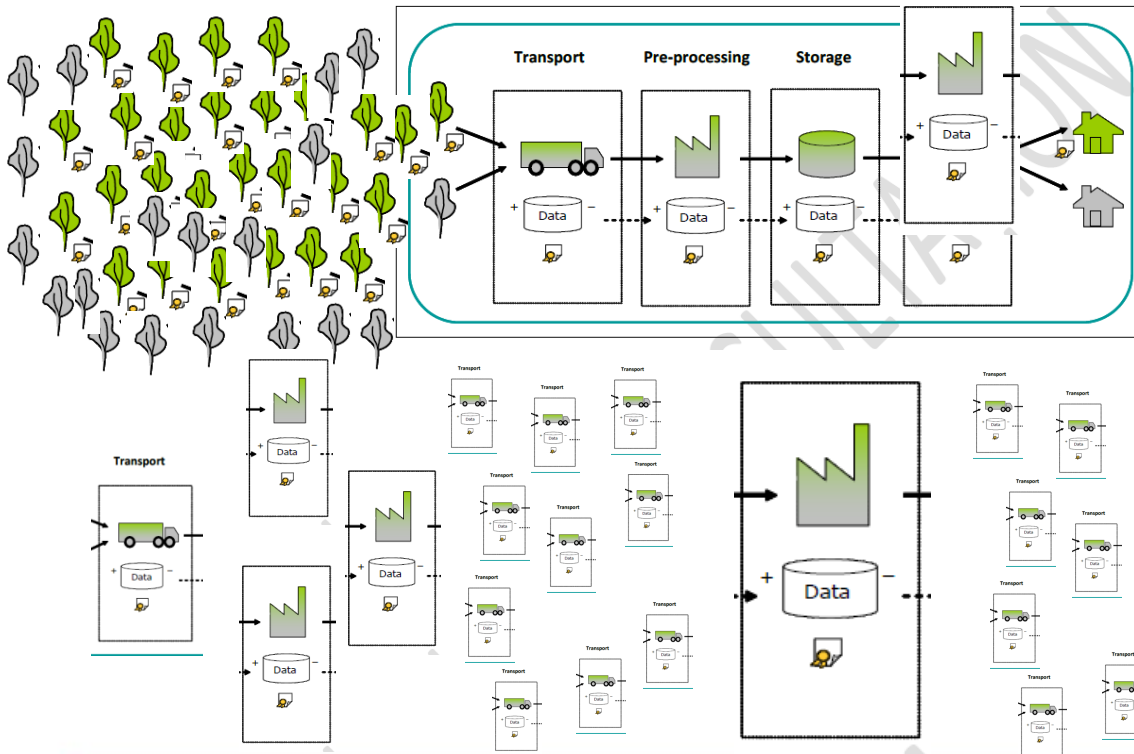


EN 14691-1 Classification and Specification of solid biomass

Supply Chain Complexity



Future for wood pellets as tradable commodity



Practical Sustainability

- Continually improving our understanding of fibre supply chains for biomass for bioenergy BUT policy recommendations changing rapidly making firm processes to ensure sustainability difficult to implement
- Certification is a good thing – anything with FSC/PEFC acceptable under new consultation guidance BUT large amounts of feedstock base not certified (cost of certification, cost and administrative burden to many small fibre suppliers)
- ALSO on-going NGO criticisms of standards, criteria and certification schemes and verification of sustainability
- Under UK Timber Procurement Policy - non-certified material subject to significantly enhanced requirements and independent verification
- Drax Sustainability Policy covers most if not all of the UK TPP requirement but shift in emphasis of supporting information required (more emphasis on carbon stock of fibre base)
- ...*DEFINITIONS.... Forest and Feedstock...*

Practical Sustainability

To ensure sustainability and address environment concerns, there is a need to

- Increase formality of tracking biomass for bioenergy
- Increase auditing and verification , to ensure support of documentary evidence
- Understand legislative direction changes, details, constraints, additional requirements
- Stabilise and standardise requirements
 - Biograce II for harmonisation of LCA GHG
<http://www.biograce.net/>
 - unified approach in developing standards (e.g. Initiative of Wood Pellet Buyers (IWPB)) to facilitate common sustainability guidelines for use in contracts
<http://www.laborelec.be/ENG/initiative-wood-pellet-buyers-iwpb/>

Thank you

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