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Climate Change

# ***UK Bioenergy Policy and Regulation: a future for biomass?***

Dr Elizabeth McDonnell 23 September 2014



# Overview

1. 2012 Bioenergy Strategy
2. The BEAC calculator
3. European Commission Staff Working Document
4. The UK Regulatory Framework
5. Next steps



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# 2012 UK Bioenergy Strategy



# Policy aspiration

## UK Bioenergy Strategy (2012)\*

Set an agreed framework  
for Government to help  
deliver the benefits from  
bioenergy and minimising  
risks

\*[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48337/5142-bioenergy-strategy-.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48337/5142-bioenergy-strategy-.pdf)





# The four principles

1. Deliver genuine carbon reductions that help meet UK carbon emissions objectives to 2050 and beyond.

2. Make a cost effective contribution to UK carbon emission objectives in the context of overall energy goals.

3. Maximise the overall benefits and minimise costs (quantifiable and non-quantifiable) across the economy.

4. Assess and respond to the impacts of this increased deployment on other areas, such as food security and biodiversity



# Possible low-risk pathways

- Generation of heat and electricity from residual wastes
- Biomass for low carbon heat for buildings and industry (process heating) and CHP processes
- Biomass as a transitional fuel to reduce carbon emissions from current coal power generation
- Biofuels for road transport if sustainability issues can be addressed

## Key hedging options - technological game changers:

- Biosynthetic gas
- Advanced Biofuels
- Hydrogen
- CCS



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# The Bioenergy Emissions and Counterfactual Calculator\*

\*<https://www.gov.uk/government/publications/life-cycle-impacts-of-biomass-electricity-in-2020>



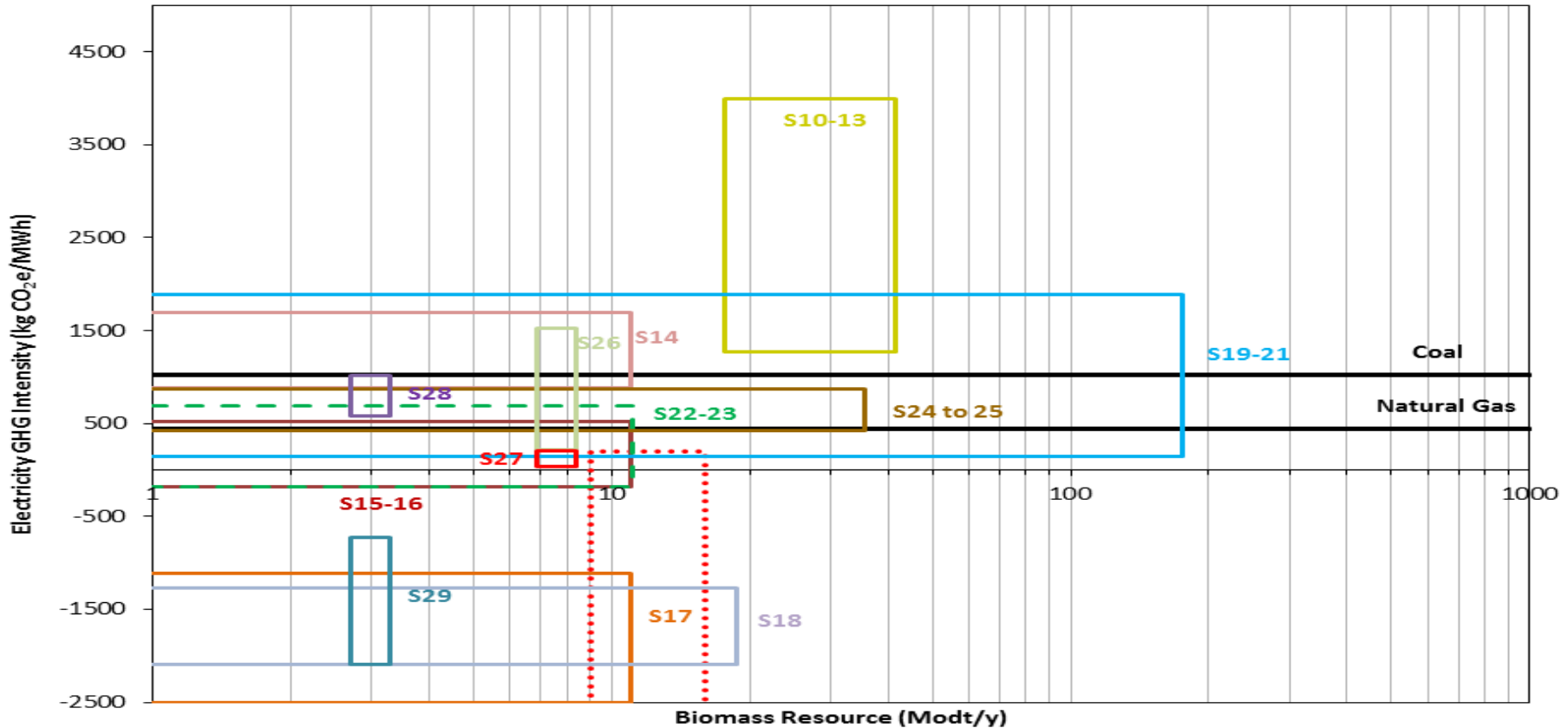
# DECC's BEAC Model

- Renewable Energy Directive Life Cycle Analysis calculation accounts for:
  - cultivation;
  - harvest;
  - processing;
  - transport;
  - changes in carbon stock if the land category changes (e.g. forest to arable land).
- Does not account for:
  - changes in average forest carbon stock (e.g. if management changes);
  - forgone carbon sequestration;
  - Indirect impacts (e.g. displacement of traditional uses of biomass).
- Recent reports show these impacts can be significant.
- The aim of BEAC is to address these gaps





# GHG Overview: Roundwood and Energy Crops (40 years)



- ..... UK 2020 biomass electricity requirement
- S10-13: Increased harvest of natural timberland
- S14: Existing intensively-managed pine plantation (cfl harvest less frequently)
- S15-16: Existing intensively-managed pine plantation (cfl convert to naturally regenerated forest)
- S17: Existing intensively-managed pine plantation (cfl convert to agricultural land without indirect impacts)
- S18: Increased management intensity from existing pine plantation causing increased yield
- S19-21: Displacement of non-bioenergy wood uses
- S22-23: Conversion of South US natural timberland to intensively-managed pine plantations
- S24-25: Conversion of South US natural timberland to energy crop plantations
- S26: Conversion of abandoned land to energy crop plantations (cfl revert to forest)
- S27: Conversion of abandoned land to energy crop plantations (cfl revert to grassland)
- S28: Conversion of abandoned land to intensively-managed pine plantations (cfl revert to forest)
- S29: Conversion of abandoned land to intensively-managed pine plantations (cfl revert to grassland)



# Conclusions of BEAC

- It gives new information about which biomass resources are likely to have higher or lower carbon intensities, and so provides insight into a complex topic.
- Overall, the BEAC shows that where bioenergy is sourced responsibly it produces lower carbon emissions than fossil fuels.
- It's an important step in refining our understanding of how we might incorporate carbon stocks into sustainability criteria.
- To minimise the energy inputs as much as possible:
  - Transport distances should be minimised.
  - The moisture content of the biomass should be reduced as much as possible before drying using a fuel source.
  - The pellets should be dried using local biomass residues, rather than fossil fuels.



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# European Commission Staff Working Document on biomass sustainability\*

\*<http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2012334%202014%20INIT>



# Key points of SWD

- The vast majority of the biomass used today in the EU for heat and power are considered to provide significant GHG savings compared to fossil fuels.
- There are substantial benefits from the use of biomass for CHP rather than power alone
- Biomass power facilities, including co-firing, can have a transitional role in the decarbonisation of the power sector
- The outcomes of GHG assessment of forest-sourced bioenergy are very sensitive to the counterfactual scenario for land use - it is possible to identify 'low risk' and 'high risk' pathways. However, the same feedstock can be involved in both.
- As a consequence, it is not possible to limit or remove risk of adverse GHG emissions by favouring or discouraging particular feedstocks - a major obstacle to regulation
- Good practice for existing bioenergy installations to achieve GHG savings of at least 70% compared to the fossil fuels comparators. (Equivalent to 201 kg CO<sub>2</sub>e/MWh biomass electricity)
- Energy conversion may be the only economically valuable or available option for the use of some biomass resource



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# The UK Regulatory Framework



# The support framework

## Contract for Difference

- Open for business 14 October 2014
- Allocation for 2014 expected to be published very soon – will set out budgets for the three pots

## Renewables Obligation (RO)

- Open for new accreditation until 31 March 2017

## Feed In Tariffs

- Scheme for small scale generation sizes (<5MW Anaerobic Digestion)



# Strike prices\*

| Renewable Technology  | Strike prices (£/MWh, 2012 prices) |         |         |         |         | Illustrative<br>Deployment<br>in 2020 (GW) |
|---|------------------------------------|---------|---------|---------|---------|--|
|   | 2014/15                            | 2015/16 | 2016/17 | 2017/18 | 2018/19 |  |
| <b>Advanced Conversion Technologies (with or without CHP)</b> | 155                                | 155     | 150     | 140     | 140     | c. 0.3                                     |
| <b>Anaerobic Digestion (with or without CHP)</b>              | 150                                | 150     | 150     | 140     | 140     | c. 0.2                                     |
| <b>Biomass Conversion</b>                                     | 105                                | 105     | 105     | 105     | 105     | 1.7 – 3.4                                  |
| <b>Dedicated Biomass with CHP</b>                             | 125                                | 125     | 125     | 125     | 125     | c. 0.3                                     |
| <b>Energy from Waste with CHP</b>                             | 80                                 | 80      | 80      | 80      | 80      | c. 0.5                                     |
| <b>Landfill Gas</b>   | 55                                 | 55      | 55      | 55      | 55      | c. 0.9                                     |
| <b>Sewage Gas</b>   | 75                                 | 75      | 75      | 75      | 75      | c. 0.2                                     |

**LCF trajectory  
(2011/12 prices)**

| 2015/16 | 2016/17 | 2017/18 | 2018/19 | 2019/20 | 2020/21 |
|---------|---------|---------|---------|---------|---------|
| £4.30bn | £4.90bn | £5.60bn | £6.45bn | £7.00bn | £7.60bn |

\* Investing in renewable technologies – CfD contract terms and strike prices Publ: 4 December 2014 - <https://www.gov.uk>



# Allocation Process

- Contracts will be allocated on the **basis of allocation rounds**. There will be competition within each pot
- **Pot 1: ‘established’ technologies:** Onshore Wind (>5 MW), Solar Photovoltaic (PV) (>5 MW), Energy from Waste with CHP, Hydro (>5 MW and <50 MW), Landfill Gas and Sewage Gas. **Immediate move to competition** - auction process from the beginning of CfD allocation
- **Pot 2: ‘less established’ technologies:** Offshore Wind, Wave, Tidal Stream, Advanced Conversion Technologies, Anaerobic Digestion, Dedicated biomass with Combined Heat and Power and Geothermal - ensure that that they can deploy at levels which enable continued cost reduction to ultimately support cheaper deployment.
- **Pot 3: biomass conversion**
- **Aim:** encourage competition within “peer groups”, deliver low carbon electricity at the best price for the consumer, balance the budget





# CfD terms and process\*

The Standard Terms and Conditions issued by the Secretary of State on Friday 29 August 2014 will be used in the first CFD Allocation Round

These include the sustainability criteria for biomass projects, which will also be included in Investment Contracts.

- The terms include flexibility to amend the sustainability criteria in the future, should our further policy work and analysis show that this is needed.
- The contracts also require generators to commit that their generation is and will be low carbon.
- The contracts also ensure that the Generator is only paid on the sustainable proportion of the renewable fuel they use.

The deadline for submitting a request to the LCCC for any Minor and Necessary Changes are required to the CFD Standard Terms and Conditions is **29 September**.

<https://www.gov.uk/government/publications/contracts-for-difference-standard-terms-and-conditions>



# Biomass specific RO transitional arrangements

## Grace periods

- 18 months for dedicated biomass – must have a place in the 400MW cap
- 18 months for biomass CHP subject to notification
- 12 month ‘enabling financial decisions’ grace period for those technologies which have an overall higher risk of delay: ACT

## Grandfathering

- Extended to include the low-range co-firing band as of 31 March 2017 at the support rate applicable on that date.
- Grandfathering policy for all other technologies remains unchanged.

## Conversion

- RO accredited biomass co-firing stations have the option of applying for a CfD or an Investment Contract as biomass conversions on a unit basis
- Biomass co-firing stations and units can bid into the CM but must leave the RO if successful



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# Next Steps



# Next Steps - State Aid Approval

- Awaiting State aid approval for the three other projects that were awarded Investment Contracts in April; two biomass conversions and a dedicated biomass plant with combined heat and power.
- Still in a constructive dialogue with the European Commission - (being in dialogue is normal!)
- Investment Contracts are conditional on State aid approval and contain provisions should State aid approval be delayed or given subject to conditions



# Next Steps

**Allocation process:** Will announce budgetary allocation very soon

**Allocation process opens: 14 October**

**Close date: 27 October 2014**

**Renewables Obligation Regulation:** Notify the EU under the Technical Standards Directive

**Timber Standard Guidance** – out to consultation. Aiming for finalised version in October

**Publish results of Supply Chain Plan Assessments** by 14 October

**First capacity auction** in 2014, for delivery of capacity in winter 2018-2019 (subject to state aid approval).



# So, a future for biomass?

2012 Bioenergy Strategy holding well – wide agreement on the future use of biomass – heat, CHP advanced biofuels

Importance of hedging technologies

Recent report by the European Commission supportive of UK action – we are doing the right thing

Clear that our emphasis on sustainability is the correct way to go – UK on the front foot