PAPER TECHNOLOGY INTERNATIONAL

THE JOURNAL OF THE BIOFOREST PRODUCTS SECTOR

PITA PAPER*matters!* 2018 Conference & Exhibition at Lancaster University

2018 - 2050: The Route to a Carbon Neutral Industry?

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PAPER*matters* 2018!

The Presentations

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25 September 2018
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2018 - 2050

The Route to a Carbon Neutral Industry?

"Carbon Neutral" – what do we mean?

- Many definitions of carbon neutrality
- Could consider all three scopes for GHG reporting
  - Scope 1 – emissions from owned or controlled sources
  - Scope 2 – emissions from purchased energy
  - Scope 3 - emissions from sources not owned or controlled but directly related to subject
- Coverage: energy-intensive "Pulp & Paper"
  - 46 UK pulp & paper mills – but no converters, depots etc.
- Scopes considered:
  - Scope 1 direct fuels purchased
  - Scope 2 electricity purchased
- Consider "carbon neutrality" as meaning zero net carbon emissions from considered sources.

Emissions baseline & current performance

- UK mandatory GHG emission reduction targets of 80% by 2050 are based on a 1990 start point.
- Pulp & Paper 1990 statistics:
  - Paper produced = 5.0 Mt
  - Scope 1 emissions = 4.1 $MtCO_2$
  - Scope 2 emissions = 2.5 $MtCO_2$
  - Total = 6.6 $MtCO_2$
- Pulp & Paper 2017 statistics:
  - Paper produced = 4.0 Mt
  - Scope 1 emissions = 1.7 $MtCO_2$
  - Scope 2 emissions = 0.7 $MtCO_2$
  - Scope 2 credit (exported electricity) = (0.2) $MtCO_2$
  - Total = 2.2 $MtCO_2$
- This is a 67% reduction vs. 1990

Emissions comparison

- Papermaking 2017 emissions:
  - 2.2 $MtCO_2$ (fossil)
  - 1.1 $MtCO_2$ (biomass)
- Other industrial sectors' annual fossil emissions for comparison are:
  - Iron & Steel = 20 $MtCO_2$
  - Chemicals = 20 $MtCO_2$
  - Food & Drink = 10 $MtCO_2$
- Pulp & Paper is not one of the major industrial emitters
- But UK total fossil emissions in 2017 were 367 $MtCO_2$
  - So we're about 0.6% - a significant contributor

How close are we to an 80% reduction?

- UK Pulp & Paper 1990-2017:
  - Emissions reduction from 6.6 to 2.2 $MtCO_2$ (67%)
  - Carbon efficiency improvement from 1.3 to 0.54 tCO_2/t (59%)
- How?
  - Fuel switching
  - Energy efficiency improvements (new machines, equipment)
  - CHP
  - Reduction in grid carbon content very recently
    - grid carbon factor in 2011 was 0.49 kgCO2/kWh
    - grid carbon factor in 2017 was 0.38 kgCO2/kWh
- Conclusion – we're not doing too badly!

Can we go further?

- We seem to be on track – but can we go further?
  - General energy efficiency improvements can deliver further progress - however, can it deliver 80% by 2050?
  - And what about coping with production increases?
  - Fuel switching is the obvious methodology to deliver more
- Fuel switching
  - Biomass
  - Electrification
  - Renewable hydrogen in gas grid or on private networks
- A combination of these fuel switches plus efficiency improvements could get us (much?) further than 80%
  - Depending on how production changes over time

Current Actions – (1) 2050 Roadmap

- 2050 Roadmap agreed between BEIS and CPI/PITA
  - Sector WG leads for CPI/PITA
  - Feeds in to BEIS Roadmap round table meetings with other 7 sectors
- Key Areas for Progression
  - Access to finance
  - Heat recovery projects
  - Energy efficiency training
  - Use of sustainable biomass
  - Innovation & demonstration projects
  - Develop UK R&D
  - Involvement in Bio-Economy development
  - Value chain collaboration
  - Leadership & strategy
  - Embedded generation, DSR & storage
  - CHP

Current Actions – (2) Sector Deal

- Government's industrial strategy encourages formal "sector deals" between industrial sectors and government
  - Each side commits to certain actions in partnership
- CPI has put forward a proposal which has been well-received by BEIS ministers
  - MoU is almost complete
- Detailed evaluation of opportunities is under way with 5 key strands
  - Energy & decarbonisation
    - 2050 Roadmap WG is main actor for CPI/PITA
  - Innovation
  - Recycling
  - Skills
  - Investment
- Aim is to have a draft Sector Deal by mid-2019

Questions?

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