



# The BioComposites Centre Bangor University

Dr Graham Ormondroyd

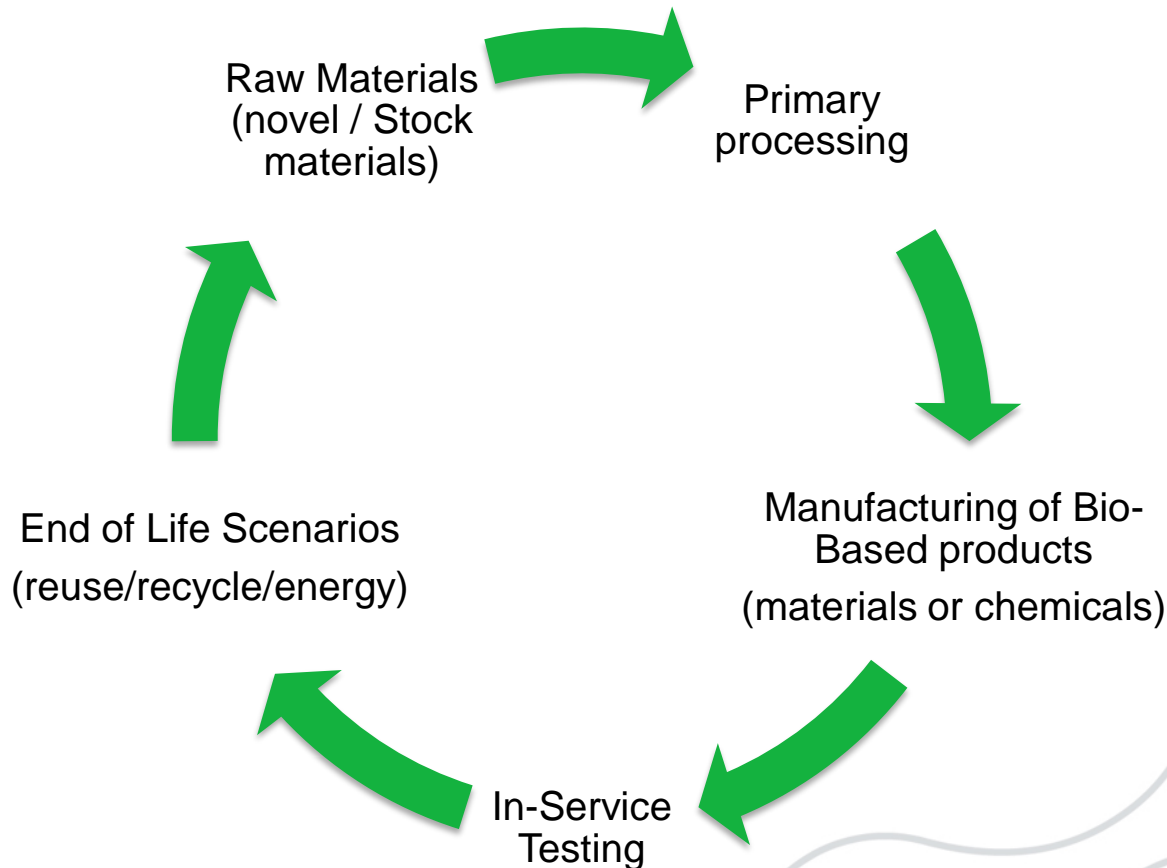


## BC origins

- Established 1989
- Original focus on wood based panels, pulp and paper, and novel products from agricultural residues
- Pilot plant for particleboard and MDF production
- Long natural fibres in non-woven mats for composites and insulation
- Resins from plant oils and extracts
- Bio-derived products in a wide range of applications
- Technology Transfer Centre at Mona on Anglesey opened in 2006



## Industry focused Innovation in Bio-based resources and products





INNOVATION IN BIO-MATERIALS FOR INDUSTRY



**BC Chemistry**



**BC Polymers**



**BC Materials**



**BC Tech Transfer**





INNOVATION IN BIO-MATERIALS FOR INDUSTRY



## Capacity to deliver – A brief overview



## Raw material identification and analysis

- Chemical characterisation
- Thermal, mechanical and physical characterisation
- Visual identification and analysis





## Wood – water interactions

- Dynamic Vapour Sorption
  - SMS DVS 1
  - SMS DVS Advantage
- DMTA with Humidity control



## Panels and panel products

- Panel manufacture
  - MDF, Particleboard, OSB
- Panel assessment
  - MDF, Particleboard, OSB, Plywood





## Timber Protection

- Thermal modification
  - Laboratory scale
  - Access to local pilot scale facilities
- Chemical modification, Resin modification
  - Pressure impregnation vessels
  - High temperature reaction vessels
- Hot oil modification
  - Thermal reactors

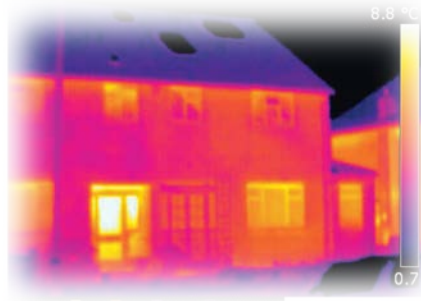


- Pressure impregnation
  - 16 bar vessel
  - 20 bar vessels
- Critical CO<sub>2</sub> impregnation
  - Novel approaches to chemical impregnation

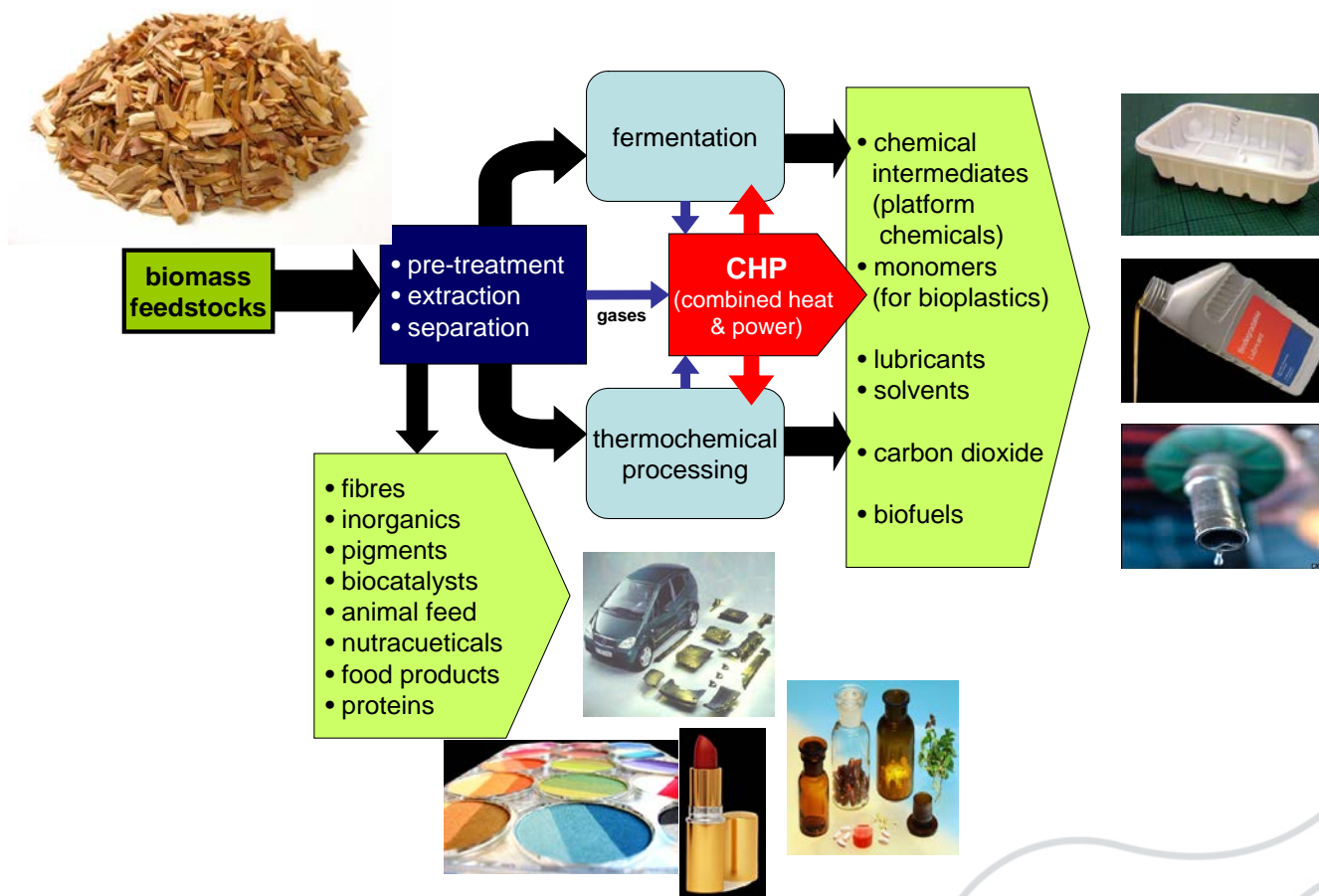


## In-service analysis and testing

- Indoor air quality and the effects of novel bio-based products on the environment.
- Thermal testing and thermal imaging

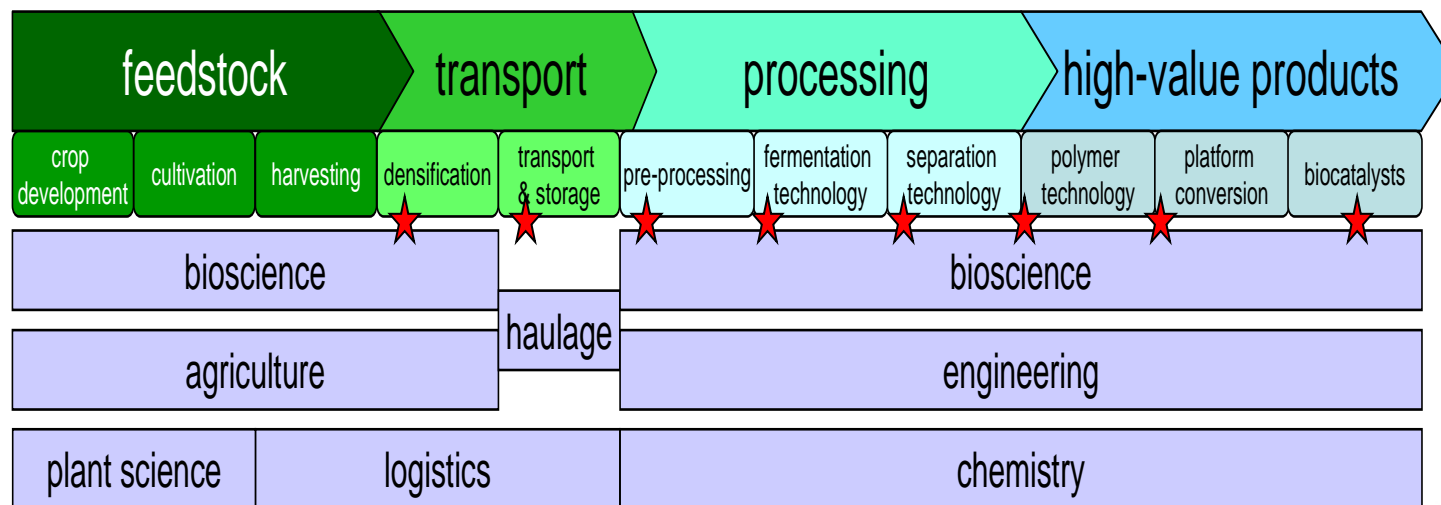


# Bio refinery





## BC ad BEACON activities in Biorefinery



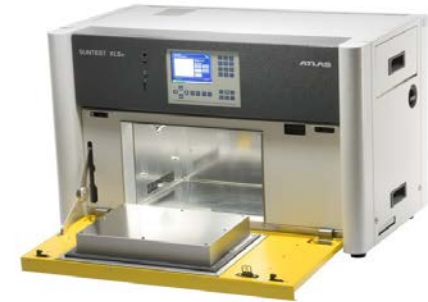
★ BEACON activities





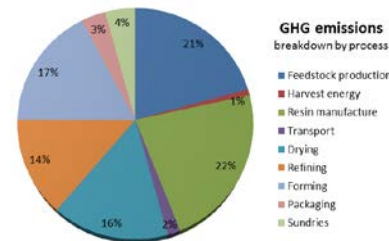
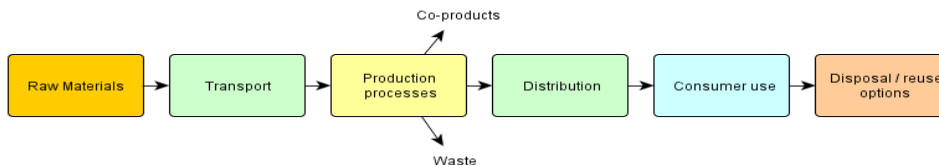
## End of life research

- Artificial / real life weathering
- Accelerated fungal and mold decay
- In-ground testing
- Recycling / reuse / energy recovery



## Life Cycle Analysis and whole life cost accountancy

- Energy monitoring at an individual machine level
- Access to the worlds leading LCA database
- Expertise in LCA and life cycle costing approaches
- Assessment of novel processes on both laboratory and pilot scale



## Capability – Product Scale-up



- BPR-TTC
  - Scale up facility
  - Biorefinery
  - Manufacture MDF, PB
  - Engineered wood
  - Bioresins
  - Phytochemicals



## Current Projects

- Energy Efficient Bio-based Natural Fibre Insulation (TSB)
- Inorganic Polymer Composites (DEFRA LINK)
- Lignin and starch derived polymers (Internal investment)
- Increasing market penetration of modified local timbers (WG A4B CIRP)
- PLA4Bread (EU Life+)
- ECO-SEE (FP7)
- DEEP-DOCK (WG A4B)
- STARS



## Just a few of our Commercial Partners





## Master class and 25<sup>th</sup> Anniversary Gala Dinner

- 16<sup>th</sup> and 17<sup>th</sup> September
  - Focusing on Indoor air quality, resins and raw materials
- Gala Dinner
  - Come and celebrate 25 years of the BioComposites Centre





## Contacts

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