



EIP-AGRI Workshop

'Opportunities for farm diversification in the circular bioeconomy'

DAY 1 (PART 2) – 6 FEBRUARY 2019

16:25 – 17:45

Break-out session

Which opportunities can farmers and foresters pursue when diversifying into the bio-economy?

- **Livestock Farming:** Mr. James Gaffey – Scientific Coordinator on the H2020 Biobased Industries Joint Undertaking (BBI JU) project ICT-BIOCHAIN, focused on developing efficient biomass supply chains for sustainable chemical bio-economy regions.
- **Arable Farming:** Ms. Anna Trettenero – A farmer herself she runs a biogas plant in cooperation with other arable farmers in Italy.
- **Permanent Crops:** Mr. Tomáš Fénix – He runs an organic family fruit and wine farm in southern Moravia, testing various circular bio-economy initiatives on his farm.
- **Forestry:** **Mr. Bernard Carey – involved in the Operational Group Biomass to Biochar for Farm Bio-economy (BBFB) in Ireland.**

The session continues with facilitated discussion addressing specific questions

Harvesting the results of the break-out session.

17:45 – 18:00

Wrap-up of the first day

Bernard Carey

Biomass to Biochar for Farm Bioeconomy



funded by the European Commission

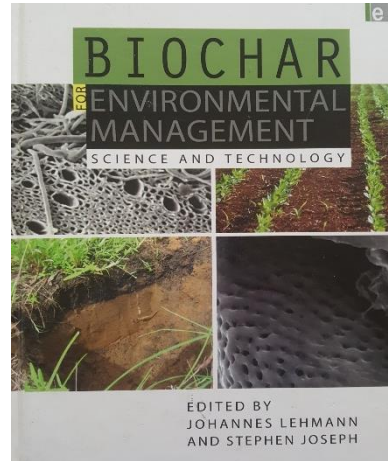


Biomass to Biochar for Farm Bioeconomy



**European Innovation Partnership (EIP)/Department
of Agriculture Operational Group
February 2019**

Biochar



- What is it?

Biochar is a charcoal-like product produced by heating biomass in low oxygen conditions between 300°C- 600°C

- How is it made?

Pits, Mounds, Ring kilns, Adam Retort, Extort Retort, Kon –Tiki kiln, custom built MPU. Cost from €0 → €millions e.g. Pyreg unit ~ €1 million.

- Science – 72,000 hits for ‘biochar’ on Google Scholar !

History of Biochar

- Amazonian Terra preta – rediscovered by us Westerners
- *Ireland - Pairing and Burning*
 - *90% of potatoes grown in Clare around famine times used this technique*
- *Future*
 - Classification of biochar, need to be able to control temperature and retention time
 - sustainable supply*

Why Now

- Greater awareness of Environmental Issues
 - Global Climate Change
 - Biochar has ability to sequester carbon in soils
 - Biochar increases microbial activity in bovine guts- promotes breakdown of feed and results in less enteric emissions of methane from Bovines
 - Reduces Ammonia emissions e.g. add to bedding in chicken houses
 - Reduces Nitrogen oxide emission in soils, but can cause methane increases in same soils.

Ecosystem Services/Public Goods

- Greater awareness of these services now. But how to compensate landowners? Current way is to pay via farm subsidies, but no directed relation between the two! However by:
 - Harvesting currently unutilised biomass such as rushes, we can reduce herbicide usage (MCPA and Glyphosate) ensuring it doesn't end up in waterways;
 - Managing habitats so we don't end up with even age monocultures of rushes or bracken landscapes;
 - Creating an income stream for landowners;
 - Helping Ireland Inc. offset its emission via sequestering the carbon in the rushes that would otherwise be lost via decomposition.

European Innovation Partnership

EIP

- Group of us formed Biochar Co Op in 2016
- EIP
 - EIPs are a new source of EU funding, €24M funding for innovative projects across the agri-food sector. A EU co-funded measure proposed by Ireland under the Rural Development Programme 2014 – 2020
 - First call in December 2016, 110+ applied, 12 approved in Round 1. 2ND 11 were approved. Total of 23 EIP project up and running now.

The Operating Group

Project Leader
Overall Technical and
Operational Management
Bernard Carey

Project Manager
Technical & Financial
Management and
reporting
Noel Gavigan

Co Op Chairperson
Communication &
Technology Transfer
Emer O'Siochru

**COMMONS
VISION WALES**
Advise and
Deployment of
mobile pyrolysis
Sion Brackenbury

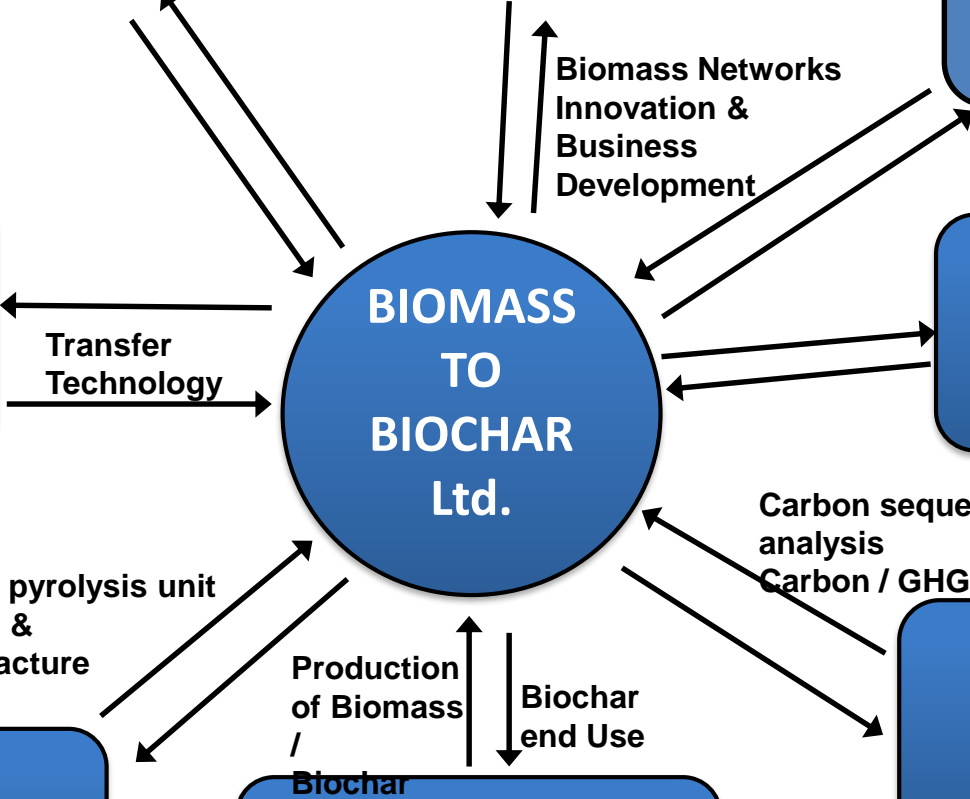
**BIOMASS
TO
BIOCHAR
Ltd.**

**Site service
Technician**
David Farrell

**PREMIER GREEN
ENERGY GROUP**
Engineering Design
Sean O'Grady

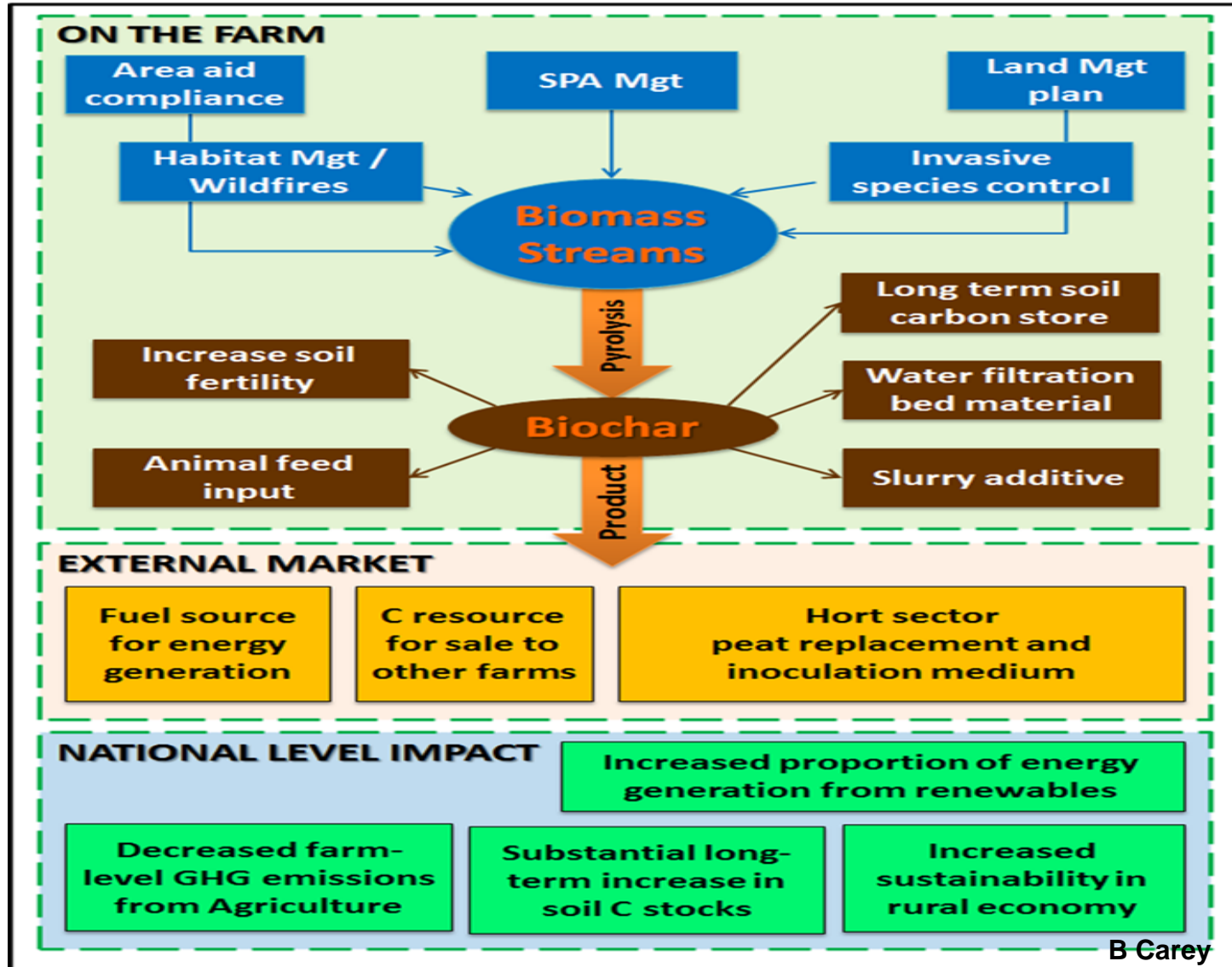
**IRISH BIOCHAR
Coop
Farmers**

**RESEARCH & LIFE
CYCLE ANALYSIS**
Dr. Brian Tobin
Dr. Mike Clancy

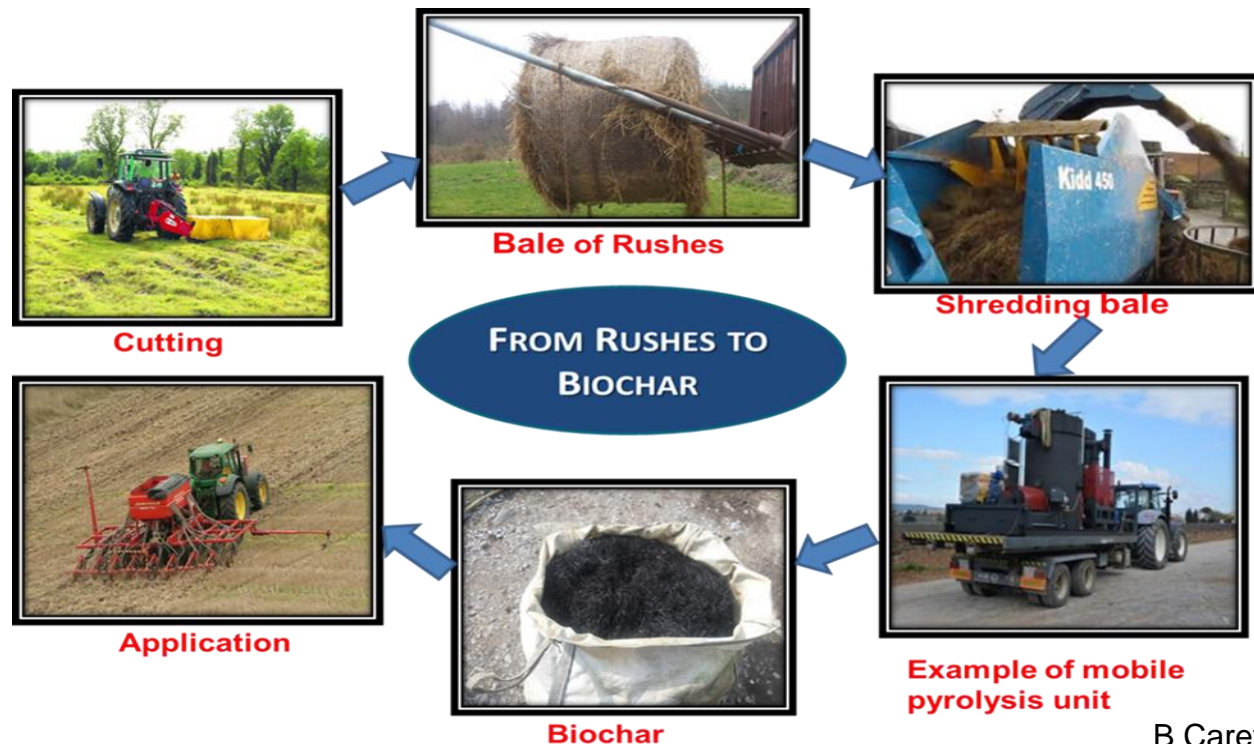


BBFB - A 4 Year Project

BIOECONOMY



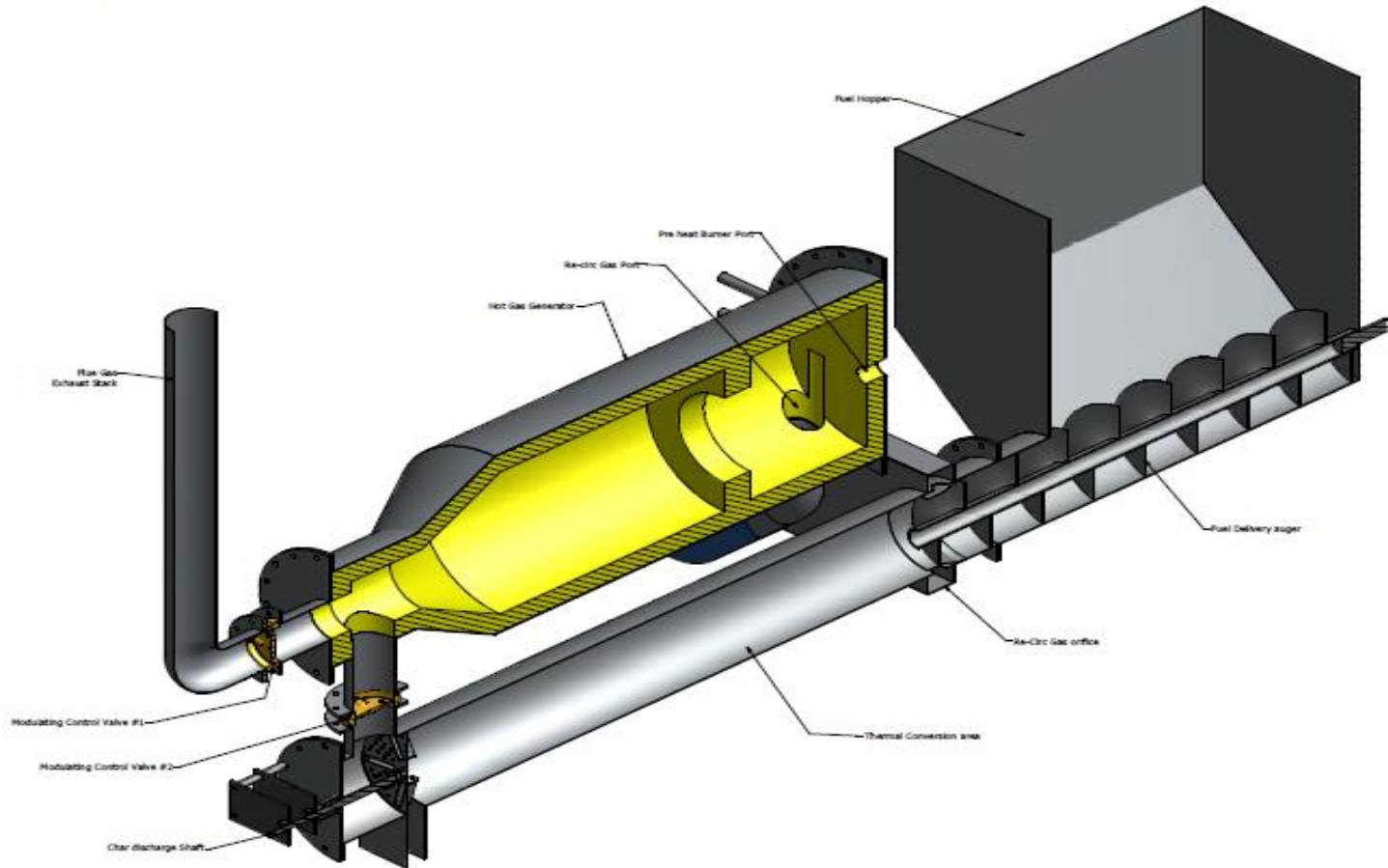
- Focus on currently readily available biomass to make biochar such as Rushes, Hazel (in the Burren Co), Bracken and other nuisance biomass e.g. Furze.
- Use a Mobile Pyrolysis Unit to convert biomass to biochar. Will also account for the potential heat generated.



Life Cycle Assessment (LCA) and Life Cycle Costing (LCC)

- LCA is a form of systems analysis and in this study the goal is to assess both the environmental and economic aspects of biochar production using rush, bracken, hazel and furze as farm biomass feedstocks.
- The LCA and LCC outputs will provide reports on the environmental sustainability and financial costs and benefits of biochar production from the proposed biomass feedstocks on the rural bio-economy addressed within the project scope

Mobile Pyrolysis Unit (MPU)



Eye on the Future after EIP

- What if
 - The Ecosystem service provide by Marginal land in the west could be ‘transferred’ to more productive land in the east.
 - Harvest unutilised biomass, convert to heat and biochar. Sell this biochar, e.g. to Dairy farmers in the Golden Vale to help them offset their emissions.
 - Ireland Inc. pays subsidy to these farmers for every ton of biochar sequestered via processing bales of harvested biomass converted to carbon?

Constraints

Restrictions	Biomass	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Non-designated land	Rushes	Weather Dependent											
GLAS Hen Harrier option		Weather Dependent		15 th Mar.				15 th July	Weather Dependent				
Bracken		Weather Dependent			Actively growing		Weather Dependent						
GLAS Bracken Cough	Bracken		28 th Feb						1 st Sept.	Weather Dependent			
GLAS Twite		Weather Dependent			15 th April				15 th Aug.	Weather Dependent			
GLAS Low input Pasture		Weather Dependent		15 th Mar.				1 st July	Weather Dependent				
GLAS Traditional Meadows		Weather Dependent		15 th Mar.				1 st July	Weather Dependent				
Nesting Season	Hazel	Weather Dependent		1 st Mar.						1 st Sept.	Weather dependent		



“There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.”



CLIMATE SUMMIT

WHAT IF IT'S
A BIG HOAX AND
WE CREATE A BETTER
WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.



12/19 USA TODAY

YEL
PITT