Sustainable Technologies

Utilisation of Roadside Verge Arisings

Alex Wilcox Brooke

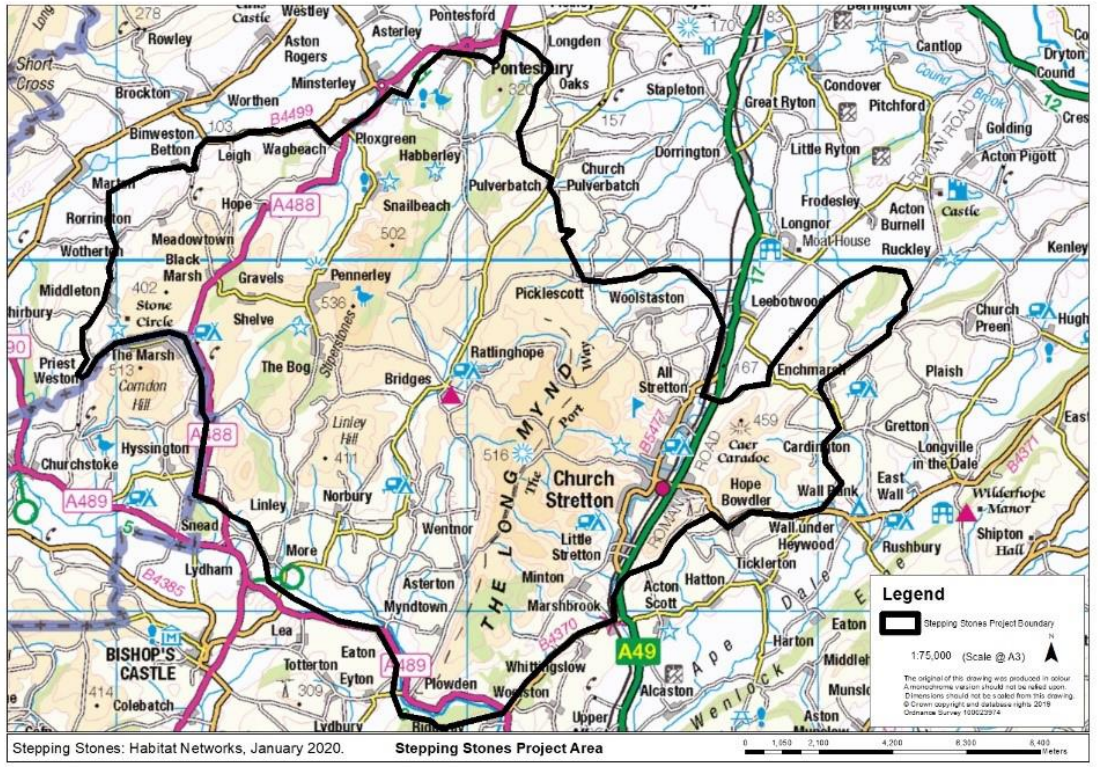
severn wye

Stepping Stones
Creating and linking wildlife-friendly spaces

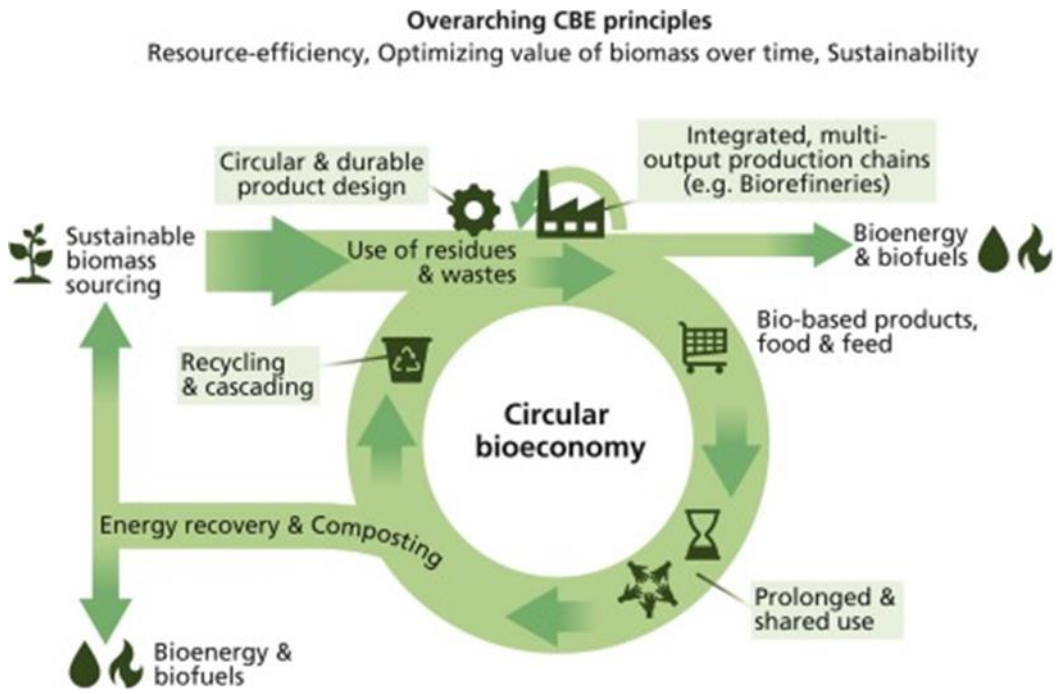
RESTORING SHROPSHIRE'S VERGES PROJECT

The brief

- Assess the economic value of the potential arisings in the Stepping Stones area including:
  - Costings
  - Yields
  - Management plans
- Roadmap for future opportunities
- Ideas for next steps



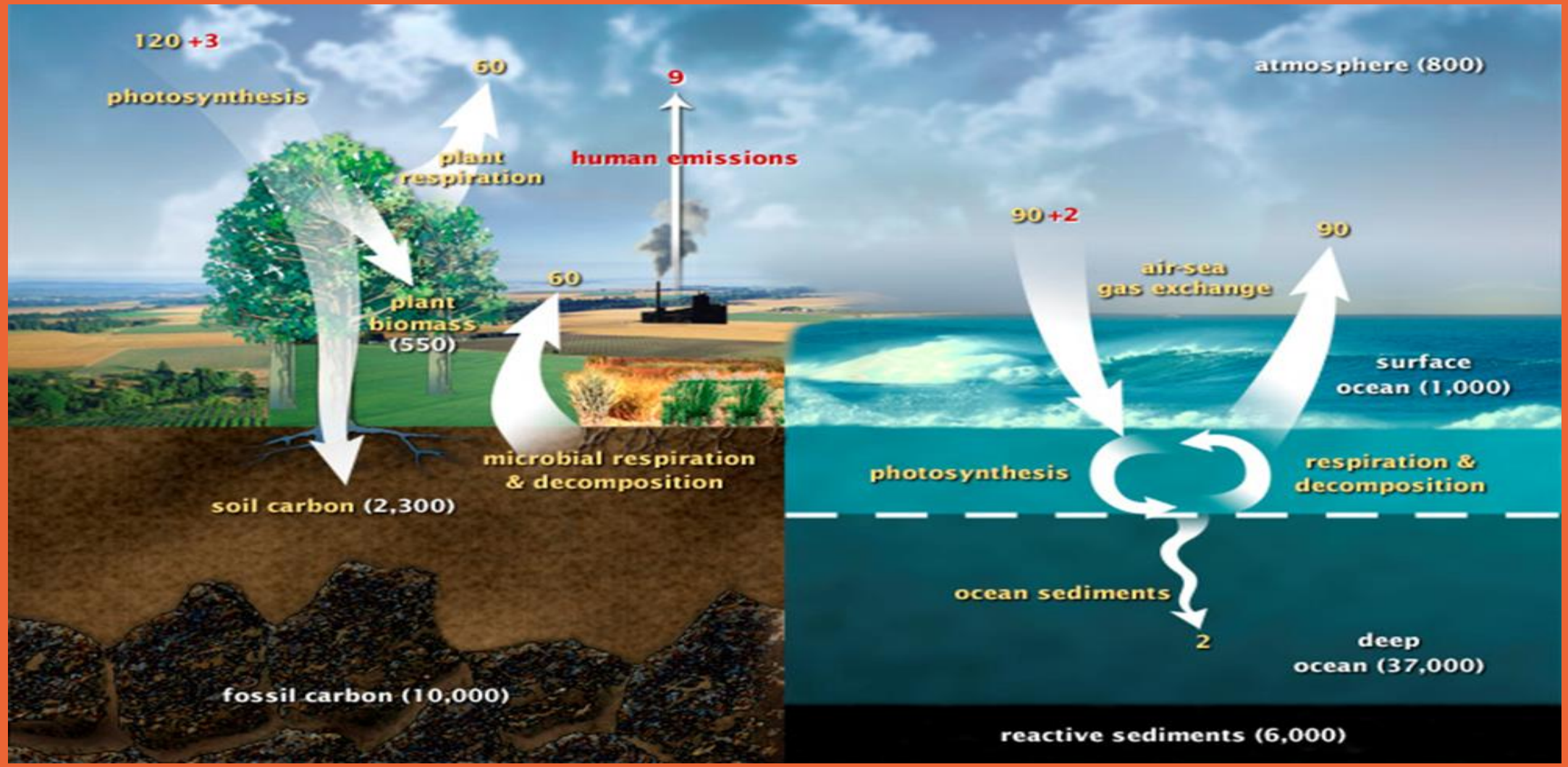
Background:
THREE-C Creating The Circular Carbon Economy



THREE

Interreg
North-West Europe
THREE C

The Carbon Cycle



Key Drivers

Why is the current practice cut and drop?

What is the ideal solution from an ecological perspective?

Lifecycle of grass & calorific value

Availability of existing treatment options – AD/composting facilities

Key Challenges?

Alternative solutions?

DLG Expert Knowledge Series 386: Biogas from Grass

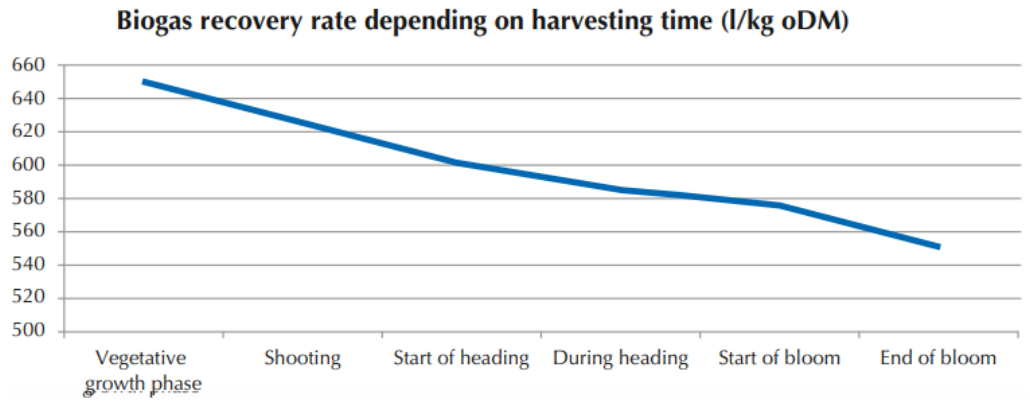


Figure 3: Biogas recovery rate from grassland growth depending on the harvesting time [Lütke-Entrup, Gröblinghoff, 2005]

Hope Bowdler trial

Trial area – Verge on B4371

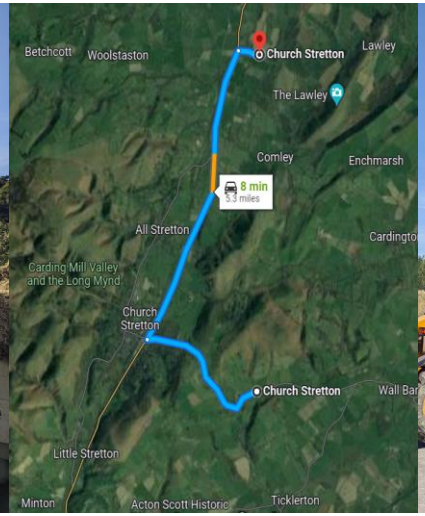
Volunteer time – Litter picking

Cut & collect – Gianna Ferrari front mower

Yield – 840kg

Transport – Iveco Flat Bed

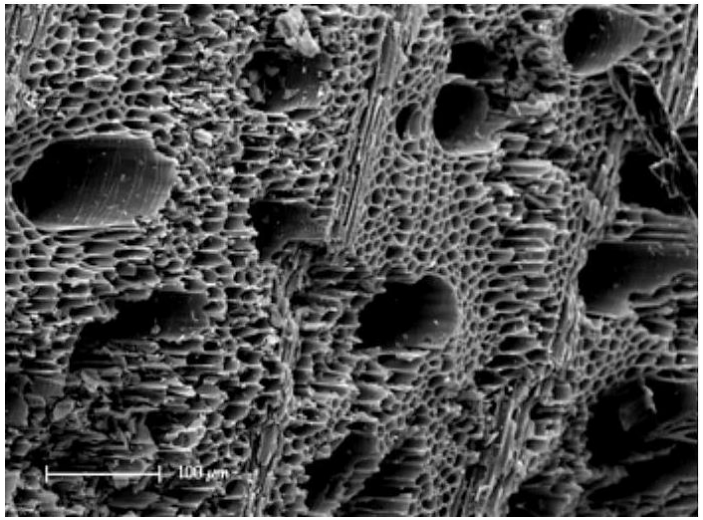
Value - ???




Smart Use of Biomass
for Alternative Carbon Products

What is biochar?

- Black, solid, high carbon content material
- Highly porous
- Recalcitrant(stable)
- Made from a variety of biomass streams
- Formed during pyrolysis
- Variable in shape and size



How is Biochar made?

Kon Tiki style flame cap kiln

Source: https://www.biocharretort.com/

Source: https://www.pyreg.de/

Use within the agriculture, forestry and the farming community

- Slurry additive
- Animal feed additive
- Biofertiliser- EU Organic Fertiliser Regulations
- Animal bedding
- Soil additive/amendment
- Boosting biogas yields in AD
- Forestry Applications

Water Quality

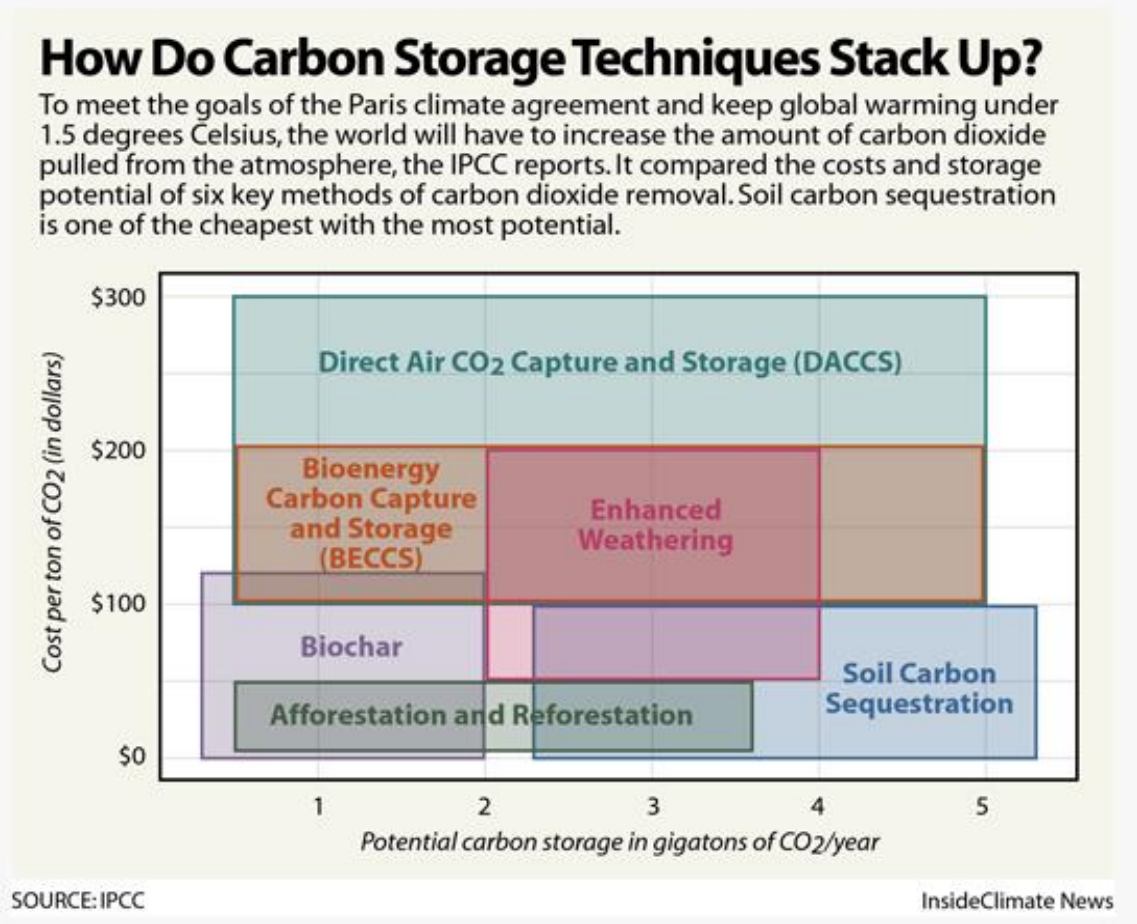
Possible applications:

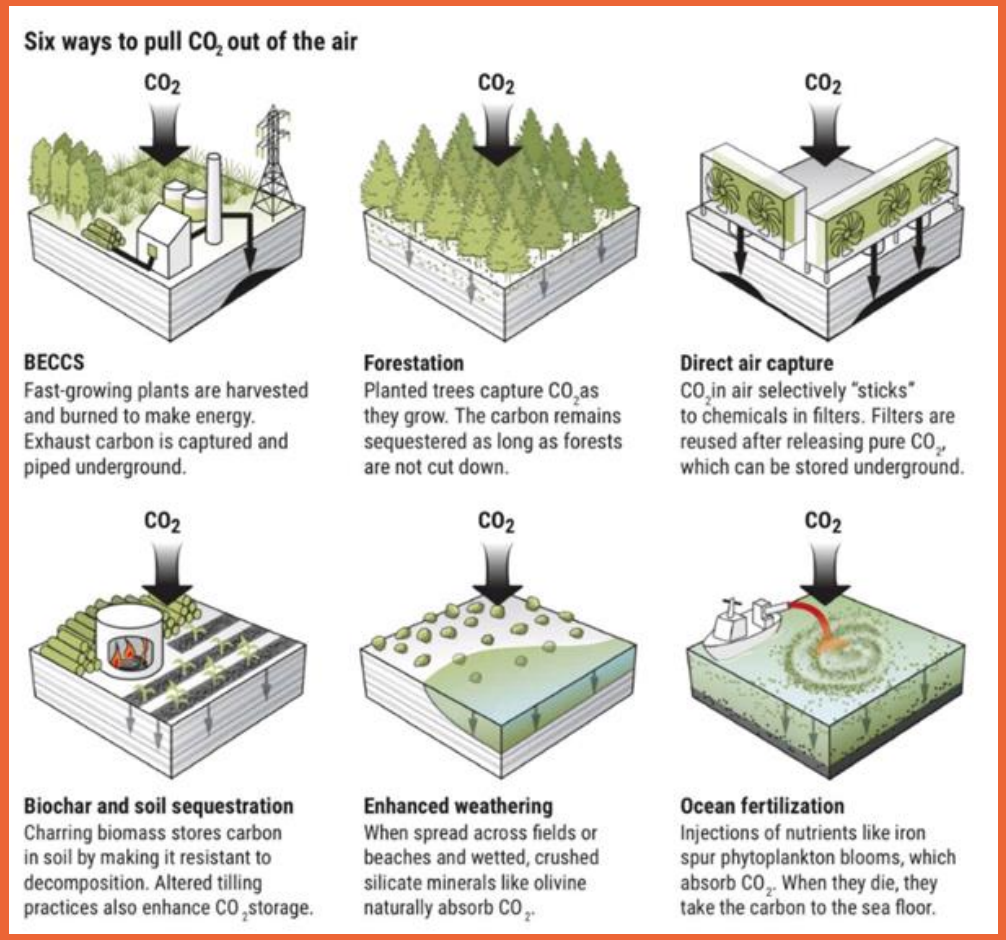
- WWTP Use
- Industrial Use
- Domestic Use
- Agricultural Use
- Municipal Use
- Remediation

https://www.princetonhydro.com/blog/biochar/

High Plains Biochar

IPCC NET- Negative Emission Technologies



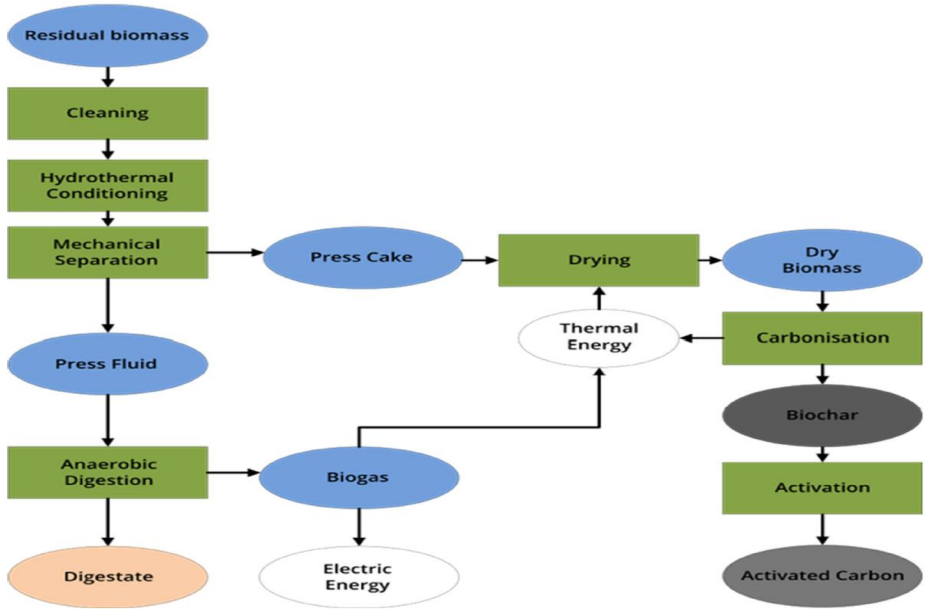


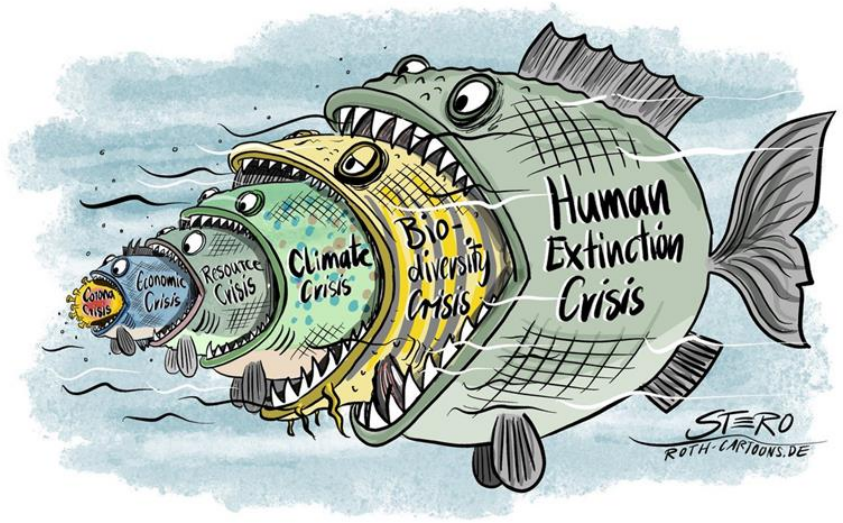
Source: https://insideclimatenews.org/news/12102018/global-warming-solutions-negative-emissions-carbon-capture-technology-ipcc-climate-change-report/

What's Next?

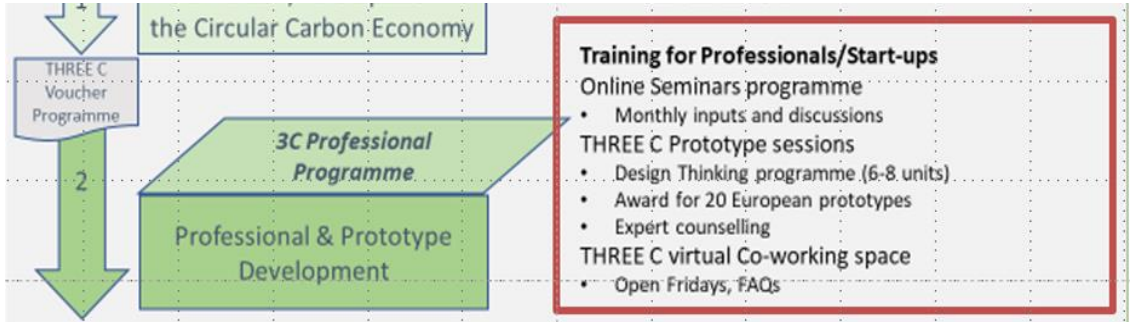
Short term vs Long term
An integrated biomass management concept
Development of a site combining pyrolysis & composting facilities
Pre-treatment facilities
Drying capabilities
Briquetting capacity
Designed to handle a variety of challenging and low value feedstocks

Wide variety of value streams
Significant Carbon Sequestration Potential





THREE C workshop series



Date	Contents	Design Thinking
	10 am to 1 pm	
16 December 2022	Start session; Intro on **Biochar and the circular carbon economy**	
13 January 2023	**"Our" THREE C Procedure** • Inputs, Processing, Outputs • Ecology, LCA	Team Building
10 February 2023	Regional Scenarios • Municipal • Agricultural • Social economy • Regional development plans	Regional Visions
10 March 2023	**Ecology, Quality** and Labs	Ideation session on products and services
14 April 2023	**Application cases and Economy**	Refining products
12 May 2023	**Excursion**	Prototyping
16 June 2023	Networking / **Award**	Pitches

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