

INTRODUCTION. This paper considers the potential for an organics upcycling hub in the upper Severn catchment based in or around Newtown, mid Wales. If enough partners consider there to be sufficient merit in the proposal then a feasibility study would need to follow.

WHY LOOK TO MANAGE OUR ORGANIC RESOURCES BETTER IN NEWTOWN? Outside of the global issues around greenhouse gas emissions (CO₂ and CH₄) and resource depletion (e.g. soils, phosphate etc.) – both of which are intrinsically linked with our management of organics - there are a range of more regional and localised issues that indicate we should take greater care of our organic materials. Organisations with responsibilities and opportunities could include:

1. **HAFREN DYFRDWY / SEVERN TRENT** incur the costs of sewage sludge removal and hold a mothballed AD plant on the east of the town. With Newtown completing its bypass and considering growing, pressures and costs look likely to increase.
2. **OPEN NEWTOWN** (managing the 140 acres of open spaces within Newtown) is one example of a land manager looking to reduce costs of grass maintenance whilst maximising the benefits it can bring to the town (biodiversity, energy etc.).



Map of Newtown showing town plus new bypass alongside Open Newtown's green spaces.

3. **FARMING COMMUNITY** includes a diverse range of businesses all of which incur costs associated with the management of organics be that the costs of buying fertilisers, of managing pollution risks or simply investing in their core asset of soils.

There is a specific issue on the horizon involving the cumulative effect of diffuse pollution from the increasing number of poultry units in mid Wales. An important part of farm diversification the units generate large quantities of litter high in ammonia which is both a potential fertiliser and a potential pollutant to water supplies. Map left illustrates density with Newtown shown with



4. **LOCAL AUTHORITIES** such as Powys County Council and **AGENCIES** who hold responsibilities for managing biomass materials such as road side verges (highways dept. balancing pollinator potential and health and safety issues alongside budgetary control – also relevant to Highways Agency), road leaf sweeping (balancing road safety with waste management costs) and food wastes (waste dept.) etc.

Outside of the identifiable parties above there are also a range of **PRIVATELY MANAGED ORGANIC MATERIALS** such as abattoir waste, grounds maintenance wastes, commercial food wastes, Network Rail and Scottish Power who have biomass management responsibilities etc.

WHY CO-LOCATION AND COLLABORATION. Two strong drivers as to why organics management requires a hub:

- A. **COSTS.** Gone are the days when a single organisation can justify the capital investment in organic conversion technology; especially in rural areas with dispersed feedstocks. Sharing resources makes economic sense.
- B. **MAXIMISING INCOME.** Providing scale/expertise to look into gas injection / use of heat rather than just electricity generation
- C. **CHEMISTRY AND BIOLOGY.** Blended is better. It simply works better to blend organic materials. Unlike whiskey's it is not more profitable to go for 'single malts', instead looking to achieve a 'balanced diet' is far preferable. A single operation able to take in a range of materials and manage its biology and chemistry will always perform better. A more biologically and chemically efficient plant means organic materials are better managed and better products are produced.

OTHER FACTORS THAT INDICATE A PILOT HUB MIGHT BE A GOOD IDEA.

Being cost effective and being biologically and chemically efficient should be enough to bring collaboration about. There are also a range of activities already underway that boost confidence, including:

REDIRECT EUROPEAN PROJECT – operated by Cwm Harry Land Trust (the driving force that helped create Open Newtown) this project is piloting a farm based plant in North Wales that converts marginal biomass materials (rush, bracken etc.) in to products (such as charcoal, briquettes and fertiliser). This farm based pilot near Bangor is dedicated to non-waste biomasses. The European ‘type site’ is a large organics hub based on the municipal sewage works at Baden Baden in Germany.



ROAD LEAF SWEEPINGS RESEARCH – WRAP funded (in 2017) detailed research on the potential for including the organic fraction of road leaf sweeping in AD. Currently classed as waste the research indicates the barriers are regulatory rather than technical. Disposal of the material currently classed as ‘waste’ is a significant cost to all Local Authorities and so the Welsh Government is keen to support solutions to this.

SMART CYMRU – is the Welsh Governments funding stream interested in supporting a pilot plant able to look at the how biomasses classed as ‘waste’ can be processed to meet End Of Waste criteria. An initial proposal to them in 2018 gained a favourable response but would require a feasibility study to be undertaken (which they will consider funding).

LINCOLNSHIRE TRIALS – are now well progressed on the economics of collecting road verge cuttings. A public private partnership has developed cost effective working practices that allow cut and collect to be considered a viable option for road verge management.



Incidentally the original trials in to cutting roadside verges and processing the material through AD were undertaken in Powys nearly 20 years ago!

ORGANIC MATERIAL = any organic based material. Examples include sewage sludge, grass cuttings and silage, food wastes, chicken litter and farm slurries, road leaf sweepings etc. Overlaying the generic ‘organics’ term with some categorisation might help:

- **MARKETABLE BIOMASS** - those with existing market values such as maize, out of date animal feeds etc.;
- **WASTE BIOMASS** - those with associated disposal / management costs such as sludges, road leaf sweepings etc.;
- **MARGINAL BIOMASSES** – those that don’t currently enter the market but which carry a range of costs / values for their managers. For example poultry litter might hold nutrient value for the farmer but also hold current or future pollution costs for both the farmer and the water companies. Bracken and soft rush reduce both farming efficiency and biodiversity if left unmanaged.

Part of the challenge is to consistently build the evidence base that allows costs to be reduced / value to be added and which moves more organic materials from waste / marginal categories in to marketable materials with positive values.

UPCYCLING AND ADDING VALUE = whilst this will include recycling nitrogen to nitrogen and carbon to carbon there already exist ways of adding value to materials and upcycling them in to higher value products. For example using methane biogas for the production of electricity or homogenising the digestate from AD to aid spreading to land reducing wastage so as to cut costs and avoid pollution, extracting the carbon portions to produce biochar as a product with higher market value.

TECHNOLOGIES = at the heart of organics conversion we might be most accustomed to anaerobic digestion but any hub looking at optimising the value of our organic materials we consider a wide range of technologies including (but not exclusively):

- Composting
- Separation and / or concentration of elements (those with costs such as heavy metals and those with value such as fertilisers)
- Pyrolysis
- Inoculation
- Pelletisation

WIDER IMPLICATIONS AND OPPORTUNITIES

An organics upcycling hub may offer each partner - and the upper Severn region - direct and immediate benefits. However there are some potential wider – and larger – benefits to be gained from an organics hub able to demonstrate:

CO DIGESTION of organic materials will be at the heart of the organics upcycling hub providing both economies of scale and optimising biological / chemical performance. However co-digestion of waste materials – especially sewage sludge – is contentious and currently not permitted, with no End of Waste protocols agreed. Setting out to devise an acceptable set of policies and protocols that allow current ‘waste’ products to become valued products can be one specific ambition of this organics hub.

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WELSH GOVERNMENT ambitions can be met in a variety of ways (and regular offer financial incentives to help devise ways of meeting these ambitions) including:

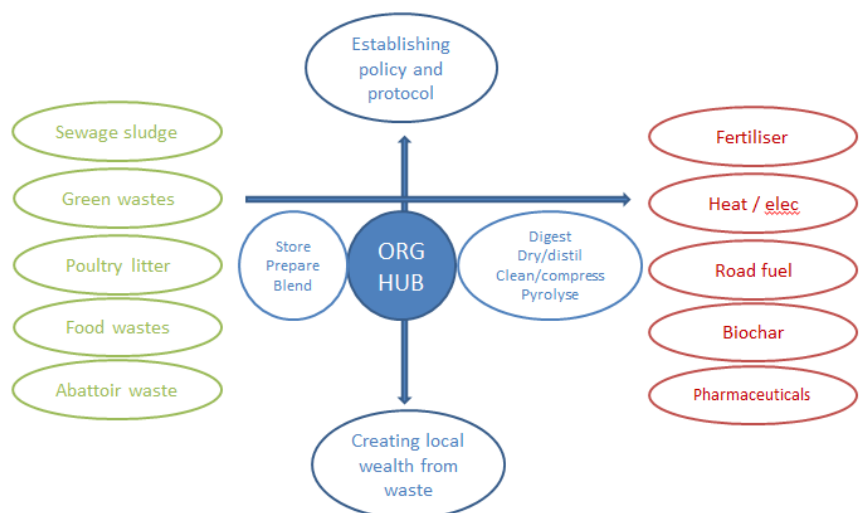
- ✓ **CIRCULAR ECONOMY** – where their ambition is to see us move away from the **take – make – dispose** processes and bring in **repair – re-use – upcycle** pathways for material use. Being able to achieve this for organics would be a major contribution.
- ✓ **WASTE MANAGEMENT** – perhaps part of the circular economy ambition above but also where WG have specific ambitions to achieve Zero Waste. Currently amongst the best in the world Wales has ambitions to continue to pioneer and lead. With the pressures falling on local authorities there is
- ✓ **SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES (SMNR)** – now enshrined in law in Wales (Env. Act) SMNR throws out some challenges as to how biodiversity can be enhanced and done so viably. An organics hub can play a part in the solution for this.
- ✓ **LOCAL ECONOMY** – at a simple level being able to demonstrate how a town or region can, by collaborating, capture the value of its organic materials and generate not just energy but jobs, skills and wealth.

WHAT AN ORGANICS UPCYCLING HUB COULD SET OUT TO DO

- ✓ **CO-DIGEST A RANGE OF ORGANIC MATERIALS** to achieve optimal efficiency;
- ✓ **DEVELOP POLICIES AND PROTOCOLS TO ACHIEVE END OF WASTE STATUS** to enable optimal use of materials;
- ✓ **DEVELOP ADDED VALUE PRODUCTS** to maximise the financial return from organic conversions.

If developed correctly all partners would gain:

- **INCREASED COST EFFECTIVENESS FOR THEIR BUSINESS;**
- **LESS ‘WASTE’ OR POLLUTION PROBLEMS**
- **ENHANCED PRODUCTS RETURNED TO THEM E.G. FERTILISERS, BIOCHAR ETC.**
- **PLUS PIONEERING ADDITIONAL BENEFITS TO THEIR INDUSTRY AND / OR WELSH GOVERNMENT**



NEXT STEPS?

We might envisage a ‘stepped’ approach to this proposal

- **‘IN PRINCIPLE’ SUPPORT** for this idea from enough partners would be a first step
 - **FEASIBILITY STUDY** would need to follow, for which funds would need to be sought
 - **PILOT PLANT** might be a realistic next step – proving principle around policy and procedures;
 - **FULL COMMERCIAL HUB** could then follow.