



# Farming Connect Management Exchange

Henry Gibbon

Austria

Biomass CHP (Combined Heat and Power)

22/02/2019

## 1 Background

I grew up on my parents' family dairy farm and was very active in the daily dairy routines from a very young age, as well as later on, looking after the machinery work including all the tractor driving duties. I also developed an interest, and skills, in maintaining all the equipment myself.

In the year 2000, I moved to live on a small farm where I started with a small beef herd enterprise of approximately 80 head of cattle while still working on my parents' dairy farm.

Always having had an interest in technology in agriculture, I purchased my first GPS system which happened to be one of the first systems in Wales to run on tractors as a simple guidance system. The supplier, Trimble, then enquired if I was interested in becoming a small re-seller business for the Trimble GPS systems to cover South Wales. Since then, I have sold and installed systems all over Wales - from basic guidance to very sophisticated high accuracy systems, including many installations that are fully automated.

This small part of my business has been growing slowly over the last 14 years, and it has contributed to Trimble becoming the number one GPS system in the UK.

However, my interest in technology did not stop there, and within the space of five years, I installed two small wind turbines and two biomass boilers to reduce the carbon foot print of the farm as well as reducing costs in a sustainable way. I also extended the shed to construct a new office building which is now rented out to a local internet company.

Having had the biomass boilers running for over two years, I then looked into Biomass CHP technology, also called cogeneration; it's the simultaneous production of electrical and thermal energy from a carbon neutral single fuel source. With the expansion of the rental business, I discovered that this would be a great option for myself and indeed any farm business that has a high energy demand. Waste heat would be utilised to heat the offices and workshop areas, whilst simultaneously producing electricity, especially with the unpredictability of wind production.

The reason I chose Austria as a destination is quite simple; it is a world leader in the production of heat and electricity from CHP systems. The country has been running these



systems for decades. The city of Vienna, which accommodates over two million people, receives 70% of its heat and hot water and nearly 80% of its electricity sourced from various CHP systems. The Austrian Government has supported the use of these systems for many years, provided they serve a public district system.

The area I visited was very rural, surrounded by small farms and villages, where biomass CHP systems would power and heat most properties through a district system. Local farms would help fund a system, and any excess heat and electricity that the farms wouldn't consume would be exported.

On Welsh farms, energy costs and emissions are now a critical item on every annual financial statement, whether for the profitability of the farm, the uncertainty of the energy market, or the global impact on climate change hence farmers all over the country are looking for ways to address this challenge.

So, my objective on this visit was to learn how to improve the efficiency of the CHP system, looking to possibly feed the system by growing my own fuel, miscanthus, on the farm or sourcing wood waste from a local woodland supplier and pellet it on-site. This would dramatically decrease the running costs of the unit, especially when the government's RHI tariff comes to the end of its contract. Currently, pellet and chip suppliers are increasing prices annually between 5 and 10 % hence the importance of trying to become more self-sufficient.

## 2 Itinerary

I was taken locally to several different plants. I also visited several farmers to talk about the benefits they achieved through this investment. I was driven by the way heat and electric was produced from locally grown fuels, which is my target looking forward.

I was even provided with some schematics by one particular company, just to illustrate what the plant was producing (attached are some examples) although due to company policy, I was only allowed to take very few pictures of certain areas of the plant.

## 3 Next Steps

I will re-visit the same area in July / August, but this time to focus more on the fuel used and to learn about the processes used in miscanthus fuel crop production and the pelleting of woodland waste.

The knowledge gained can help my business' productivity and efficiency, advancing both the farming and diversification enterprises.

A list of action points can then be made, including the possibility of future government funding schemes to help in the production of fuel crops and woodlands.

## 4 Key Messages to the industry

1. Electricity prices fluctuate continuously; the committee for climate change predicts that energy prices will rise by up to 38% by 2030.
2. Farms are well suited to use their land for clean energy development. They can take advantage of tax benefits and government incentives.
3. Grasses or hardy plants can be planted and then harvested as biomass which can be used on the farm as heating. With the incorporation of CHP biomass, both heat and electricity can be produced on a small scale.



4. Considerable CO<sub>2</sub> reductions can be achieved worldwide with the adoption of these technologies across many industries including agriculture. Global fossil fuel reserves are becoming harder to find; governments and industries worldwide, including agriculture, will need to work together towards a cleaner future.
5. CHP is the only renewable technology that can supply a constant, on demand supply of heat and electricity simultaneously; wind, solar and hydro power is free but unreliable and unpredictable unless an expensive battery system is installed.
6. Austria is a country that successfully utilises all its land: prime agricultural land is used for food production and fuel crops; large scale forests are managed to a very high standard, and all waste is used for the production of heat and electricity.