Renewable energy – costs and incomes

Where might costs be incurred or incomes change if you move towards integrating food and energy production and producing renewable energy on your farm? This will depend on a wide range of variables; the table below takes you through some of the costs and incomes you might consider and some of the variables that could affect them. Considerations should also include inflation, price growth and fluctuating costs / prices in energy markets.

Costs

Item	Variables	Considerations
Capex Capital expenditure, the cost of buying in the technology	• Size of set-up – e.g. how many hectares of solar panels, size of anaerobic digestor, number of wind turbines. • Energy output – type of energy (e.g. electricity or biomethane) and average and peak energy outputs • Ease of connection to national energy networks (if desired) • Remoteness of location in relation to transport and construction costs	Is the technology: • Installed and owned by the farm • Part of a co-operative between several farms • Part of a partnership with a renewable energy firm Are establishment grants/loans available? Legal costs, for instance related to planning
Opex Operational costs, the cost of running the technology	• Opex could include (for example): maintenance, cleaning, repairs, upgrading or updating technology. • Partnerships with a renewable energy company could include operational costs	Technology lifespan to calculate total opex costs: • Agrivoltaics estimated lifespan: 15 – 20 years • Biogas plant estimated lifespan: 20 years plus • Wind turbine estimated lifespan: 20 – 25 years • Ground source heat pump: 20 – 25+ years

Incomes

Item	Variables	Considerations
Power / Energy Electricity, biogas (for use in CHP) or biomethane	• Average / total annual power output • Is energy used on-farm or exported	Energy prices can fluctuate • Average EU wholesale electricity price in 2024 was 75 € / MWh • Average EU wholesale gas price in 2024 was 35 € / MWh These are annual averages; prices fluctuate across the year and between countries
Renewable energy Premium or guaranteed price may be paid for energy from renewable sources	If a different price is paid it could be: • Fixed for a set time • Fixed to a set price	Green Energy certificates certify that electricity has been generated from renewable sources. There are different schemes in different countries, in the UK the *Renewable Energy Guarantees of Origin (REGO)* is used.
Grants / subsidies Regional, country-wide or wider (e.g. EU), dependent on location	Grants or subsidies may be: • Paid annually • For initial set-up of technology • For a set time span • For the life span of the technology	Current grants or subsidies could also be linked to land use. For example subsidies paid for food or feed crops may not be paid to grow dedicated energy crops on the same piece of land

Additional possible incomes

Item	Variables	Considerations
Rental income In partnerships a renewable energy firm may lease land for renewable energy production	• Rental incomes could be paid over long time period	
Crops Crop yields could be impacted by the technologies	• Impact on crop yields could be positive or negative • Use of biogas digestate as fertiliser could reduce farm costs	Agrivoltaics could also mean different crops are grown, changing income streams Changes in crop rotations to include cover crops for biogas production could impact on yields, e.g. including a nitrogen fixing cover crop (used as feedstock) could improve yields or the protein content of subsequent crops

A more in-depth look at costs and incomes associated with generating renewable energy through agrivoltaics or biogas production on farmland can be found in the Partial Budgeting Tool on the Value4Farm website - *https://value4farm.eu/decision-support-platform/*

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