

Community Energy Projects

- A Cinderella concept
 - Or
- Vital part of our future
 - You can decide

Why a community energy project?

It involves the community

Controls future power bills

It keeps the income local

Generates cash for local causes



Gwent
Energy
C. I. C.

It involves the Community



Controls future energy costs



Renewables have no fuel costs
Once set up future cost is set

It keeps income local

- Energy costs are a DRAIN on your PROSPERITY
 - Saving £2,500 for 25 years at 5% inflation
 - You are £118,000 better off
- Abergavenny spends @ £16 million a year

Generates cash for local causes

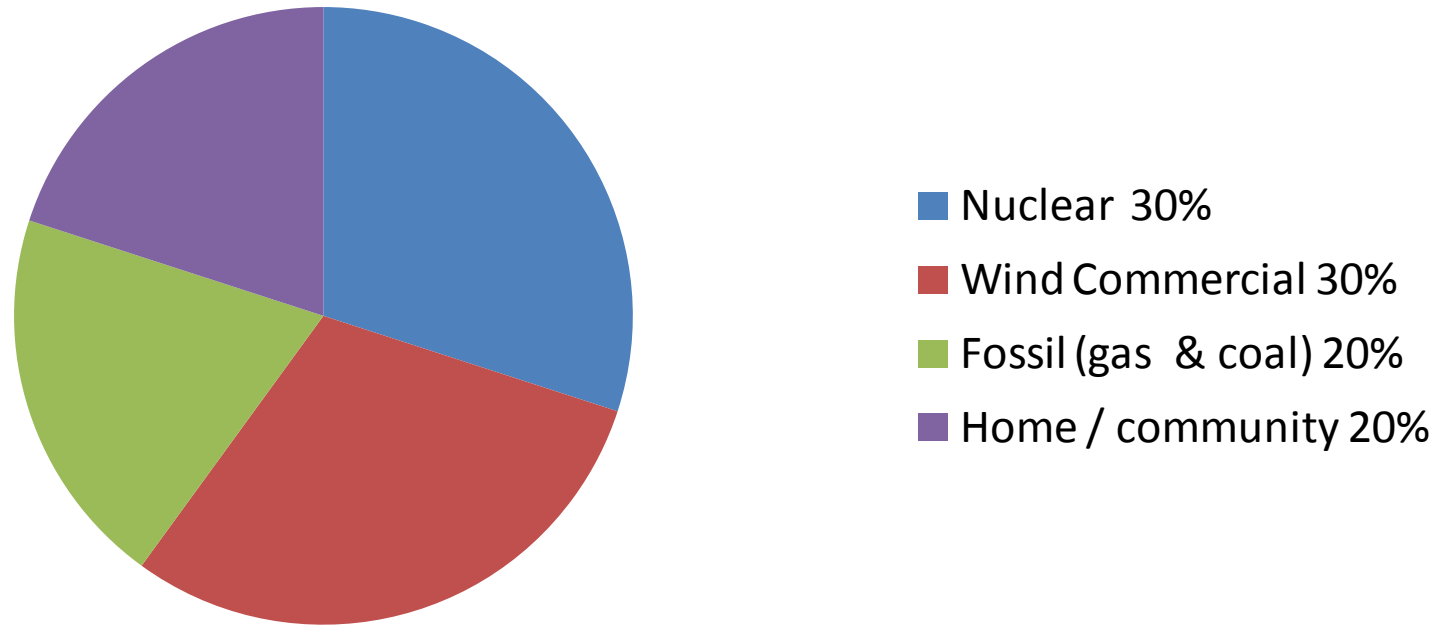
**First community benefit funds from 50MW
Swindon Solar Farm to be paid £55,000**



History of community energy

- **1. Local people building their own turbine**
 - Paid for with share issue early years no dividends
 - Tariff cuts made these hard to fund
 - **2. Then EIS tax relief helped**
 - City firms like triplepoint took advantage
 - **3. Government then scrapped EIS**
 - Community organisations also hit
-
- **Stand alone projects not now feasible**

Future generating mix



Fossil fuel will be with us for some time due to its versatility
But battery storage is coming very soon
And in a few years will displace Fossil fuel

Future community energy

- The next stage is to sell your power locally
- You have to sell power at commercial rates
 - No money for community good causes
 - **There are 4 ways to do this**
 - **Use a licensed supplier (white label)**
 - **Use a private wire (offgrid)**
 - **Self power a site (generate on site)**
 - **Use a virtual network (cloud based)**

Community energy @2020



Wind for bulk generation



PV for daytime peak load

Renewables are intermittent and can NOT supply isolated systems alone

10 kWh battery storage



Fuel cell & AD for intermittency



White label

**Use a licensed supplier to buy and sell
your power to specified people**

There are additional costs like

- 1. Nuclear decommission**
- 2. metering & billing your customers**
- 3. balancing supply with customer needs**

Setting up a small supplier costs £500k

500,000 customers & £5m to be viable

Private wire

- Disconnect a group of houses from grid
 - You need power 24/7 to match demand
 - Renewable generation not suited to this
 - Needs some fossil backup like diesel or fuel cell
 - Reliability of supply might be an issue
- Power plants will have VERY low efficiency
- Farm anaerobic digester compliment solar ?

Self Power a site

- **Install generation and batteries to a building**
- **connect to the grid to provide balancing function**
- **We have a site at Bream operating this way for 18 months**
- **4 kW of solar and 2 kWh of storage on a single persons house**
 - **Excess power in summer / deficit in winter**
 - **Return to Gwent Energy is about 8%**
 - **Customer bill saving in first year £53**

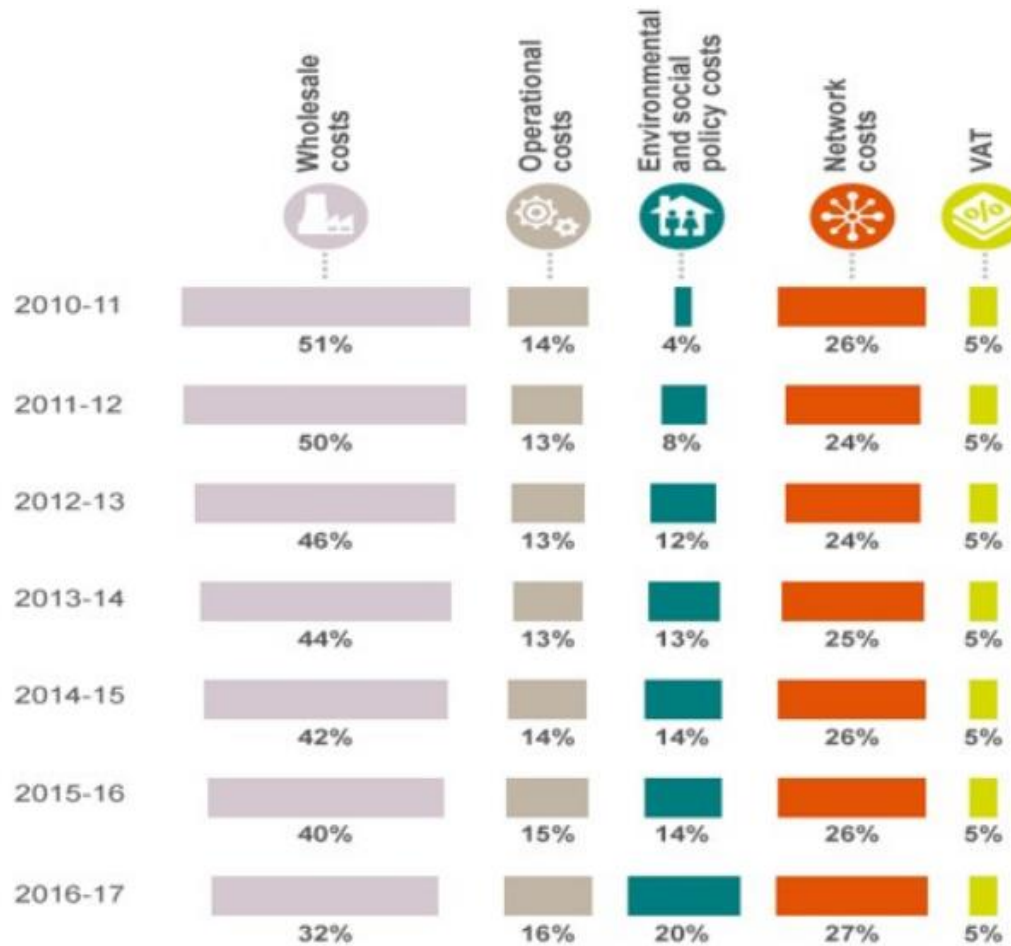


annual figures	
Generation	3,600 kWh
Export	2,577 kWh
Consumption	1,888 kWh
Import	1,023 kWh
Old bill	£339 per year
New bill	£286 per year
GE income	£102 + tariff

Virtual network

- You use smart metering to monitor demand
- The demand is online aggregated
- Your supplier “sells” you that quantity
- You sell that power to your customers
- It needs smart meters
- It needs everyone on the same supplier
- Your supplier needs to have power 24/7
- If a solar farm then you would need batteries

Breakdown of electricity bill



Breakdown of costs

- Wholesale costs
- These have fallen due to the of power coming from renewables

- Network costs
suppliers are charged for their use of these grid.

- Operational costs
These are the costs of running of an energy company; including metering

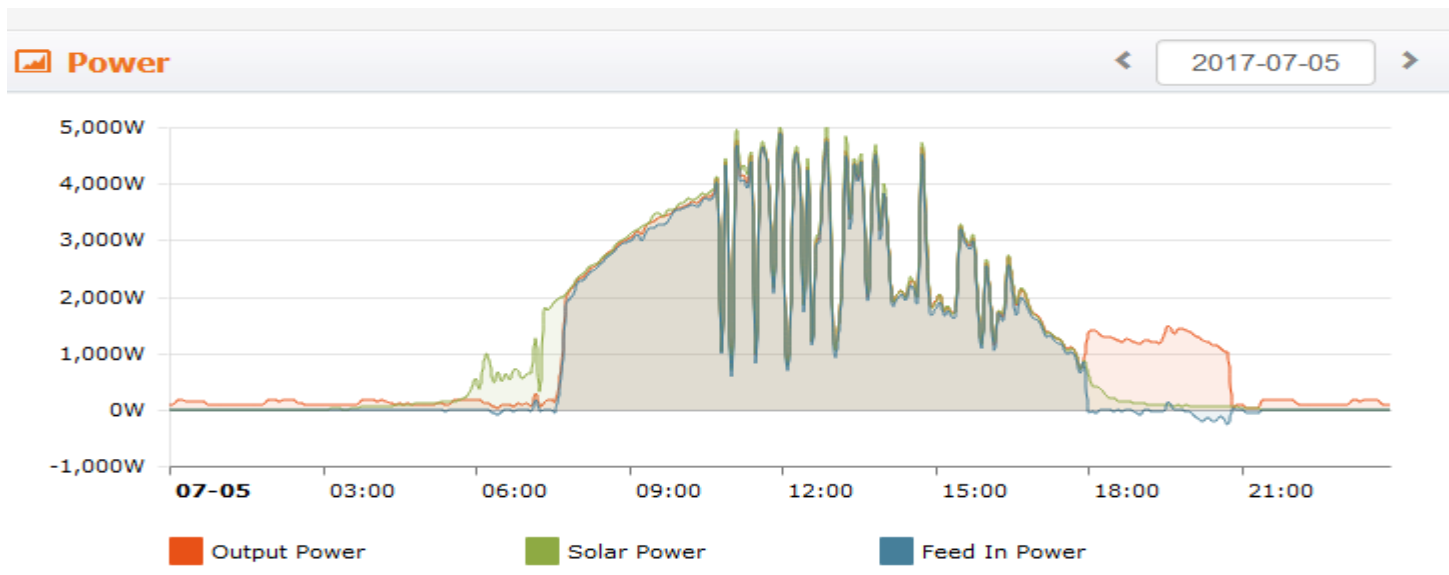
- Environmental and social policy costs
- **The Energy Company Obligation** subsidised heat and insulation measures.
- **The Warm Home Discount** a **£140 discount** for low-income households.
The rollout of new Smart Meters will bring an end to estimated billing.
The Feed-in-Tariff to eligible low-carbon electricity generation technologies

Limitations of renewables

- Solar produces 10 more in summer than winter
- If you provide solar for summer demand you have a big deficit in winter time
- If you provide solar for winter demand in summer 90% of output is wasted
- Wind has similar problems
- Batteries are too expensive and inefficient to store power for more than a couple of days
- Fuel cell, AD or diesel is needed to fill the gap

Salem Memorial Hall

- Recently installed 10 kW solar & 5 kWh of battery
- Solar is providing power during the day
- Battery provides power for evening function and at night
- Battery recharged by 7:30 then surplus is exported
- In winter is might not get fully recharged for the evening



Charging electric vehicles

