

Community-owned Renewable Energy

Caroline Harmon
Marches Energy Agency

caroline.harmon@mea.org.uk

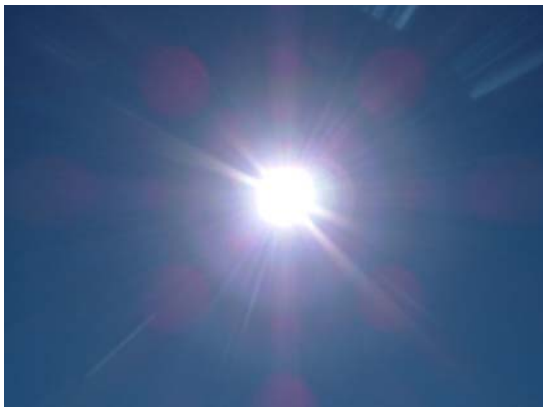
Will Cover

- Types of renewables available
- Examples of community-owned renewables projects
- FITS/RHI
- Sources of Information

What is Renewable Energy?

Renewable energy is natural energy which does not have a limited supply.

Renewable energy can be used again and again and will never run out.



Basic Principles of Energy Efficiency

In this order of importance:

1. Changing behaviour to reduce heating and power needs.
2. Stop heat escaping.
3. Make sure heat is where you want it.
4. Generate this heat in the best way possible for the environment and your pocket.

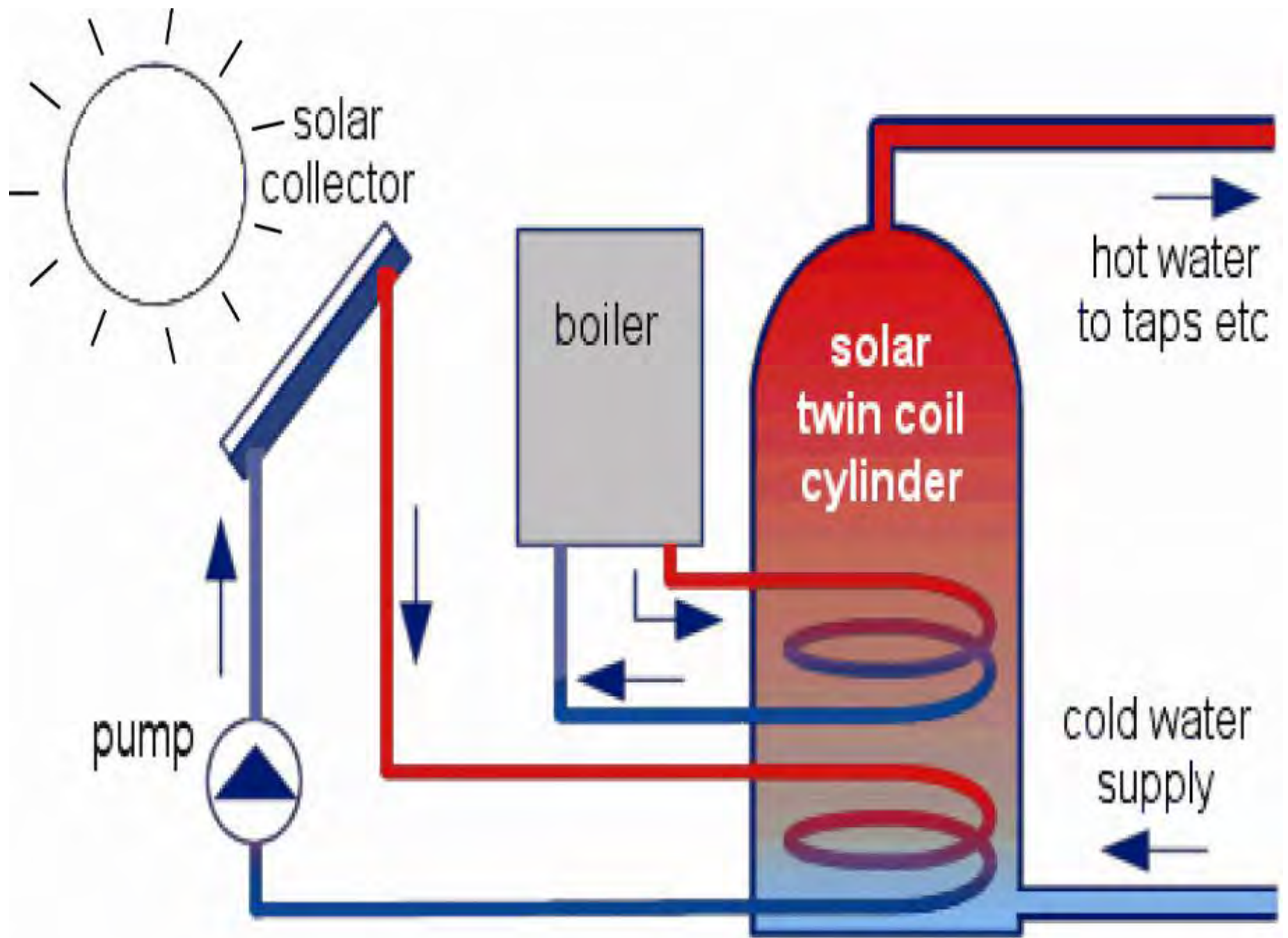
Energy Efficiency





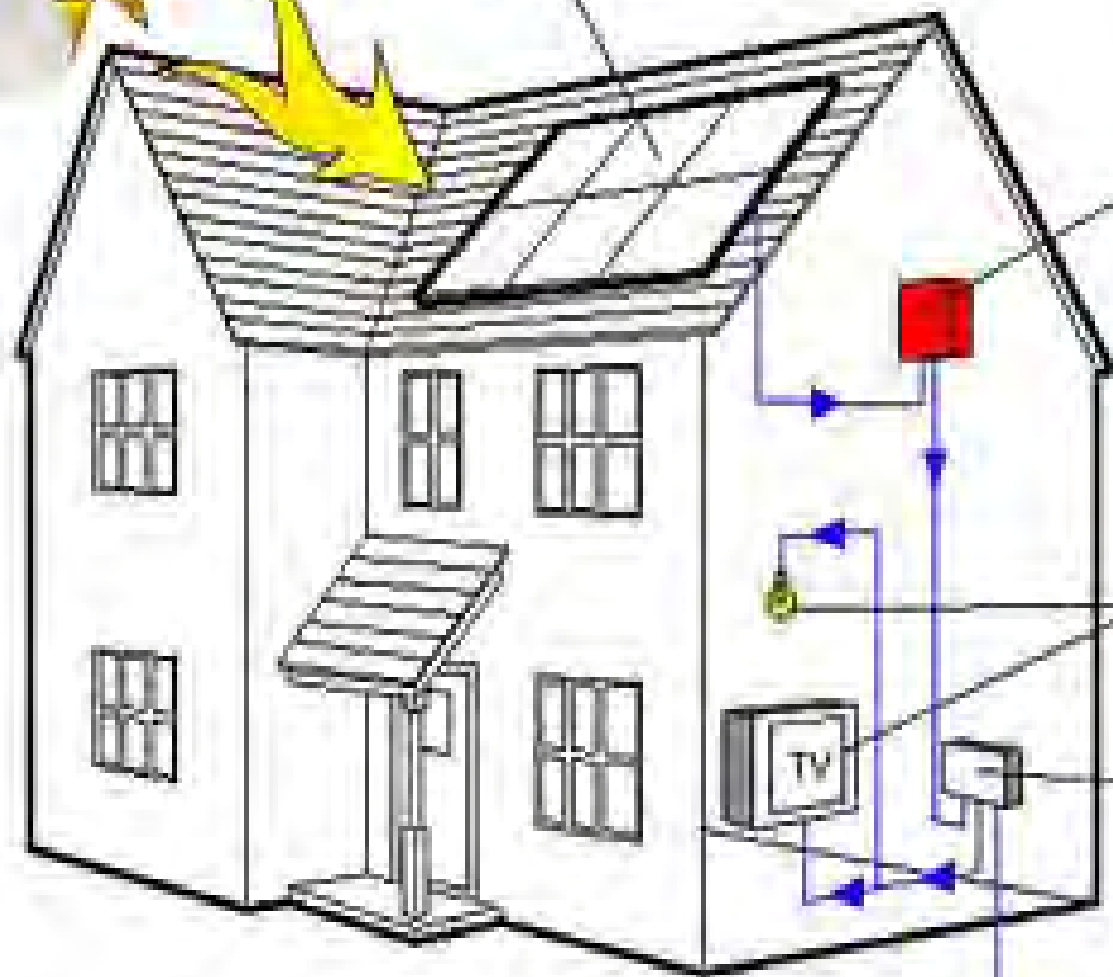
Solar Photovoltaics







PV panels



Inverter

Lights and appliances

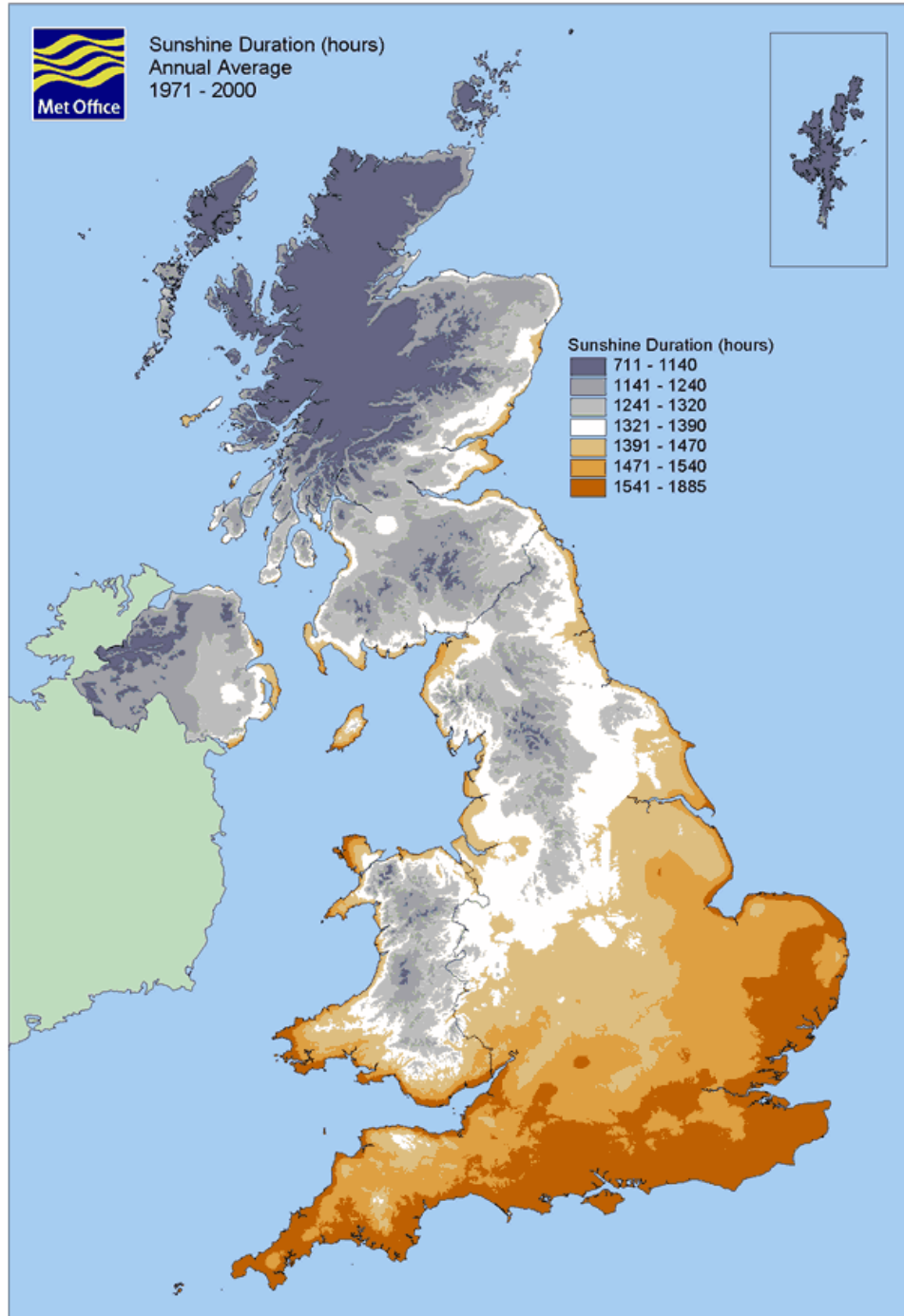
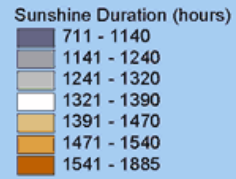
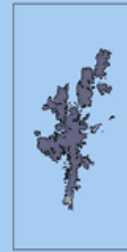
Fuse box



National Grid

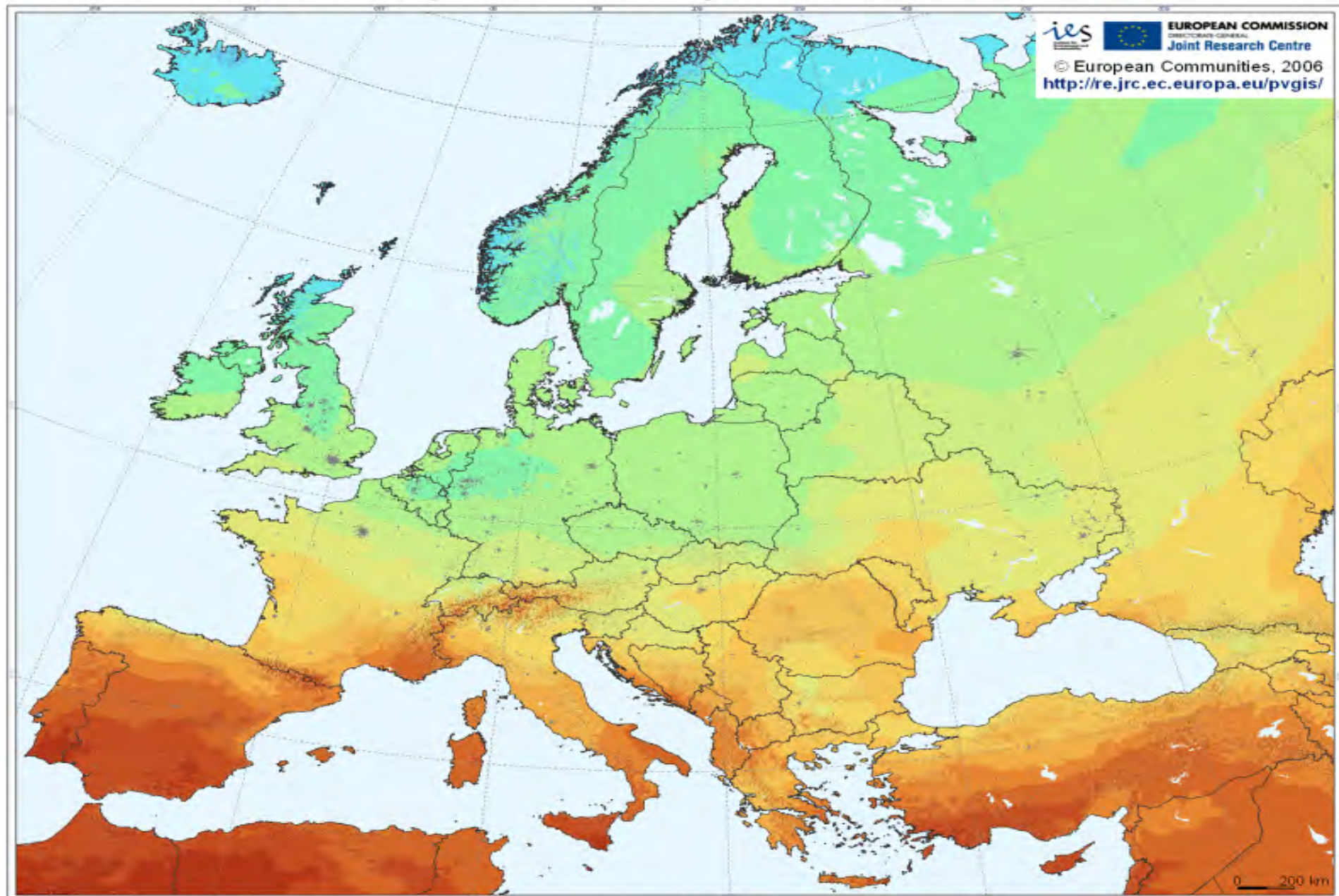


Sunshine Duration (hours)
Annual Average
1971 - 2000



Photovoltaic Solar Electricity Potential in European Countries

ies
EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre
© European Communities, 2006
<http://re.jrc.ec.europa.eu/pvgis/>



Yearly sum of global irradiation incident on optimally-inclined south-oriented photovoltaic modules

Global irradiation [kWh/m²]
<600 800 1000 1200 1400 1600 1800 2000 2200>

Yearly sum of solar electricity generated by 1 kWp system with optimally-inclined modules and performance ratio 0.75

Solar electricity [kWh/kWp]
<450 600 750 900 1050 1200 1350 1500 1650>





What conditions do solar panels need?



Conditions for solar panels

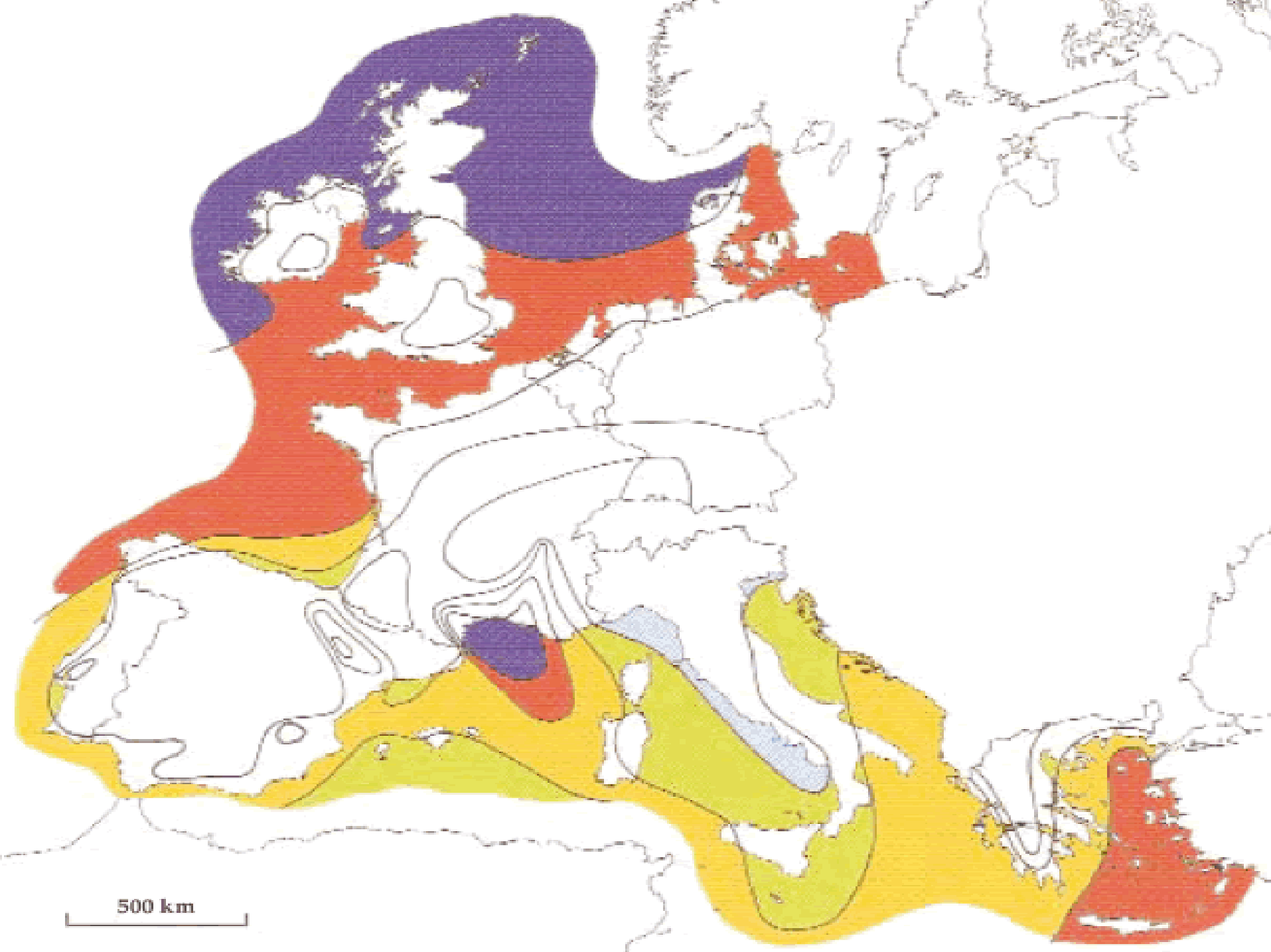


- Lots of sun
- South facing
- Sloping upwards



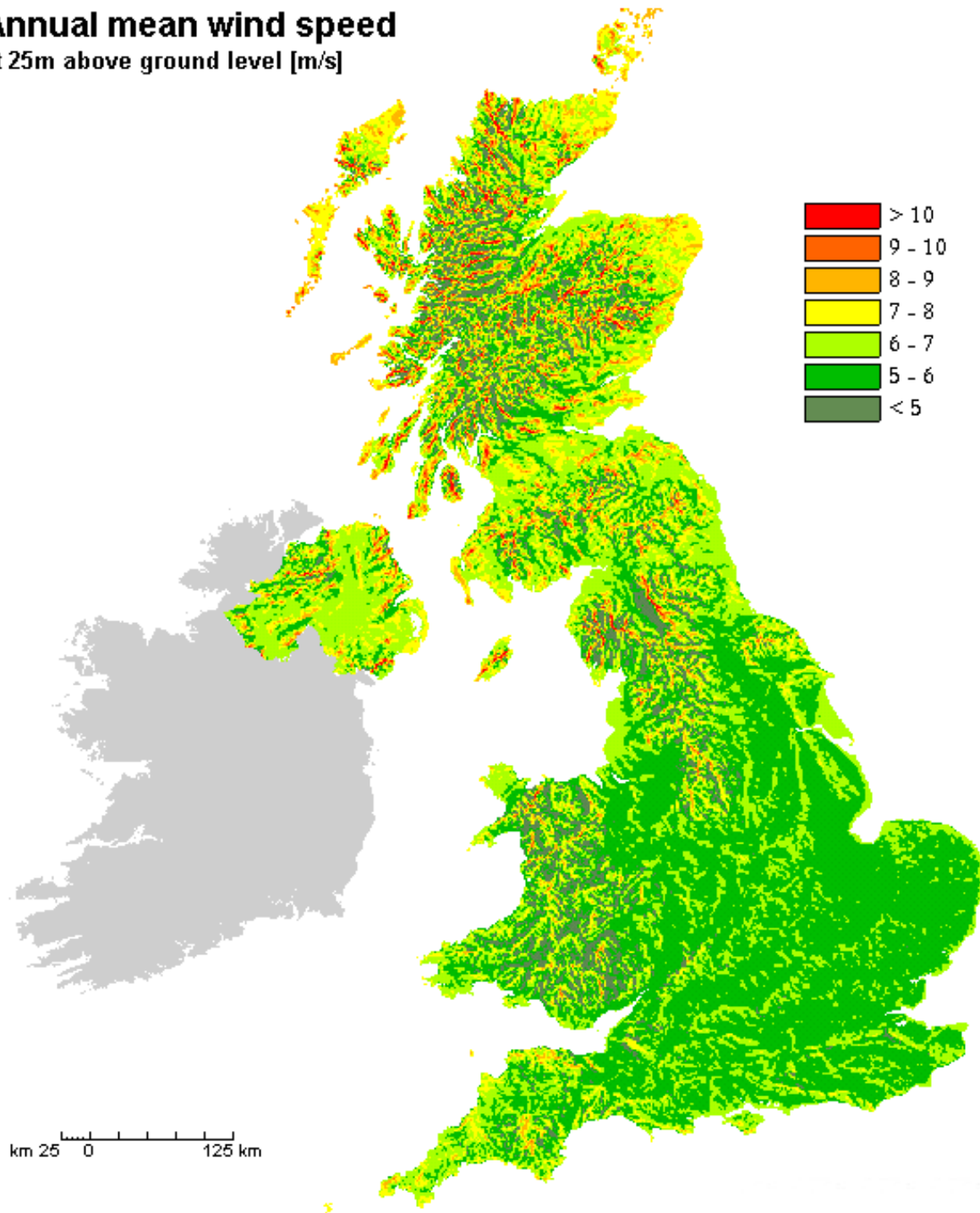






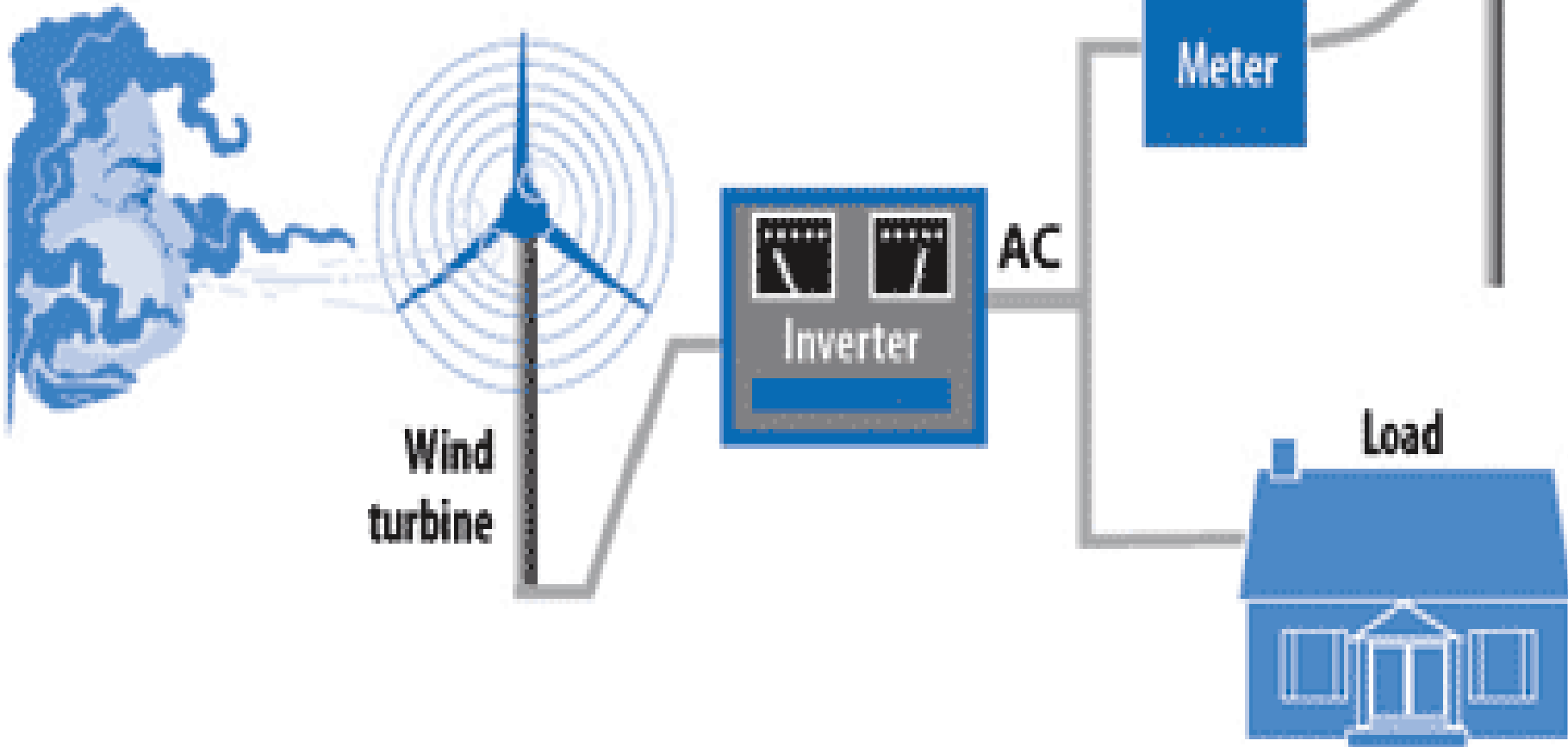
500 km

Annual mean wind speed at 25m above ground level [m/s]





Grid-connected Systems



Wind direction

Area of turbulence



area of turbulence caused by a single house









What conditions do wind turbines need?



Wind power conditions



- **Wind**
 - hills
 - open space
 - no obstructions

Groundsource Heat Pump

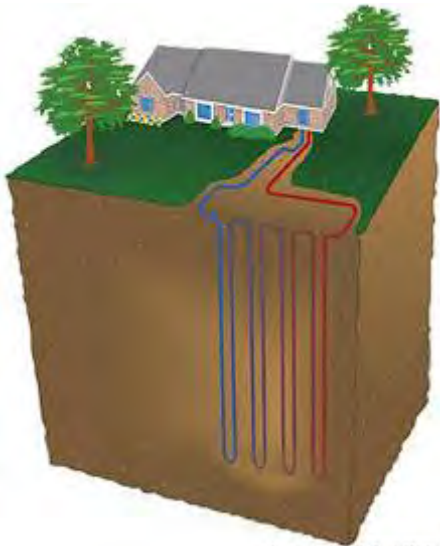
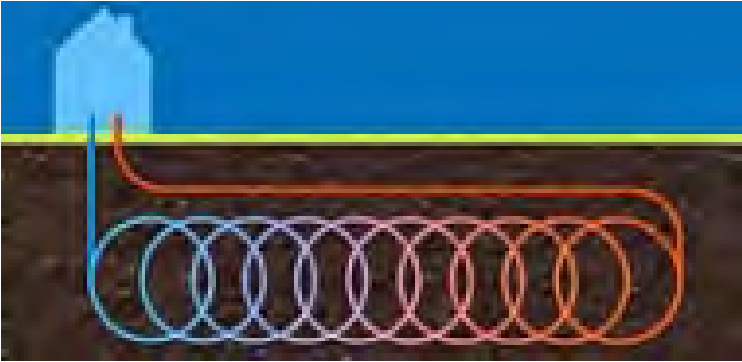


Image courtesy of ClimateMaster



Air Source Heat Pump



Hydroelectricity



Anaerobic Digestion

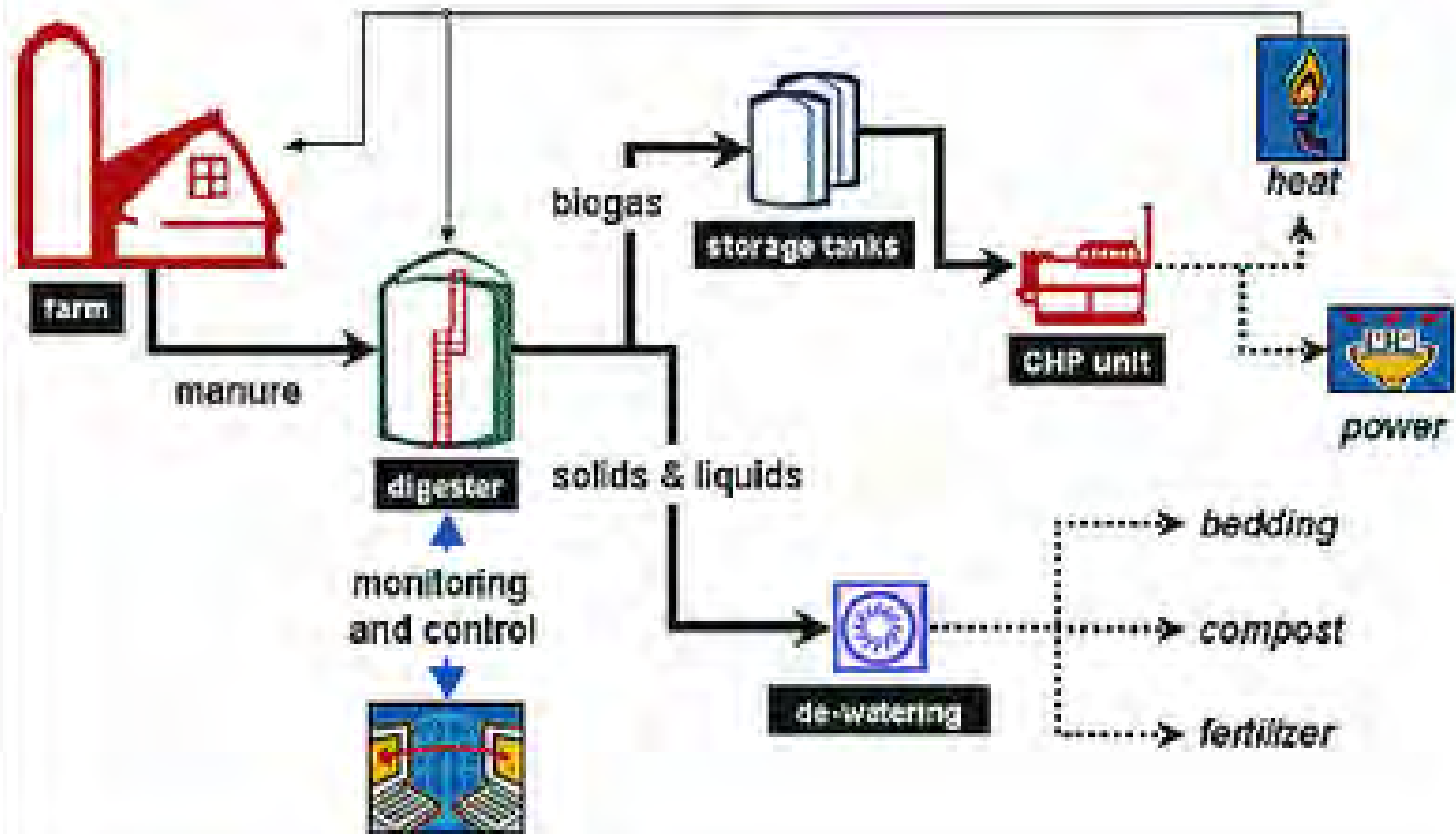








Anaerobic Digester Facility



- The National Farmer's Union target: 100 AD plants
- Currently fewer than 15
- Germany has 5000

- AD is one of the most profitable forms of renewable energy (but not as good as wind)
- AD Plants need to be large: thus, capital investment of around £1-5 million.
- Individual farm will not be large enough to produce enough feedstock. Need to work with a number of farms/suppliers of waste food.

Environmental Benefits

- Reduction in CO₂ emissions: e.g.: 6000 tonnes per annum for a 1000kW plant by:
 - Replacing heat and power produced by fossil fuels
 - Reducing methane release in the atmosphere by slurry and intensive fertilisers
- Digestate is an organic fertiliser with less smell than slurry and it does not spread weeds or disease as slurry does.
- Consistent Energy Production: will operate at full capacity for over 90% of the year. A 1000kW plant will produce as much energy as a 3000kW wind turbine and, in addition, produce heat.

Food vs Energy

- 1000 AD plants will use less land than is currently used for golf courses or keeping horse for leisure.
- Farmers have traditionally used 25% of their land for energy, either to produce wood or feed for horse or oxen for motive power.

Why would communities look at AD?

- It is relatively profitable, second only to wind
- It takes less time to develop than wind. Less time to assess production and obtain permission.
- It generates local employment in construction and running of the plant.
- It produce both heat and power, producing a big impact on a community's carbon emissions.
- Payback on capital costs are just four to eight year.

Downsides

- Not suitable if there is no local source of suitable feedstocks.
- Location needs to consider necessary connection to the grid.

Barriers to Overcome

- AD is largely seen as a chemical process and industrial chemists do not relate easily to the agricultural world.
- Farmers are less likely to be part of co-operatives in England than in Scotland.
- AD is often wrongly perceived to be incineration and isn't well understood by regulators and the public.
- It is often difficult to obtain information on the performance and cost of AD plants.

- The information in this presentation on Anaerobic Digestions was taken from the report:

‘Energy Farms – Anaerobic Digestion’

Author: Keith Richardson, CoRE

(Open Source)



?

Examples of Community-Owned Renewable Projects



Sustainable Hockerton – Wind Turbine

- 225kW Wind Turbine erected within the parish in March 2010 and owned by the community and other individuals who have bought shares.
- IPS. People were able to invest between £250 and £20,000.
- There is now a waiting list to buy shares.
- Worked hard to gain local support from the outset.

Clyde Valley Energy Co-operative



Clyde Valley Energy Co-operative

- In development. Will consist of **two 80m high wind turbines** and an installed capacity of 5MW – enough to heat 3000 homes – around half of the homes in Carlisle, the nearest town.
- Setting up as a **Co-operative**: one member, one vote.
- If each home in the area invests £1250 the turbine will be wholly owned by the community. Expect a 10% return per annum.
- Proposing to partner with a local credit union to allow participation to start at just £250.
- Working with **Energy4All**, a not-for-profit organisation which helps communities own renewable projects.
- The Co-operative will administer a fund of around £25k per year to benefit local projects.

Transition Marlow: Solar 100

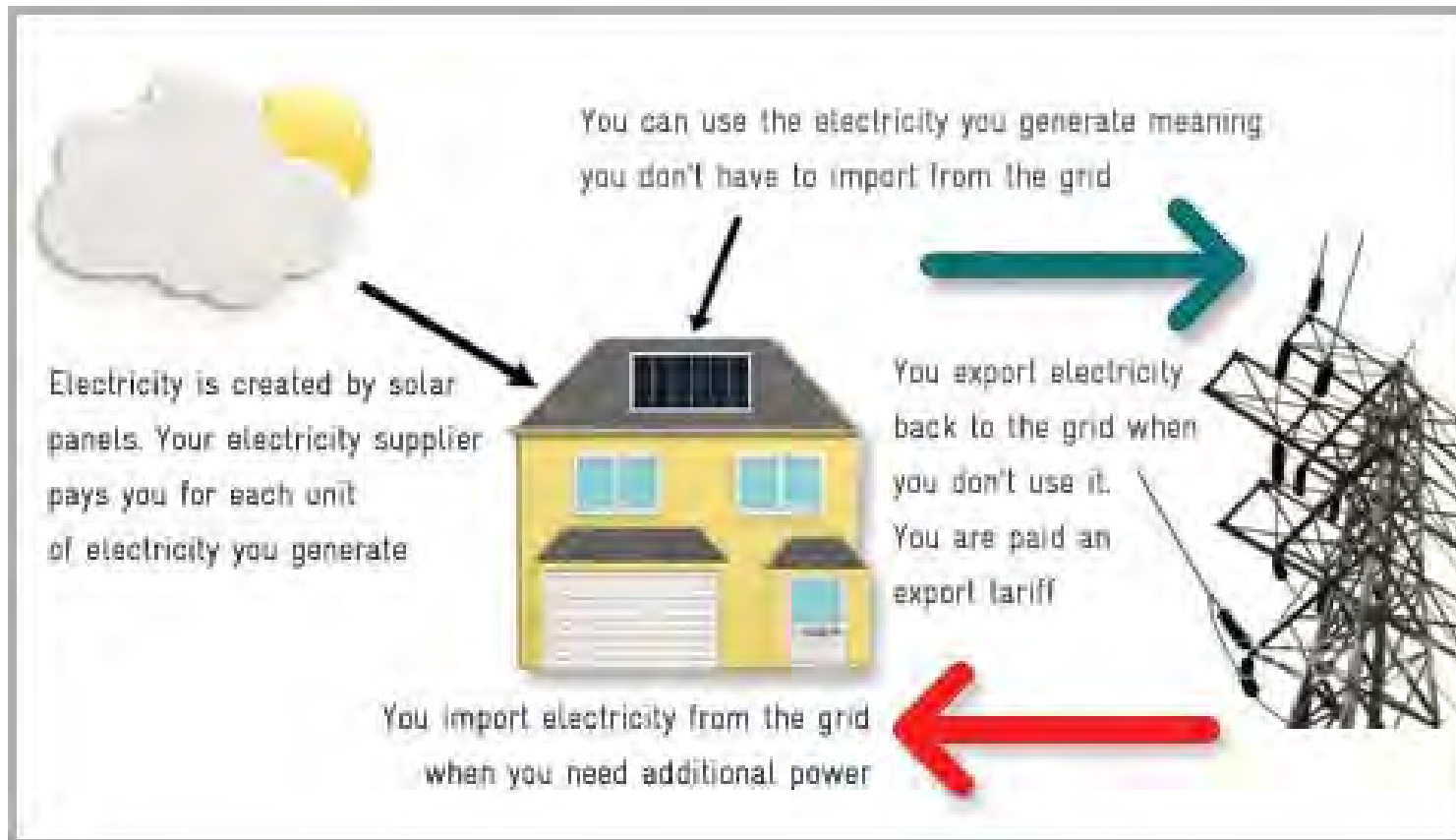


Transition Marlow: Solar 100

- Aim: to get 100 homes to install solar pv
- How: created a solar buying club.
Negotiated a deal with an installer: once 30 people have installed then everyone gets a 12% rebate. Once 100 people install, everyone get a 20% rebate.
- Savings: **80,000kg** carbon per year.
- www.transitionmarlow.org.

Feed-in Tariffs

- Since **1st April 2010** householders and communities who install low carbon electricity technology such as solar photovoltaic (pv) panels and wind turbines up to 5 megawatts have been paid for the electricity they generate, even if they use it themselves. The level of payment depends on the technology and is linked to inflation.
- A further payment is made for any electricity they feed into the grid. These payments are in addition to benefiting from reduced bills as renewables reduce the need to buy electricity. The scheme will also apply to installations commissioned since July 2009 when the policy was announced.
- Must use a certified installer: see handout



www.est.org.uk

Technology	Scale	Tariff level (p/kWh)*	Tariff lifetime (years)
Solar electricity (PV)	≤4 kW (retro fit)	43.3	25
Solar electricity (PV)	≤4 kW (new build)	37.8	25
Wind	≤1.5 kW	36.2	20
Wind	>1.5 - 15 kW	28	20
Micro CHP	≤2kW	10.5	10
Hydroelectricity	≤15 kW	20.9	20

- Example: According to the EST a typical 2.5kW well-sited solar pv installation could offer a homeowner a reward of up to £900 and save them £140 a year on their electricity bill.
- www.est.org.uk/Generate-your-own-energy/Sell-your-own-energy/Feed-in-Tariff-Clean-Energy-Cashback-scheme

Recent developments

- Currently the government are conducting a 'fast track consultation' (it closes TODAY) as they are considering reducing the size of scheme that is eligible (currently 5MW). Prompted by businesses swallowing up the funding available, but could also affect schools and community buildings.
- Originally the best FIT payments were available on installations completed before 31st March 2012. This date will be brought forward if take up is high.

Renewable Heat Incentive

- Being introduced in July 2011.
- Covers solar thermal, GSHP, biomass, deep geothermal, woodfuel burners, heat components of CHP, biofuel heating, anaerobic digestion and green gas injection into the grid.

Renewable Heat Incentive

- Initially: 'RHI Premium Payments' towards the upfront cost for domestic sector. Regular payments for non-domestic.
- By October 2012: long-term tariffs offered on domestic installations.

www.energyshare.com

- Groups can apply for up to £100,000.
- Need to demonstrate community support.
- Need to register on their website, and drum up support from your community before the end of May.
- Information day taking place at River Cottage on 16th May. Register on the website before 9th May.

Sources of Information

- Loads of them!
- See handout
- What MEA can offer

CCAN Service

- Community Climate Action Network Service – Derbyshire & Nottinghamshire
- Monthly E-newsletters: Add your name to the list or email: ccan@mea.org.uk
- ‘Ask Me a Question’ Service
- Forthcoming workshops and study tours, including workshops on how to engage with the planning process.

www.everybodys-talking.org

- The climate change portal for Derbyshire and Nottinghamshire.
- Groups can have a profile on the site: an easy way to have an online presence.
- Currently looking for group case studies for the site.

Everybody's talking about
climate change



The climate change
portal for
Nottinghamshire and
Derbyshire.

marches
energy agency



Caroline Harmon
Project Manager
Marches Energy Agency

caroline.harmon@mea.org.uk

Examples of Community-Owned Renewables

- Summarise what the project is about and how it does/will work.
- Highlight two or three things about the project that struck you.
- Does your group think the idea, or parts of it, are replicable in your community? Why or why not?