

RENEWABLE ELECTRICITY

A GUIDE FOR LOCAL AUTHORITIES

A PUBLICATION FOR THE RES-E PROJECT

17/02/2006



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1. Introduction

The pressures on an energy manager in a local authority are significant and rising. Energy prices in the early part of the 21st century were at a historic low. The new reality is of rising energy prices and tight budgets, coupled with directives to reduce carbon emissions.

Fulfilling the requirements of reducing the cost of energy supply and carbon emissions can seem an impossible task, particularly as you may not have expertise in renewable energy - precisely the sector which can balance the equation.

This document aims to help answer some of the initial questions you may have about various types of renewable energy source - electricity (RES-e), as well as point you in the direction of further help of a specific nature.

The types of electricity production which are probably most relevant for local authorities are wind, PV, CHP, biogas and hydro. Some of these have good demonstration value, and some are already making major contributions to energy production in local authorities across the UK.

One of the most important pieces of information for local authorities interested in RES-e installations are case studies which can be seen as 'best practice' templates. Links to some of these case studies are available in the links section.

Some of the information in this booklet has been compiled from documents on the 'enthuse' website, which is dedicated to helping local government install renewable energy. This useful resource is available at www.enthuse.info

Whilst many questions will undoubtedly remain beyond the scope of this booklet, there should be enough information to point you to the next steps in your planning of RES-e installation. The very nature of RES-e means that each installation will be very site specific and will need its own planning.

The appendix contains a matrix which can be used as a starting point to determine the current level of development of RES-e in your local authority, and as a tool to promote further development of renewable energy.



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2. The Case for RES-e in Local Government

The environmental case for RES-e has never been clearer, with daily press reports of the increasing difficulties caused by the continuing change in climate.

The economic case has also been made far more straightforward by the relentless increases in price of all forms of fossil fuel since 2004.

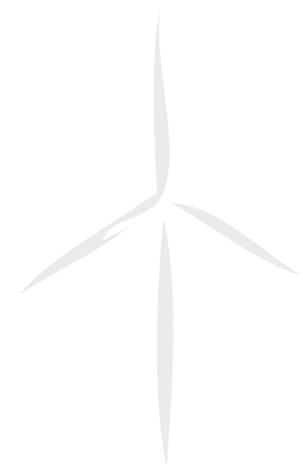
The arguments in favour of the benefits of RES-e need to be made forcefully, and none more so than the economic case.

Some important points to raise on this subject are:

- In some cases renewable electricity is unquestionably the most cost-effective solution (e.g. photovoltaic bus stop lighting, speed warning signs, parking meters; landfill gas generation etc)
- Whole lifecycle costs should be considered in all procurement, design and construction. For example, a building with a 25 year lifespan should not have the architect-included renewable generating capacity removed to save on initial costs
- Energy service contracting can allow the local authority to save money on fuel bills, decrease carbon emissions and eliminate risk
- Almost all installations of renewable energy prevent leakage of money from the local economy to fuel providers from other regions or overseas
- Capital funding may be available to offset all or part of the cost of purchase and installation of RES-e plant
- Ringfencing of savings gained by use of renewable electricity can lead to a virtuous circle of decreasing fuel bills and increasing local revenue year on year
- Energy produced from renewable sources is exempt from the Climate Change Levy

On its own, the economic argument may not be enough. This is why the other benefits of renewable electricity make such a compelling case.

- Low or zero emission generation reduces local pollution and health problems
- Local government has signed up to carbon reduction targets, and energy generation is an inescapable part of the overall strategy
- Local production of energy requires highly skilled and trained installers locally. This will favour local business development, directly benefiting the local economy, adding to local business revenue and adding value to rural and urban livelihood
- Eliminated or reduced need for mains works on cabling and electrical connection, reducing upheaval on infrastructure work



3. Issues for Planners

The planning system is a very important component of the installation process for RES-e, both for those people within the local authority area who wish to install their own generators, and for the local authority itself.

The local authority is often responsible for the design and construction of many buildings, and usually issues guidance and decisions on planning applications.

So what special needs and benefits do RES-e installations have?

The environmental and legal (mandatory targets) case has already been mentioned, but there is a strong case for including RES-e generation within an overall development/ planning strategy. There are further benefits associated with RES-e which can help make other targets easier to attain, for example increasing local employment, increasing community funds and benefits, and strengthening local business.

These benefits are often quantifiable, and attributable directly to individual or multiple installations.

The needs of RES-e installations are not excessive, but they are important.

It is, for example, very important that decisions are made based upon the best scientific evidence available, rather than being swayed by emotive or inaccurate arguments. Large-scale wind turbines are often the target of campaigns of dubious integrity, and it is worth checking out government websites which provide facts on relevant issues (e.g. www.dti.gov.uk/renewables/renew_1.1.2.2.htm).

It is more likely that planners will face applications for smaller-scale installations. Certain minor changes can be made to buildings without planning permission being required, and solar panels are normally included in this category, although there may be exceptions to this for listed buildings, ancient monuments or in a conservation area vista.

Small roof-mounted wind turbines are a matter of great interest among members of the public. Whilst analysis of the current market situation implies that large-scale penetration of this type of device is some way off, prices are falling for the main two types of turbine (Windsave and Swift), and it may be that by the middle of 2007 they will start to become a more common sight.

A comparison of the two above turbines has been carried out for the RES-e project, and is available at www.res-e-cymru.org.uk on the publications page.

The major policy documents setting out the guidelines for planners are Planning Policy Wales, and the Ministerial Interim Planning Policy Statement, which are supplemented by the new TAN8 document. Although the perception is that TAN8 refers solely to large wind farms, it does cover all forms of renewable energy, and does a reasonable job of informing about each of the technologies. It is available for download at <http://www.wales.gov.uk/subiplanning/content/tans/tan08/newtan8/tan8-e.htm>

Local authorities are able to set supplementary planning guidance which can (for example) require any development to produce a proportion of its energy from renewable sources. This is a very useful and powerful tool, and can help greatly in driving forward public acceptance and awareness, and help stimulate the market for renewables and the development of necessary skills for installers.



4. Technologies

Biogas

Many local authorities already produce a significant amount of electricity through biogas production, at landfill or sewage sites. Biogas is extremely cost-effective, and there is a large untapped potential for further use of household organic waste, roadside/parks grass cuttings etc to be used in large digesters to supplement this electricity production.

If they are sited near a heat main or by a large user of heat (eg dairy equipment), they can use the heat as well as the electricity, and this will mean that the effective cost is dramatically reduced, as very little of the total available energy is wasted.

Small farm-sized digesters are being manufactured by several companies in the UK, and these have the potential to be used by local authorities in several different scenarios.

CHP

CHP (combined heat and power) is a way of supplying a large heat requirement, whilst generating electricity at the same time. In general this increases the efficiency of the overall operation.

CHP units are commonly powered by gas, although wood-fuel systems are becoming available which can greatly contribute to the local economy, environmental targets and to lowering energy costs.

A CHP system should be sized appropriate to the heat load required, and the electricity by-product will be a substantial financial and environmental benefit.

Energy Performance Contracting can be a low or no-risk way for local authorities to deliver the heat and power required to a given building or group of properties, with a guaranteed price of delivery is usually less than current fuel bills.

Hydro

Hydro schemes are usually (though not always) unsuitable for individual users, but have potential for exploitation by local authorities. They are usually exceptionally efficient and reliable, although the nature of the technology means that capital costs do not differ greatly with the size of the project, meaning large projects are more cost-effective than small projects.

Abstraction licenses will need to be obtained from the environment agency, and this is particularly difficult in environmentally sensitive areas.

Solar PV

Solar photovoltaics are probably the best known form of renewable electricity, and they are increasingly being deployed across flagship buildings as a way of raising awareness.

They are expensive, but grant funding is available of up to 50% from the DTI large PV demonstration programme. Some projects might attract additional funding through other sources, which can make it financially worthwhile.

Contact your local energy agency for more information about possible funding sources.

Wind

Wind turbines now come in every size imaginable - from several hundred watts to multi-megawatt. There are some interesting examples of local authorities using them off-grid in small cafes etc, although there is also considerable potential for them to be used on local authority land, where they can provide a healthy income stream.

Wind is very economically attractive, and there are many resources available to individuals to make initial assessments about the suitability of a site for installing a wind turbine.

Further information can be obtained from the sister publication "Small-scale wind systems- a reference guide" on the res-e-cymru website. The British Wind Energy Association website also has good advice for initial queries (see links).



5. FAQ's

Q: What grants are available to help with RES-e installations?

A: This depends on the end recipient of the RES-e system. Individuals and businesses can claim a grant of up to £5,000, depending on the technology. Community groups can obtain 50% funding up to £50,000, again depending on the project. The clear-skies website (see links) has details. Local authorities normally benefit from higher levels of grant funding than individuals or businesses.

Often grants for installations are competitive and not automatic, meaning that project proposals need to be of a very high standard before being accepted for a grant.

Q: What forums exist on a national level to help with energy matters for local authorities?

The CLAW group of Welsh local authorities helps deal with all aspects of property management, including energy.

The Welsh HECA forum exists to share best practice amongst HECA officers in Wales.

NASEG (National Assembly Sustainable Energy Group) has regular sessions throughout the year with invited speakers on very varied energy-related topics, which are often relevant to local authorities.

Links to all the above are available on the links page.

Q: Who is the best person to approach for impartial advice on a project?

A: There are several possibilities. General information on the technologies is available from the Energy Saving Trust, by phone or on their website. More specialised advice can be obtained from the consultants and energy agencies listed overleaf. They will normally be happy to provide advice for free over the phone, although on-site advice will often incur a cost.



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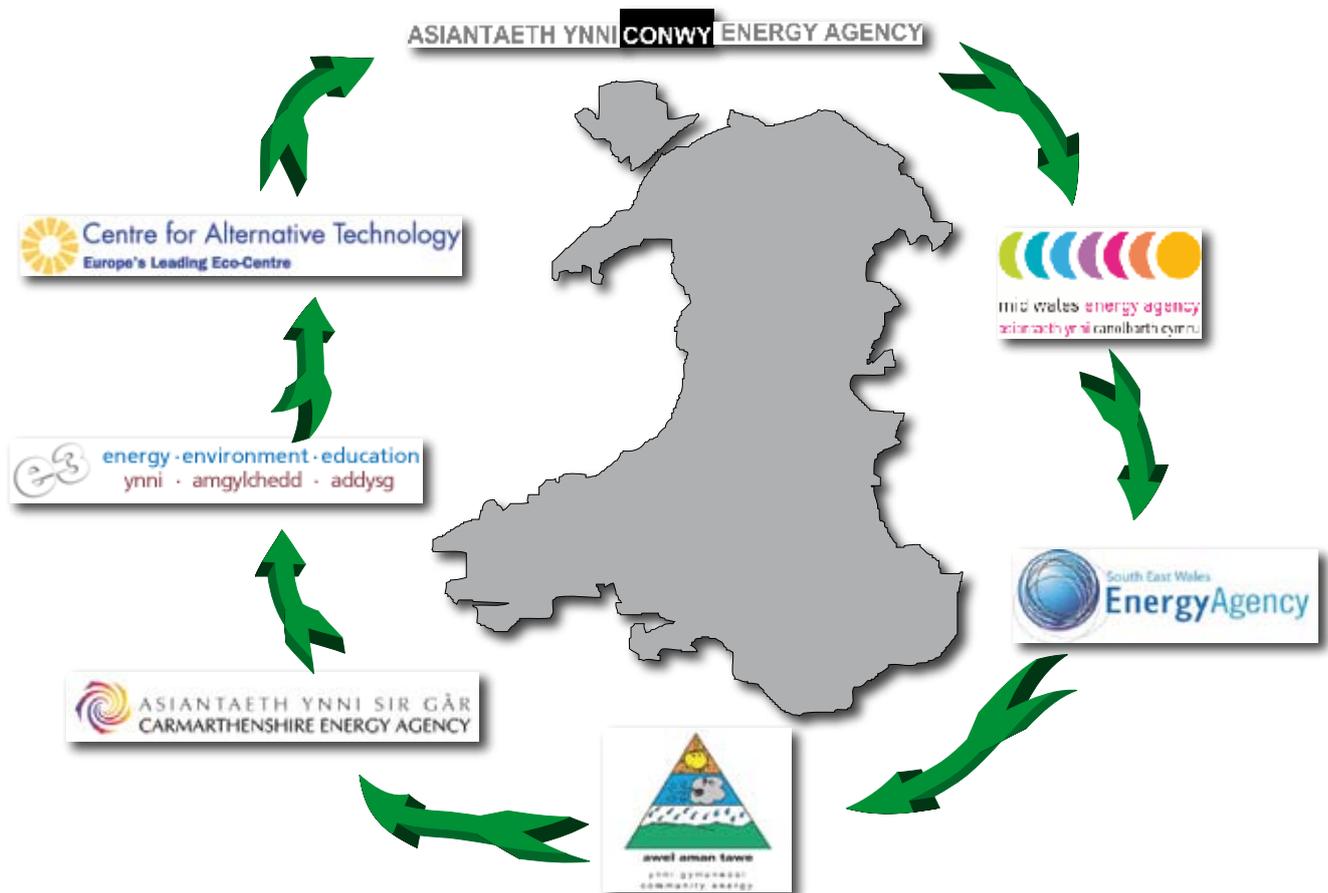
6. Consultants and Energy Agencies

All of the following consultants are accredited by clear skies. It is likely that all on the list will consider work in any part of Wales, although their general location has been indicated.

Website	Specialities	County
www.sustainergy.net/	PV, wind	Pembrokeshire
www.dulas.org.uk	all renewables	Powys
www.energytech.co.uk	all renewables	Swansea
www.greendragonenergy.co.uk	PV, wind, hydro	Swansea
www.sundancerenewables.org.uk	all renewables	Carmarthenshire
West Wales Renewable Energy (01974 298851)	PV, wind	Ceredigion

It is possible that this list will change over time. The most up-to-date version should be available from the clear skies website (www.clear-skies.org).

Energy Agencies



- | | | |
|-------------------------------------|--|--------------|
| • Awel Aman Tawe | www.awelamantawe.org.uk | 01269 822954 |
| • Carmarthenshire Energy Agency | www.ynnisirgar.org.uk | 01994 230003 |
| • Centre for Alternative Technology | www.cat.org.uk | 01654 705950 |
| • Conwy Energy Agency | www.conwyenergyagency.co.uk | 01492 651024 |
| • Mid Wales Energy Agency | www.mwea.org.uk | 01654 703064 |
| • South East Wales Energy Agency | www.sewenergy.org.uk | 01633 267824 |
| • West Wales ECO Centre | www.ecocentre.org.uk | 01239 820235 |

7. Tables of Cost and Suitability

Type	Capital Cost	Maintenance Cost	Running Costs	CO ₂ Emissions	£/tonne CO ₂
Biogas	High	moderate-high	medium	Very low or zero	
CHP	High	Moderate-high	Medium	Low	40-80
Micro-CHP*	High	Moderate-high	Medium	Low	600
Hydro	Very high	low	Very low	Very low or zero	highly variable
Solar PV	Very high	Very low	Very low	Very low or zero	550-1100
Wind	High	Moderate-Low	Very low	Very low or zero	200
Microwind	Very high	Low	Very low	Very low or zero	**

* MicroCHP is slowly being rolled out across the UK, and the most recent analysis suggests that the smaller units do not perform as well as hoped. This will probably change as further design changes are made: www.thecarbontrust.co.uk/carbontrust/about/publications/181105_01.pdf

**Microwind units are currently being manufactured by two UK companies, Windsave and Swift. MWEA has performed a comparative study which is available from the res-e-cymru website (see links). The costs of these units is currently very high, though they are predicted to drop steeply with increasing production

Type	High-density urban housing	Low-density urban housing	Distributed suburban housing	Rural housing
Biogas	Unsuitable	Sometimes suitable	Sometimes suitable	Very suitable
CHP	Very suitable	Sometimes suitable	Sometimes suitable	Sometimes suitable
Micro-CHP*	Sometimes suitable	Sometimes suitable	Very suitable	Very suitable
Hydro	Highly	dependent	on local	conditions
Solar PV	Sometimes suitable	Very suitable	Very suitable	Very suitable
Wind	Unsuitable	Unsuitable	Sometimes suitable	Very suitable
Microwind	Sometimes suitable	Very suitable	Very suitable	Very suitable

Industrial areas are increasingly being viewed as good places to install RES-e systems, and wind turbines and CHP units are particularly suitable for such locations.

Biogas systems are usually, although not always, better suited to rural or semi-rural environments due to their required feedstock.

Some of this information has been taken from the energy savings trust document "New and Renewable Energy Technologies for Existing Buildings"; a relevant link is available on the links page

8. Useful Links

General

www.res-e-cymru.org.uk/content/pubs.php

(Publications and presentations on small-scale wind, public opinion, the current state of RES-e in Wales and more)

www.enthuse.info

(Website dedicated to 'creating local government enthusiasm for renewable energy')

www.est.org.uk/housingbuildings/publications/index.cfm?mode=listing&audtype=100&doctype=105

(General downloadable documents on renewable energy)

www.clear-skies.org/

(Information on current grant schemes)

www.wales.gov.uk/subiplanning/index.htm

(Planning portal of the Welsh Assembly Government)

www.mwea.org.uk/content/1018.php

(Link to MWEA project providing free information on Energy Performance Contracting)

http://www.hecafora.com/regions_files/regions.php?reg=wales&sec=home

(Welsh HECA forum homepage)

<http://www.claw.gov.uk/index.asp>

(CLAW homepage)

<http://www.naseg.co.uk/>

(NASEG homepage)

<http://www.energyanswerswales.co.uk/>

(A directory of suppliers and businesses in the renewable energy industry in Wales)

<http://www.energysavingwales.org.uk/>

(Links to organisations which provide advice and information on small-scale renewables and energy efficiency)

Case Studies

www.woking.gov.uk/environment/climatechangestrategy/climatechange.pdf

www.est.org.uk/housingbuildings/casestudies/index.cfm?mode=listing&audtype=2&casecat=114

http://www.london.gov.uk/mayor/environment/energy/london_renew.jsp

Technologies

Biogas

www.greenfinch.co.uk

www.ees.adelaide.edu.au/pharris/biogas/beginners.html

Wind

<http://www.bwea.com/planning/guide.html>

Solar PV

<http://www.est.org.uk/housingbuildings/funding/solarpv/getting/>

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Inclusion of any company in this document does not constitute an endorsement by MWEA, and we would recommend getting several quotes from different companies before making a commitment to a RES-e installation.



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Appendix 1: The Organisational RES-e Matrix

	policy	organisation	procurement	communication	finance	monitoring
4	<p>Formal RES-e targets adopted by top level management</p> <p>Integrated with national and international targets</p> <p>Action plans with clear goals and regular reviews of policy and targets</p>	<p>RES-e integrated into higher management structure to ensure all relevant areas of the organisation positively influence RES-e developments</p>	<p>RE procurement internally is maximised and procurement for external organisations is facilitated</p> <p>Pioneering new technology and methodology</p>	<p>Proactive identification and facilitation of RES-e projects</p> <p>Handholding between all interested parties</p> <p>PR maximised to maintain profile and political support</p>	<p>Facilitation of sustained large scale financing from public and private sector</p> <p>Use of innovative funding mechanisms in addition to traditional public capital expenditure</p>	<p>Full, detailed energy management monitoring of RE systems on own facilities and continued assessment of RES-e development in this area</p>
3	<p>Local specific RES-e policy and target set</p> <p>Adopted at middle management level</p>	<p>Responsibility for RES-e becomes spread out through all relevant parts of organisation</p>	<p>All electricity purchased from local RES-e sources</p> <p>Installation of RES-e technologies with medium-term payback</p> <p>RES-e technologies are considered in all energy procurement</p>	<p>Development of network of individuals and organisations with an interest in RES-e</p> <p>PR used to disseminate success and raise profile</p>	<p>Strategic plan for financing schemes</p>	<p>Basic monitoring of own RES-e systems</p> <p>Integration of RES-e into other internal energy management systems</p>
2	<p>RES-e specifically mentioned in key documents</p> <p>Adopted at a lower level</p>	<p>RES-e is part-time responsibility of management level personnel e.g. energy manager</p>	<p>Proportion of electricity purchased from local RES-e sources</p> <p>Expansion of cost-effective installations of RES-e on own facilities</p>	<p>Formal advice given to influence developers</p> <p>Promotion of currently economic RES-e to private sector</p> <p>Limited PR</p>	<p>Ad hoc financing for pilot/small scale projects and currently economic RES-e technologies in local area from regional, national or EU sources</p>	<p>Assessment of existing RES-e generation and economic and technical potential in the area</p>
1	<p>RES-e as an aspiration in some local non-policy documents</p> <p>Non-written aspiration of key officer</p>	<p>RES-e is part-time responsibility of low-ranking personnel</p>	<p>Proportion of electricity purchased from RES-e sources, of any location</p> <p>Small installations of most cost-effective RES-e installations on own facilities</p>	<p>Informal contact with community/consumers and RES-e organisations</p> <p>Informal advice and guidance given on request</p>	<p>Some internal financing through conventional channels of most economic RES-e systems</p>	<p>Informal recognition of some RES-e in area</p> <p>Ad hoc assessment of internal installations</p>
0	<p>No mention of RES-e in any written or unwritten policy</p>	<p>No individual or organisational responsibility for RES-e</p>	<p>No procurement of RES-e technology, energy or services</p>	<p>No contact with RES-e producers or consumers</p>	<p>No interest in financial aspect of RES-e</p>	<p>No monitoring or assessment of RES-e</p>

source:www.enthuse.info



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