RENEWABLE ENERGY SOLUTIONS ADDRESSING FUEL POVERTY PROCEEDINGS

CONFERENCE 14TH JUNE 2011
Oculus Centre
Aylesbury, United Kingdom

IEA Bioenergy

TV Energy

FOREWORD

This conference was organised by TV Energy on behalf of partner organisations including the Task 29 action of the IEA Bioenergy Agreement.

Task 29 is concerned with the socio-economic impacts, drivers and barriers to wider application of biomass technologies in member countries (for more information see http://www.task29.net). The particular concern focused on by this conference, is that biomass and more widely renewable energy, is not being accessed significantly by the poorer members of society, those that exist in fuel poverty. The conference goes on to explore reasons and to exhibit best practice for using bioenergy and other renewables, often in hybrid or multi-technology solutions.

TV Energy would like to thank the members of the IEA Task team for their contributions as well as our local partners and sponsors in particular Robert Smart (Aylesbury Vale District Council), Cllr Dr Royce Longton (West Berkshire Council, Chair TV Energy), Prof Stephen Nortcliff (University of Reading), Godfrey Bevan, Gemma Lacey (Waitrose), Ben Burfoot (Reading Borough Council) and Andrew Lamb (SSE). Our thanks also to Peter Hatch (Housing Solutions), Abigail Nichols (Community Transport, Buckinghamshire CC), Chris Miles (Econergy), Steve Carter (Ardenham Energy) and Darren Baker (Photon Energy) for exhibiting and / or speaking.

Dr Keith M Richards OBE
Task 29 Leader & Managing Director TV Energy

29th June 2011

SUMMARY

Fuel Poverty affects more than 6 million people across the UK and with increasing insecurity of conventional fuel supply coupled with ever increasing costs, these numbers can only get worse if no remedial action is taken. The consequences of such a large number of struggling households has a dramatic effect on the overall economy and in particular impacts on those least able to help themselves; the fuel poor.

TV Energy organised and hosted an international Fuel Poverty Conference on behalf of the IEA Bioenergy Task 29 (socio-economics) initiative at the Oculus Centre in Aylesbury, Buckinghamshire, UK on the 14th June 2011. The event targeted an audience of around seventy and included a mixture of delegates from Housing Associations and Local Councils to installers and utility businesses. Presentations were given by members of the IEA team; Canada, Croatia, Germany, Norway and UK as well as local partners of TV Energy. The presentations contrasted and compared the actions from different countries on such issues. A series of case studies were presented to explain what is currently being done in the UK to harness the potential of local, renewable energy resources to mitigate some of these impacts within our communities.

A number of exhibitors, from the UK, were also in attendance to help demonstrate innovative good practice and illustrate the benefits of renewable energy to tenants and/or local communities within in UK. The conference was followed by a day of technical tours and site visits to show associated IEA members a number of working examples of biomass boilers and other forms of renewable energy at various different sites across the Thames Valley.

CONFERENCE PROGRAMME

Renewable Energy Solutions Addressing Fuel Poverty
Tuesday 14th June 2011
The Oculus Conference Centre, Aylesbury
Buckinghamshire HP19 8FF

9.30 – 10.00	**Registration**	
10.00 – 10.10	Welcome & introduction to the conference	Chairman of Aylesbury Vale DC Cllr Derrick Isham Leader of Council Cllr John Cartwright
Session 1: The Thames Valley Perspective		Chair: Dr Royce Longton, Chairman, TV Energy
10.10 – 10.30	Opportunities for renewable Energy Solutions in the Thames Valley	Keith Richards OBE, MD TV Energy & Task 29 Leader, IEA Bioenergy
10.30 – 10.50	The challenges and benefits to Landlords and Tenants of going green	Peter Hatch, Group Operations Director, Housing Solutions
10.50 - 11.10	Fuel poverty from a small country perspective: what we do in Croatia	Julije Domac, REGEA & Task 29 Associate Leader, Croatia
11.10 – 11.25	Discussion	
11.25-11.45	**Tea & Coffee**	
Session 2: Private and public sector initiatives		Chair Prof Stephen Nortcliff, University of Reading
11.45- 12.05	Engaging communities in renewable energy solutions	Gemma Lacey, Waitrose Ltd
12.05 - 12.25	A developer's practical experience of installing bioenergy systems	Chris Miles, MD Econergy Ltd
12.25 - 12.45	Dealing with the cold: the Canadian experience	Bill White, Forestry Service, Canada
12.45 – 13.00	Discussion	
13.00 – 14.00	**Lunch & Exhibition**	
Session 3: Domestic and International comparisons		
14.00 – 14.10	Introduction to the afternoon session	Chair: Godfrey Bevan CBE (retired IEA &DTI)
14.10 – 14.30	Renewables and the fuel poor: a large utility's approach	Andrew Lamb, SSE Ltd
14.30 – 14.50	How a Local Authority can deploy renewables to address fuel poverty	Ben Burfoot, Reading BC
14.50 – 15.10	The economics of fuel poverty	Sebastian Elbe, Sprint Consultants, Germany
15.10 – 15.30	Fuel poverty in an energy rich country	Erik Hohle, Energy Farm, Norway
15.30 – 16.00	Discussion and debate on the way forward for renewable energy to help address the issues and challenges raised by fuel poverty	
16.00 – 16.05	**Concluding Remarks and Close**	**Keith Richards**

PRESENTATIONS AND DISCUSSION

The conference examined many different views of fuel poverty reflecting concerns and initiatives from public, private and social sectors along with contrasting standpoints from other countries. The main points from each presentation are set out below and the slides (in PDF format) are available to download from the TV Energy website: www.tvenergy.org.

SESSION I

UK perspective-Keith Richards, TV Energy

Households are considered, by the UK Government, to be in fuel poverty if they need to spend more than 10% of their disposable income on fuel to keep their home in a 'satisfactory' and warm condition. With rapidly escalating fuel prices (e.g. Scottish Power have just announced a 19% increase in gas prices and a 10% increase in electricity prices from 1st August), a series of harsh winters causing domestic consumers to need some 10% more fuel than previously and often poor standards of housing (poorly insulated, drafts etc.), the UK is set to see an increase in those who are effectively fuel poor and unable to keep warm at home. Groups that are particularly affected include those mostly on low and fixed incomes: the elderly, young and disabled, single parent households. In order to break out of this vicious circle of fuel poverty greater assistance is required. Social Landlords can play a big part in this by taking advantage of emerging renewable energy options which will help vulnerable individuals.

The UK has a number of schemes operating to help with the cost of fuel and to help improve energy efficiency in our poorest housing stock. Improvements are being made but there is still a long way to go. The Feed-In-Tariff (FIT) was introduced on the 1st April 2010 with 25 year contracts and is marketed as the 'green cash back' as the consumer gets paid for all the electricity generated by a number of renewable technologies. In addition, the consumer gets paid for any electricity which is sold back to the grid. This scheme has been highly successful in starting to mainstream certain technologies such as PV (Photo-Voltaics) by effectively halving the payback on systems. Deploying such technology can enable both the Landlord and the Tenant to benefit financially and to directly combat Fuel Poverty. Other presentations will pick up on these opportunities where TV Energy has been assisting local initiatives to seize the moment. Time is of the essence to get the best deal form the FIT before further changes are made by government on the scale of the payments. In particular, larger PV systems above 50kWp are to be penalised and returns will be longer. This will have implications for large community buildings and homes, nevertheless, for the vast majority of applications, rates will not be affected until April 2012 when all is reviewed.

In July 2011, the Renewable Heat Incentive (RHI) will commence and this will represent the first fiscal assistance for renewable heat; bioenergy, solar thermal and Ground Source Heat Pumps (GSHP). The RHI offers major opportunities for Social Landlords to look at renewables to provide more cost effective methods of heating their properties. Again, there can be benefits to both Landlord and Tenant of changing to greener, more sustainable fuels. TV Energy is working with a number of organisations to examine the extent of this potential.

Finally, the 'Green Deal' will be introduced into the UK in the autumn of 2012 and is a new radical way of improving energy efficiency in homes, businesses and community spaces where no up-front costs are incurred. Instead, consumers will pay for improvements on their quarterly bills. Micro generation can also be included in this 'deal' enabling the installation of PV, solar thermal and heat

pumps. The 'golden rule' must apply whereby savings are equal to or greater than the costs of the works involved.

The UK, like other countries, face challenges with introducing changes – even when these changes are beneficial as is the case with deploying renewable energy technologies. There remains considerable work to do in communicating with ordinary people and achieving the necessary change in attitudes. For this reason, continuing education is paramount if renewable energy is to be taken seriously and have a major influence on the fight against fuel poverty.

Housing Solutions, UK-Peter Hatch

Housing Solutions Ltd own, manage and maintain more than 6,000 homes that house more than 9,000 people. A high proportion of these residents are classed as fuel poor. In a recent survey, some 73% of tenants placed household fuel spending and energy efficiency at the top of their priority list, for action. This represents an escalation of concern over the last 2 years.

To help those in fuel poverty, Housing Solutions (HS) has started their own 'Green Deal' in the confidence it will help alleviate those who most struggle to pay their energy bills. This was done as it is believed that the government Green Deal will be unaffordable for a majority of tenants. HS aim to modernise houses (by improving energy efficiency of buildings), increase the number of renewable energy options and educate tenants in more effective ways to use energy. A key early initiative is a pilot programme to install PV panels on 104 homes and 19 blocks. This programme, based on TV Energy estimates, will reduce fuel poverty by reducing tenants' fuel bills, provide an income stream for the company whilst also reducing CO_2 emissions. Heat pumps, solar thermal and biomass are other option HS are examining to deliver renewable heat where a number of properties are off the gas supply and are particularly impacted by high fuel oil costs.

Housing Solutions has been faced with challenges in the past with resident apathy. They have seen, for example, a 25% refusal rate on a free loft insulation service as tenants feel there is considerable inconvenience involved in installation. A further example relating to the ground breaking Housing Solutions Greenfields Development in 2001 which saw PV arrays included in a highly energy efficient set of houses and flats. Housing Solutions had to deal with tenants changing the meters without letting them know, resulting in a loss of the PV benefits.

Such incidents reinforce the need for tenant education or many of the perceived benefits of change will be lost. Emphasis also needs to be placed on ensuring that systems that are introduced are as far as possible, compatible and practical for the tenants.

Finally, Housing Solutions are encouraging staff to embrace green agendas so that they can make a real difference to climate change and help tenants learn about the benefits of renewable energy.

Croatia's perspective- Julije Domac

The term 'fuel poverty' does not exist in the Croatian dictionary and it is not seen as a problem since access to energy is part of the 'public service' in Croatia. However, since 2008, Croatia has encountered economic problems and case studies revealed that there are many people living in fuel poverty in the country. The most vulnerable of these being the elderly and with the percentage of people aged 60 and over increasing, the problem is expected to grow. Fuel poverty is a condition that is seen to affect mainly those living in houses and likewise, since this sector is growing (currently 65% of the population live in houses) this will also become an increasing problem.

In March 2009 a project called 'I can have solar panels' was set up to help around 60 households to reduce their energy bills. Overall, a total of 150 applications came through from individuals eager to join the scheme. The process of choosing applicants involved a questionnaire and from this each household had to meet certain criteria. The scheme aims to help finance the cost of solar thermal equipment as well as pellet and biomass stoves, PV systems, heat pumps, and small wind turbines. It has been a huge success with eight more areas within Croatia introducing this scheme. Currently, there are more than 1,000 household benefiting from the scheme and it has received both national and international recognition. Finally, this scheme has recently been given a Local Energy Award.

A further initiative 'I can have a warm home' was started in May 2011 and involves the improvement of buildings within Croatia. The objectives are to increase the number of energy efficient windows and doors as well as to insulate walls. In addition, programmes have been set up to teach Nursery aged children all about energy efficiency by encouraging them to participate in trade fairs, helping to educate them. Energy related cartoons have been very successful with this age group!

Session I- question and answer

There were a number of questions to all speakers from different organisations. The session saw praise for Peter Hatch at HS with questions relating to District Heating Schemes, return on investment as a landlord and solar planning applications for homes with and without solar. Peter detailed that Housing Solutions are currently looking at District Heating Schemes but there are challenges they need to overcome first; cost and time demand in particular. Currently, HS are concentrating on a pilot study of solar schemes. Maximising the financial benefits from the FIT is key to the landlord being able to achieve a good return on investment. Prior to the FIT, however, return on investment was achieved by environmental improvements as part of an overall programme and was funded by Housing solutions upfront. Finally, he expressed an opinion that the ideal technical solution is to have integrated solar PV tiles. He also believes that HS will experience some opposition to the PV retrofit but aesthetics versus fuel poverty and natural resource efficiency need to be given appropriate weight. Keith and Julije expressed opinions that the aesthetic sensitivities need to be addressed alongside promoting positive reasons for change.

Cllr Lambert from AVDC (Aylesbury Vale District Council) questioned how Croatia got the government involvement on renewable energy schemes. Julije stated that it took 2 years to get the first government officials on board, which wasn't easy, but after seeing the success of the schemes other government departments wanted to join.

The Green Deal in the UK and eligibility to qualify for the FIT and RHI was a further question. There needs to be further clarification from government as to how these schemes will all work together to give the maximum impact.

Conclusions from the session- Building regulations are moving further towards requiring micro generation systems in order to reach the UK's CO_2 targets. With this in mind, planning barriers will gradually disappear as renewable technologies become mainstreamed. Overall, it is important to work together to share experiences of schemes and successes from a number of countries and businesses.

SESSION II

Waitrose, UK- Gemma Lacey

Engaging communities with using renewable technology is something that the John Lewis partnership has been doing for some time. A number of changes have been made within the business taht include: greening their transport fleet, increasing energy efficiency and stopping the use of HFCs in their refrigerators throughout the stores. Waitrose also has become a grower of willow coppice on the Leckford Estate. This crop not only provides cover for their free range chickens, but is also harvested to produce woodchip, providing a number of jobs for local individuals in the process.

Gemma went on to say, that with increasing targets for renewable energy in the UK set alongside the requirement for large businesses to reduce their CO_2 emissions, Waitrose takes green energy very seriously. In this regard, Waitrose has recently set a target to deliver a 15% actual reduction in their carbon footprint by 2020 against a 2010 baseline. To assist in reaching these targets an energy centre in East Cowes, Isle of Wight, will be opening at the end of this year focusing on renewable energy. Waitrose will be working with local government and landowners on the Isle of Wight to assist in the local supply of wood fuel that will fuel a biomass boiler which will heat an adjacent store. In addition, the boiler at the energy centre will also be able to provide green energy to 200 new homes in the area. This new energy centre will create employment and educational opportunities for local people and visitors. This includes designing a visitor's area with glazed viewing panels into the energy centre heart.
With the great interest created by the energy centre in East Cowes, Waitrose are currently looking at opening more energy centres in Bracknell and Truro with an additional 150 sites across the UK also being reviewed for similar ideas. Waitrose are continuing to explore other renewable energy opportunities that will not only help them become more sustainable but will help them to help local communities benefit from green energy.

Econergy, UK-Chris Miles

Urban community heating is the main focus of Econergy and they believe biomass and the new RHI have great potential in helping reduce heating bills. With the Governments targets of 15% of UK's energy to come from renewable sources by 2020 and within that, 12% of heating from renewable sources by 2020, the RHI is the main fiscal instrument to create the nexessary change. At present, heating in the UK accounts for 47% of UK's CO_2 emissions with 2 million homes using oil. These are the houses that need to be the primary target if widescale adoption of renewables is to become a reality.
The key to designing biomass district heating networks is to design for minimum cost over the boiler's lifetime and it is also important to think about fuel type, delivery method and storage facilities as these can increase the cost of systems. An example from Econergy, Walsall Housing Association, demonstrated that by changing to a biomass boiler, as a source of heating, the reduction in the heat demand in a number of flats fell to between 40%-60% and helped save up to 25% on fuel compared to gas and up to 80% when compared to electricity. In addition, 9,000 tonnes of CO_2 over the lifetime of the scheme will be saved by switching to biomass.
The Government's 2020 biomass heat target of 38TWh will require 11 million tonnes per year of wood fuel. Short rotation coppice is seen to be a popular choice since there are only finite amounts of existing wood fuel available and it is estimated that it is possible in the UK to produce approximately 700,000 tonnes per annum by 2020. However, this is seen as an unlikely occurrence as there are insufficient incentives to get farmers to change.

At present, more than 300,000 tonnes of wood pellets are produced in the UK of which 90% are exported. This is a very substantial supply in itself and when coupled with imports shows that availability in the UK is unlikely to be an issue for the foreseeable future.
To conclude, the financial benefits afforded by the RHI make biomass an inviting option for a low cost, green technology choice for the future.

Canada's perspective- Bill White

Adequate heating in the home is crucial in Canada given the harsh cold winters that are experienced across the country. However, the term 'Fuel Poverty' has only recently entered the Canadian dictionary. As is the case in the UK, energy costs are increasing in Canada and alternative energy options remain more expensive than current choices. Canada has a big problem with polarisation of income and the greatest impact of those struggling to pay energy bills are the most vulnerable in society; the elderly, the ill and the disabled. Government programmes are in place to try and make homes more energy efficient but the people who have more money are again better off in this situation and are able to make the improvements needed. An increase in incomes would help the vulnerable but this cannot be done on a large scale over a short period of time and thus other policies such as subsidies for the poor need to be examined. Bioenergy in Canada is one way that can impact on fuel poverty in rural and remote areas with the use of district energy schemes which would replace subsidy schemes in part.

Overall, fuel poverty is a new concept and there is very little known about it in Canada. However, Canada can learn from UK experience and policies. As far as renewables are concerned, a priority is to reduce the cost so that they can compete effectively with traditional fuels. Only then will they be a force to be reckoned with on such agendas as Fuel Poverty.

Session II- question and answers

There were a mixture of questions in this session relating to Waitrose and the Green Deal, district heating schemes along with biomass and agriculture. Ignorance of the financial benefits of the RHI were also discussed.

Gemma Lacey (Waitrose) responded to the question on the Green Deal and stated that talking to the Government helped Waitrose and the John Lewis Partnership to understand opportunities regarding energy products and domestic energy assessment services. Waitrose is also thinking about being involved in Green Deal delivery – details yet to be agreed. The partnership has also introduced small incentives for the staff to become greener and more energy efficient.

Questions concerning biomass boilers and the RHI were also examined. Chris Miles stated that there has been a selection of biomass boilers put into schools which are not currently being used. This was though mainly due to the cost of wood fuel relative to competitor fuels (oil, gas, electricity, LPG). The reality is that many of these schools may well be better off using wood given the RHI, but that the schools were ignorant of the benefits accruing. He gave an example of 7 schools in Bristol which were not using their biomass boilers. This meant that they would have missed out on the benefits of the RHI which totalled around £40,000 per boiler per annum. After learning of the financial benefits of the RHI during the next heating season they are expected to be using them!

Chris also answered questions on capital cost of pipework & distribution for district heating schemes which is not dealt with by the RHI. One response was "Social housing providers may have an obligation to improve the energy situation for tenants. For example, Walsall Housing Association has seen that electric heating bills are extortionate. This has led to the options for supplying heat to be reviewed to try and get a better deal for tenants. Comparisons for new electric heaters, gas

community heating or biomass communal heating have been carried out. The RHI will fund the difference between the community heating or biomass communal heating. In many cases a Bioenergy scheme turns out to be the best financial answer given an RHI uplift or the parallel Eco grant replacing CERT/CESP".

Finally, the question of global food supply/security, population increase and biomass was explored. Stephen Nortcliff responded to a questioner and said that old set-aside areas or agriculturally unproductive areas would be best suited for bioenergy as these crops are sufficiently robust for growing on infertile/contaminated land. Roger Emmett also said that with larger scale agriculture & equipment, all fields have areas where it is less likely to grow food crops and perhaps these areas would be ideal for biomass leaving the main section for food crop growing.

Conclusions from the session- The RHI can help with the (economic) decision of whether to choose a biomass communal technology as opposed to another communal technology given that communal infrastructure is needed. In particular, by replacing electric heating with a biomass district heating schemes, social housing can overcome the hurdle of high capital costs (for bioenergy schemes) since this can be funded through the social obligation improvements programmes of housing associations.

SESSION III

Scottish and Southern Electric, UK- Andrew Lamb

SSE is the largest renewable energy generator in the UK and has in excess of 2,000MW capacity including energy production from hydro, wind and biomass. SSE is a company that also supplies and installs renewable technologies as retrofits or in new builds throughout the UK. With new obligations on developers to build low carbon developments, SSE are mostly focusing on helping to introduce renewable heating systems and other renewable technologies to achieve targets set (e.g. by Local Planning Authorities). With this in mind, SSE review schemes which have at least 400 housing units to see if a viable scheme is possible. Below this number, the fixed costs associated with such schemes make smaller projects too expensive. However, SSE do not rule out smaller schemes and will give consideration to special cases.

SSE are actively helping those in fuel poverty, for example those on a gas take contract can typically save between 10-15% on bills. The customers on gas and electricity save an additional 10% on electricity and those in fuel poverty can qualify for further reductions on their bills.

Reading Borough Council, UK-Ben Burfoot

Due to increasing costs of living and the rise of commodity prices, the UK has been predicating a deteriorating picture when it comes to fuel poverty. Like many councils, Reading Borough Council has found that un-insulated houses are a big problem when looking and trying to alleviate fuel poverty. As a starting point, Reading BC has a project underway which involves insulating around 30,000 houses in Reading. The Council would like to do much more and make a major investment in renewable energy sources. The Council is very aware that local and regional studies conducted by TV Energy and others have indicated that at least 8% of energy could to be produced by renewable technologies by 2020 in the South East of the UK.

With this in mind, the Council has been looking proactively at where renewable, exemplar projects might be deployed. Coley high rise flats were used as an example in this presentation to show that fuel poverty is common in Reading and that the town is actively trying to help tackle the issue along with seeking ways and means to alleviate the impact of energy use on climate change. As a result, a renewable options study has been carried out. This study assessed the opportunities to replace electrical heating system with more affordable and low carbon options. The work revealed that the technologies that these flats could use included a biomass system with gas back up boiler, gas only or a gas fired Combined Heat and Power scheme (CHP).

Ben also stated that Reading Borough Council is involved in the low carbon community scheme and has funding potentially available for investment in a significant solar PV roll out scheme (through the Local Strategic Partnership).

Finally, Ben stated that the RHI will help with boosting renewable technology choices but that there also needs to be an Energy Service Company (ESCo) involved to assist in making projects happen. In essence, ESCos from a community aspect can help the Local authority sell energy and is a good way of getting people from communities involved in projects. Community involvement is vital if renewable energy technologies are to be used and taken seriously.

Germany's perspective- Sebastian Elbe

In Germany there is no official definition of Fuel Poverty but German academics have suggested a few ways of describing it. There are not as many people in Germany affected by Fuel Poverty as there are in the UK but it is still the same categories of people who are affected; the elderly, poor and marginal households. Studies in Germany have found that the number of poor households has risen from 12% in 1999 to 17.2% in 2005. Like the UK, households in Germany face consequences of dealing with fuel poverty. There is the possibility of getting their energy supply cut off and as a result of using more money to buy energy creating financial shortages in other important areas of life. The indebtedness caused by the payment of energy costs ultimately leads to a vicious circle of depredation for low-income households.

Hartz IV was introduced into Germany in 2005 and is the main support for those who are affected by Fuel Poverty. In 2009 there was €36 billion set aside for this scheme and in April 2010 a total of 6,876,684 people ranging from single people to couples with children were living in households that received support from Hartz IV. As well as this other initiatives can be found in Germany ranging from individual related initiatives in buildings that attempted to identify leaky houses and search for ways to renovate or fix the leaks in conjunction with landlord involvement.

Other ideas to manage fuel poverty have been set up by different groups in Germany. A project was in introduced to help low income households and provides the vulnerable with a certain amount of energy for free; essentially enough to keep basic devices running. This in turn prevents cut-offs and guarantees basic living standards. It was implemented by Caritas and in turn, energy agencies advise households about their daily energy consumption. This way, households can save money through teaching and guidance. It also tries to find ways to provide low-income households with more energy-efficient household appliances.

Norway's perspective- Erik Hohle

Fuel Poverty similarly exists in Norway and is predominantly due to the lack of flexible distribution systems and infrastructure for energy. This too coincides with increasing fuel prices and more and more people are having trouble paying their bills.

Norway is an energy rich country and predominantly produces energy through hydro power. Despite the high energy production in Norway it is a country that is getting more dependent on imported electricity and thus is a country becoming more vulnerable to the rising cost of fuel prices. Today the electricity prices for households are between 10-14 pence/kWh in the heating season compared to 3-4p/kWh in 2000. Electricity dominates energy use in farm houses even though bioenergy is only metres away and it is thought that the cost or lack of understanding is preventing people from using this very local sustainable energy option.

District heating systems are widely used in nearby countries, Sweden, Finland and Denmark and it is questioned why Norway isn't using more heating schemes like its neighbours. By increasing the building or infrastructure for heat (central and district heating systems) through national financial support programmes funded perhaps by a tax on using electricity for heat, will help introduce more energy efficient buildings into the country and provide a more sustainable way of heating properties.

Norway wishes to copy the UK's RHI as they believe in the system and are currently trying to convince the government and politicians to introduce a similar scheme. If this is done, Erik believes that it will draw in green capital and increase the production of biomass based heat across the country helping to alleviate fuel poverty in Norway.

In conclusion, Erik recognised that energy efficiency must also be a central part of the solution to fuel poverty.

Session III- question and answer

Most of the questions in this session were concerning Ground Source Heat Pumps (GSHP) and Air Source Heat Pumps (AHSP). In particular, how efficient and effective they are as an alternative technology.

Firstly, Ben Burfoot considered heat pumps to be an important technology choice for Reading which in turn led them to undertake the Geopower project. Reading Borough Council owns a number of schools and offices which are BREEAM (BRE Environmental Assessment Method) excellent and use GSHP for heating. Erik then stated that he wants ground source to be included in any Norwegian renewable heat incentive and recommends them as a good renewable energy technology. Following that, Andrew Lamb mentioned that due to London's CO_2 obligations for new builds, GSHP are a good technology option, especially if there is no roof space for solar and no internal space for biomass. He also shared plans for GSHP on a site next to the Thames in London. In addition, he mentioned the Geothermal International project 'One New Change' by St Pauls Cathedral in London which is a project that incorporates a mixture of in-pile, closed loop and open loop GSHP schemes that contribute to the heating and cooling solution requirements within a large new office and retail area.

Air Source Heat Pumps (ASHP) had a mixture of reviews. Recent trials by Sovereign Housing (who couldn't attend the conference) had found mixed results for ASHPs. Some tenants had negative reactions likely to be related to higher electricity costs of running them and believed GSHPs had a much greater potential. Andrew Corner on the other hand informed the conference that they had found no problem with ASHPs provided they were specified and installed properly. An important question related to the cost of running heat pumps and fuel poverty was also raised in this regard.

Andrew Lamb answered and mentioned a joint project between SSE and the geothermal international project which involved the retrofitting of 40-50 households in Wales with ASHPs. This scheme had reduced tenant's bills by up to 50%. Finally, Lesley Stoner (Wycombe District Council) revealed that a pilot of ASHPs and solar thermal in rural homes had substantially reduced tenant's fuel bill.

Conclusions from the session- Most countries include heat pumps in any grant or incentive scheme and deep geothermal is coming more into use across Europe Technology choice is dependent on the location and efficiency of a building. Both GSHPs and ASHPs can have benefits and help reduce energy bills.

CONFERENCE CONCLUSIONS (Godfrey Bevan)

There is undisputed evidence that fuel poverty exists and is leading to an inadequate access to energy sources and an inability to pay for those resources worldwide; however, it is not a term that is fully understood in many countries. The main points from the presentations show that renewable energy technologies are seen as expensive but it is now a necessity for us to help combat both fuel poverty and climate change and continuing action needs to be taken. Evidence shows, however, that in the not too distant future, renewable energy prices will fall below that of fossil fuels helping to promote these fuels and also offering the opportunity to alleviate fuel poverty.

Some policies and measures fall short of helping to reduce the effects of climate change and it is a major problem that we all face. In addition, there are still many doubters who continue to confuse and frustrate matters which are counterproductive when seeking to deal with the issues of fuel poverty and climate change. This is why education and understanding of renewable energy options and fuel poverty is vital if we are to reduce the effects of both. As can be seen from the presentations, a number of housing associations and renewable energy companies are implementing schemes incorporating renewable technologies into buildings to help improve fuel poverty and help to reach the UK's 2020 targets.

Finally, the Task 29 team are very aware of the great challenges ahead with promoting renewable/ bioenergy solutions to communities where fuel poverty might be a key driver. The team will seek to do more and look for European as well as IEA based opportunities.

Sad to report that the UK is likely to pull out of the IEA Bioenergy Agreement at the end of this year. Some other Agreements such as the PV one are also likely to be axed. These programmes are carried out at modest cost and generate considerable benefit many times the value of the government investment. The reasons cited are budgetary. For those in the audience (and reading these proceedings) we encourage you to ask why this work is targeted when the UK has high targets to achieve and international collaboration is one important way to help meet those targets.

BIBLIOGRAPHY

- **Richards, KM (TV Energy, UK).** Opportunities for renewable Energy Solutions in the Thames Valley
- **Hatch, P (Maidenhead Housing Solutions).** The challenges and benefits to Landlords and Tenants of going green.
- **Domac, J (REGEA, Croatia).** Fuel poverty from a small country perspective: what we do in Croatia.
- **Lacey, G (Waitrose).** Engaging communities in renewable energy solutions.
- **Miles, C (Econergy).** A developer's practical experience of installing bioenergy systems.
- **White, B (Forestry service, Canada).** Dealing with the cold: the Canadian experience.
- **Lamb, A (Scottish and Southern Electric (SSE)).** Renewables and the fuel poor: a large utility's approach.
- **Burfoot, B (Reading Borough Council).** How a Local Authority can deploy renewables to address fuel poverty.
- **Elbe, S (Sprint consultants, Germany).** The economics of fuel poverty.
- **Hohle, E (Energy Farm, Norway**). Fuel poverty in an energy rich country.

Presentations available to download from the TV Energy website: www.tvenergy.org

EXHIBITORS

Seven exhibitors; TV Energy/TV Bioenergy, Housing Solutions, Ardenham Energy, Photon Energy, Econergy, USEA and Community Bucks were in attendance at the conference displaying various case studies and a number of green energy technologies.

In addition, a sustainable electric minibus was on hand for delegates to inspect. The vehicle had been loaned to Aylesbury Vale DC for the event and was used to transport IEA delegates around the area including site visits.
Rob Smart reported that "The vehicle was easy to drive and to charge. Conversations were more easily heard with just road noise during motion. The journey from Heathrow to Aylesbury was uneventful, smooth and we arrived comfortably with plenty of charge left. Recharging was easy and when I topped up the vehicle for a journey out to a local village after the conference, the top up to full charge was achieved quickly (back to full charge within 2 hours). The recharge cost about 70p per night!"

Our thanks to Steve Harris (steve.harris@alliedvehicles.co.uk) for the loan.

CONFERENCE ATTENDEES [1]

WELCOME & CHAIRMEN	
Cllr John Cartwright	Leader of AVDC
Cllr Derrick Isham	Chairman of AVDC
Dr. Cllr Royce Longton	Chairman TV Energy
Professor Stephen Nortcliff	Professor Reading Uni
Godfrey Bevan	Director TV Energy
SPEAKERS	
Dr Keith Richards	TV Energy Ltd
Dr Bill White	Forestry Service, Canada
Dr Julije Domac	REGEA, Croatia
Sebastian Elbe	SPRINTconsult, Germany
Erik Hohle	The Energy Farm, Nowary
Ben Burfoot	Reading BC
Andy Lamb	SSE
Gemma Lacey	John Lewis/ Waitrose
EXHIBITORS	
Darren Baker	Photon Energy
Steve Carter	Ardenham energy
Rob Smart	AVDC
Peter Hatch	Housing Solutions
Chris Miles	Econergy
Abigail Nichols	Bucks CC
DELEGATES	
Anthony Amitage	West Berks Council
Jonatan Bates	Photon Energy
Gareth Beard	AWE
Michael Beech	TV Energy Ltd
Gabriel Berry	TV Energy Ltd
Fiona Brocklehurst	Consultant
Adam Byng	VAHT
John Caine	South Bucks DC
Jenny Carr	Oxford City Council
Laura Corfield	TV Energy Ltd
Andrew Corner	Geopower international
Jan Deacon	USEA
Mark Dibblin	St Georges Community Housing ltd
Prof. Tim Dixon	Prof. and director at Oxford Brooks uni
Zoe Dixon	Bucks CC

[1] Those highlighted in red showed an interest in attending the conference but were unable to attend.

Member of Bucks CC	Bucks CC
Member of Bucks CC	Bucks CC
Roger Emmett	Wycombe DC
Kelly Gardiner	USEA
Karl Hansen	Living Rainforest
Stacie Hollingsworth	Wycombe DC
Brad Hook	USEA
Kate Ingham	Wokingham BC
Deborah Irvine	The Right ideas
Rob Jarmen	National Trust
Rebecca Jones	NEA
Cllr Lambert	AVDC
Astrid Blackburn	West Oxfordshire DC
Terry McGivern	Institute for Sustainability
Phil Measures	West Oxfordshire DC
Graciela Melitsko	Reading BC
Niranjan Patel	Project Director, Local Partnerships and IEA Task 36
Louise Quinn	Chiltern DC
Cllr Alan Sherwell	AVDC
Louise Simmonds	TV Energy Ltd
Neil Stannett	Wycombe DC
Lesley Stoner	Wycombe DC
Cynthia Sullivan	VOWH DC
Emily Tomalin	TV Energy Ltd
Jo Trussler	National trust
Kim Wilkins	Berkshire West PCT
Dr Alison Wilshaw	TV Energy Ltd
Cliff Wilson	National Energy Foundation
Matthew Woodcock	Forestry commission
Damon Woulfe	VAHT

Technical visits-15th June

Following the conference, a number of site visits took place to present the some of the different renewable technologies the UK, specifically the Thames Valley, has.

Visit I- Tour of Vale of Aylesbury Housing Trust communal housing property, Vale House

The Vale House, Aylesbury is a late 1970's building consisting of 5 separate low rise blocks of bed sits and 1 – 2 bed flats, predominantly for young mothers and families. All flats are currently being fully regenerated to meet the government's decent homes target, as well as installing additional insulation and external cladding. The Vale house in Aylesbury was an excellent example of a social housing scheme for one of the vulnerable groups of fuel poverty. Aylesbury Vale Housing Trust (AVHT) took the opportunity to install a number of PV arrays across 3 blocks; Rothschild House, Walton Court and the head office to coincide with the government's decent homes target. It was decided by both AVHT and Ardenham Energy that a PV array of under 50kWp would be installed on all blocks although there is space to install more on 2 of the 3. This decision was made to enable the maximum potential of the new fast track Feed-In-Tariff rates to be received.

A total of 156 housing units are spilt across these blocks and each unit within a block shares a meter, meaning all tenants benefit from the PV panels with a small reduction in their electricity bills.

Rothschild House also includes a communal space with a number of washing machines, toilets and an office for the local community support team. The array on the roof here generates enough electricity to power the facilities helping to reduce the service charge for the residents, and any unused electricity is sold back to the grid at 3.1p/kWh.

Overall, a total of £2.7 million was spent on the installation of the panels with a payback of 7-8 years and a 12% return is expected. In addition, general feedback from residents and AVHT has been positive. With any new technology change education is important and the Housing Trust aim to get technology installed and set up on the communal TV to enable residents to see how much electricity the panels are producing, how much CO_2 is being saved and to help educate them on the other benefits of the technology.

Visit II- Tour of the wood fuel heating plant at Cressex Community School

Cressex Community School is a specialist business and enterprise school located in High Wycombe, Buckinghamshire. It currently has around 800 pupils who attend on a daily basis throughout term time. Following completion in July 2010 the school became a model for the government's Building Schools for the Future (BSF) programmes and features a number of renewable energy technologies including a 500kW Herz Biomatic Biocontrol chip boiler with a 60m^3 underground chip store and Ground source heat pumps (GSHPs) for heating and cooling. It is these technology choices and other energy efficient initiatives within that make the school the most up to date and ecologically sustainable school within Buckinghamshire. Both the technologies provide heating (and cooling for the school) and the school was the first biomass boiler that the tour saw. As the new school wasn't completed until July 2010 it is still in the initial period of finding out the benefits of both technologies are.

Visit III- Tour of the wood heating plant at Hill Fields Farm Estate

Hill Fields Farm is a complex of former farm buildings near the village of Lower Basildon in the Royal County of Berkshire. Nigel Steljes, technology entrepreneur and founding chairman of Steljes Ltd, purchased Hill Fields Farm in 2006 with a view to using the house as his permanent residence whilst running other buildings on site as rental accommodation. Before his acquisition there had been few or no changes in the building performance or energy provision for some years. The oil heating situation in particular was not compatible with a cost-effective overall operation.

When Mr Steljes first purchased the complex he decided that the heating system needed to be up-dated and made more modern. In 2007 a 220 kW$_{th}$ Herz Biomatic 220 BIOCONTROL boiler system, with an additional heat buffer tank was installed to provide heating for the site. The boiler provides around 90% of heat demand on estate. In addition the site has over 260 acres of woodland and with the biomass boiler the decision was made to produce woodchip locally on site to fuel the boiler. As the wood is being sourced on site, it assists with the rural economy. Additionally the

good management of the local woodland by members of staff brings diversification within the area, retaining income inside the local economy. The installation of the biomass boiler saves around 160 tonnes of CO_2 every year as well as saving money (May 2011 saw prices of heating oil at 5.6p/kWh compared to 2.6p/kWh for woodchip). The move from oil to woodchip has helped the estate reduce their heating bills. In addition to the boiler, two solar thermal collector systems were also installed at the end of 2007 to heat water in both the swimming pool on the complex and a house on the estate.

Visit IV- Tour of the wood heating plant at The Living Rainforest

The Living Rainforest in Berkshire is an eco-centre dedicated to educating people about threatened ecosystems and to exploring the relationship between humanity and the world's rainforests through education and research and was the final visit. The centre features a tropical rainforest-inspired ecological garden, which requires a large amount of heat to replicate the rainforest environment.

The Living Rainforest became the first tropical rainforest glasshouse to convert from fossil fuel to renewable biomass heating with the installation of a woodchip boiler (Froeling Turbomat), producing 220kW of heat. The centre completed installation and commissioned the boiler in summer 2006. It uses around 150 tonnes of woodchip per year supplied, by TV Bioenergy, with 35% moisture content and provides space heating for the whole site. The biomass system currently monitors the various glasshouses and associated areas individually and draws sufficient heat from the boiler systems to maintain appropriate temperatures in each areas as well as a number of offices.

In addition, The Living Rainforest also features passive solar gain and a 2.1kWp PV array which provides electric for the whole of The Living Rainforest site.

Before installation, over 100,000 litres of oil was consumed annually at a cost of around £37,000 per year. It is estimated that with the increasing prices of fossil fuels The Living Rainforest is saving around £8,000 per year on heating fuel, while the PV array saves The Living Rainforest around £110 a year on electricity

As the first public, indoor rainforest attraction to convert from fossil fuel to renewable biomass heating, the biomass boiler helps reduce The Living Rainforest carbon footprint by saving up to 220 tonnes of CO_2 each year. Both renewable systems at The Living Rainforest also provide educational purposes for schools and visitors helping to encourage renewable energy use across the region.