SCOTTISH SUSTAINABLE CONSTRUCTION FORUM MEETING

Held on

FRIDAY 7 SEPTEMBER 2007

in

THE GATEWAY CENTRE, OFF NORTH METHVEN STREET, PERTH

Present

As per attached List

Apologies

As per attached List

ITEM	MINUTE	ACTION

1.0 INTRODUCTION

Councillor Alan Grant, Perth City Council and Chair of the Environmental Committee welcomed the members of the Forum to the meeting. He referred to the recently established Sustainability Members Officer Group and stated that Sustainability is of great importance to the Council.

Alan intimated that the Gateway Centre is the principle hub of the Voluntary Services with whom the Council has a very proactive relationship.

Alan intimated that the Programme today concentrates mostly on Biomass as a source of heat and power.

The Council are currently involved in an information and learning project which consists of 6 projects, 3 for biomass heating and the other 3 will allow them to convert to biomass at a later stage. In terms of achievements to date, a huge amount of work has been done. They are assessing which techniques would be best for particular situations but this is very difficult. In terms of sustainable construction in General, Councillor Grant hopes the Government will make changes.

RP Thanked Alan for his welcome and thanked everyone for their attendance at the meeting.

2.0 PRESENTATIONS

2.1 Dan Gates - Business Development Officer - Wood Energy Group
Presentation - Wood Energy - Heating that doesn't Cost the Earth

Dan is the Business Development Manager for Wood Energy Ltd. Wood Energy are the leading UK supplier of Biomass heating at a time of rapid growth in the biomass sector. As a native of Scotland, Dan has previously been working for the Forestry Commission as a Woodfuel Officer, during which time he was instrumental in administering the Scottish Biomass Support Service

Dan stated that he wished to update the group on how you should approach the project. He reported that biomass is a very well established technology used by 25 countries in the EU and is the cheapest and most cost effective way of using biomass but from a contractors point of view they have not accepted this yet.

Wood Energy began in 2002 and are now providing 8 to 10 MW of biomass heating every 5-6 months.

There are several key issues when looking at a project, eg

Managing Low Loads - Accumulator Tanks

An Accumulator tank stores heat energy
It can also provide peak power and so reduce boiler size (and cost).

Fuel Selection

Pellets are much easer to access and there are 3 pellet plants coming on stream shortly. In the UK we have a woodchip supply. The best solution would be for a boiler to take a wide variety of fuels but this does not come cheap.

It is essential to have discussions at the early stage of a biomass project to allow you to plan the system.

Dan stated that boilers can be fully automated. There is ash in any biomass system but very little ash remains. Inevitably small pieces can enter into the heat exchanger and if this happens efficiency drops very dramatically. Dan therefore advised that if you are looking at this type of system you should ensure you install a good heat exchanger.

There are 2 different types of boilers because there are 2 different types of fuel.

One issue which arises is the moisture content in the fuel. Dan stated that if you have a query in regards to same the staff of Wood Energy would be willing to discuss this with you.

Dry Fuel - an underfed hearth system, for fuels with up to 35% moisture content, can be installed. This costs about 10 to 15% more but gives a lot more fuel efficiency.

Wet Fuel - a Step Grate System for fuels with 50% to 55% moisture content..

Dan stated that Wood Energy have installed small scale systems in domestic projects but that most of their business is in industrial systems. Wood Energy carry out all the work as a whole package. They have also carried out quite a few projects for the Public Sector.

There is a dedicated pellet only boiler for which a 35% Dti LCBP grant of is available.

Wood Energy have installed a biomass boiler at HMP and YOI at Guys Marsh. They have also installed a biomass boiler in the NAW Parliament Building in Wales. The boiler operates from either Oil or Pellets. A small biomass system was installed in Blaise Nursery, Bristol, for heating glass houses.

Wood Energy are trying to reduce installation costs and make these systems easier to install. They are using plug and play boilers of up to 2 to 3 MW.

Hook bin systems are used to store the fuel, especially in Local Authority projects. They can accommodate 35 cubic metres of fuel.

There is no grant aid for the very large industrial systems but these have a pay-back period of approximately 18 months.

Dan stated that the technology will last 25-30years. You should therefore try to plan your system correctly at the beginning to ensure it works. To do this you require to work closely with your fuel supply chain and take advice from the supplier.

The keys to getting it right…

1. Know the fuel you're going to use – and apply the right technology
2. Use high quality, proven biomass technology
3. Keep fuel deliveries as simple as possible

Q1 ***Question***

Do you have a list of suppliers for woodchips etc.?

A1 ***Answer***

Yes, the Forestry Commission have a website regarding this. Wood Energy will point you in the right direction. Contact is as follows :-

dan.gates@woodenergyltd.co.uk
or
www.woodenergyltd.co.uk

Q2 ***Question***

Are there any issues in regards to storing moisture content chips ?

A2 ***Answer***

Yes, in the Highland and Islands they have metal hoppers. It is worth while installing underground hoppers if possible.

If the woodchips get frozen then you should allow at least 7 days in a fuel store before use.

Q3 ***Question***

In regards to the Plug and Play Boiler, how do you store your fuel supply ?

A3 ***Answer***

Fuel store is on the top and pellets on the bottom.

Q4 ***Question***

What at the installation costs for a domestic boiler ?

A4 ***Answer***

Wood Energy do not supply a domestic boiler but you can probably install a full system, e.g., electrical work, the flue, fitting of expansion tank etc., for a minimum of £14,000 to £16,000.

Q5 ***Question***

Do you supply district heating for housing ?

A5 ***Answer***

We do not supply for one off domestic customers.

Q6 ***Question***

What size of Plug and Play boiler do you supply ?

A6 ***Answer***

We supply 300kW, 200kW and 500kW and can also offer an 800kW off the shelf unit.

Q7 ***Question***

Carbon Balance - Has a Whole Life Analysis of pellets versus chips been carried out, assuming chips would be quite attractive from a cost point of view but might not be so economic due to the transportation of the chips ?

A7 ***Answer***

Yes, there are figures available for this and I can access these for you. There is a more comprehensive report i.e., "The carbon balance of Woodfuel" (2007), Highland Birchwoods. Copies are available from :

The Project Manager
Northern Woodheat
Highland Birchwoods
Littleburn Road
Munlochy IV8 8NN
E-mail: info@northernwoodheat.net
or
fiona.mcphie@highlandbirchwoods.co.uk
Tel: 01463 811606

Q8 ***Question***

What is the cost per kW hour ?

A8 ***Answer***

Approximately 3.54p. The cost of pellets works out at about £160-£180 per ton.

Elaine Morrison intimated that she has a woodchip boiler and is currently paying £200 per ton.

Q9 ***Question***

Presumably, in Scotland, pellets will be sourced from Saw Mills.

A9 ***Answer***

There are 2 plants, 1 in Invergordon producing from all timber in the North. There is also a plant down from Invergordon. It is felt a depot in the Southern belt would be of benefit. There is only a limited amount of sawdust available in Scotland.

A contract is recommended and some 5-10 year contracts are available.

The difficulty is there are not much pellets available in central Scotland.

R Pedersen intimated that the Wood Fuel Task Group is looking at the supply problem. Rob urged people to visit the chipping plant to see for themselves the volume being produced.

Rob reported that a School in Dundee currently requires a boiler replacement and biomass is being considered but legislation is pushing in one direction and pulling the other way. Dundee is experiencing difficulty in resolving the problem due to the requirements of the Clean air Act.

2.2 Mike Scott - Not for Profit Aberdeen Combined Heat & Power Presentation - Combined Heat & Power Biomass Scheme in Aberdeen

Mike hails from Aberdeen and is a qualified Town Planner and Housing Manager. He worked for 30 years in Local Government in Planning, Housing, Health & Social Care, mainly as Chief Officer. Mike took early (very early) retirement at the end of 2005 and then followed his various interests with, and on the Boards of, a number of national and local agencies and organisations. He is currently a Member of the Boards of SCARF (Save Cash and Reduce Fuel) Aberdeen and Aberdeen Heat & Power Ltd. He has a long-standing interest (over 20 years) in tackling **Fuel Poverty** and promoting **Energy Efficiency**. Ian created one of the first dedicated Energy Manager posts within Scottish Local Authorities.

Mike gave an overview as to where they are in regards to Aberdeen Heat & Power and stated it will take approximately 18 months to realise this. Aberdeen Heat & Power was created 4 years ago and remains a not-for-profit organisation. It was extensively set up with, and by, the Council. They have considered a number of sale arrangements and have consulted with residents in regards to preference e.g., Flat rate charge for heat; Tenants - heat with rent and Owner Occupiers - direct debit established. A flat rate was agreed.

Electricity sales - doing well direct but slow through a Consolidator. There is a buying and selling route through this.

Mike reported that multi-storeys are viable sustainable models. In 1999 they adopted an Affordable Warmth Strategy and wanted to target the least thermal efficient homes. Structural surveys required to be carried out to determine what made them inefficient etc. This study looked at fixed and affordable warmth, what people were currently paying, try to reduce CO^2 omissions and what was affordable to the Council. Good information was received and this gave them a future strategy. District Heating Systems were looked and at it was decided that combined heat & power was the best way to go. Access to money played a large part in the project. The Council has a strong link with the Company.

A CHP consultant was appointed. They had a number of contracts to establish e.g., supply and fit to tenants, maintenance, access to properties. A Business Plan was drawn up and a Cash Flow forecast was carried out to determine how much money could be taken in from the sale and selling. External funding and access to grants was crucial in the creation of the company.

A pilot scheme was set up which included 100 houses. Very fortunate to access a significant amount of grant money of which £2M came to Aberdeen.

A CHP plant and distribution system was set up for which they were able to secure bank finance of up to £1 million based on income from Council of £215,000 per annum. Money was also received from the Energy Efficiency to offset costs of heating systems within privately owned flats. Surplus income generated provided capital to start work on next cluster. The Scheme has been up and running for 3 years.

The Hazlehead Cluster project included a plant room located in a School which has a swimming pool and which is heated by the system. There is also a link to 180 flats in the area. This was a fairly compact area using a fairly compact system. It helped to establish a wider partnership with the Council. This was a useful exercise for them.

Seaton Development (Phase 1) - this included a plant room designed to blend with Beach Links. It was an integrated system. They were able to form a Partnership with the Council. A 1MW gas fired CHP with back up boiler was installed. There are 6 blocks of multi-storeys (500 flats) in the area. There is also a link to a regional sports facility which is due for completion in 2010-11. The Council has a number of public buildings in the area i.e., ballroom, ice rink, leisure centre etc. They will now be able to pass on the benefit of more affordable heat and power to the Council.

Partnerships are beginning to build. The community benefits through the new buildings, more affordable heating etc.

The Future - Biomass - The 2nd Phase at Seaton will incorporate a biomass plant and they have planned ahead in regards to the space requirements. A Planning Application is going to the Council and they are currently looking at the capital and cash flow. They are also looking for various commitments from the Government - at the least £120,000 per annum or £½M at its best. There are some grants available and are looking to maximise these. This is an issue with a number of other Councils - where is the money.

Looking at new technologies all the time. A supply chain infrastructure has been looked at very closely and carefully e.g., what amount of wood is coming from abroad, require to look at the local market and continental market. The supply chain is a major issue.
Connections - Require to look and see what they can accomplish in regards to the commercial arena. Is there any way companies can plug into their distribution system. Have been speaking with their local Business Enterprise colleagues to look at marketing etc.

Seaton Development (Phase 2) - Looking at a second generator (gas or biomass fuelled). This will give a significant capacity to 3,000 to 5,000 residents. Looking at a cost of £2.9M. £1M expenditure should be carried out by 1 April 2008 in relation to the second generator. Have received a £400K grant from the Scottish Executive.

Woodchip Gasification Plant - Gasification Plant is woodchip. This gets them into securing the supply chain. Trying to get best deal. Mike stated there should be an increase in the number of suppliers in the market within the next 18 months when the project is scheduled to go on stream. Are keen to ensure that they get a 5 year contract in relation to same.

Storage Facility - At its maximum there would be 2 to 3 lorry loads per day. This would result in an increase in the amount of traffic. Careful planning is required in regards to storage capacity and moisture content of fuel itself.

As with Grants there is usually a timeframe and this is the driving force for us to get the money spent. The 18 month timeframe will give us an extra degree of comfort in looking into this.

We are always looking to the future and are currently looking at the regeneration of 5 areas in the City. This would include demolition and re-build with approximately 800 new houses. One of the areas is currently located near to the plant.

Similarly, we can start looking at a City Centre network to link blocks of flats, public buildings, etc. We are building up a large amount of knowledge and expertise.

Mike intimated that any further information could be had by contacting him at the following e-mail address :-

micscott@hotmail.co.uk

Q1 ***Question***

Have you had any issues or discussions in regards to emissions and the Clean Air Act's legislation ?

A1 ***Answer***

Discussions have taken place with the Council in relation to this as they could come into difficulties with this. The issues are emissions and type of fuels used. This could be an issue in regards to Planning Applications. There is an issue in trying to give advice to people dealing with Planning Applications.

Dan Gates intimated they had just quoted for zero emission boilers and confirmed that it does add to the price of the boiler. Dan reported that they are compliant with all the legislation. As soon as someone can confirm what levels should be met they can then confirm a price.

Q2 ***Question***

Does the Council carry out any type of energy conservation measures prior to installing the heating systems ?

A2 ***Answer***

Initially, what occurred was that when the structural survey was carried out they managed to pick up a number of issues. 40% of the capital programme was in regards to efficiency issues for housing.

2.3 Peter Copeland - Former Director of Estates & Buildings, University of Dundee
Presentation: Biomass Boilers, Supply and Transport Linkages

Peter is a Consultant Mechanical Engineer specialising in thermal plant and distribution systems. He has long term operational experience of CHP plant. He is the Director of Dundee University CHP Company (DUUSCo Ltd) and was the former Director of Estates at Dundee University. Peter has experience in Waste to Energy and large scale District Heating networks. He is a dedicated innovator of Energy Saving Technology and Environmental Damage Limitation Strategies.

Peter intimated that The Bruntland Report was produced in 1987 and this defined the concept of sustainability as "....*Development that meets the needs of the present without compromising the ability of future generations to meet their own*".

He stated that we require to be very careful in regards to Carbon Footprints.

Biomass is an emergent industry and anything emergent is vulnerable. A feasibility study is required to get started. Application is the key issue as you require the application for the use of the heat and the size of the plant to fit together.

Sizing is important. Scottish Weather gives a high moisture content (50% plus) and this has an adverse effect on the thermal value of delivered fuel. Biomass boilers are best under stable load conditions. It is best to under-size and use a large thermal store. Fuel storage should be kept to a minimum. The Site Energy Control should be integrated with the Boiler Management System.

Transportation - Distance and road sizes are critical factors and if they don't work you can just forget the rest.

Why choose Biomass ? It is carbon replacement; You must undersize the plant rather than oversize; You have to maximise Delta T; a large thermal store must be used; 2MW boiler required for a 100 ton store (this is 7½ x 2½M); you need a fossil fuel back-up - it is there for large demands (1 in 100 occasions possibly).

Application - localised or district heating. You can heat and cool. Added value from CHP application.

There is over 50% financial value when you opt for CHP.

You require a joined-up structure e.g., Housing, Factories, Supermarkets etc. This was carried out in Lerwick. This can maximise the annual running time. It is essential that, under every condition, you know what the cost of these KW hours are.

As stated previously high moisture content of 50% + has an adverse effect on the thermal value. There is a degradation of stored material and a risk of blockages.

Supply Infrastructure - A viable product depends on a stable supply chain with an ownership of undertaking v fuel supply. If you own the whole package (the person who operates it and takes the final heat) you require to work out what the possible risks are. Market growth factors are required in determining the Contract format. Fail safe mechanisms are required.

Part of the Scottish problem is to grow the industry big enough to make a real impact. Canada and the continent is where most of the wood is coming from.

Modes of Transport - The relative engine outputs to load transport are shown below.

Method of transport	Engine Power (kW)	Tonnes per trip
Tractor	40	5
Lorry	150	20
Train	1500	800
Ship	25,000	60,000

If we really want to grow the biomass industry in Scotland we require to have a product that is worth more than it can be. We require to think about how we can re-define the way Scottish energy is applied to the people of the nation.

To serve the fuel needs of this new energy industry would require the transportation of 3.5/5M tonnes of wood every year. Additional trucks would be required which would be undesirable. Trains would be a more efficient means of transport where with centralised collection depots being formed on spur lines linking with the existing rail network. Scotland has a very good infrastructure and is very well placed with a high voltage network.

Waterways and Harbours - see notes attached.

The Scottish Scene - see notes attached.

Peter suggested that, to grow this industry substantially, you require very large scale energy schemes. A series of 6 x 100MWe electrical output power stations with thermal recovery would be required as the nuclear plants are decommissioned. 200MWe of heat and power can be recovered and used through the community.

Dundee is a good example of playing host to one of the 100MWe CHP plants as it has a former power station site on the harbour front with the rail line adjacent and the grid connection still in place.

One of the important issues is that it is one thing to buy the boiler but the last thing you want is a fuel store as they take up a lot of space. A 100MWe plant would take delivery of approximately 2 x 800 ton loads of woodchip per day. The process would be that you would have very little storage. The trains would be the storage e.g., one arriving, one unloading and one departing.

Forestry Commission - Looking at 400 tonnes of demand in terms of fuel supply you would be looking at using supplies from approximately 6 miles away.

Q1 ***Question***

Scotland's Nuclear Power Stations are rapidly running out of time. Are they to be replaced and by what ?

A1 ***Answer***

Peter considers that 6 x 100MWe 'Municipal style' Biomass CHP installations would be required which would generate around 5TWHhr of electricity. He reported that at the present time electricity requirements are 34THWhr. If Scotland, and the role that the Parliament of Scotland, plays in the carbon footprint mechanism, this will come from high scale biomass centres of population. The larger plants come with very much more Blue Gas management systems. Peter feels that if we do not think 'big' enough, and put this into a new context, e.g., energy for the people - where the people live, then we are going to miss one of the high energy needs of the cities. He feels the target for this is 5 years.

We have almost 2 contrasting strategies. We have the political will to do this and put it together. On the other hand, is there the political will and has Scotland got the political imagination to do this ?. Can all the individual Authorities work together to do this ? The limitation is not the technology or construction but we require the political will. The next stage of the process is that we have to move on from this Forum and discuss this at local levels. You have to put the right people together to discuss this. We have the technology, the makings of the infrastructure and we have the resources.

Q2 ***Question***

Have we considered waste instead of biomass ?

A2 ***Answer***

Yes, waste is an interesting product. This is classed as an Incinerator because of the pollutants in the blue gas. One would have to be realistic - every combustion process does produce nasties (even how clean it is). We have to think holistically. The biomass scene looks rosy - but the real issue is where do you put it and how do you service it. 600MW would generate an industry itself of £5M per year.

Q3 ***Question***

If we are to tackle the problem as to how we meet the energy needs for our Cities we require to do this. Have you any thoughts on what solutions can be introduced within the European areas ?

A3 ***Answer***

I would suggest you look at the Austrians who have developed a thriving Biomass economy but there are some fundamental differences between the conditions on the Continent and here is Scotland which require to be looked at. It would be very positive if communities could take their community responsibilities seriously. Biomass needs far more publicity and people require to be encouraged. The cost of the biomass boiler is much more than your conventional oil/gas boiler but grants are available. You require a subsidy in the earlier days to get this running e.g., an allowance for so much per tonne which would allow you to feel a bit more comfortable about your investment. The cost of the fuel is a big issue and there are not a lot of suppliers.

2.4 Rob Pedersen - Dundee City Council and Elaine Morrison - SCARF Demo House Update

The Demo House project was started by John Porter and was set up as a way of bringing to the public a variety of renewables communications and post construction practices.

R Pedersen and E Morrison gave a short video presentation showing progress to date on the Demo House. This was previously shown to a number of Contractors/Contributors etc., to discuss this further.

Elaine indicated that the project has reached a stage where they are having to pay to get the building works completed. Various building contractors and suppliers offered labour and material. Understandably contractors supply labour when available to do so but with the currently booming construction industry, continuity has been difficult with different tradesmen turning up at different times to carry out the same task.

Various bits of funding have been received as well as private sector contributions. £70,000 is required to complete the project of which £50,000 is in place. £20,000 is therefore require to make up this shortfall. Further contributing partners are therefore required to allow the project to be completed.

Elaine asked if other Local Authorities would be willing to partner with them. More contributing contractors would also be welcomed at this stage and they would be fully recognised for their involvement with the project. Any private sector organisation who would like to make a donation should contact either Elaine or Rob at the undernoted :-

elaine@solarcitiesscotland.org.uk
rob.pedersen@dundeecity.gov.uk

The intent is to complete this as a video diary and give this to every contributor.

One of Dundee City Council's Project Managers is to work with the Contractor to see the project through to completion. A 12 week programme is in place for completion. This will allow Dti to install monitoring equipment. The project will be Web based and can be accessed from anywhere. It is hoped to go live in the Spring of 2008 once the Dti monitoring equipment is installed.

Rob thanks his staff for the input into the Video.

RP thanked the Speakers for their interesting and enlightening Presentations which, by the response from the audience, were very well received.

3.0 MINUTES OF MEETING HELD ON 8 JUNE 2007

The minute of the previous meeting held on 8 June 2007 was accepted as a true record.

4.0 MATTERS ARISING

4.1 Membership Update

It was noted membership has risen by 8 since June 2007.

4.2 Funding

Scottish Executive Funding is available for the next 2 years. It is suggested that a membership fee may have to be charged e.g., individual member - £20; Organisation with 1-10 employees - £50 and Organisation with 10 or more employees - £75. This would allow us to cover the costs we have year on year. RP to prepare a paper to all members seeking their views in regards to same. **RP**

4.3 Targets 2007-08 - Questionnaire

To date only 22 submissions have been received. Ideally Rob would like to see further submissions and asked for those who have not already done so to complete same and return this to him. RP intimated that the Questionnaire is one of the obligations we have to demonstrate to the Scottish Executive to prove that we do what we do. Regrettably, last year, only 30 Questionnaires were completed and returned. A further report requires to be made to the Scottish Executive by the end of October/beginning of November this year and therefore your co-operation would be much appreciated.

4.4 Website Update

If possible, Presentations will be placed on the website but if this is not possible hard copies are available from Yvonne on request. Anyone who wishes information placed on the Website should contact Yvonne at yvonne.mchugh@dundeecity.gov.uk

4.5 New Initiatives

Rob feels that we require to consolidate the initiatives we already have. This item will be removed from the next Agenda.

5.0 ANY OTHER BUSINESS

None.

6.0 FUTURE PRESENTATIONS/SPEAKERS

RP stated the next meeting will be held in West Lothian on the 8 February 2008 and that a number of speakers are available but if anyone has a specific theme for the meeting they should contact him in regards to same..

7.0 DATE OF NEXT MEETING

The next meeting will be held on **FRIDAY 8 FEBRUARY 2007** in West Lothian. Details to follow.

The June 2008 Meeting will be held in Dundee with a visit to the Demo House**. A venue is still required for the September 2008 meeting**. Anyone wishing to offer a venue for this meeting should contact Rob Pedersen, e-mail **rob.pedersen@dundeecity.gov.uk**

Please Note : Copies of the presentations will be available shortly on the SSCF Website. - www.sscforum.org.uk

Where it is not possible to place a Presentation on the website, due to the size, this can be made available on disc and anyone wishing a copy should contact Yvonne in the first instance at yvonne.mchugh@dundeecity.gov.uk

It was requested that, if anyone wishes to use the presentations, they credit the source.

UPDATE : Unfortunately the Presentations for this meeting were too large to be placed on the Website and are therefore only available on disc.

RP thanked the Speakers once again for giving up their time to present their interesting and enlightening Presentations

He also wished to thank the following:

Yvonne for taking the Minutes.
Ian Cameron for organising the venue and catering for today's event.
Councillor Alan Grant for his opening remarks.
Perth & Kinross Council for the venue facilities and lunch.

Rob Pedersen thanked everyone for attending.

Distribution /...

Distribution

All Forum Members
Director of Support Services
Chief Executive
A Anderson, ECPD
Fergus Wilson
Mike Galloway
Anne Wilson

cc Councillor George Regan
Councillor Fraser McPherson

N.B. PLEASE FORWARD ANY AGENDA ITEMS FOR NEXT MEETING

RP/YM
17 September 2007

SCOTTISH SUSTAINABLE CONSTRUCTION FORUM

MEETING ON 7 SEPTEMBER 2007 in

THE GATEWAY CENTRE (OFF NORTH METHVEN STREET) PERTH

LIST OF ATTENDEES

	NAME (PLEASE PRINT)	LOCAL AUTHORITY/ ORGANISATION	DESIGNATION
1	Jean Morrison	SCARF	
2	Sharon Thomson	Solar Cities Scotland	
3	Elaine Morrison	Solar Cities Scotland	
4	Hazel Carnegie	Aberdeen City Env. Forum	
5	William Marshall	Falkirk Council	
6	Mac Roberts	Dundee City Council	
7	John Kinnear	do.	
8	Graham Hutchison	do.	
9	Derek Mitchell	University of Dundee	
10	Bill Browning	North Lanarkshire Council	
11	Doug Duncan	Mansell	
12	Graeme Burns	Dundee City Council	
13	Andy Kidd	do.	
14	Alan Mackie	do.	
15	Ron Mackenzie	do.	
16	Kevin Jameson	do.	
17	Alistair Barclay	EnviroCentre	
18	Mail Muhammad	NHS Tayside	
19	Rebecca Carr	FCS	
20	Alan Rough	University of Dundee and SCC	
21	Eric Hamilton	Dundee City Council - DCS	
22	Doug Shearer	do.	
23	Amanda Waugh	Glasgow City Council	
24	Kris Leitch	Scottish Water Waste Services	
25	Joanne Boyce	Scottish Building Standards	
26	Vicky MacKenzie	East Dunbartonshire Council	
27	Eliska Vaneckova	East Dunbartonshire Council	
28	Sandy Dawson	Clackmannanshire Council	
29	Dolin Hamilton	do.	
30	George hay	East Lothian Council	
31	Alfred Leslie	Highland Council	
32	Mat Craigon	Elders Consulting Engineers LLP	

	NAME	LOCAL AUTHORITY/ ORGANISATION	DESIGNATION
33	Peter Copeland	Consultant	
34	Alan Grant	Perth & Kinross Council	
35	Yvonne McHugh	Dundee City Council (Secretary SSCF)	
36	Rob Pedersen	Dundee City Council (Chair of SSCF)	
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PUBLIC SECTOR SUSTAINABLE CONSTRUCTION GROUP

MEETING – FRIDAY 7 SEPTEMBER 2007

THE GATEWAY CENTRE, OFF NORTH METHVEN STREET, PERTH

Apologies

David Banks	NHS Tayside
Douglas Forbes	University of Dundee
Sandy Halliday	Gaia Research
Catherine LLoyd	Tayside Biodiversity Partnership
Craig Muir	Dundee City Council
Lindsay Cowan	Mansell
Heather McQuillan	Dundee City Council
David Moon	WRAP
Kristine Flynn	WRAP
Denis O'Kane	North Lanarkshire Council
Ed McIntosh	Ninewells Hospital
Clare Darlaston	Concern for Swifts
Alistair Smillie	The Moray Council
Wolfgang Kopp	Dundee City Council
Stuart Brown	Principal Quantity Surveyor
Clare Du Boulay	Vivarium, co-housing for older people
Bruce Patrick	Dundee City Council
Hugh Muschamp	Changeworks
Fergus Wilson	Dundee City Council
Mike Porter	Aberdeenshire Council
John Wilson	Scottish Executive
Brian Menzies	EnviroCentre
Sheena Stone	Markgaret Blackwood Housing Association
Derek Jarvie	Envirowise

NOTES REFERRED TO IN RELATION TO PETER COPELAND'S PRESENTATION ENTITLED: BIOMASS BOILERS, SUPPLY AND TRANSPORT LINKAGES

INTRODUCTION. (Slide 1)

The Bruntland Report in 1987 defined the concept of sustainability as''…. *Development that meets the needs of the present without compromising the ability of future generations to meet their own''*

This is a tall order given our track record to date, and the purpose of this short talk is to review some of the key issues which must be overcome to enable biomass to become an established contributor to the national energy economy.

BIOMASS ENERGY (Slide 2)

Key issues which will determine the robustness of any scheme and influence its ability to withstand adverse economic trends. The Austrians have developed a thriving Biomass economy but there are some fundamental differences between the conditions on the Continent and here in Scotland which must be explored in the planning/design stages.

THE FEASIBILITY STUDY (Slide 3)

Understanding the underlying principles of the biomass combustion process will help avoid costly over sizing leading to poor performance and high running costs. Emphasis is laid upon securing a reliable fuel supply chain. What are the risks and how can they be mitigated.

THE APPLICATION (Slide 4)

To maximise return on investment requires high value energy sales CHP provides the optimum long term solution when combined with an extensive and varied thermal distribution load profile as presented by a substantial urban environment. Scale of operation plays a part in this argument. Capital costs fall when plant capacity exceeds 50MWe.

PLANT SIZING (Slide 5)

To achieve best efficiency biomass plant should operate under stable load conditions for prolonged periods, careful matching of boiler size to load profile with thermal buffering to handle short duration excursions. Constant year round fuel use will enable suppliers to provide a regular delivery and minimise on-site storage.

MOISTURE CONTENT (Slide 6)

Unlike Continental Europe with good summer drying the UK scene is one of intermittent rainfall and humid atmospheric conditions which limit the rate of ambient drying leading to 50% m.c as a common condition. High moisture content reduces the effective calorific value and can cause handling problems due to blockages in conveyors plus stagnant stores can become mouldy.
SUPPLY INFRASTRUCTURE (Slide 7)

Confidence in the whole process can only arise if all risks are thoroughly evaluated at the outset and currently the major detractor is the lack a of a well defined supply infrastructure. This starts at the point of ownership of the forest right through to the delivery service. There must be price stability and a long-term commitment to the undertaking. Single points of supply are too risky, what happens when a supplier fails? The industry is reliant on too few individuals to possess the robustness needed to create confidence within the financial sector.

There needs to be some form of underwriting to provide customers with the confidence they need to take the decision to invest in biomass against the safer fossil fuel based options.

TRANSPORTATION (Slide 8)

'Cottage Industry' (50-250kW) sized plant can be served by *ad hoc* arrangements ranging from farm tractors to HGV using a variety of containers. Once the annual demand exceeds 10,000 tonnes the impact of these deliveries can be disadvantageous and the more formal arrangements involving rail haulage and shipping become essential components of the planning process.
A 100MWe CHP plant will consume 600-750,000 tonnes a year which would require2/3 train loads of wood chip per day.

MODES of TRANSPORT (Slide 9)

The relative engine outputs to load transport are shown on this slide.

DISTRIBUTION of WOODLAND in SCOTLAND (Slide 10)

This map shows how the forest resources are distributed and should be compared with the following slides to gain an appreciation of the supply to demand logistics.

POPULATION DENSITY (Slide 11)

As a sparsely populated country Scotland has few centres with more than 100,000 inhabitants. These cities would be the locations for a new generation of medium scale Biomass fuelled CHP installations. A series of 100MWe plants strategically located to provide a substantial proportion of the nearby energy needs would create a meaningful reduction to the Nations' Carbon footprint whilst contributing to the overall economy. An internal energy supply industry worth £500m per annum would evolve as the undertakings reached full capacity.

RAIL NETWORK (Slide 12)

To serve the fuel needs of this new energy industry would require the transportation of 3.5/5M tonnes of wood every year. Centralised collection depots would have to be formed on spur lines linking with the existing rail network. Dedicated trains of purpose built bulk carrier trucks would be formed into delivery units diagrammed into the freight network at times of low demand. This would assist in increasing the volume of freight transported, nationally, and improve the overall level of resource utilisation.

ROAD SYSTEM (Slide 13)

The prospect of an additional 200,000 truck movements per year being imposed upon the principal traffic routes in central and eastern Scotland would be undesirable, costly in environmental terms and damaging to the road network.

The HV NETWORK. (Slide 14)

Unlike south west England Scotland is well provided with a comprehensive HV distribution network which will be able to accept additional generating capacity being introduced without major renewals. The former Carolina Port power Station site in Dundee still has the 132kV Grid connection available for use by a new plant on that location.

WATERWAYS and HARBOURS (Slide 15)

The role of water as a means of supplying the needs of Biomass CHP is a valid one as the major cities Glasgow Edinburgh Dundee and Aberdeen all have the wharf areas needed to dock the large bulk carriers needed to serve these installations, if the indigenous resources are unable to do so (or as a way of mitigating the risk).

The SCOTTISH SCENE (Slide 16)

The picture is therefore one of potential awaiting development, it is not a ' chicken and egg' scenario. The energy industry will need more generating capacity as the nuclear plants are decommissioned and with a potential to provide 5TWHhr of electricity from 6Nr ; 100MWe 'Municipal style' Biomass CHP installations

plus the contribution to the communities of the heat recovered there is an industry waiting to be developed.

DUNDEE CITY (Slide 17).

I have made reference to Dundee playing host to one of the 100MWe CHP plants. The reasons are clear; it has a former power station site on the harbour front with the rail line adjacent and the grid connection still in place. It does not have any thermal infrastructure as such; but with the city centre redevelopment due soon there would be an opportunity to lay the arterial mains into the centre and create a distribution network which could extend up to 5 km (as far as Ninewells Hospital)
Once a fuel supply centre was in existence it would be able to service a variety of smaller users at very attractive rates.

QUESTIONS (Slide 18)

APPENDIX (Slide 19)

RELATIVE FUEL COSTS ADDED (Slide 20)

A simple comparison of the four modes of transport described earlier.

7th September 2007