

# FORESTRY, TIMBER & CONSTRUCTION IN SCOTLAND – THE LINKAGES

Discussion Paper to Forestry Policy Group

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November 2007

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## SUMMARY

*This paper examines how the availability of different timber species in Scotland has affected and continues to affect the development of timber construction methods and design. But it also draws attention to how, in turn, the demands of the construction industry affect the growers' planting and management strategies. This close relationship suggests both dangers and opportunities for the development of Scottish forests and woodlands as a whole and, in particular, a greater need to develop and support construction systems and products that use a wider variety of timbers than at present. The paper highlights a lack of integration in policy thinking across the construction and forestry sectors and suggests this as a basis for a FPG critique.*

*BP has been writing on the subject of "DESIGNING THE FUTURE FOREST" for some time and this paper is drawn from that work in progress. The thrust of this is that the time is ripe for a renewed overall "forest vision" for Scotland that makes a serious attempt to reconcile the multiple objectives and timber requirements of climate change policy, the construction industry, the bio-fuel industry and biodiversity policy as well as wildlife and water catchment management. Such an exercise would need to go much further than the SFS's rather crass percentage targets (see below) and look at specific species and site types. Indeed more than one SEA has flagged up the need for an holistic land use strategy for Scotland that would integrate food production with forestry and, ultimately, this might be considered as the "highest level" of debate for any think tank in the field of land use : and where FPG could bring to bear its wealth of cross-sectoral expertise !*

## BACKGROUND TO WHERE WE ARE

The perceived problem 20-25 years ago was the prospect of a near monoculture of Sitka spruce expanding across Scotland from Galloway to Caithness. Albeit there would be areas of Scots and lodgepole pine but essentially it was exotic, monoculture, softwood forestry that was perceived as the threat and the target for criticism.

The problem of this was essentially twofold depending on perspective :

- 1) the ecological damage in terms of lack of biodiversity, acidification of water catchments and soils, incursion into native woodlands etc etc..
  - 2) What to do with all that low value/low structural grade timber
- (actually there was a third - landscape based - critique but we'll ignore that one)

We are familiar with the efforts of both state and NGOs to address the first of these problems - that is to rectify and improve the environmental policies of the forestry industry and to balance the funding of more purely economic forestry with a broadleaved and native woodland policy.

The last 25 years has however perhaps seen an even greater effort to answer the second of these problems – a joint effort by industry and FCS culminating perhaps in the establishment of the Centre for Timber Engineering (CTE).

But in a sense nobody really seemed to address the consequences of success in finding uses for all that softwood. And success there has been. In contemporary parlance it is as if there was no Strategic Environmental Assessment (SEA) of the strategies that have now solved that particular problem.

Put quite simply, the consequence of success in finding uses for low grade spruce has resulted in greater justification than previously for the planting of even more spruce. There is now a very identifiable and very hungry market for it so that CONFOR can very readily make a case for forestry policy that will deliver the expanding quantities it requires – to keep the wheels of industry turning and men in jobs. This is a self-perpetuating cycle and in some ways we may have to acknowledge that we are in a worse situation than 25 years ago by solving a problem in isolation from its ecological consequences.

What is more, the thrust of much environmental, construction and forestry strategy is towards home-grown material to reduce road miles and stimulate more local and widespread downstream processing. As foreign timber prices rise, a recent and significant upsurge in roadside prices for Scottish softwood has resulted (20% this year so far reported). Suddenly the balance is tipping. Scandinavian timber may begin to lose its supremacy and home-grown material starts to look more attractive.

As embodied energy auditing starts to take off and more design schemes are assessed against environmental indicator systems such as BREEAM eco-homes, higher points are awarded for local sourcing which again will promote the home-grown softwood market.

There is not a little irony in the fact that the environmental agenda is now a key driver in actually promoting the growth of home-grown SS in Scotland.

## **JUST THE BEGINNING**

The Scottish timber framing market is rubbing its hands in glee as the UK government set huge targets for new house building in the coming 20 years. And what is all this made of ? – spruce. The majority of Scottish spruce is exported to England for the lower grades of timber they require in largely non-structural timber framing.

But timber framing is not the only driver of a spruce dominated forest industry. The manufacturing industry is now geared to utilize a whole range of chip and fibre to make various composite boards including OSB and Caberboard. These boards can and do use Scots pine fibre too which at least justifies a second conifer species. Wood fibre can even be made into insulation – we don't do it yet in Scotland but....

Engineered products are also in the ascendancy and generally only require smaller dimension timber – all pointing to smaller trees and shorter rotations.

And then there is the bio-fuel industry. The potential demand for fast growing cellulose for this market may yet dwarf that of any other and, whilst fields of willow are beginning to be seen in Scotland on good farmland, the threat of a new wave of exotic conifers on lower ground on short rotations looks more serious than ever before.

## WHAT DOES IT ALL MEAN ?

What it means is that, as ever, we are failing to tackle things in an integrated way. This failing is beginning to be acknowledged in a number of SEAs of government policy/strategy . It is becoming a bit of a theme and this is perhaps where a FPG critique should focus.

The basic principle might be expressed thus :

THE RANGE OF SPECIES AND RELATIVE QUANTITIES OF EACH THAT INDUSTRY DEMANDS = THE SPECIES COMPOSITION OF THE FOREST RESOURCE WE GET (We need to remember that demands on timber are made by pulp/paper industry as well as construction and growing bio-fuel industries. And that the species composition “we get” is also modified or extended to some extent by grant aid conditions and by amenity schemes.)

However :

THE RANGE OF SPECIES AND RELATIVE QUANTITIES OF EACH THAT INDUSTRY DEMANDS DOES NOT = THE SPECIES COMPOSITION OF THE FOREST RESOURCE WE WANT (from an ecological perspective).

Furthermore, a limited timber resource (limited in species and age class) simply tends to lead to a limited manufacturing base (in terms of species used). A self perpetuating system.

Whilst it is almost impossible to imagine a reversal in this now immensely powerful industrial spruce corporate hegemony, there are ‘things around the edges’ that can be addressed to ameliorate its effects. Whilst the industry and government are congratulating themselves on having found ways of mopping up an embarrassment of low grade spruce (the so called “wall of spruce”), the timber demands of the smaller industries are being ignored. Yet these are the very ones that have the potential to add diversity to timber markets and therefore ultimately to forest resources/planting strategies.

The most glaring example of this neglect right now revolves around timber cladding and it is so important that it might deserve a whole FPG initiative in itself. It serves to illustrate the whole problem under discussion in this paper.

### **TIMBER Cladding – A textbook example of lack of integration in Govnt policy**

Quite a lot of research effort has been spent on this recently including CTE timber cladding trials around the country. Scottish Executive published “Timber Cladding in Scotland” in 2002 which promoted its use widely and next year will launch a follow up major publication “Designing the timber façade”. Borders Council has commissioned Gaia Architects and North Woods to write new Supplementary Planning Guidance to promote timber cladding widely in the LA region. FCS is heavily involved in all these and more initiatives aimed at increasing use of home-grown timber cladding in Scotland.

There is now an identifiable resurgence of timber cladding throughout Scotland including recently in major publicly funded projects such as SNH HQ in Inverness and Culloden Visitor Centre amongst many others. This resurgence – part of a much wider European trend – will be celebrated in Peter Wilson’s new book on contemporary timber projects in Scotland to be published at the end of this month. It has also already been recorded in a 3 part article in BFF (Buildings for a Future Magazine).

Ironically it is now getting harder and harder to source good quality larch – the best timber we have for untreated cladding - in any quantity in Scotland and mills such as Woodschool and Russwood who are keen to sell cladding are constantly on the look-out for it and buy when available.

The result of the large demand for EL by just one project – the SNH HQ – has caused Novar Estate to have to stop supplying larch now and maybe for some years – a major supplier to the north Highlands.

Despite the FCS cladding promotion campaign and its own use of larch on its own projects such as FE offices at Dingwall and Culloden, it appears to have no policy in place to increase or even protect the existing larch resource. Indeed there are reported examples of FE restocking larch areas with SS ! The reason (excuse) given for this – and by others – is the relative susceptibility of larch to deer damage. ie there is less need to maintain high quality of fencing and deer control to achieve a good restock with SS.

The 10% “rule” for grant aided schemes is cited by FCS as dealing with the larch requirement but clearly it does not. There is a strong case to be made for an enhanced rate of grant for this species for a period of say 10 years at least in order to help recover stocks and provide the resource for the anticipated major future demand promoted by Govnt construction/climate change policy.

Currently the greater part of the 10% other conifers is treated as peripheral landscaping and is planted with no particular regard to site or future use. This needs to be acknowledged and tackled.

## **MINORITY CONIFERS**

The situation with other so-called minority conifers is not so clear (to me). However the demand for DF is also thought to be steadily rising and there has always been a small but important niche market for this timber as structural beams. The timber resurgence is giving rise to more demand for DF in exposed internal post and beam frames including some long lengths and large sections. A number of new public buildings have used home grown material recently and there is evidence of a spread of interest in sourcing this material from within Scotland instead of from Canada.

It is worth noting that the occasional small parcels of Western hemlock and Western red cedar that come on the market from Wales and England find an immediate high value market and it is clear from the amount imported that home-grown material would be snapped up in Scotland if available.

## **HARDWOODS**

Very limited amounts of hardwood are used these days in UK construction – except in flooring, window and door manufacture and virtually none is home-grown. Highland Birchwoods’ original remit back in the 80’s was to find and promote uses for birch including in construction and the most successful potential use was found to be as flooring. The project also effectively demonstrated the application of quite a range of native and honorary native Scottish hardwoods as floorings and linings.

Glencoe Visitor Centre (Gaia Architects) demonstrated a large oak floor and birch ceiling but sourcing turned out to be difficult and few others have followed. The design for the new FCS Queens View café (Locate Architects & North Woods) will use a whole range of home-grown hardwoods in mixture in the floor and furniture if budget allows. Whilst it is possible to source Scottish hardwood flooring and linings through ASHS, large projects may be difficult to cater for and lead times may be long. An obvious problem for Scottish suppliers is that one can so easily

order high quality sawn oak in almost any dimension (eg from Russwood) from France in a matter of days and also one can source French oak (and chestnut etc) flooring from any number of suppliers. This oak is sustainably grown from many small suppliers and cannot be faulted as a good and green product except that it travels from France – not a big deal in construction miles terms.

Oak however also makes excellent cladding and, for this purpose, does not need to be of “furniture” quality. There is a definite market for home-grown oak as the cladding market expands and demands products from nearer home to reduce carbon footprints.

## **NEW TIMBER PRODUCTS**

There has been much global R&D effort into so-called engineered timber products in the last 20 years. Many of these deliberately utilize lower grade and smaller sections of softwoods as being the most abundant type of timber available. The I joist is a classic example utilizing an OSB web (can be Scottish) and a 50x50mm section of (Scandinavian) spruce only. Such products do little or nothing to help diversify the planted resource in Scotland.

“Massive timber” panels are now just entering the Scottish construction scene following a 2 year EU funded research and education project by Gaia and North Woods. These structural panels comprise of solid timber and are made throughout Europe and Scandinavia – typically, you guessed, of spruce. They are gaining ground rapidly due to excellent environmental profile including ability to fix large amounts of carbon. Two companies in Scotland are at an early stage of setting up manufacturing capability.

The internal face of these panels is typically exposed as wall or ceiling in a European building and whilst the Scandinavians may use SP for this, in Scotland we could use DF or larch for a tougher and more decorative surface.

## **CONCLUSIONS**

The worrying conclusion from all this is that the spruce market is not only well established but set to grow considerably and that home-grown material may increasingly substitute for foreign material. The demand for pulp and biomass fuel will grow to accommodate very low grade material and, increasingly, engineered construction products will only demand small sections. The consequences for a more environmental forestry look bleak with the one species providing the vast majority of market requirements and, added to that, it can be small and fast grown, encouraging shorter rotations than ever. It is also relatively deer resistant which – in a country with a deer population that has trebled in 40 years – is a definite plus point for the grower.

It seems therefore more imperative than ever to focus some attention on to whatever timber demands/markets there are that utilize different species. Of these (in construction) cladding is the most obvious. Flooring and internal joinery is secondary. A strong case can be made for the growing of larch and to a lesser extent for DF as both structural and decorative timber. Oak can also be shown to be in good demand and likely to increase as both a flooring and cladding material.

A major campaign for larch and DF would probably find favour across a broad community of conservation and landscape interests and it is suggested that FPG consider a focus on the larch cladding issue.

However, arguably, the bigger conclusion concerns the whole approach to forestry policy and grant aid and the lack of integrated thinking/policy when it comes to the construction/forestry linkage. The Govnt needs to see that the question of mopping up a large spruce resource is no longer the big issue. The more urgent issue now is to find uses for other species and to recognize the few we already have which could be nurtured. It is particularly important to recognize the chicken and egg situation in manufacturing markets. (Without the resource, the manufacturing cannot develop - but nobody will plant a species without a healthy market.) This is where the focus of grant aid can be used to make critical changes. It only took a minor enhanced grant on native hardwoods and Scots pine to bring about substantial new planting schemes. Is it not time for a similar approach to “other conifers” or even specifically to larch and perhaps to targeted hardwoods such as oak and chestnut with demonstrable uses in construction ?

An integrated forestry strategy for the future : would have a clearer idea of what the desired forest resource of Scotland is and try to define this in terms of species and relative abundance. The SFS only does this in terms of softwoods vs. native/semi natural/mixed woodland giving the following proportions : NOW as 4 and 13% rising to 8 and 17% by 2050.

**This “definition” or analysis of the Scottish forest resource of the future is simplistic to say the least and not detailed/sensitive enough to deliver either (a) a more biodiverse or ecologically balanced forest or (b) a more economically strategic one in terms of a wider or more varied processing/manufacturing base of varying scales. A more refined or detailed specification for a future forest resource could then inform the targeting of grant systems.**

“Designing the future forest” : has to be a subtle combination of approaching a solution from both ends. One end is looking at an ideal (or improved) forest composition from an ecological viewpoint (soils, biodiversity, carbon sequestration, water catchment management, fisheries). The other end is looking at the uses of/demands for different timber species. Such an exercise needs at least a Scotland-wide perspective but, better still, a European and Scandinavian perspective. This would allow a more **bio-regionally strategic approach taking account of both bioclimatic growth factors and the realities of an international timber market.** A number of government strategies and SEA’s have hinted at this need already.

(See following page for some useful quotes especially the one in red from SFS)

## **PEER REVIEW OF THIS PAPER**

I have had this paper read over for factual accuracy by Ivor Davies of CTE. He makes no corrections and says he “largely agrees”, adding the following (paraphrased) comments :

- 1) The reasons Scottish timber frame companies favour imported softwood is its better dimensional stability – along with price and long term supply agreements.
- 2) The market for timber cladding in the UK is now doubling every 2 years or so. Current consumption may be as much as 3million m<sup>2</sup>/yr yet only about 1% is from UK sources.
- 3) Durability in all three species of larch is largely a function of age and rotations of 60 years plus are necessary to supply good cladding (ie heartwood).
- 4) Home grown DF and WRC are not as durable as imported old growth material – a further market constraint for home-grown material.
- 5) Hardwood mills in the UK using over 1000 m<sup>3</sup>/yr have dropped from 11 only 5 years ago to about 3 now ! Appears impossible to compete in the global market. Yes, the French (and others) really have it sorted.

Continued/

- 6) Would the addition of say 10% DF and larches really help the ecology of forests significantly?
- 7) The paper doesn't say enough about SP or discuss growing timber for quality with better management regimes than currently.

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November 2007

## SOME QUOTES ON TIMBER & CONSTRUCTION FROM GOVNT POLICY

### SCOTTISH CLIMATE CHANGE PROGRAMME

“The Executive is working to remove barriers to durable use of timber in construction which can substitute for more energy intensive materials and retain the carbon fixed in the timber”

### SCOTTISH FORESTRY STRATEGY

Vision for the 2<sup>nd</sup> half of 21<sup>st</sup> century :

“A broader range of forestry related businesses is also well established, including new value-adding enterprises, local timber processing based on softwoods and hardwoods...”

Objectives :

“encourage small businesses supplying local markets”

“promote the use of timber in sustainable construction”

“Encourage the hardwood timber sector”

Key theme 2 : What needs to be done ?

“Promote development of the quality and diversity of timber resource required by the full range of existing and potential markets”