

Charcoal & wood fuel

Sourcing and transport



BioRegional

solutions for sustainability
www.bioregional.com

Ben Witchalls

Biomass Business Development Manager

- A registered charity founded 1994. Offices at BedZED.
- Programme areas:
 - Biomass (woodfuel and charcoal)
 - Fibres (Laundry recycling, minimills and hemp textiles)
 - One Planet Living (OPP, international, Olympics (with WWF), OPL in Sutton)
- Working with commercial, local authority and academic partners



BioRegional Charcoal Company

- Established 1995
- Network production
- 300 – 400 ha of woodland managed
- 15 suppliers across UK
- Each supplies from 1-30 tonnes/yr
- 3kg bags, 56 bags per pallet
- FSC
- Partnership with Rectella International
- find it at B&Q, Tesco, Sainsburys, Homebase



Making Charcoal – GHG lifecycle?

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Credit: Charles Raby

Vs.

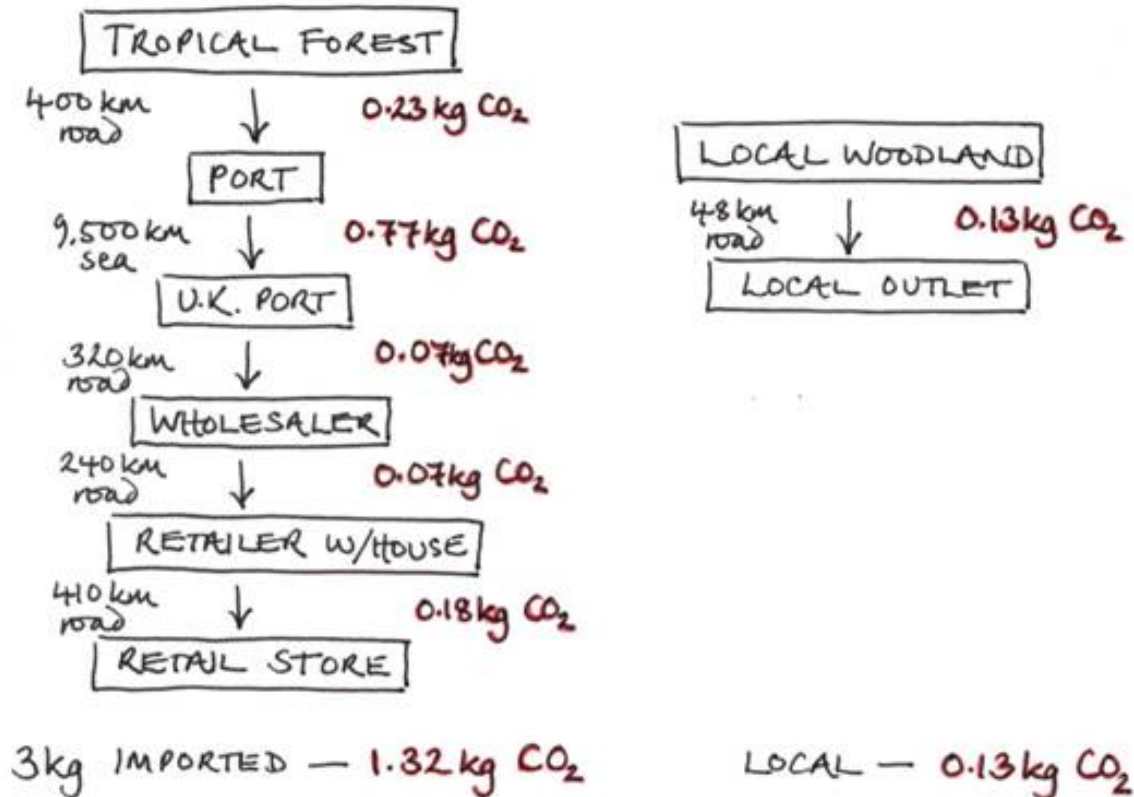


Pyro-7 manufactured by Necsa in South Africa

BioRegional Charcoal Company

- Reducing transport emissions by 85% over importing from South America for example

(London University Study)



TreeStation concept

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- **Receives logs and chip**
- **chip logs**
- **screen chip**
- **store**
- **deliver**
- **But no drying**

Tree Surgery Arisings

- London minimum of 127,000 tonnes/year (2008 survey)
- chips and logs
- green
- requires screening and drying
- existing uses: path surfacing, mulch, firewood logs
- needs investment –
- Croydon TreeStation cost around £350,000, production 5-10,000 tonnes/year



Transport and Energy

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	Moisture content %	£/tonne delivered	£/oven dry tonne	p/kWh
Tree surgery waste – fresh	45	22.00	40.00	0.84
Tree surgery waste – dried	30	45.00	64.28	1.28
Woodland chip	45	39.00	70.91	1.48
Sawmill co-product	35	25.00	38.46	0.76
Waste wood	20	25.00	31.25	0.60
Short rotation coppice	30	42.00	60.00	1.19
Miscanthus	16	38.50	45.83	0.88

Types of wood fuel



Wood chip is:

- bulky, low density
- variable
- relatively low value;
so
- best produced close
to point of use




Wood pellets are:





- 4 times the density of chip
- uniform size and moisture
content
- around twice as expensive
as chip
- often imported

Delivery methods

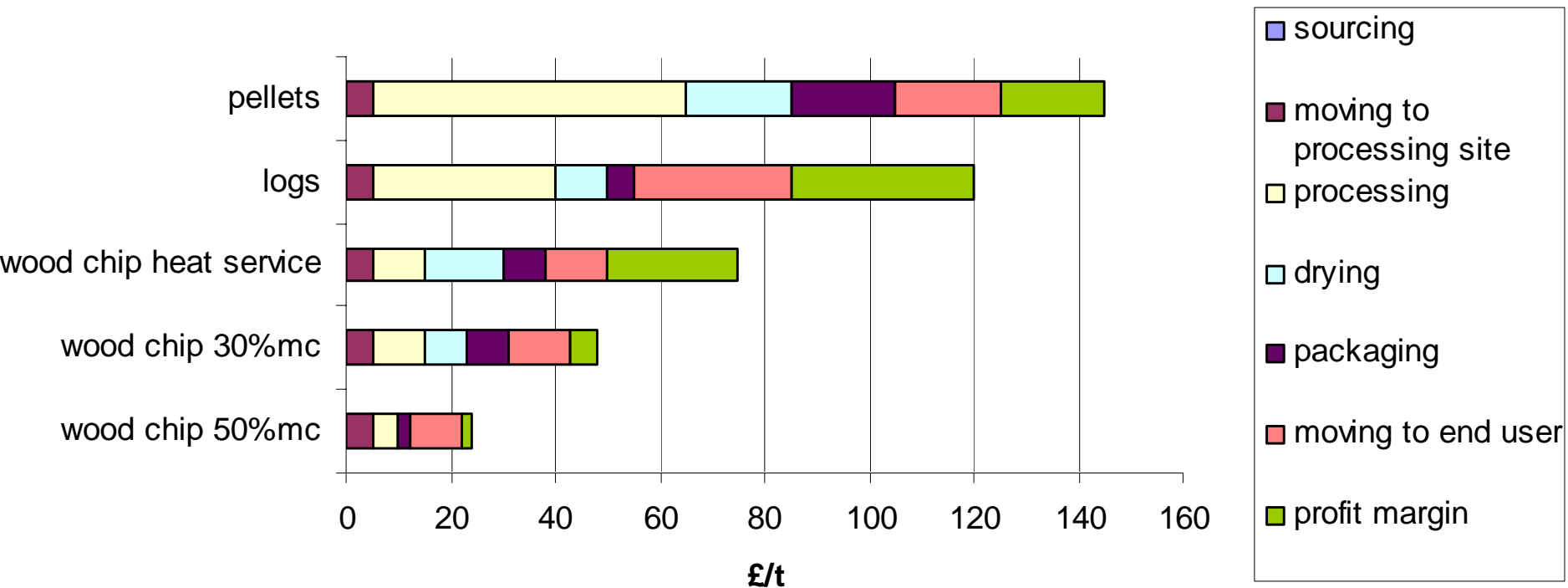
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Delivery method	Example	Typical fuel type	Typical payload	Availability
Flexible hose from a blower tanker		Most commonly pellet but also chip	Pellet: c.15-20m ³ (10-14 tonnes) Chip: c.10-20m ³ (4.5-6 tonnes)	Pellet – common delivery vehicle. Chip – specialist delivery vehicle, not common.
Bulk bag deliveries		Pellet or chip	1-2m ³ /bag	Common in some areas (e.g. Scotland).
Tipper trailer		Pellet or chip	Chip: c.20-30m ³ (6-9 tonnes) Pellet: c.20-30m ³ (14-21 tonnes)	Tipper trucks widely available and common delivery method, particularly for chip.
Scissor lift tipping trailer		Pellet or chip	Chip: 20m ³ -30m ³ (6-9 tonnes)	Specialist delivery vehicle required.

Delivery methods

Blower trough and tipper truck		Chip	c.20m ³ (6 tonnes)	Tipper trucks widely available but blower troughs are specifically purchased for site fuelling.
Hook lift bin/Ro-Ro bins		Chip	30m ³ -35m ³ (9-12 tonnes)	Specialist delivery vehicle required.
Front loader		Chip and bales	c.1m ³ (0.3 tonnes)	Common machinery for farm/estate application.
Walking floor trailer		Chip	60m ³ (18 tonnes)	Specialist delivery vehicle required – suited to large scale deliveries.

value chain wood fuels





TreeStation challenge – fuel quality delivered

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Continual feed, mixed output?

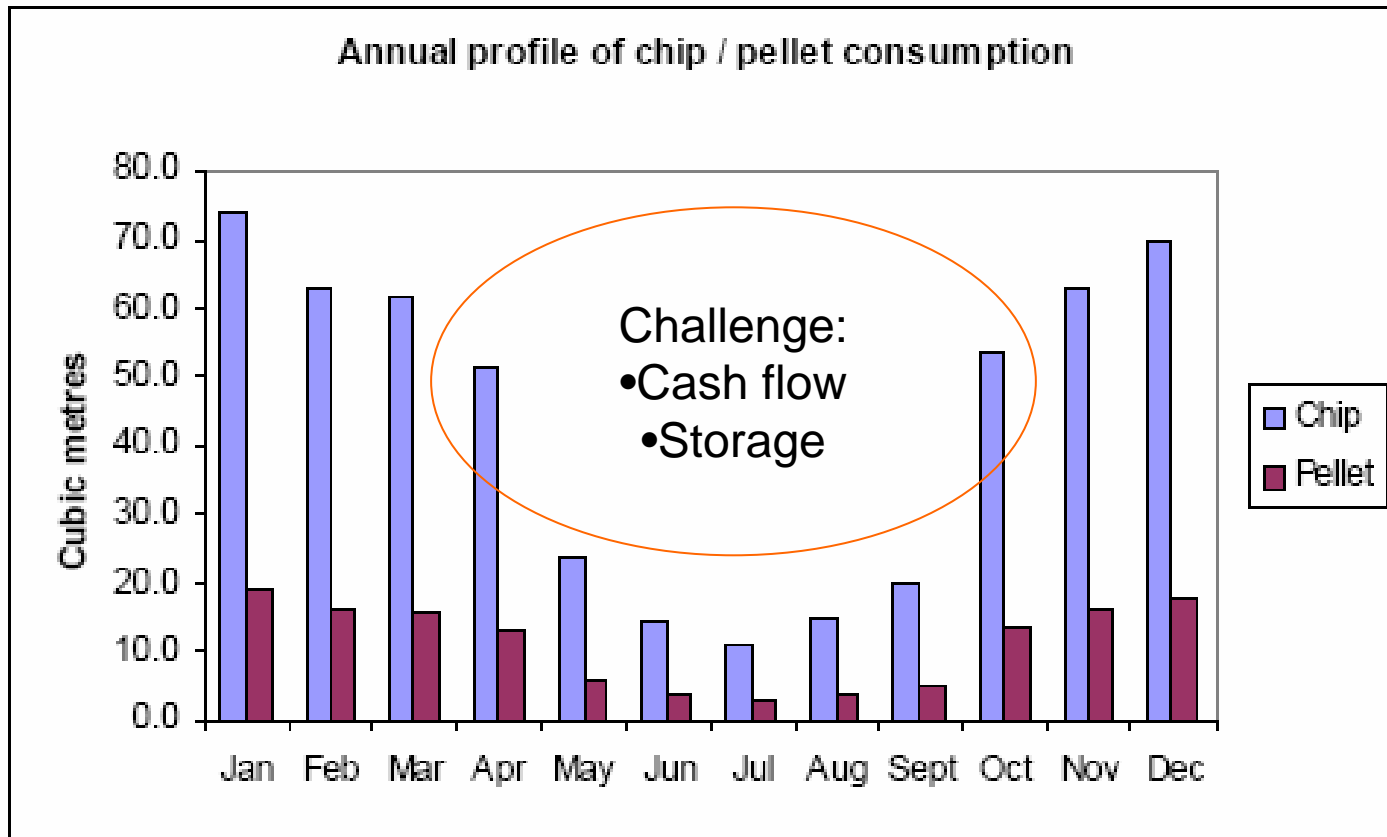
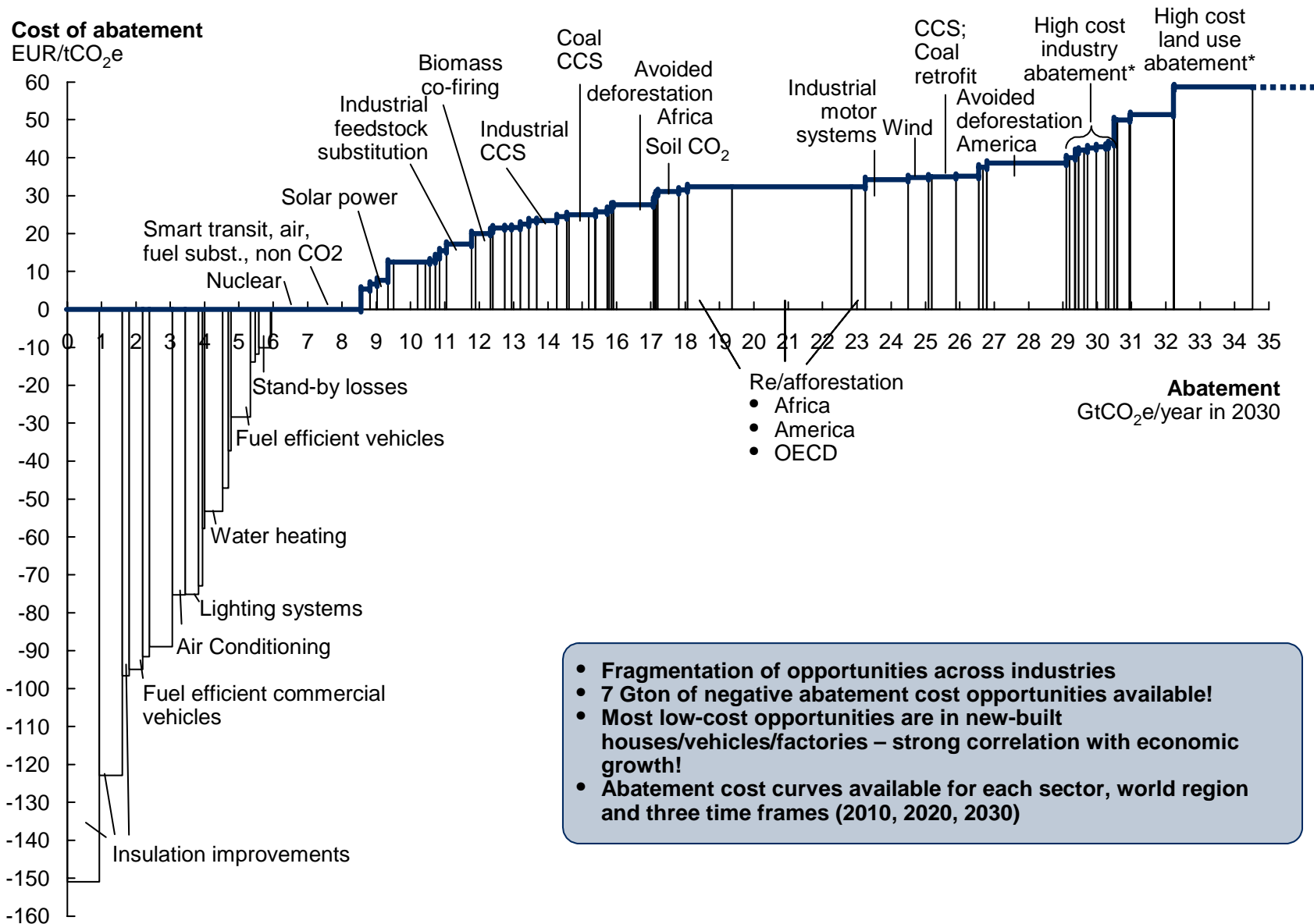


Figure 4.2 Annual wood fuel consumption profile

Global cost curve of greenhouse gas abatement opportunities



- **Fragmentation of opportunities across industries**
- **7 Gton of negative abatement cost opportunities available!**
- **Most low-cost opportunities are in new-built houses/vehicles/factories – strong correlation with economic growth!**
- **Abatement cost curves available for each sector, world region and three time frames (2010, 2020, 2030)**

Conclusions

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- Where is the feedstock?
- Energy vs offset
- Supply and demand location
- Carbon price > \$60/t ?

