



'Planning, procuring and delivering biomass heat schemes in the public sector'

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*Planning, procuring and delivering
biomass heat schemes in the
public sector*

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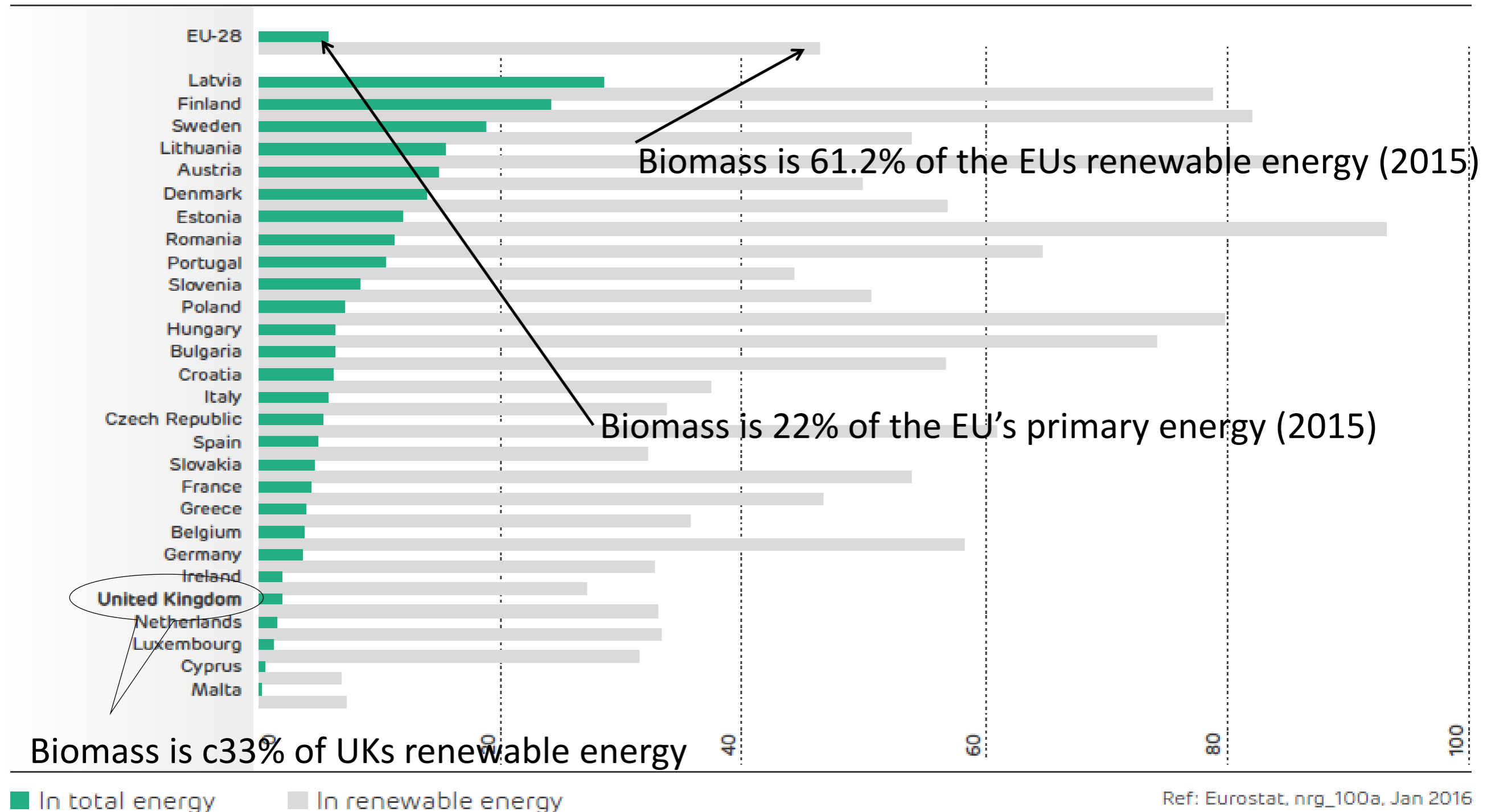


The role of woody biomass in renewable energy

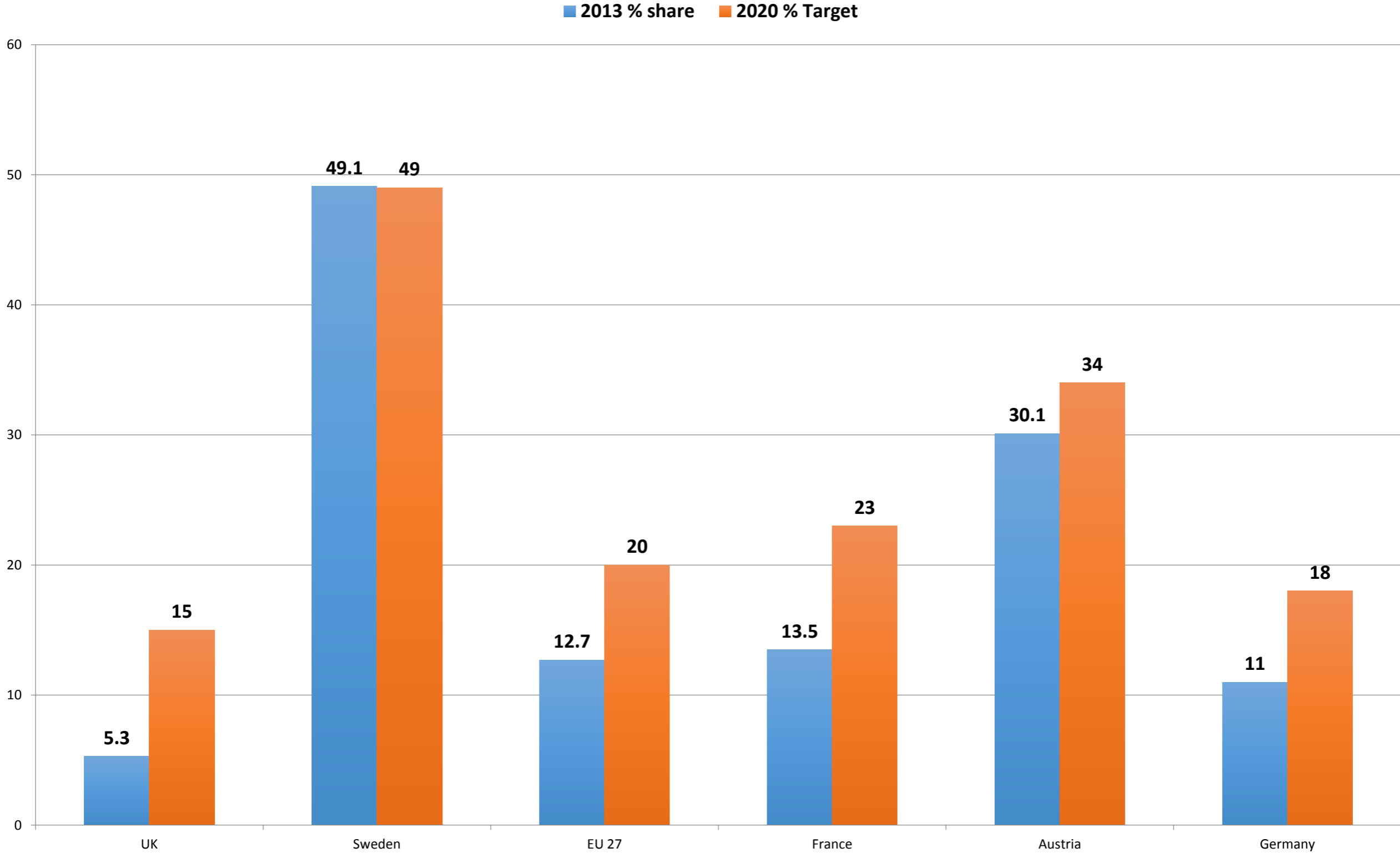


Wood as a source of energy, 2013

% share of wood and wood products in gross inland energy consumption, in Tonnes of Oil Equivalent



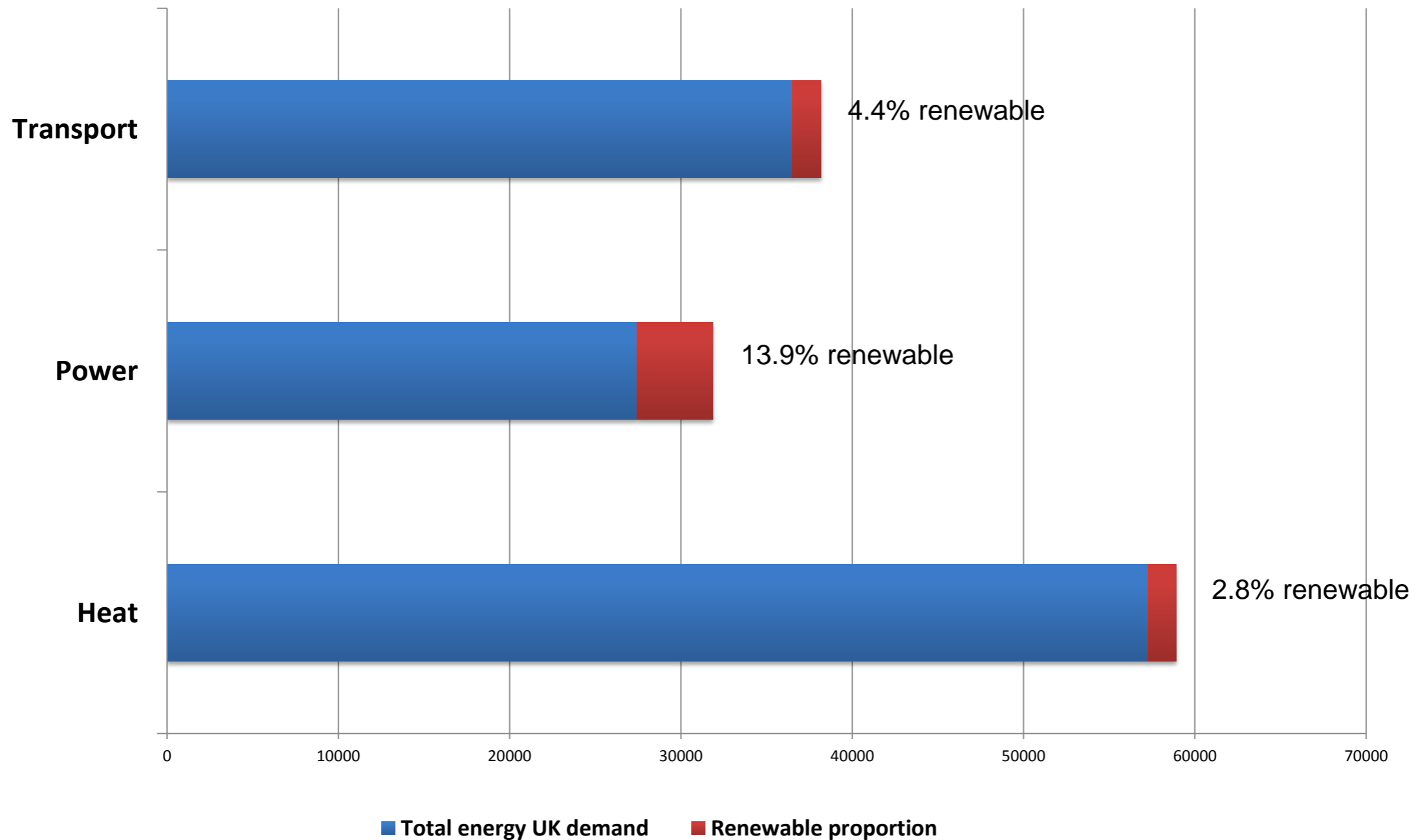
Progress to RED targets



UK's progress to 15% RED target: 5.3% now! heats importance to the UK energy policy



UK energy use KTOE (5.3%) (2013)



In brief DECC intend:

- Increase heat pumps
 - Increase large biomass (4MW+)
 - Cessation of under 1MW biomass
- This is not about money, its about ‘picking winners’**

Table B4: Level of RHI Budget Caps

Year	2016-17	2017-18	2018-19	2019-20	2020-21
Budget Caps	£ 640m	£ 780m	£ 900m	£ 1,010m	£ 1,150m

<i>Technology</i>	<i>2016/17 – RHI support</i>	<i>2020/21 –RHI support</i>
<i>Biomass</i>	£30 million	£229 million
<i>Heat Pumps</i>	£6 million	£128 million

Why are DECC proposing this: decarbonised power grid?

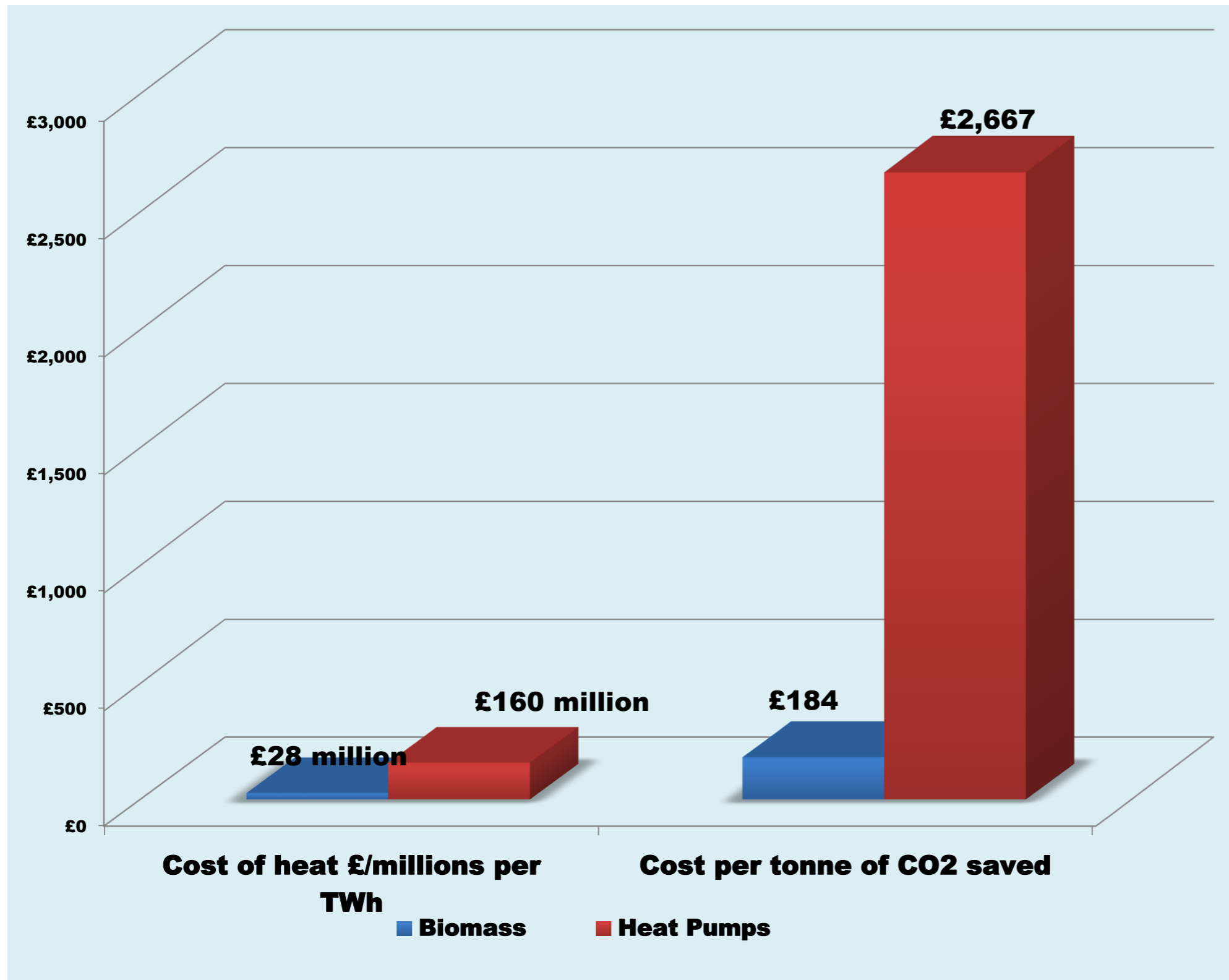
But consider that in last 4 years under the non-domestic RHI (about):

- 500 heat pump schemes were installed UK wide
- 13,000 biomass schemes were installed UK wide

But:

- Large biomass won't deliver as there aren't enough sites
- Heat pumps won't ramp up to levels required

Adverse impacts of reform?



- RHI won't spend
- RED targets won't be met
- Carbon savings reduced

- Its not about money
- Delay?
- Interim freeze?
- Single tariff?
- We know only until March 2017



Biomass design, build and operate schemes in Scotland (2014 to 2016) – Retrofitting.....



- West Lothian Council – 6 sites
- Argyll and Bute – 15 sites
- East Dunbartonshire – 12 sites
- North Ayrshire – 12 sites

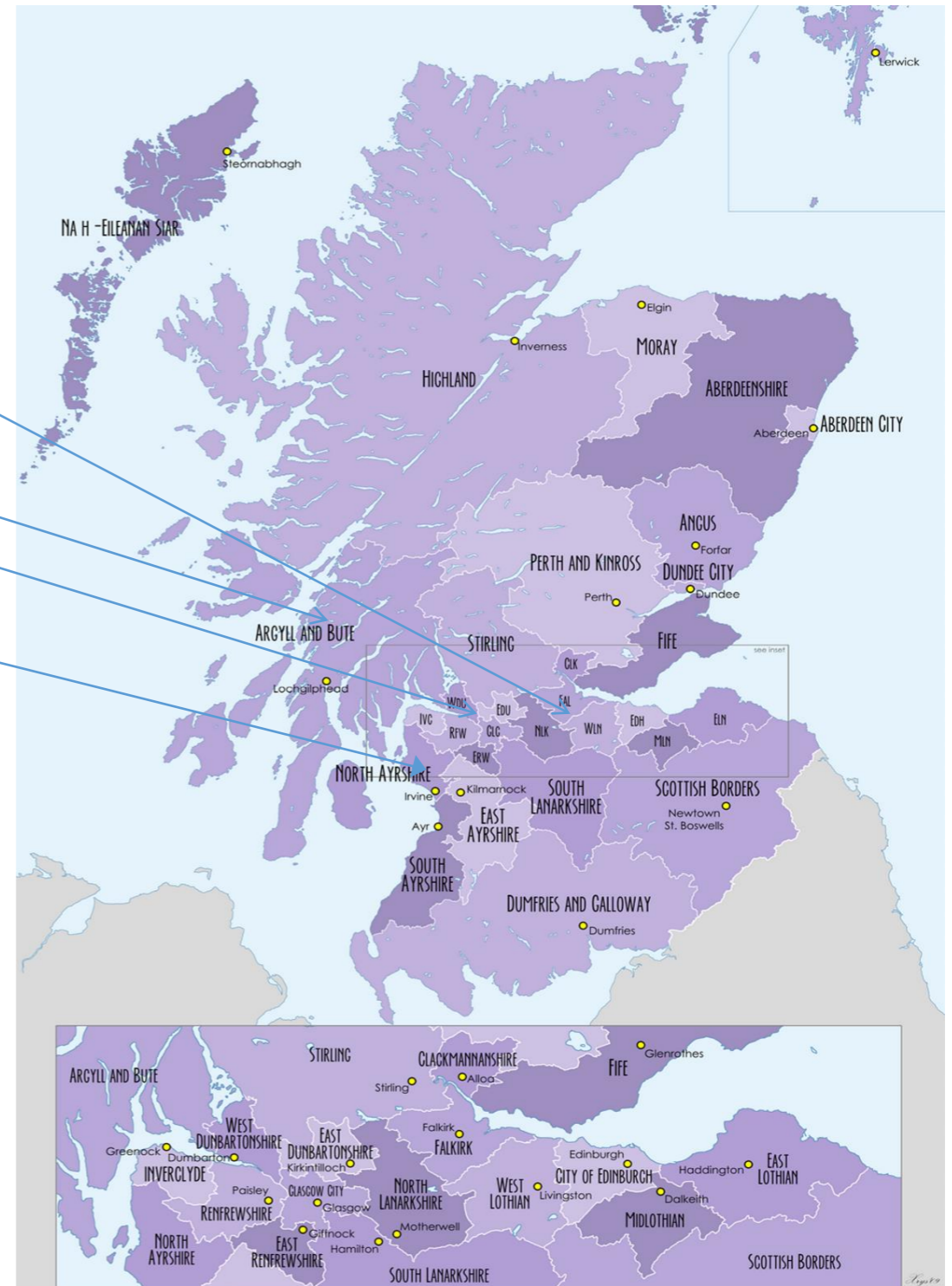
45 projects

11MWs of installed capacity

Over £10 million capex

£12 million opex over 6 years

C50% operational now



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Some photographs of the schemes



Where biomass works in the Local Government Estate?



Key opportunities:

1. Retrofit
2. Off gas first (oil/coal/LPG)
3. Electricity challenging
4. Modern heat systems better than old
5. Heat bills above £10k (£50k perfect)

Then....

- Social rented high rise
- Schools – high and primary
- Leisure Centres
- Civic offices
- Sheltered Housing

- = 7 year paybacks
- Zero/low cost heating in best sites
- Groups of sites
- At least 10 to 20 suitable sites per LA
- £400k to £2M



What can go wrong: rather a lot.....



Cheapest scheme usually provided by installers;



Fuel supply not considered by designer



No contract that defines who pays for problems and disputes at any stage in design and build



**Running and O&M costs not defined or fixed – how and where is heat paid?
Efficiency issues**

The Scottish Government

Scottish Government appointed 10 biomass framework Service Providers for the provision of biomass energy supply agreements in 2013.

They are vetted suppliers

Standard contracts produced for repeatable tenders

The process provides for a '**design, build and operate**' solution

Allows the procurement of well designed systems with a long term plan for heat supply

The model is applicable in England and solves all of the problems being encountered

Let the specialists design and build it based upon a '***performance specification***'

Integrates fuel supply with scheme design

Allows biomass supplier to balance opex and capex via wholelife assessment.

Tenders are judged on **payback** as it combines opex and capex

Transfers **performance and efficiency risks** to those best placed to manage them.

The RHI income is guaranteed.

The amount of renewable heat is guaranteed.

Group procurement to deliver economies of scale in planning, build and operation

1. MCPB (under Framework) or 'ITT' or 'Employers Requirements' (performance specifications) – 40/50 pages
 2. Standard Building Contract – JCT D&B or SBBC etc with Bills of Quans
 3. Heat Supply Agreement – 30/40 pages
- Resource and expertise implications
 - Quantity Surveyor
 - Contract Administrator
 - Allow time for planning consents if required
 - Lead times for equipment order
 - It's no different from many small construction projects

Performance Specification coverage:

- ‘Maximum Quantity of Heat’ : Heat loads and profiles (occupancy patterns, BMS)
- Location and appearance standards required
- Role of existing fossil fuel plant (Heat Provision Ratio) – retain, remove, replace?
- Planning consents, building warrant, emissions – costs that may change post award
- Tender submission requirements (what are firm designs and costs?)
- Award process: evaluation criteria (payback not cost)

- For the construction works
- Use a standard building contract - eg JCT ‘design and build’ forms
- Don’t use the installers T&C’s
- At the least define payment terms, programme, damages, variations

- Contract coverage:
 - Payment terms (Monthly on site, no upfront payments)
 - Contract of Purchase/off site payments
 - Valuations and post tender changes/unforeseen issues
 - Define programme,
 - LAD and retentions,
 - Level of contingencies

- For the running phase
- Term (6 years?)- indexation (CPI/RPI) – compare that to gas risks
- Deals with payment for metered heat (£/MWh) – remember they designed to a cost for the metered heat rate
- Deals with fully planned O&M (£/month) – repairs and renewals
- Heat outages = biomass down time with fossil back up – HPRs set
- Not required to be 24/7 call out service in a retro-fit situation
- Defines compensation for loss of RHI

Actual costs 2015



Sites	Capital costs	Do nothing energy cost	Biomass Costs	Back Fossil Fuel up Costs	RHI income	Net energy new cost	Simple Payback
1	459,898	34,793	71,881	0	72,349	468	13.4
2	155,452	19,894	22,024	1,590	28,211	-4,597	6.3
3	158,188	27,990	29,509	4,190	31,561	2,138	6.1
4	160,500	18,870	21,200	1,320	27,755	-5,235	6.6
5	168,866	6,554	11,260	0	21,032	-9,274	10.6
6	211,273	25,915	18,735	1,554	24,239	-3,949	7
7	345,813	57,060	62,549	2,853	69,877	-4,474	5.6
8	156,471	15,720	18,124	942	26,055	-6,988	6.8
9	156,023	14,259	16,599	855	25,212	-7,757	7
10	185,094	26,970	27,163	4,044	31,053	155	6.9
11	133,728	10,419	6,699	518	9,112	-1,894	10.8
12	171,423	19,257	11,146	964	17,806	-5,697	6.8
Totals	£2,462,729	£277,701	£316,889	£18,830	£384,262	-£48,543	7.5 years

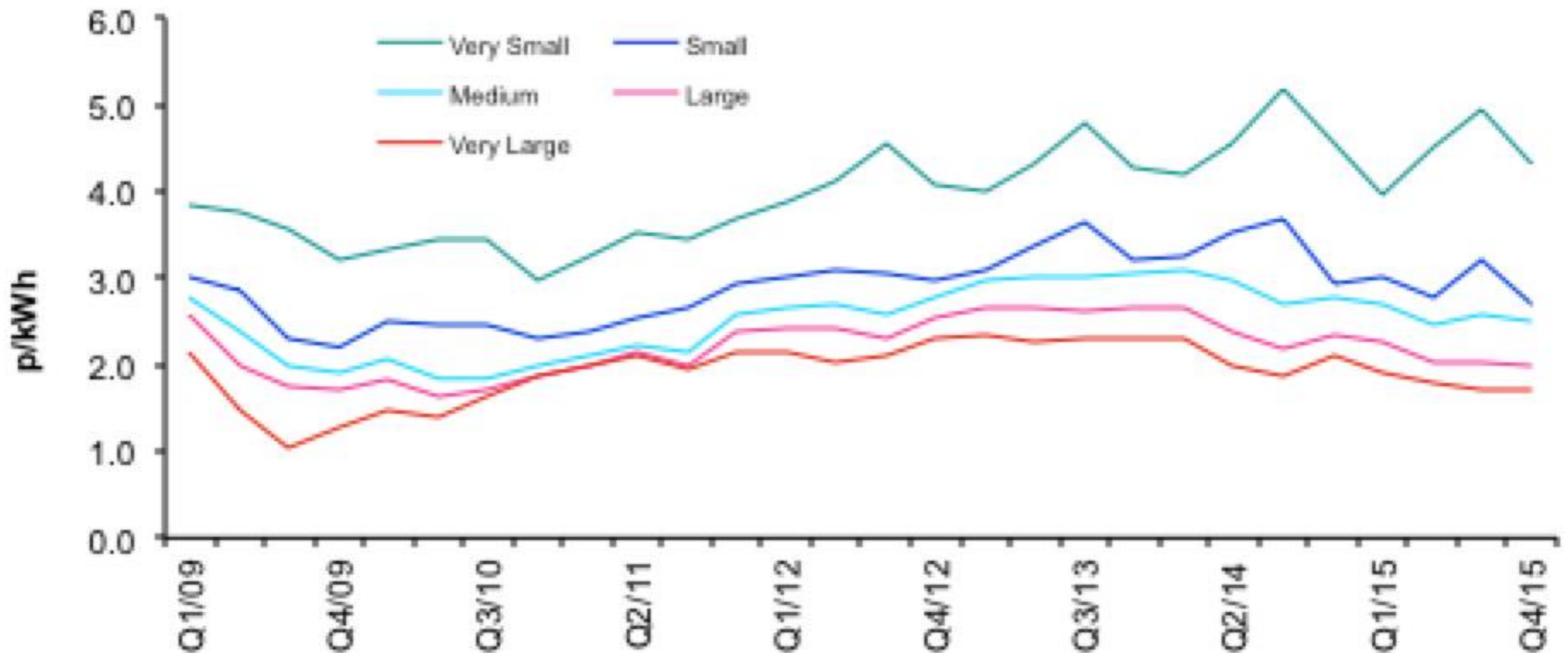
1. Highly successful financially
2. Low financial risk given performance guarantees in HSA's
3. Zero risk in terms of heat continuity in retro-fit
4. Group procurement ideal and reduces costs
5. Consider financed solutions if prudential borrowing not possible
6. BMS and secondary side integration an issue at all schemes
7. Ground conditions and some unforeseen costs at most sites
8. Metering locations and £/MWh key
9. Protocols for fault identification and call outs: biomass takes the blame in retro-fits

Volatile prices, uncertain future prices

Falling from over 3.5p/kWh to 2.5p/kWh recently

Procurement guidance required for a 10 year investment choice

Average non-domestic gas prices including CCL



Conclusion:

1. Window until March 2017 (but may remain to 2021)
2. There is just time
3. DBO the way to go
4. Group procurement best

Thank you for listening

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