

The Costs of Co-firing in Irish Peat Stations

Amy O'Mahoney
15th October 2009



Outline

- Policy
- Irish Peat Stations
- Biomass
- Current Challenges
- Fuel Ranking
- Meeting Target

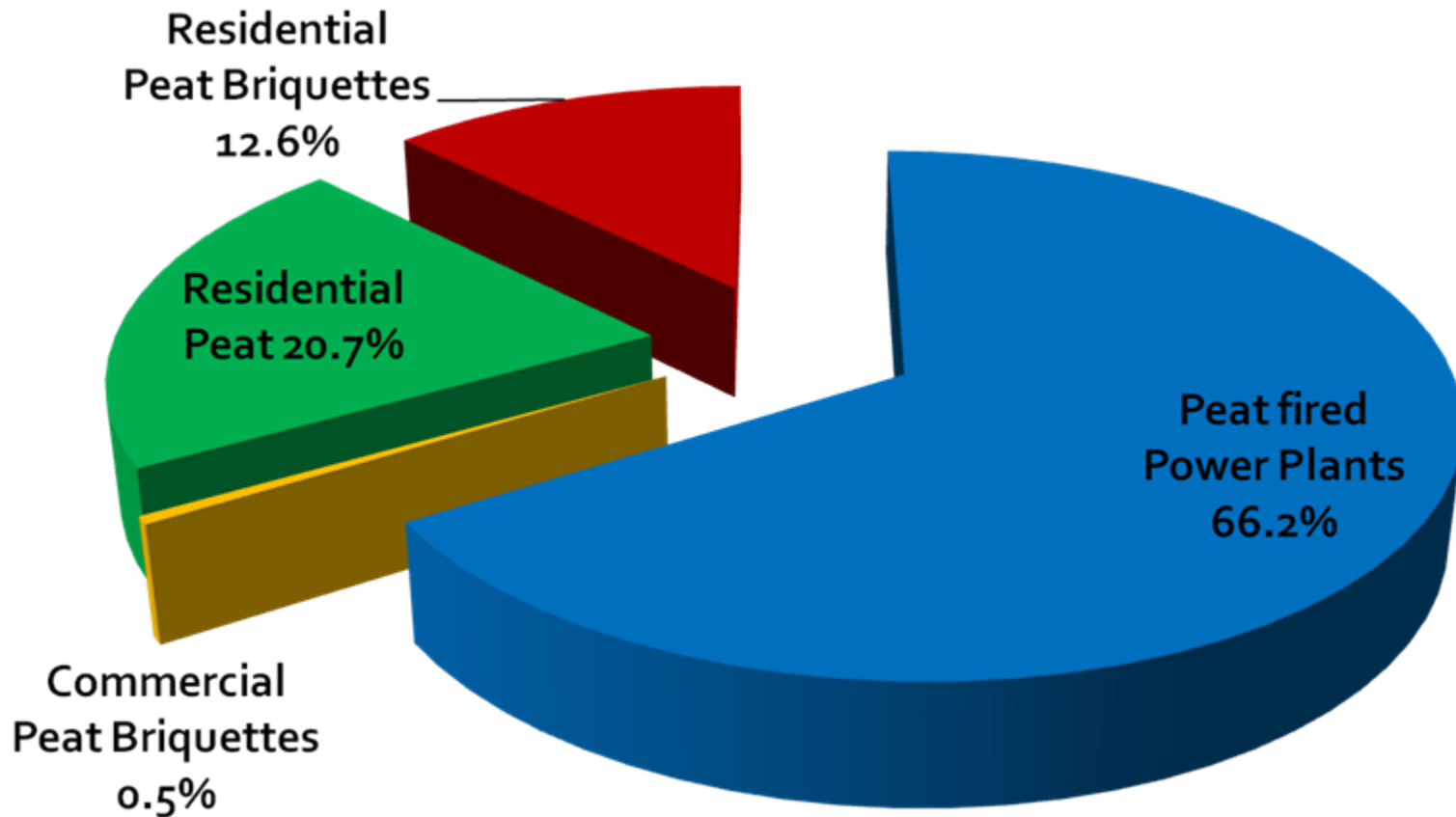


Government White Paper 2007

- Sets target of 30% co-firing at the three State owned peat power generation stations to be achieved progressively by 2015
- Replacing approx 924 000 tonnes of peat per annum



Irish Peat Stations



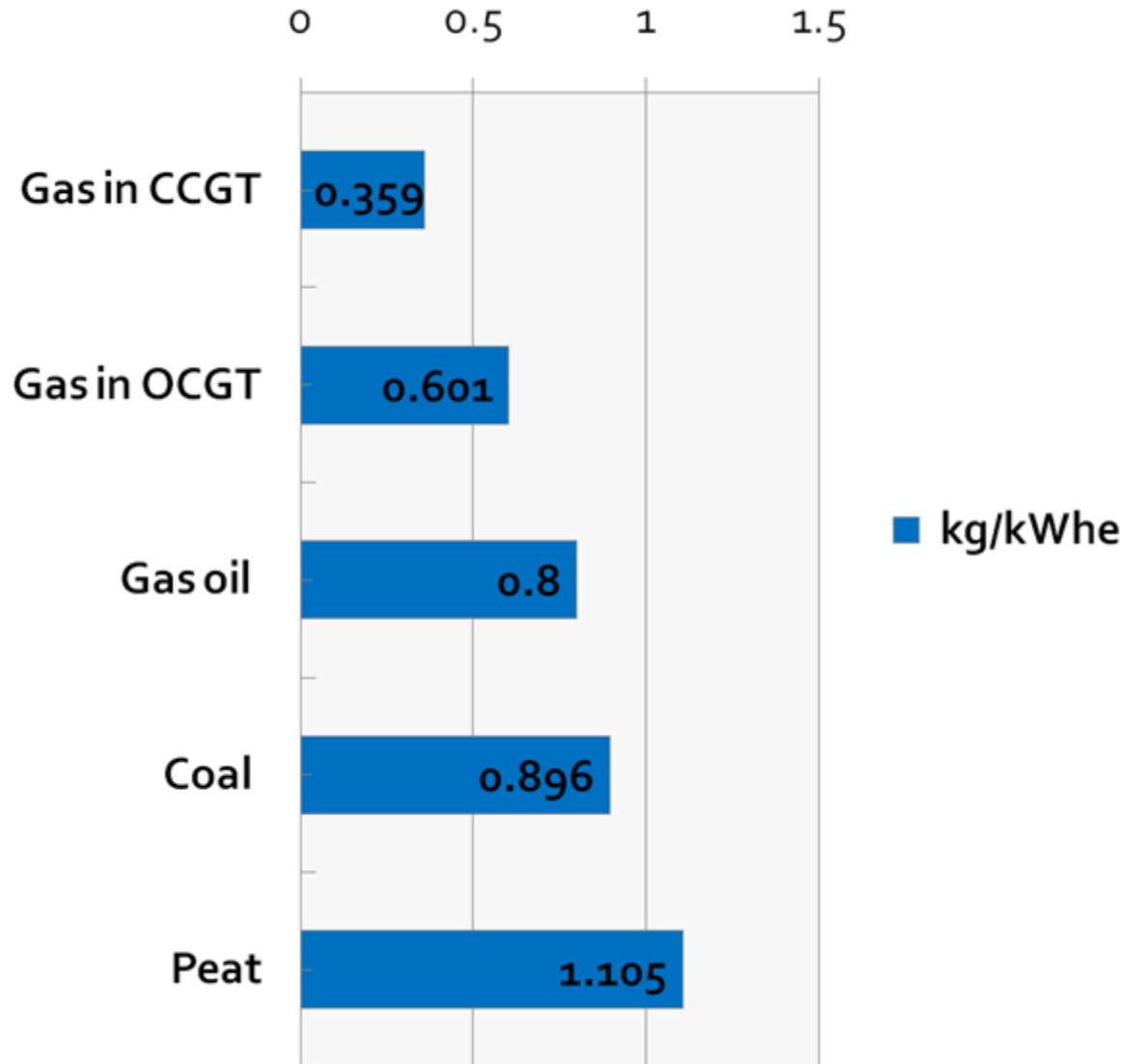
Irish Peat Stations

- Edenderry - BnM
- Lough Ree , West Offaly – ESB

- Combined total output of 360MW
- Use fluidised bed technology
- More efficient than the stations they replaced



CO₂ Emissions



- **Biomass all the earth's living matter; materials such as wood, plant and animal wastes, which – unlike fossil fuels – were living matter until relatively recently**
- Sustainable
- Carbon neutral



- To preserve the security of supply benefits of peat, only considering indigenous biomass
- Miscanthus, Willow, MBM, Forestry
- Not looking at waste residues or sources for which there is already a market



Costs of fuel

- Price per GJ is main consideration for peat stations
- Practical issues cannot be ignored however

- Storage – MBM, energy crops, wood pellets
- Handling – Miscanthus, MBM
- Processing – Miscanthus

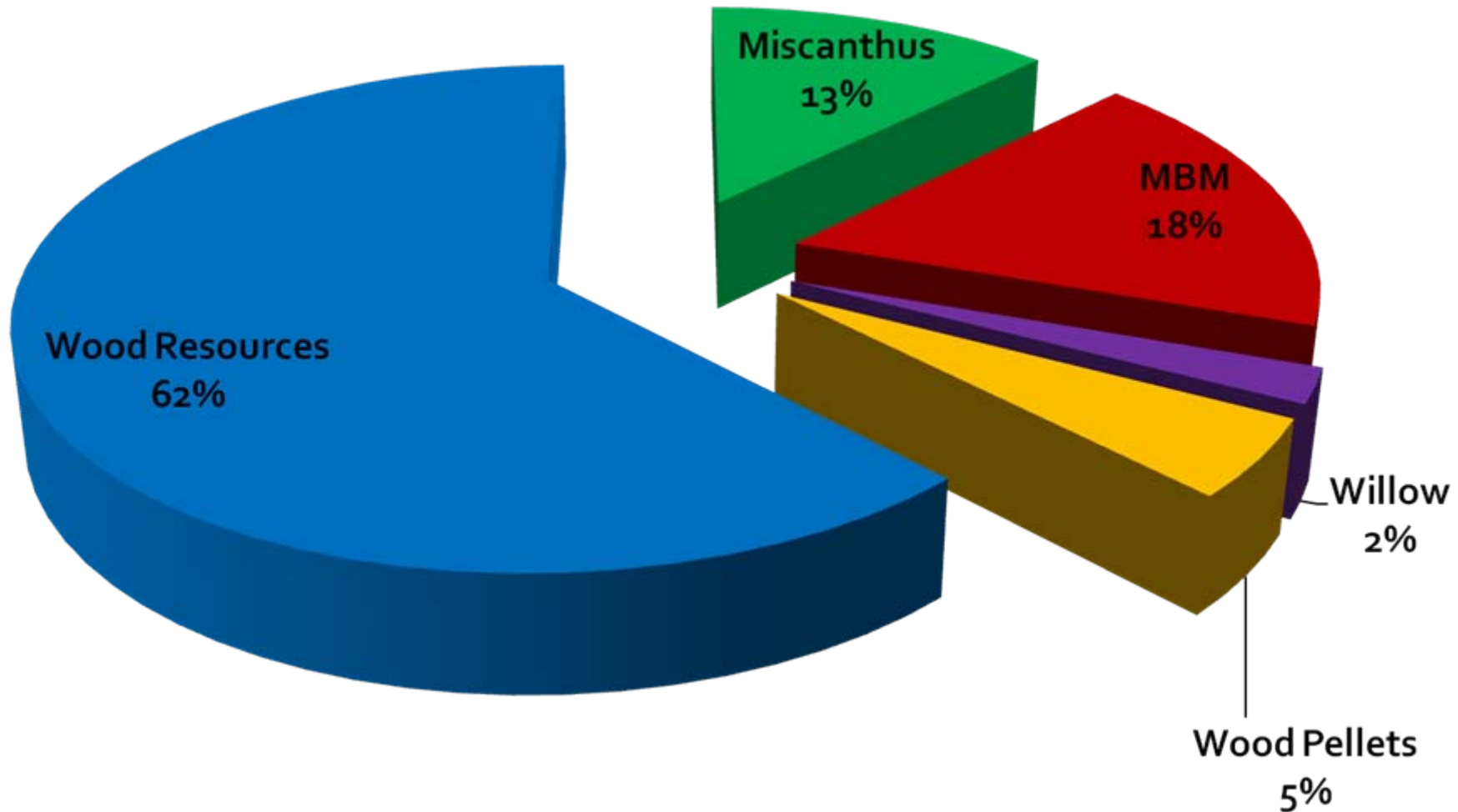
- All add to actual cost per GJ



Fuel Ranking

Rank	Fuel	Calorific Value (GJ/tonne)	Price per GJ	Resource	GJ Potential
1	Wood Resource	6.5	€4.5-6.5	274,545 tonnes	2,109,542
2	Wood Pellets	17	€4.5-6.5	10,000 tonnes	170,000
3	Willow	12.13	€8-12	500 ha	77,000
4	MBM	15	€5-6	40,000 tonnes	600,000
5	Miscanthus	13.72	€8-12	2500 ha	427,500

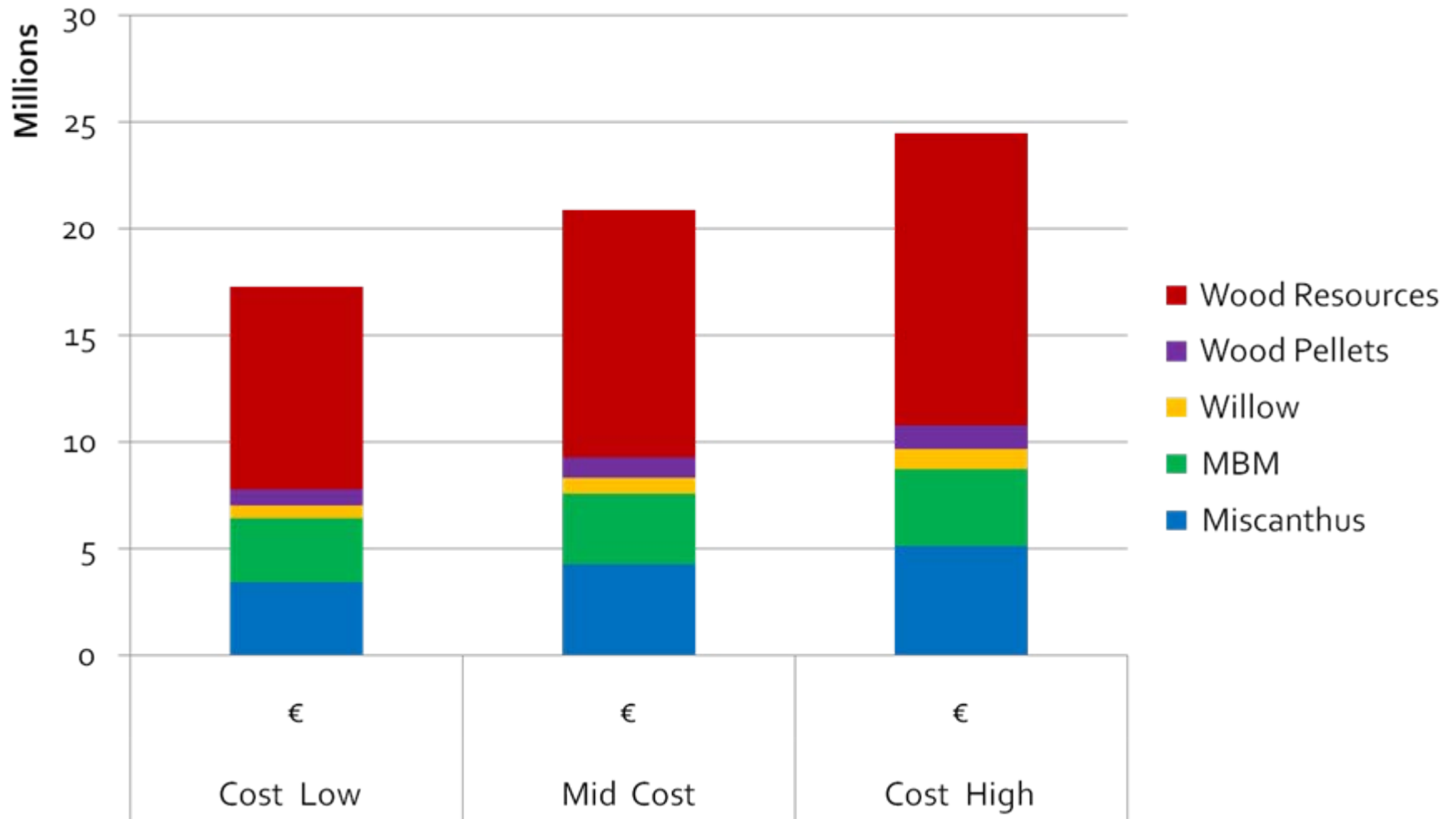
Current Resources



- As biomass for the heating industry takes off, the amount of wood & wood pellets available for co-firing could fall significantly, and the cost will certainly rise
- Further amounts of energy crops are unlikely to be available without an increase in price to entice farmers and a commitment to buy all available resources



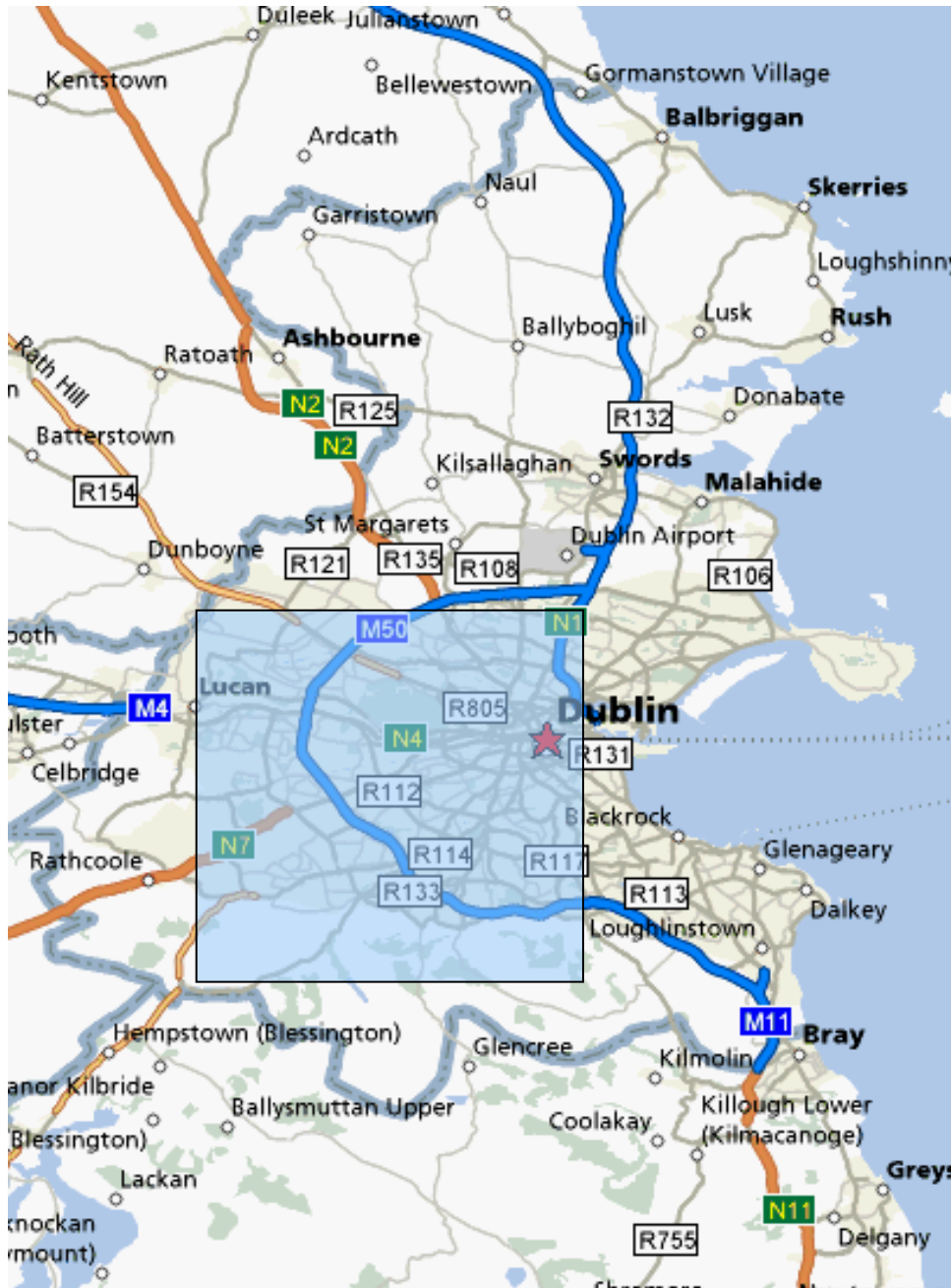
Price Range of Fuels



Current Resources

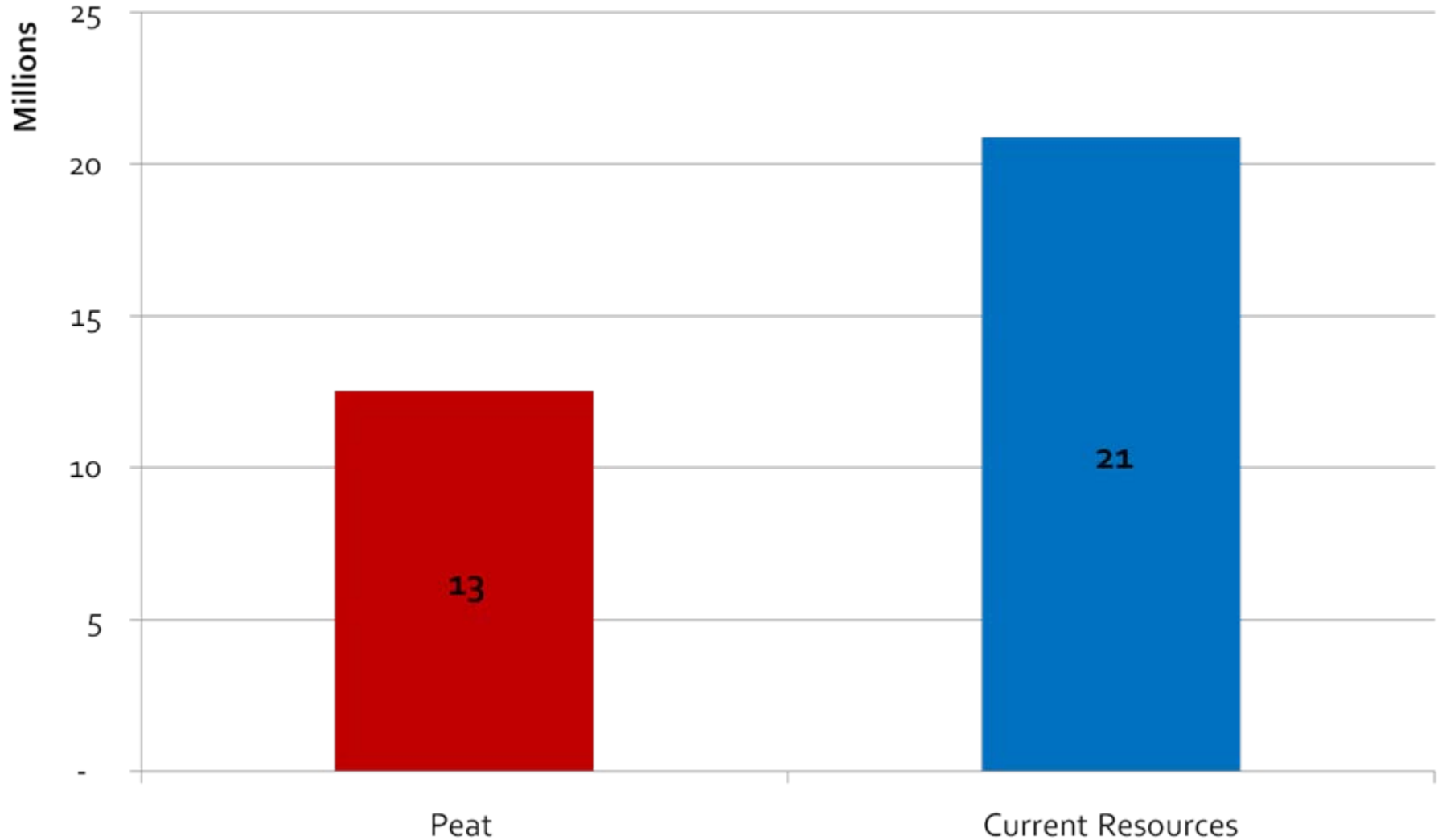
- Costs between €17.3 - €24.5 million
- Would displace 376,200 tonnes of CO₂
- Only have the potential to meet 48% of target
- To make up rest of target, can increase our production of energy crops (Willow or Miscanthus)
- Would require an extra 21,730 ha of Miscanthus or else 24,130 ha of Willow
- Imports are less expensive, but offer less of an emission reduction in real terms



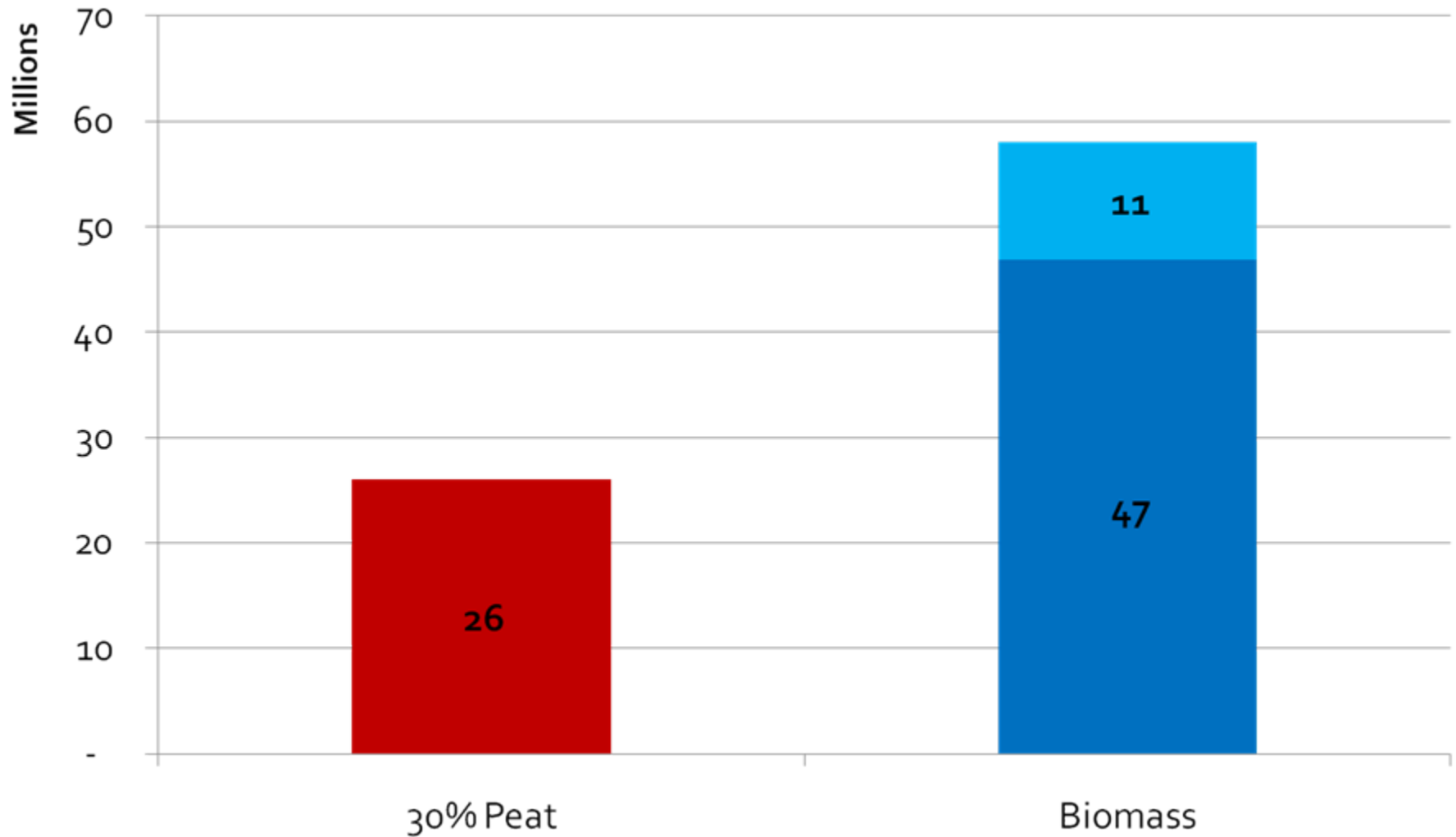


**Additional land
required
to meet target
through
energy crops**

Current Resource Costs



Full Target Cost Estimates



At what point is biomass cost effective?

- The cost of 30% of current peat consumption is just over €26 million – much less than biomass fuel cost
- Must also consider the cost of carbon – At what point does the cost of both of these combined exceed the cost of biomass?



- At a cost of €40/tonne of carbon, the additional fuel cost of burning biomass is covered
- Does not account for capital costs necessary to co-fire at high levels – in reality carbon would need to be higher
- Edenderry currently co-firing
- Issues regarding feasibility of co-firing at ESB stations



Conclusions

- 30% target unlikely to be met
 - Problems with ESB Stations
 - Don't have enough indigenous biomass
 - Too expensive, Carbon prices too low

- Recommend revision of national target

