



Welcome to the second Sludge Working Group meeting

2 March 2016

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<p><b>1. Defining the Market: The boundary around sludge activities</b></p> <ul style="list-style-type: none"> <li>• Where should the boundaries lie between sewage treatment and sludge? What is “market contestable”?</li> <li>• What are the important costs and revenues we need to consider across boundaries?</li> </ul>	<p>10am to 11:45am</p>
<p><b>2. Defining the Market: Costs, barriers and benefits</b></p> <ul style="list-style-type: none"> <li>• Benefits of Market.</li> <li>• Barriers to market opening.</li> <li>• Main Costs to participants of our design options</li> </ul>	<p>11:45am to 1:10pm</p>
<p><b>Lunch</b></p>	
<p><b>3. Water company sludge regulation: RCV allocation for sludge control</b></p> <ul style="list-style-type: none"> <li>• RCV as the basis for a cost based price control</li> <li>• Valuation of assets: what do we mean by MEAV and difficulties of valuation</li> <li>• Protection of RCV at 2020: suggested mechanisms to track the cost base and implement the revenue guarantee</li> </ul>	<p>1:45pm to 3:15pm</p>
<p><b>4. Actions and setting the agenda for next meeting</b></p>	<p>3:15pm to 3:30pm</p>

# 1. Defining the market: Boundary between sludge and sewage treatment

# Defining the market: the boundary around sludge activities

Andrew Snelson



# AW sludge operations in numbers

2.25m tonnes of liquid sludge

280k tonnes of dewatered sludge

1,130 WRCs – 73% have p.e. <2,000

10 sludge treatment centres with advanced anaerobic digestion

13 interim dewatering sites

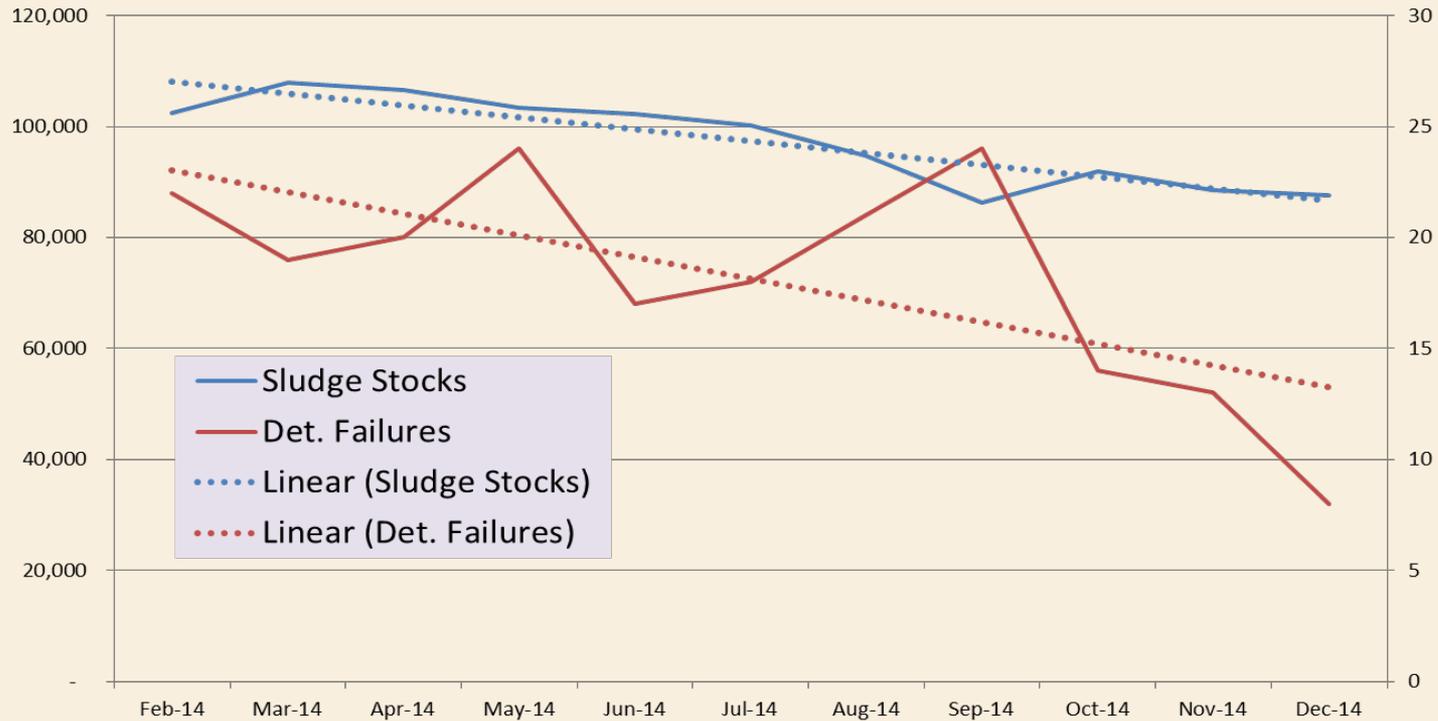
99% of treated sludge recycled to farmland

74% of sludge is tankered - E+W average of 35-40%

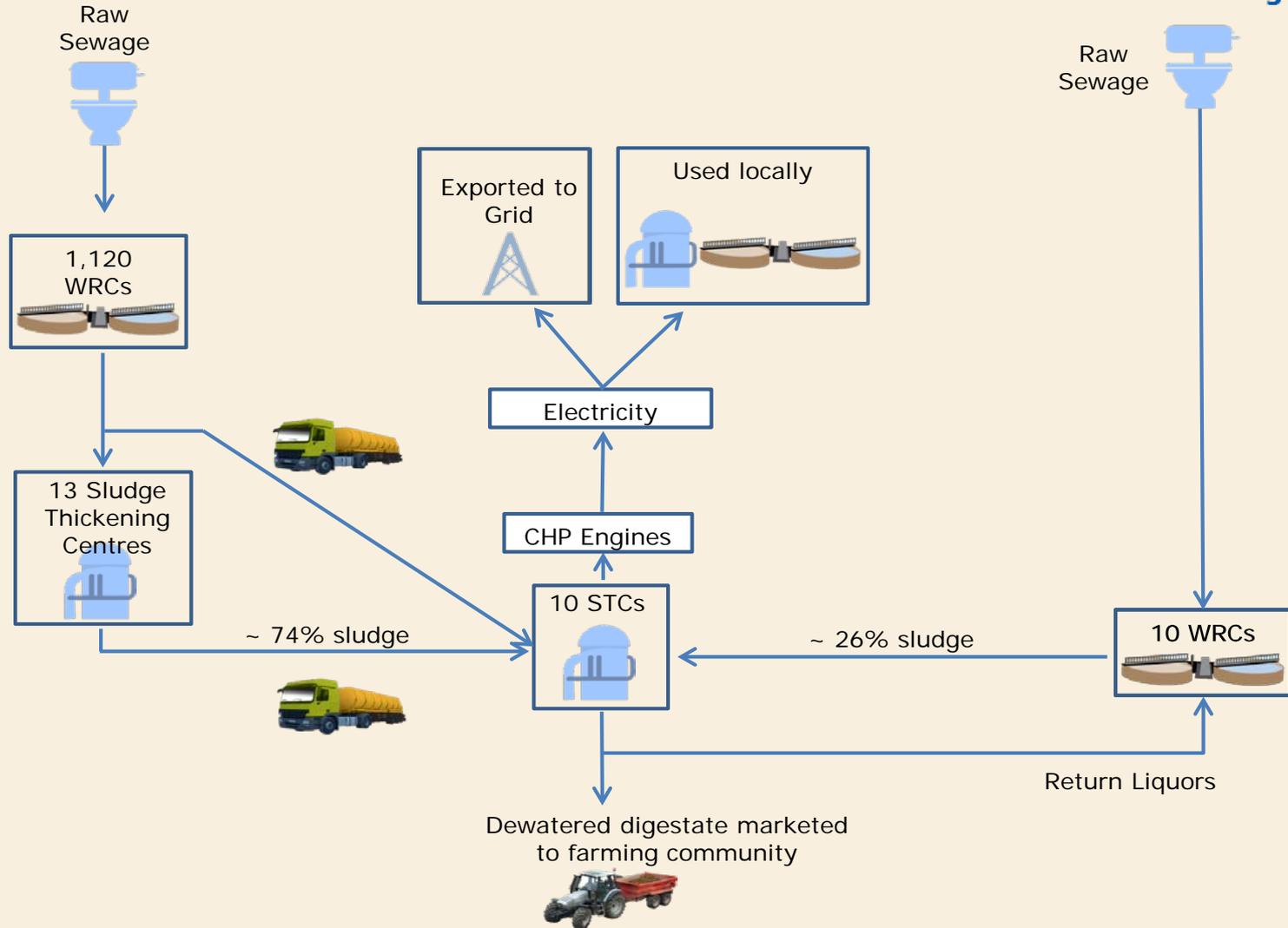


# Sludge stocks/WRC compliance

## Relationship between sludge stocks and determinand failures

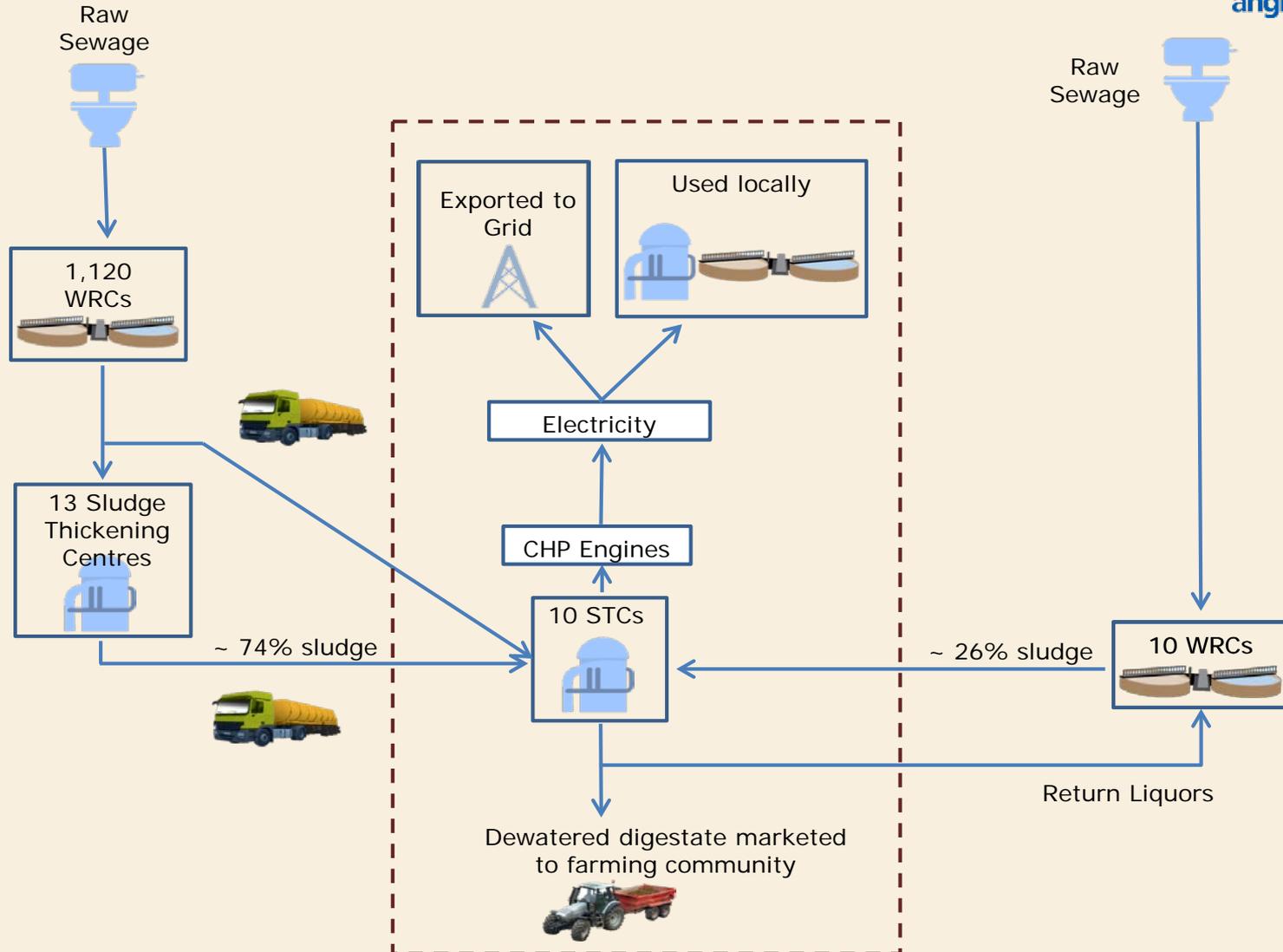


# Boundary options

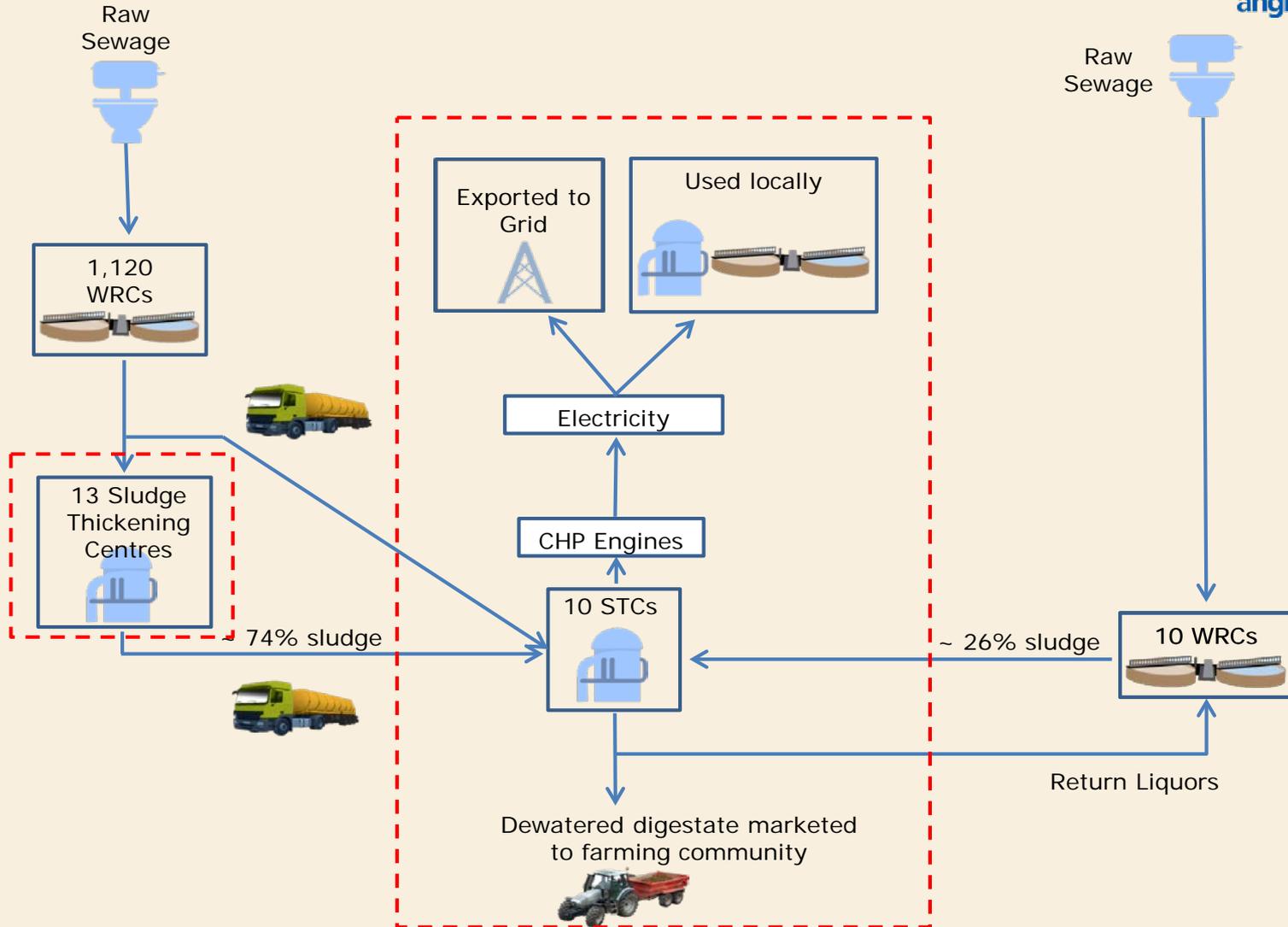




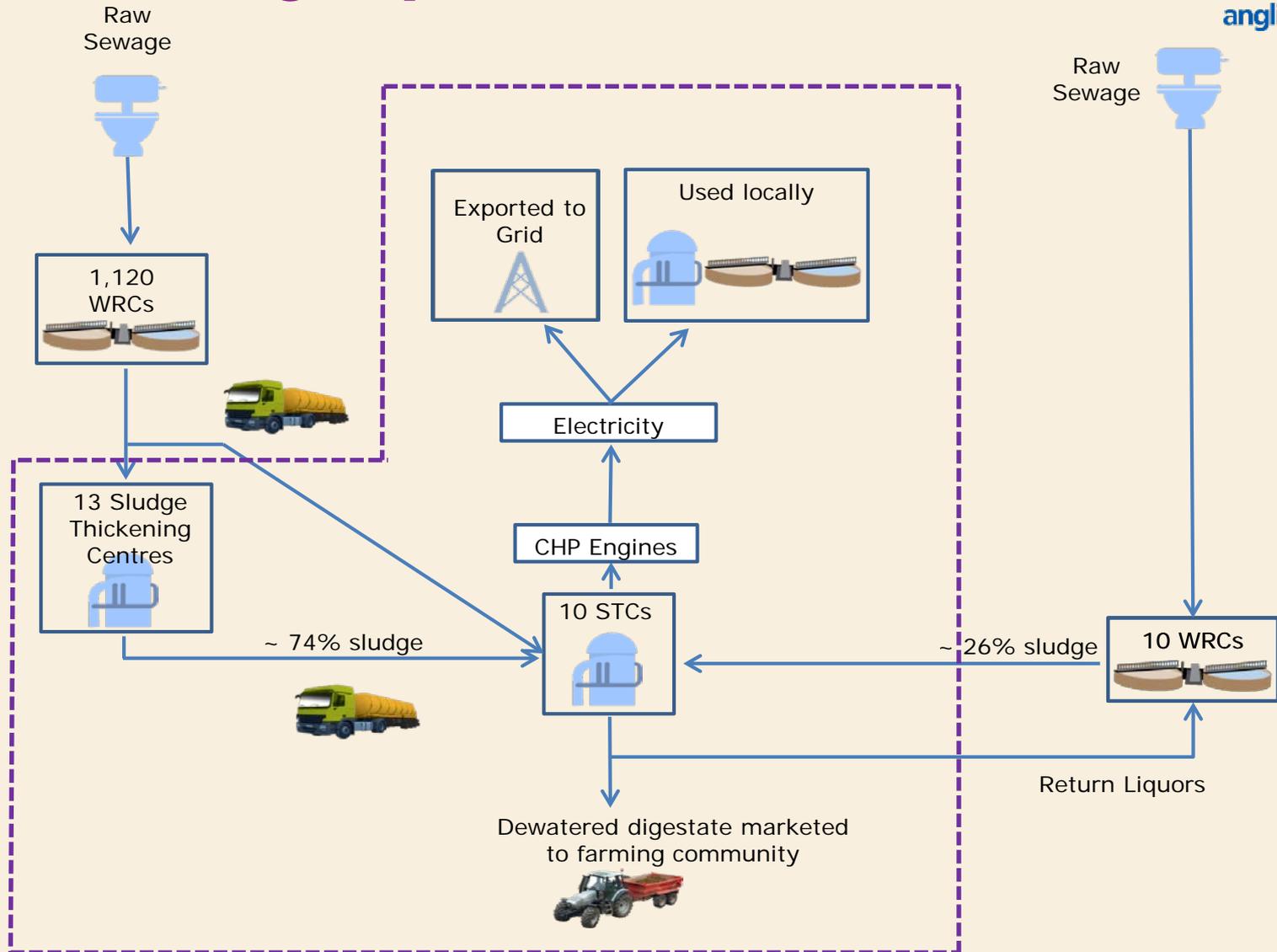
# Boundary options 2/5



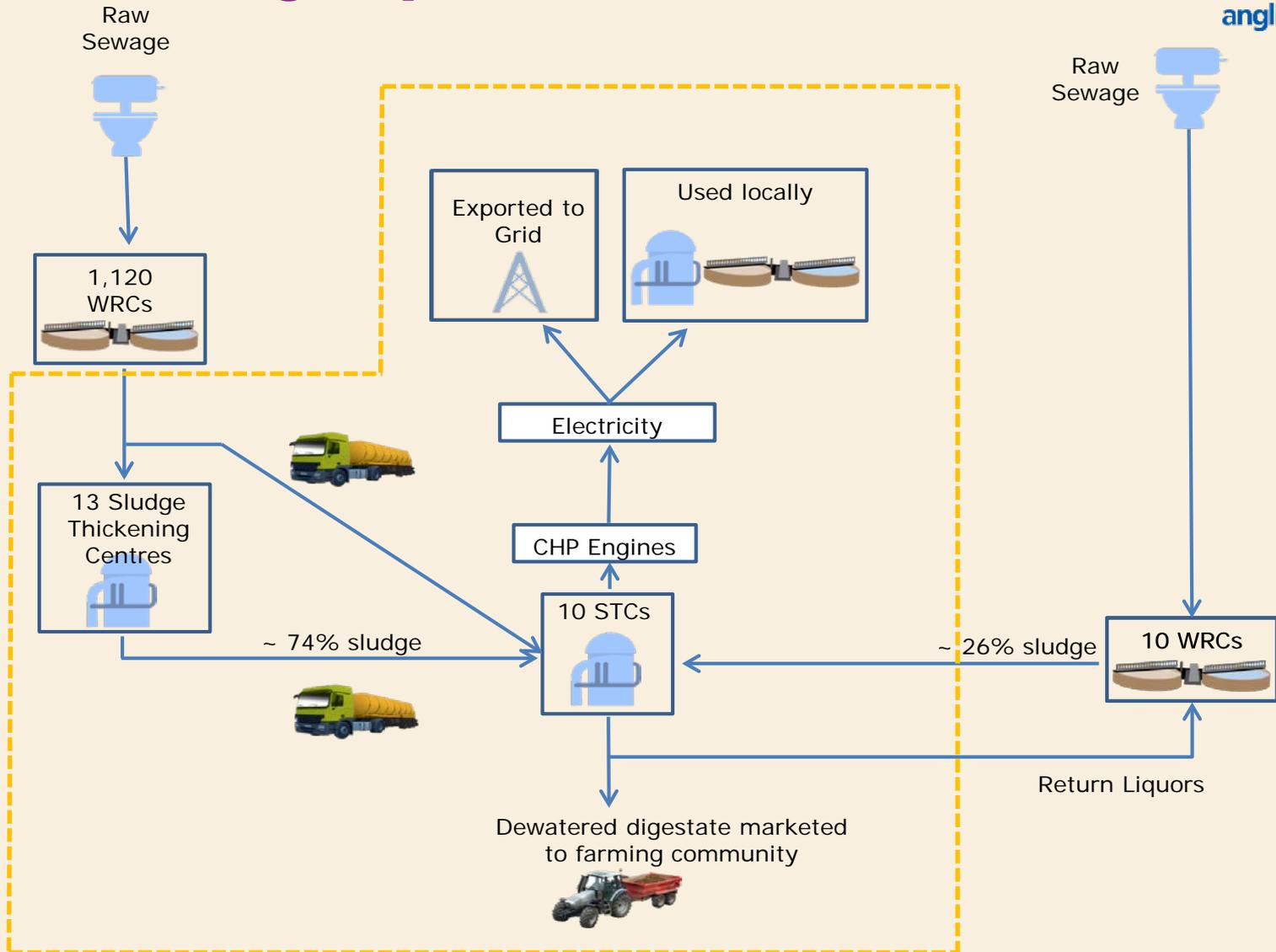
# Boundary options 3/5



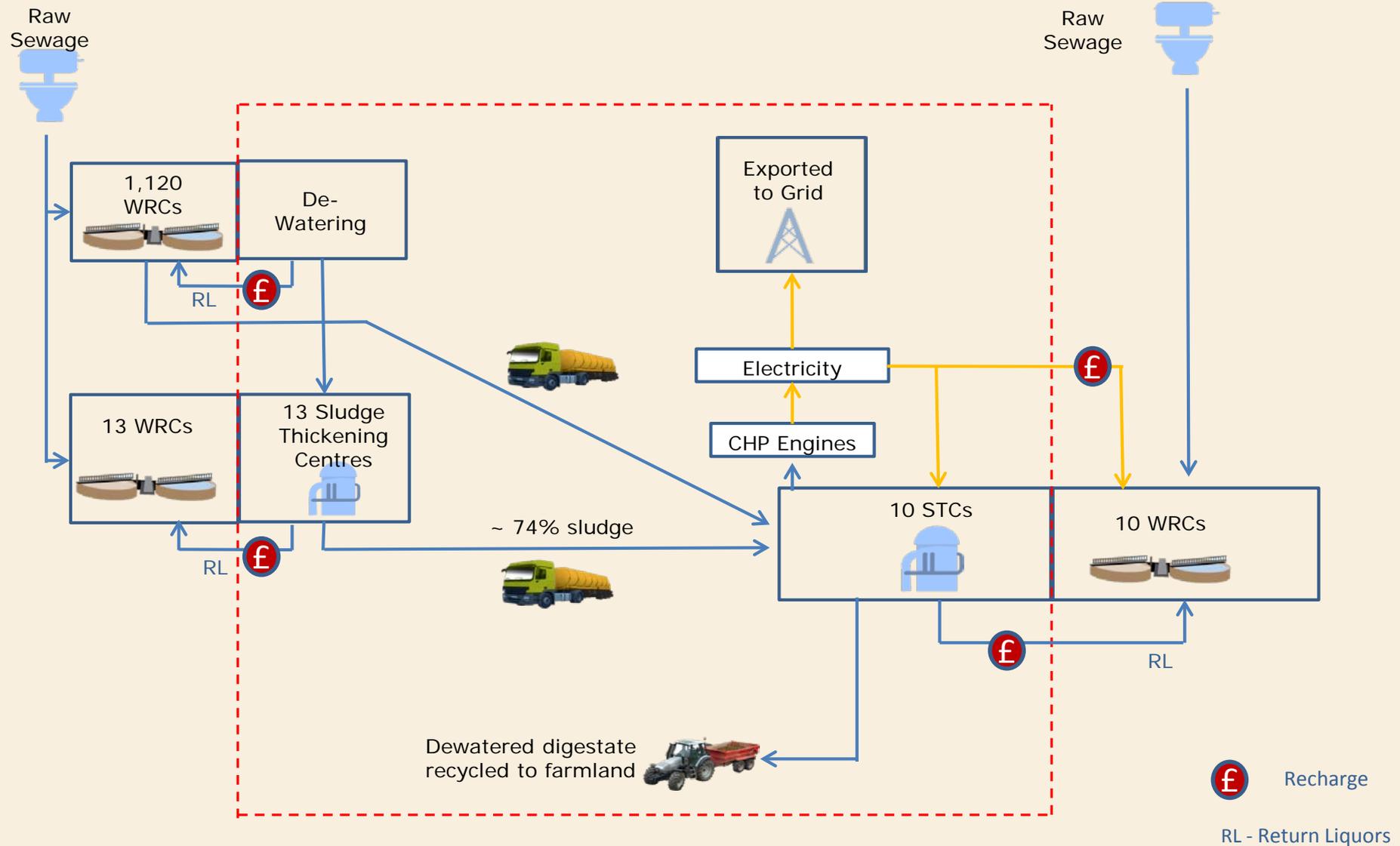
# Boundary options 4/5



# Boundary options 5/5

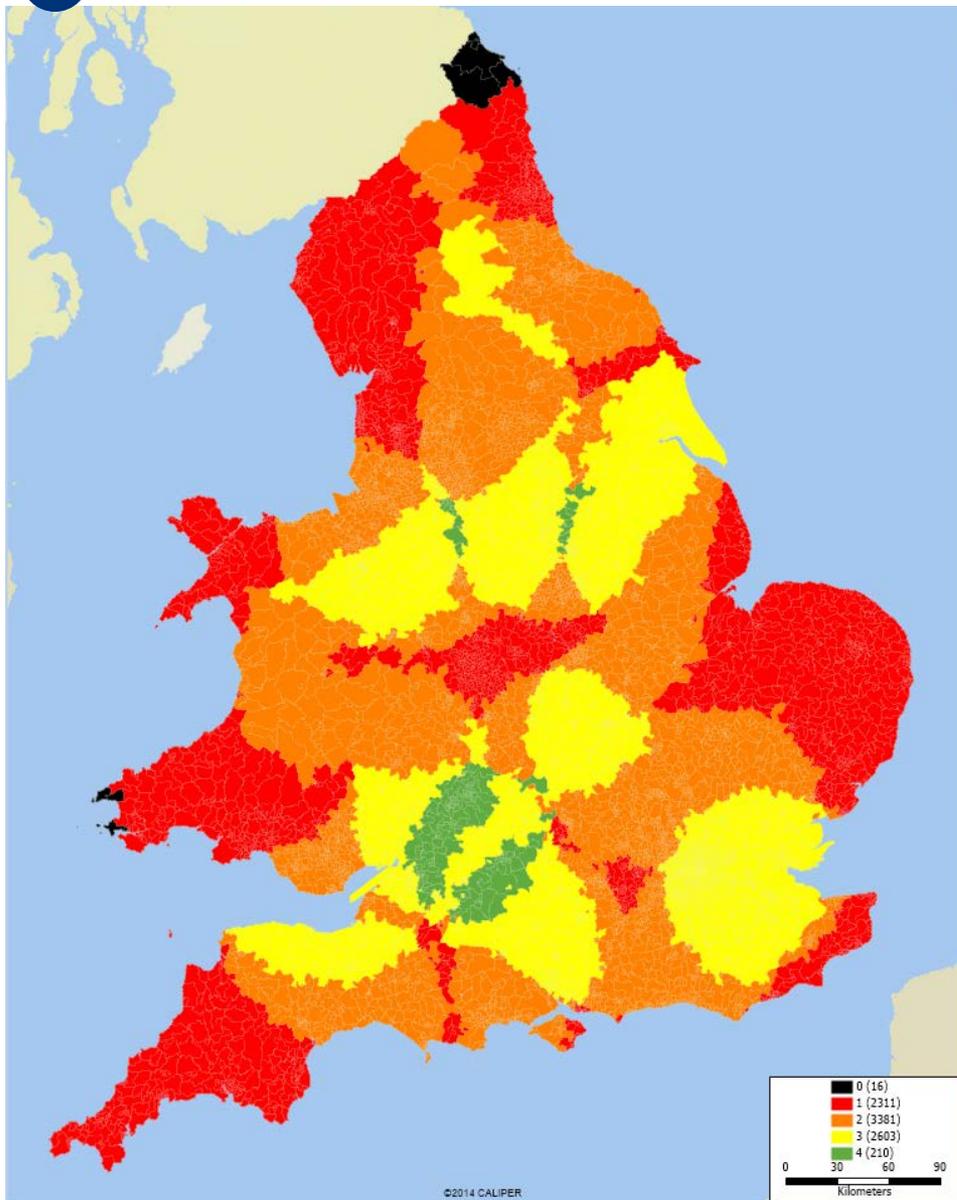


# Sludge Accounting Boundary



## 2. Defining the market: Benefits analysis

1



Number of neighbouring WaSCs with STCs within 50km radius	Proportion of STCs
0	33%
1	42%
2	23%
3	2%

50km radius:  
67% of STCs

Drive distances of 50km:  
42% of STCs



In order to get a better handle on the savings associated with moving sludge across WaSC boundaries our approach is to:

Headline	Detail
<p>Look at distance from a sewage treatment works to a neighbouring company's sludge treatment centre. Calculate tonnes of sludge "up for grabs".</p>	<p>Capture all sewage works within a 50km radius. 50 km as crow flies (but taking out sea/estuary crossings) For now, discount sewage works with a co-located sludge treatment centre. Starting assumption is that sludge won't move from these sites. <b>Is that valid?</b> Sensitivity – 30km and 70km radii. <b>But how far does sludge travel now?</b> Sewage works data: EU WISE database of sewage works above 2000 population. Assumed 70g sludge per person per day to calculate sludge production at each site.</p>
<p>Tonnes of sludge x difference between neighbouring company annual opex cost per tonne to calculate a potential saving.</p>	<p>To work out unit cost we use tonnes of sludge produced as reported by companies. Opex from accounting separation data – treatment and disposal costs (not including transport).</p>
<p>Calculate maximum benefit of moving sludge across WaSC boundaries</p>	<p>Move sludge only where there is a saving! <b>No capacity limit on receiving company – we don't have that information.</b></p>



In order to get better handle on the savings associated with moving sludge from WaSC to Organic Waste treatment providers

Headline	Detail
<p>Look at distance from a sewage treatment works to an other organic waste AD facility Calculate tonnes of sludge “up for grabs”.</p>	<p>Capture all sewage works within a 30km radius of an AD site 30 km as crow flies (but taking out sea/estuary crossings) For now, discount sewage works with a co-located sludge treatment centre. Starting assumption is that sludge won’t move from these sites. <b>Is that valid?</b> Sensitivity – 50km. <b>But how far does sludge travel now?</b> Sewage works data: EUWISE database of sewage works above 2000 population. AD sites from WRAP database of operational AD sites (ignoring test facilities, demonstration sites etc) <b>Do we use farm and commercial?</b> Assumed 70g sludge per person per day to calculate sludge production at each site. (Calculated from tonnes produced and population served at industry level)</p>
<p>Opex saving?</p>	<p>We don’t know the potential savings of sludge going to a local AD facility. This would be for commercial negotiation in unregulated sector.</p>
<p>Calculate estimated benefit of the market</p>	<p>Assume a percentage of the sludge that could move does move (say 10%?) Assume there is a percentage saving on company opex as a result (say 10%?) <b>Are there better assumptions to use and if so what?</b></p>



## Checking transport assumptions

Headline	Detail
Look at distance from a sewage treatment works to nearest STC in same company	Capture a figure for “company sludge tonne miles”.
Unit cost calculation - £ per sludge tonne miles	Use modelled “company sludge tonne miles” and company sludge transport opex from accounting separation data, to work out £/company tonne miles. We can’t distinguish between tanker and pumping costs. <b>Will this materially affect the calculation?</b>
To calculate how far it is worth transporting sludge to check on reasonableness of radii used for market assessment	We can then calculate economic sludge distances (above what they already travel) for each company from {difference in opex between companies} divided by {£/company tonne miles} of the sludge producing company. <b>Is this a reasonable approach? Do you have any better ideas?</b>



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## 2. Defining the market: Other benefits, costs and barriers

# Other benefits we identified of our policy options.

Benefit	Detail	Assumptions/case studies	Questions
Level of uptake of innovation	Greater competition can also be associated with increased innovation. This could lead to efficiency and environmental gains.	<p>Cave Review: <b>0.4 % per annum for upstream Markets</b></p> <p>For sludge given the dynamic nature we propose a range between <b>0.4% and 0.8% per annum.</b></p>	<ul style="list-style-type: none"> <li>• Do the Cave review/our assumptions seem right?</li> <li>• What innovation do we expect to appear in the coming years?</li> <li>• Given the dynamic nature of sludge treatment – what range should we use?</li> <li>• How much would this change between options?</li> <li>• Do you foresee greater environmental benefits from innovation?</li> </ul>
Optimisation of existing capacity - Delayed Expenditure in new assets	Greater trading between companies and OOW can delay the need for companies to invest in new assets.	<p>We are aware of at least one case where trading is likely to delay the need for new investment.</p> <p>At PR14 there was approximately <b>£200 million of enhancement capital expenditure proposed in business plans</b> for sludge treatment and recycling/ disposal between 2015-2020.</p>	<ul style="list-style-type: none"> <li>• How much free capacity is there in sludge treatment? How do we define it?</li> <li>• Is it right to expect entry from OOW to result in delayed investment?</li> <li>• How much expenditure can we assume is delayed and by how long? <b>10% - 25%</b> for between <b>10 – 30 years?</b></li> </ul>
Greater Management Focus	Greater commercialisation and more focused price controls can identify greater efficiencies.	<p><b>WSX Geneco case study:</b> greater revenues and tighter management focus resulted in materially lower sewerage bills for its customers.</p> <p>At PR14 for wastewater as a whole we assumed upper quartile efficiency (<b>~9%</b>). Upper quartile catch-up was <b>25%</b> efficiency.</p>	<ul style="list-style-type: none"> <li>• What aspects of our policy options will achieve greater management focus?</li> <li>• Cave review used the difference between average company and frontier to determine productivity efficiencies. Should we use the same approach? What range of catch-up can we expect to see as a result of our proposals?</li> <li>• How fast do you think we will achieve the efficiencies?</li> </ul>

# Options we have considered in December

	No change		Preferred option	4
	1	2	3	
Separate price controls	Non-binding network plus sub caps		Binding price control for sludge (treatment, transport and disposal)	Remove sludge from price control and move to backstop customer protection
Information remedies	No additional information requirements	Companies publish data based on Ofwat stipulations	Independent information platform publishes relevant market data	
Market and system operation	System operator functions undertaken by WaSCs and other market participants			Independent system operator (ISO)
Trading regime/ incentives	Do nothing	Regulatory transparency regarding funding of contracts with third parties		Introduce sludge trading incentive

# How do the benefits differ between options?

	Option 1 (No change)	Option 2	Option 3	Option 4
<b>Trading between WaSC's</b>  (how much is currently done (status quo) compared to an increase?)				
<b>Trading with OOWs</b>				
<b>Level of uptake of innovation</b>  (how much will it increase?)				
<b>Optimisation of existing capacity – delayed expenditure in new assets</b>				
<b>Greater management focus – doing sludge better</b>				

How will the costs and benefits change between options?  
 Is it right that we can expect all benefits to increase over the different options?  
 How fast will the benefits materialise?



- Are there any other significant barriers?
- What are your concerns over these barriers? Could they affect the market development materially? If so which ones and how?
- If it does have a material impact what/if anything can be done to reduce it?

# Costs identified of our policy options.

Cost	Detail	Assumptions/case studies	Questions
<p>WaSC set Up and Implementation Costs</p>	<p>Internal systems and processes for:</p> <ul style="list-style-type: none"> <li>• Separate price controls</li> <li>• Information platform</li> <li>• “Bid” transparency</li> </ul> <p>Other costs likely to include licence changes and possible development of market codes.</p>	<p>Modest one off impact</p> <p>Third party platform could be set up and administered by either a third party or Ofwat</p>	<ul style="list-style-type: none"> <li>• Do companies hold the required information currently?</li> <li>• Will the impact relate to adapting systems and reporting for:               <ul style="list-style-type: none"> <li>- information platform</li> <li>- separate price control and volume risk</li> </ul> </li> </ul>
<p>WaSC operating (on-going costs)</p>	<p>Operating costs of:</p> <ul style="list-style-type: none"> <li>• Reporting information to the information platform</li> <li>• Maintaining a third party platform</li> <li>• Managing a separate price control</li> </ul>	<p>Information platform could be administered by an independent third party or Ofwat</p>	<ul style="list-style-type: none"> <li>• Will the costs mainly be one-off with minimal marginal costs?</li> </ul>
<p>Independent system operator and sludge trading incentive</p>	<p>Option 4 proposed separate system operator and introduction of sludge trading incentives</p>	<p>Independent organisation set up to optimise sludge movements, treatment and recycling.</p> <p>We would anticipate a similar trading mechanism to the one in water resources.</p>	<ul style="list-style-type: none"> <li>• How much more/less would it cost companies to run under a separate system operator?</li> <li>• Would there be any impact on economies of scale?</li> <li>• What impact could we expect on the market from implementing a separate trading incentive?</li> </ul>

## Costs identified of our policy options.

<b>Cost</b>	<b>Detail</b>	<b>Assumptions/case studies</b>	<b>Questions</b>
WaSC Financing Costs	Impacts on systematic risks and cost of capital	PWC study considered that the financing costs maybe offset by RCV protections if investors see the upside potential to the reforms. There we consider that there is unlikely to be a significant impact on financing costs.	<ul style="list-style-type: none"><li>• What are the likely changes in market share in the sludge sector in the short, medium and longer term?</li><li>• Will the reforms create the potential for future benefits for market participants?</li></ul>

# How do the costs compare between options?

	Option 1 (Status Quo)	Option 2	Option 3	Option 4
<b>Set Up and Implementation Costs</b>				
<b>On-going operational costs</b>				
<b>Operating under independent system operator, and sludge trading incentive</b>	x	x	x	
<b>WaSC financing costs</b>				

How will the costs vary between options?

Are there any additional costs?

Area	Benefit	Risks
<b>Resilience</b>	Greater number of companies operating in sludge treatment should increase the headroom and therefore resilience.	<ul style="list-style-type: none"> <li>• Potential risks where the overall capacity could reduce where companies trade with other decreasing the available headroom.</li> <li>• An additional risk occurs where an entrant goes into administration – taking capacity off the circuit.</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>• reduced greenhouse gas emissions from potential increase in renewable energy generation;</li> <li>• Greater volume of bio-solids products displacing inorganic fertiliser use in agriculture; and</li> <li>• carbon footprint improvements from reduced sludge miles (although the net impact of our proposals on this is unclear).</li> </ul>	<ul style="list-style-type: none"> <li>• Potential reduced quality of sludge being spread to land.</li> </ul>

- Are there any other environmental benefits or risks we should be aware of?
- Is there anything we can do to reduce these risks?

Lunch