



THE ROAD SURFACE TREATMENTS ASSOCIATION

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# CO2 Emissions Measuring and Managing

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# Presentation Content



- Cold In Situ Recycling – an overview
  - Process
  - Technology
  - Products
- Carbon Generation & Waste
- Carbon Measuring
  - SPL's Calculator



# THE PROCESS



**IN-SITU ROAD RECYCLING**

**Profile Planing**



## WR200i – Cold Reycler



- **Foamed Bitumen**
- **Bitumen Emulsion**
- **Cement Bound**



## W380CRi – Single Pass rear loading



- Recycling in a single pass
- Mix is conveyed to paver for variable paving widths



- Foam Bitumen
- Emulsion
- Hydraulic

# The Mixing

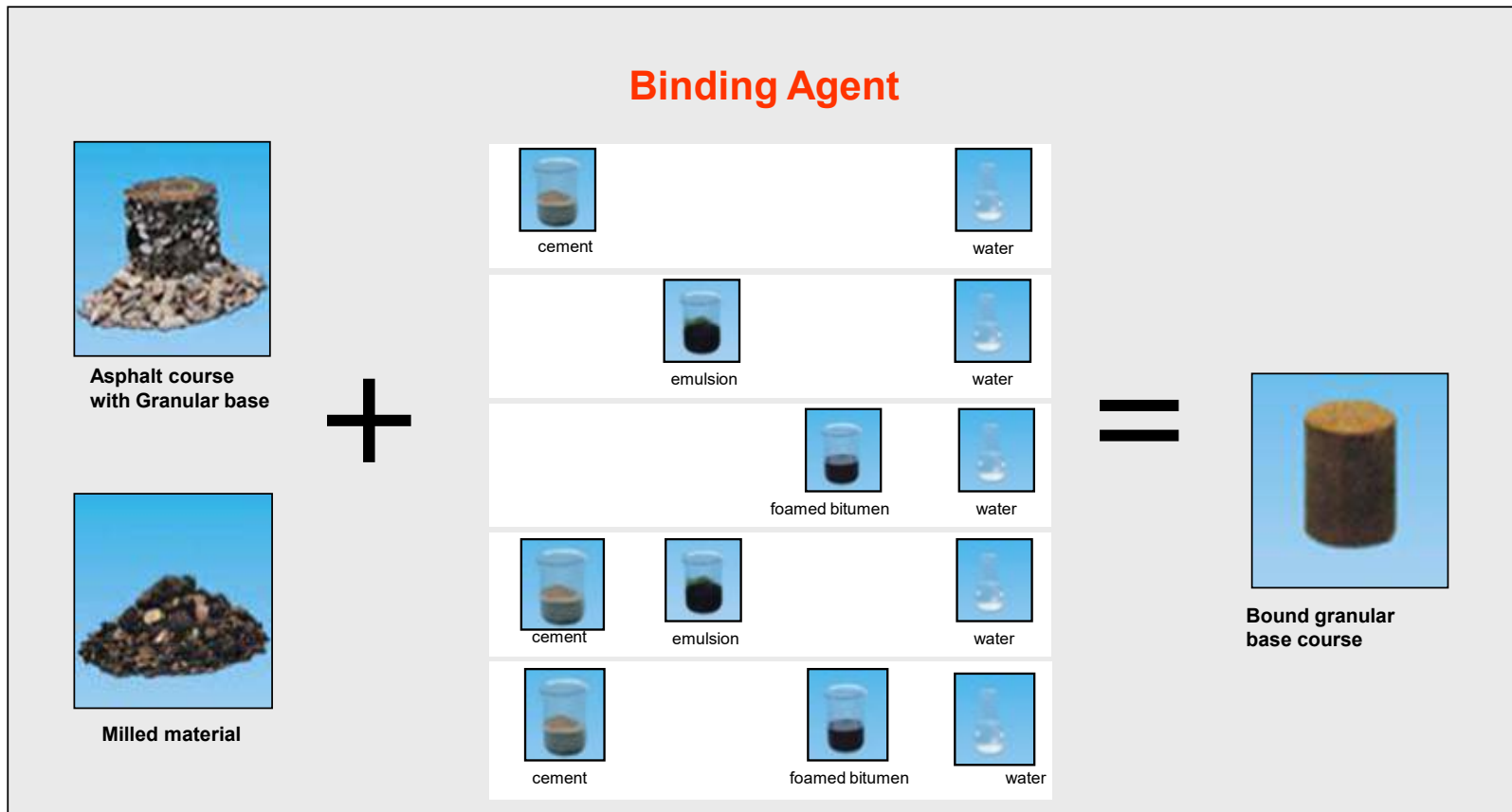


Conventional Pulverizing

# The Down Cut



# full product range



# Contents



## Carbon Generation & Waste

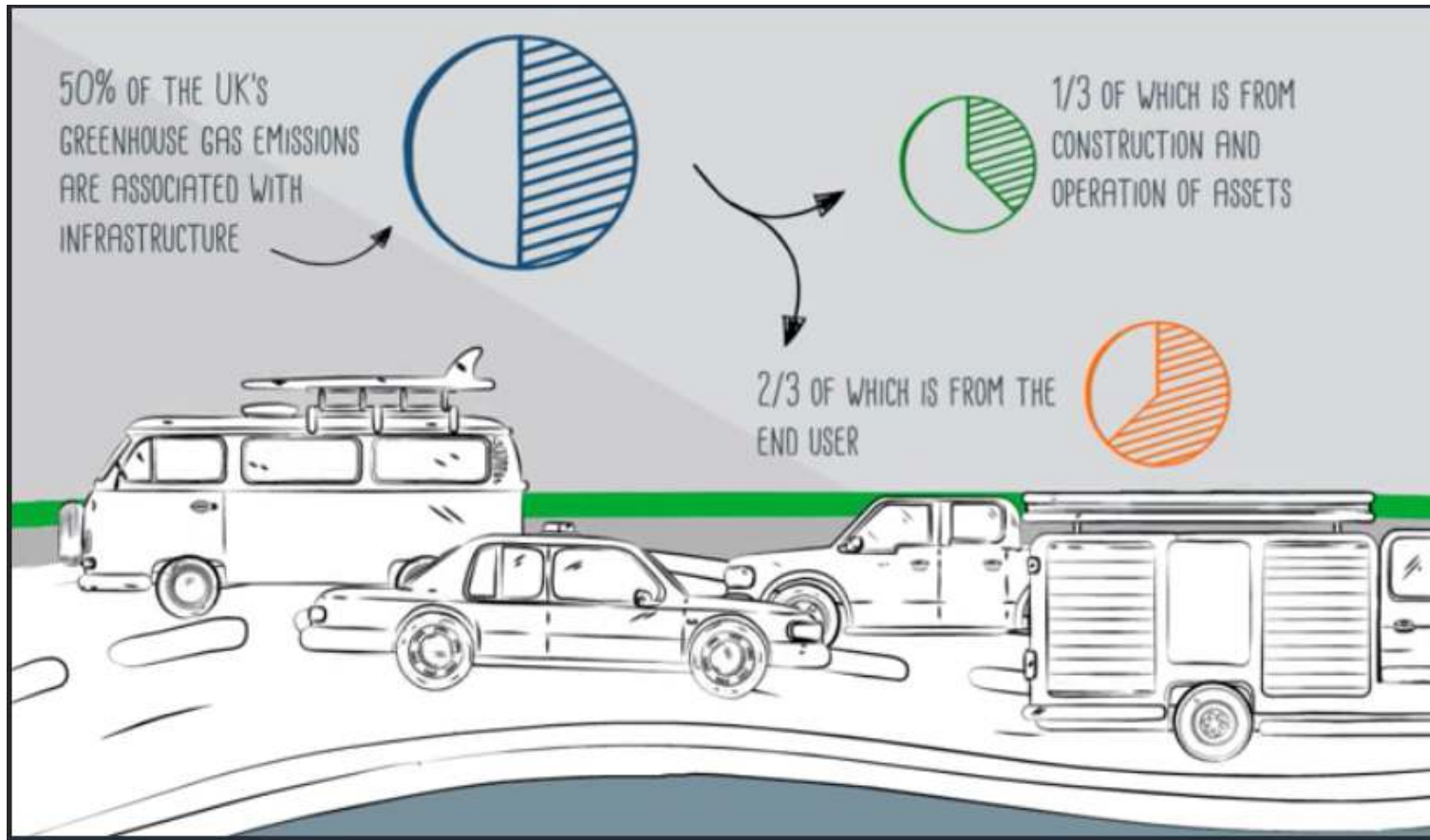


## Stay on-side

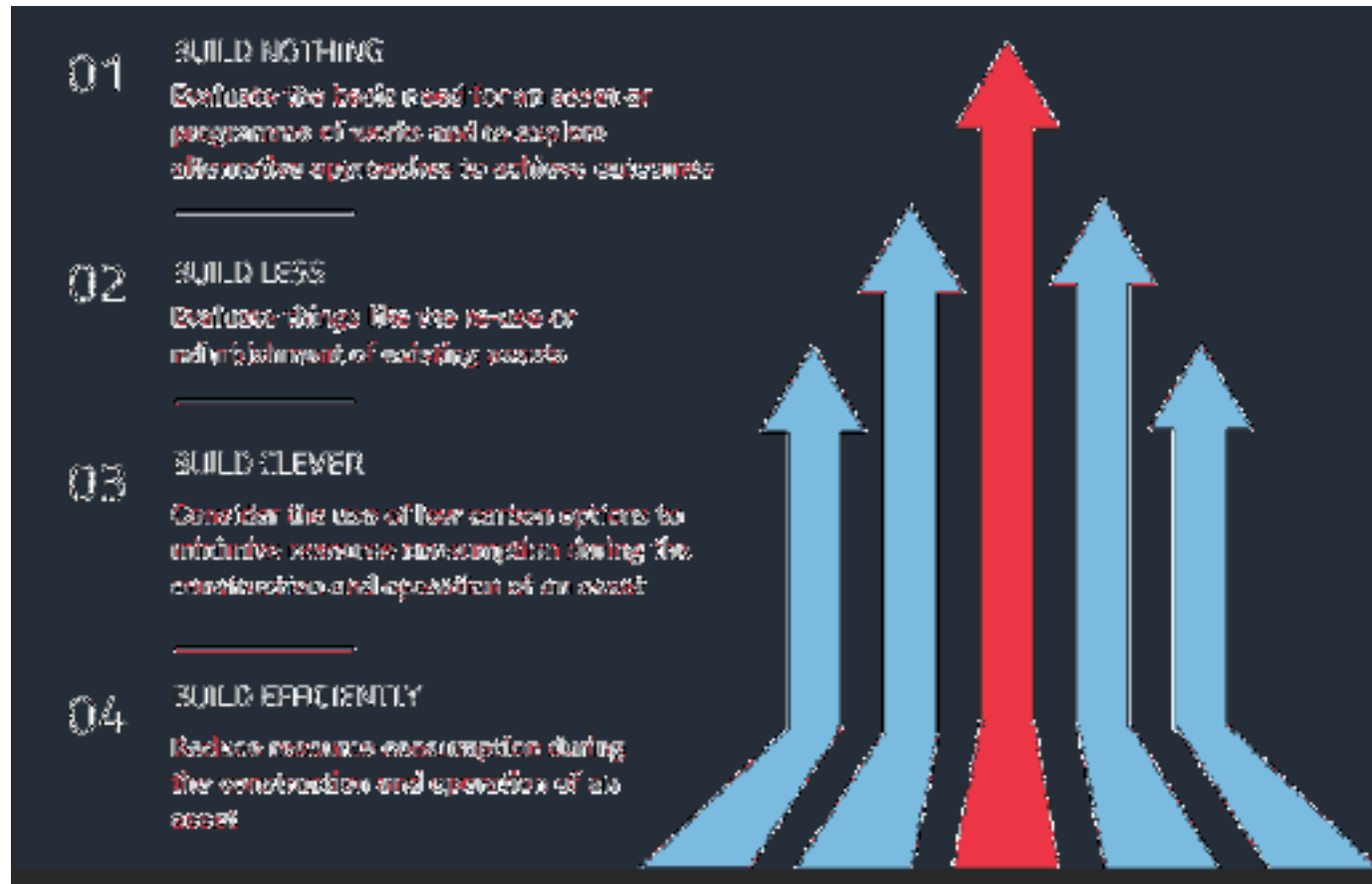


- Public awareness and expectation for Climate Change responsibility is increasing
- Not adapting to change is neither acceptable nor permissible

# Carbon in infrastructure



# Co2 emission reduction hierarchy




## What about me



- How do I reduce my Carbon?
  - Adopt the culture through leadership
  - Early consideration through design
  - Identify Carbon Hotspots & Evaluate low CO2 options
  - Use your supply chain, no-one wants to be left behind in the effort to reduce Carbon

# Vehicle movements



The vast majority of lorries, vans and plant burn diesel which emits carbon. As a general rule, and perhaps unsurprisingly the larger the engine size the higher the emissions.

# Lorry movements



- Number of lorry movements required to recycle 1km of road

• In-situ		17
• Ex-situ		336

## Avoid the use of virgin materials



Virgin materials require extraction, processing and transport to site, all resulting in carbon. Often recycled or secondary materials can be used in their place which have a lower carbon footprint. In addition, the use of recycled and secondary materials does not result in the additional environmental and social impacts associated with activities like quarrying and mining.

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# Avoid excavation



Carbon can be reduced by designing out the need to do excavation works in the first place, reducing diesel consumed by plant and the need to transport **spoil off site**.

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## Reduce waste



The disposal of **waste** is another key carbon issue, both in terms of how much you produce and how you dispose of it. To address this, reusing and recycling as much as possible will help reduce carbon.

## Promote Long term solutions



As we've seen there can be significant amounts of carbon emitted due to the operational phase of infrastructure. It is therefore important to consider carbon right at the project's beginning in the design of the infrastructure in order to minimise the amount of energy consumed in its use phase.

# Contents



## Carbon Measuring

# Measuring carbon



- BETTER UNDERSTAND WHAT RESOURCES YOUR BUSINESS USES
- BETTER IDEA OF WHAT YOU NEED TO DO TO IMPROVE EFFICIENCY
- CREATING EFFICIENCIES CAN REDUCE CARBON AS WELL AS COSTS

## C41 St Andrews - Fife



- Site approx. 13000m<sup>2</sup>
- Conventional approach 100mm inlay patching
- Local authority survey estimated over 70% required treatment
- Coring showed levels of tar above hazardous thresholds
  
- SPL carried out trial hole investigations
- 150mm Shallow recycling treatment was decided
- Double layer surface dressing & “Lock Chip” was applied
- The full 13000m<sup>2</sup> was treated in 3 days

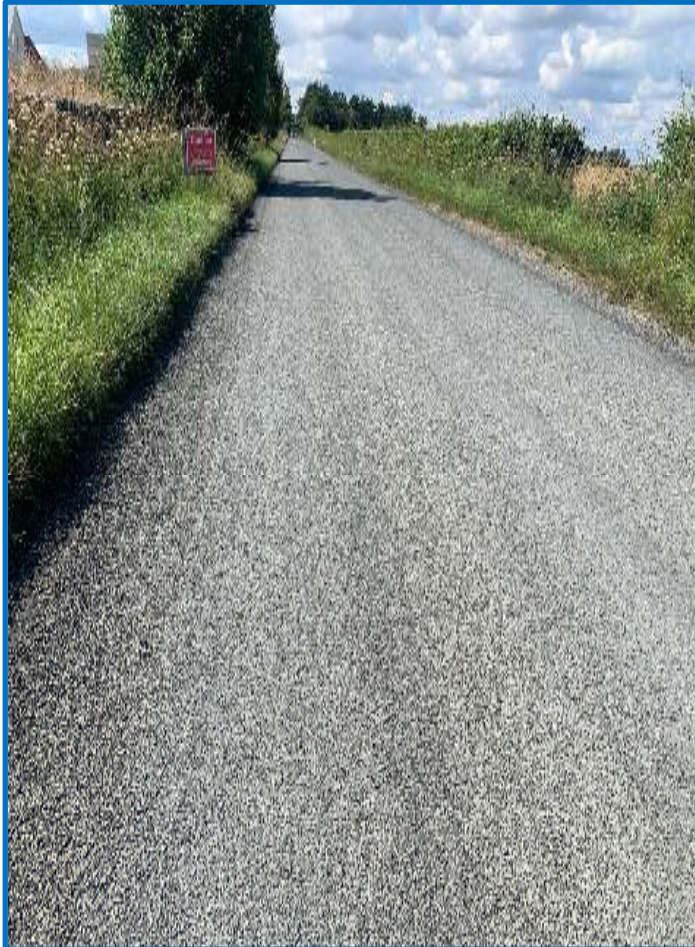
# C41 St Andrews – Pre Works



# C41 St Andrews – Recycling Process



## C41 St Andrews – Finished Article





# Headline Figures



- 177 tonnes of Co2 from Asphalt
- 82 tonnes of Co2 from SPL treatment
- 95 tonnes of Co2 saved on project
- 54% reduction over asphalt construction
  - 4485 tonnes of material recycled
- 45% cost saving over proposed asphalt treatment

# SPL calculator



- SPL input sheet
  - Size of scheme
  - Volume of material to recycle
  - Distance travelled (Plant)
  - Material specification details
  - Distance travelled (Materials)
  - Proposed Wearing Course
- Asphalt Comparison

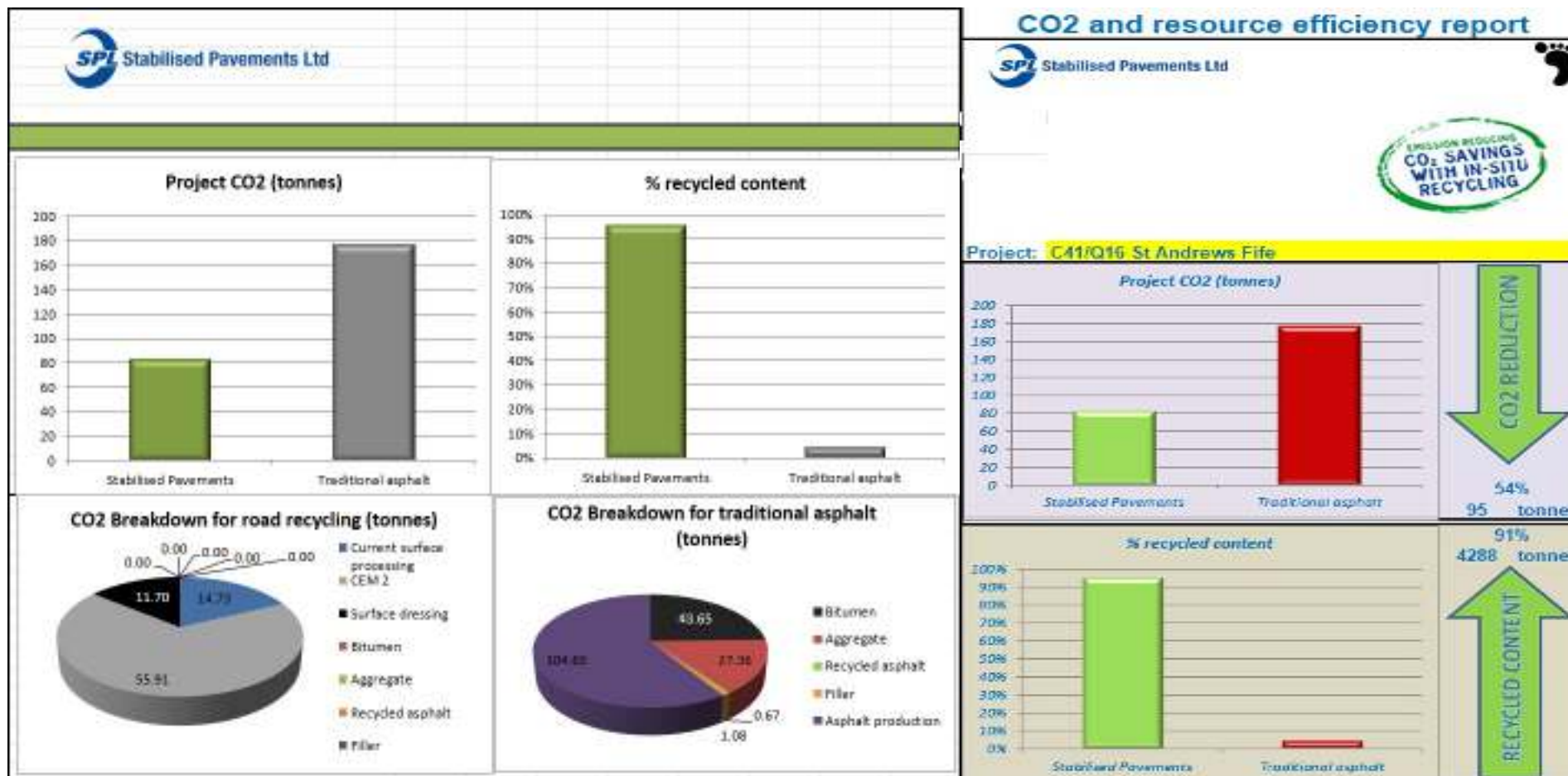
Project:		C41/Q16 St Andrews Fife		
Project mix	What size is the Project in m <sup>2</sup> ?	What is the Project depth in mm?	How many kms is the plant transported to the work site?	What is the CEM2 delivery distance in km?
Road recycling urban	13000	150	480	150
Asphalt wearing course	13000	12		
Traditional asphalt solution, including planing	13000	100		

# Carbon Calculation



Stabilised Pavements CO2 calculator																					
Project:		C41/Q16 St Andrews Fife																			
Mix	Project m2	Project depth (mm)	Project tonnes	Tons transport of plant to site	Raw material	CO2 per tonne (Origin, kg)	% of supply	% recycled or secondary	Journey 1 type	Destination 1	Distance (km)	kg CO2 per t per km	Delivery	Journey type	Distance (km)	kg CO2 per t per km	Total material kg CO2 per tonne (delivered)	CO2 from process (kg/t)	Total CO2 for project (tonnes)	Tonnes primary material	Tonnes recycled / secondary material
Current road material recycling	13000	153	4485	482	Current road material	0	96.0%	100%									0.00	3.35	14.73	0	4395
					CBM2	0.15	70%	Road	Plant	150	0.055								621.75	0.00	65.91
Surface dressing	13000		130					0%										0.95	11.70	130	0
			<b>4615</b>																	<b>193</b>	<b>4422</b>
																		<b>Total Carbon Footprint for Project (tonnes)</b>		<b>82</b>	
																		<b>% recycled material</b>		<b>96%</b>	
																		<b>Total CO2 per tonne (kgs)</b>		<b>17.8</b>	
Standard asphalt	13000	103	2983		Gravel	280	5.0%	0%	Road	Site	120	0.06	Road	00	0.06	282.00	35.00	43.88	150	0	
					Aggregate Recycled	3.3	80.0%	0%	Road	Site	30	0.06	Road	00	0.06	18.40	35.00	119.46	2621	0	
					asphalt	4.9	2.0%	100%	Road	Site	75	0.06	Road	00	0.06	11.70	35.00	2.76	0	60	
					Fine	1.5	5.0%	50%	Road	Site	15	0.08	Road	00	0.08	7.20	35.00	8.31	75	75	
			<b>2990</b>																	<b>2855</b>	<b>135</b>
																		<b>Total Carbon Footprint for Project (tonnes)</b>		<b>177</b>	
																		<b>% recycled material</b>		<b>5%</b>	
																		<b>Total CO2 per tonne (kgs)</b>		<b>59.3</b>	
<b>CO2 reduction over standard asphalt construction:</b>																		<b>95 tonnes</b>			
<b>% CO2 difference over standard asphalt construction</b>																		<b>64%</b>			
<b>Increase in recycled content over standard construction</b>																		<b>91%</b>			
<b>CO2 per tonne reduction over standard asphalt construction</b>																		<b>41.5 kgs</b>			
<b>CO2 reduction per tonne</b>																		<b>70%</b>			
<b>Increased recycled tonnes used</b>																		<b>4288</b>			

# Project Graphs



## Not just measuring:



- Allows you to understand what you consume and make direct cost savings for your business as well
- Unlock savings that a purely financial approach will not reach
- It will also protect you from supply risks and put you in the forefront when it comes to responsible business and innovation

# Don't be left behind



- Government has set the challenge to :
  - Reduce costs by 33%
  - Programme by 50%
  - GHG reduction by 50%





# The SPL relationship

Early Contractor Involvement  
Scheme Identification  
Site Surveying & Validation  
Pre CO2 Saving  
Solution Proposals & Cost  
Evaluate Opportunities

Site Investigation & Design  
Programme  
Delivery

Works Review – What's been learnt!  
Confirmed CO2 Report  
Ongoing Inspections – 6 & 12 Month



THANK YOU

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