CECA SOUTHERN WEBINAR IN ASSOCIATION WITH TARMAC - SUSTAINABLE MATERIALS

Introduction by

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Sustainable Solutions

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Agenda

- Introduction
- Warm Mix Asphalt
  - Terminology
  - History
  - Overseas use
  - Benefits
  - Processes
  - Availability
- Recycled Asphalt
  - RAP
  - Tar Contamination
  - Product Assurance
- Q&A

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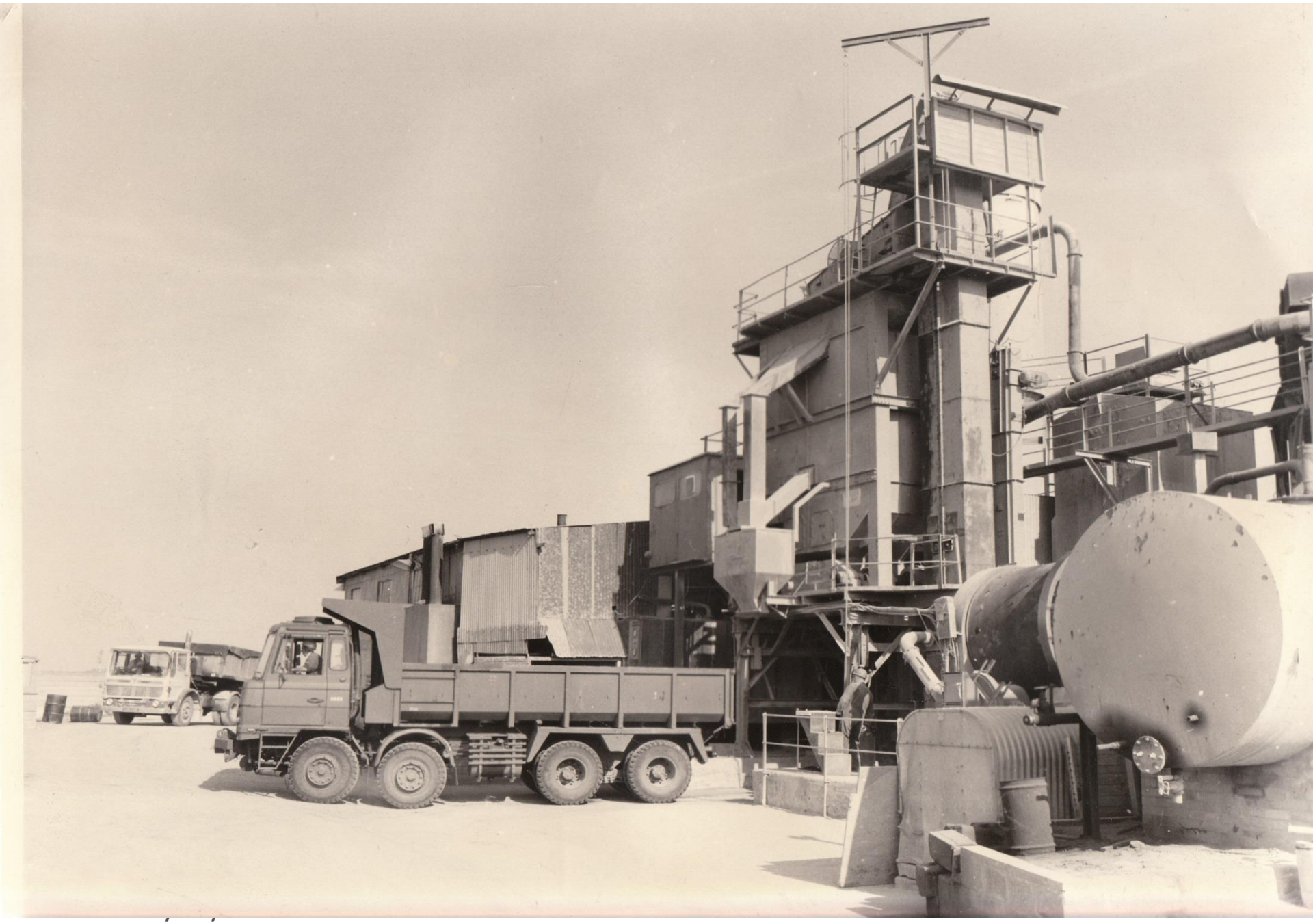
Material Selection

Material Selection


PARKER PLANT
17 GB 90

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Agenda

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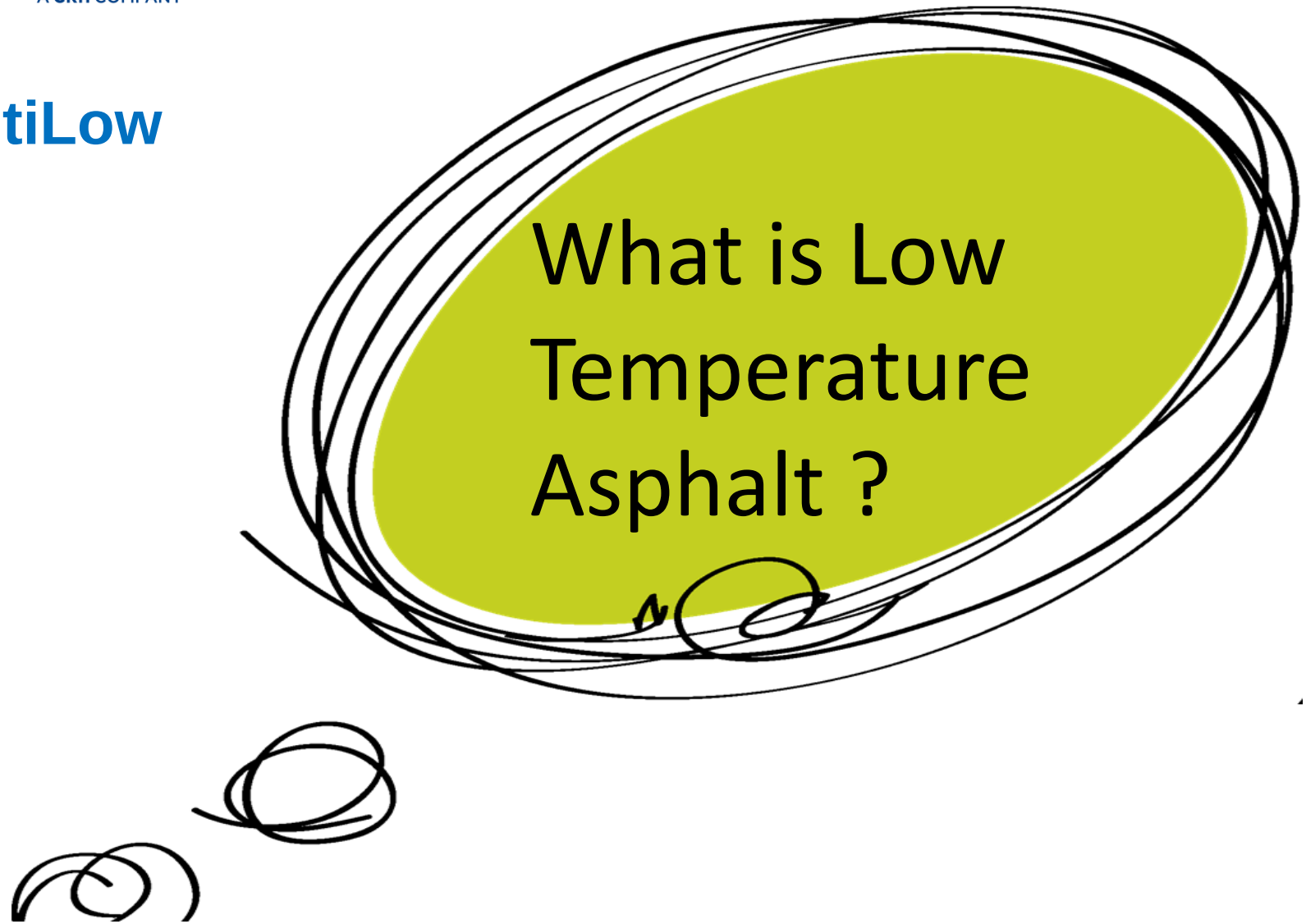
UltiLow



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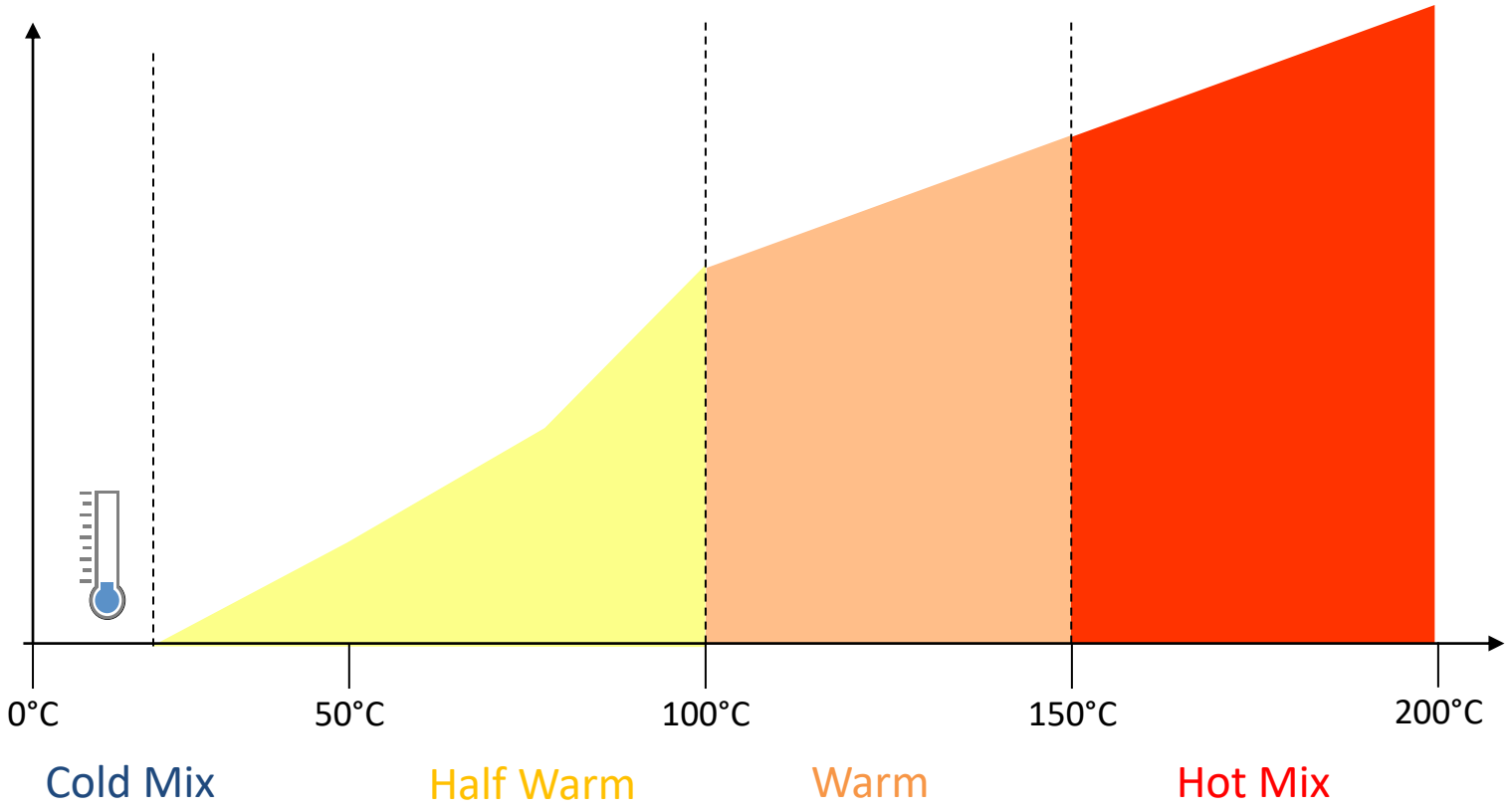
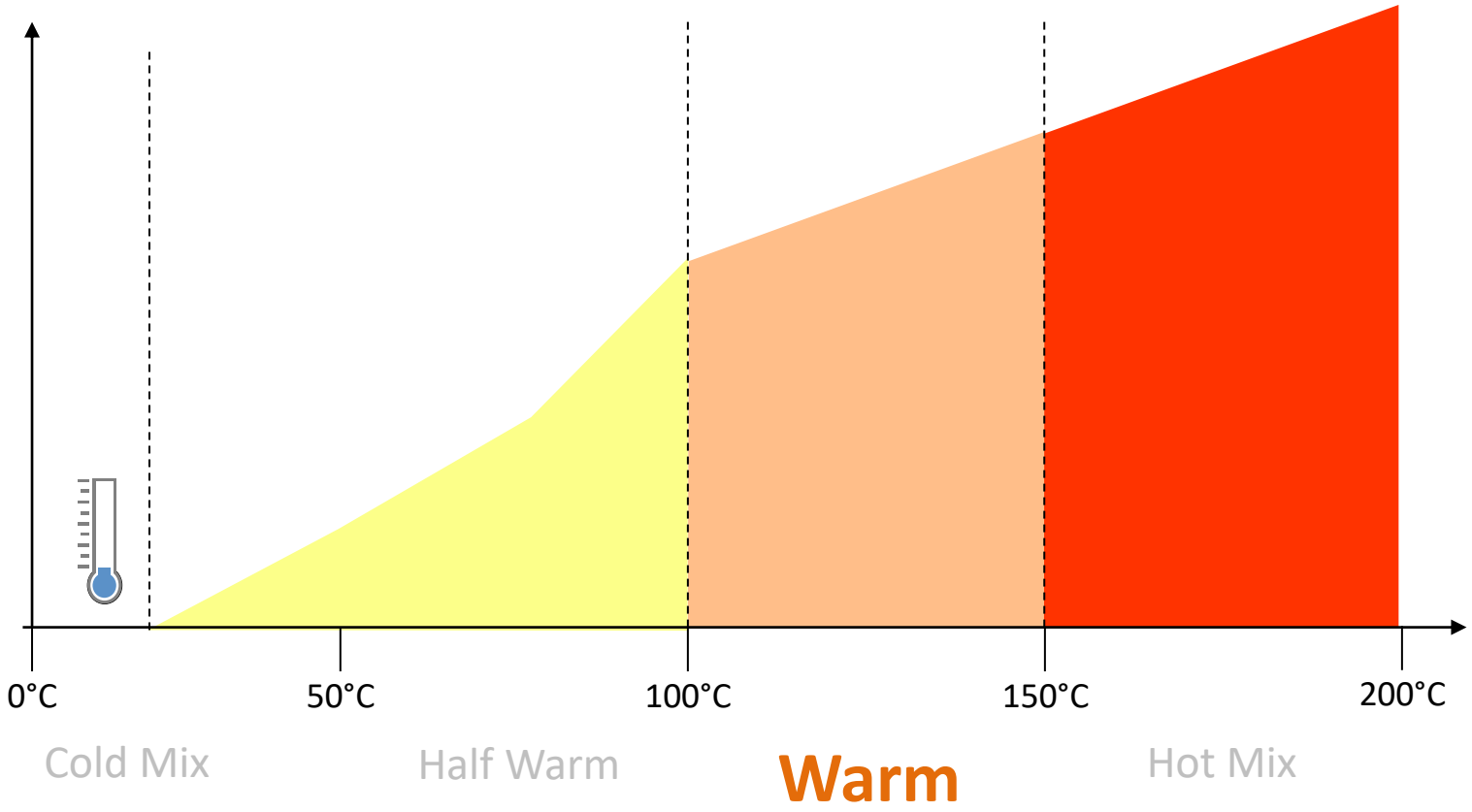
Low Temperature Terminology



Low Temperature Terminology



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Not a new idea.....

1995	Trials in Scandinavia (Shell WAM-Emulsion process)
1995	Trials in Germany (Aspha-min Zeolite)
1997	Trials in Germany (Sasobit wax)
1998	**First UK WAM-Emulsion trial by Tilcon**
2000	Trials in Scandinavia (Shell WAM-Foam process)
2001	**First UK WAM-Foam trial by Lafarge**
2004	Trials in Netherlands (Nynas LT Asphalt)
2005	Trials in France – LEA half warm process
2006	Major US visit to Europe triggers great interest and much research
2007	Commercial Warm mix foam systems available in US and Europe
2010	**Tarmac / Carbon Trust trials of Half-Warm Foam system**
2013	**Lafarge Tarmac / Carbon Trust Project Completion**

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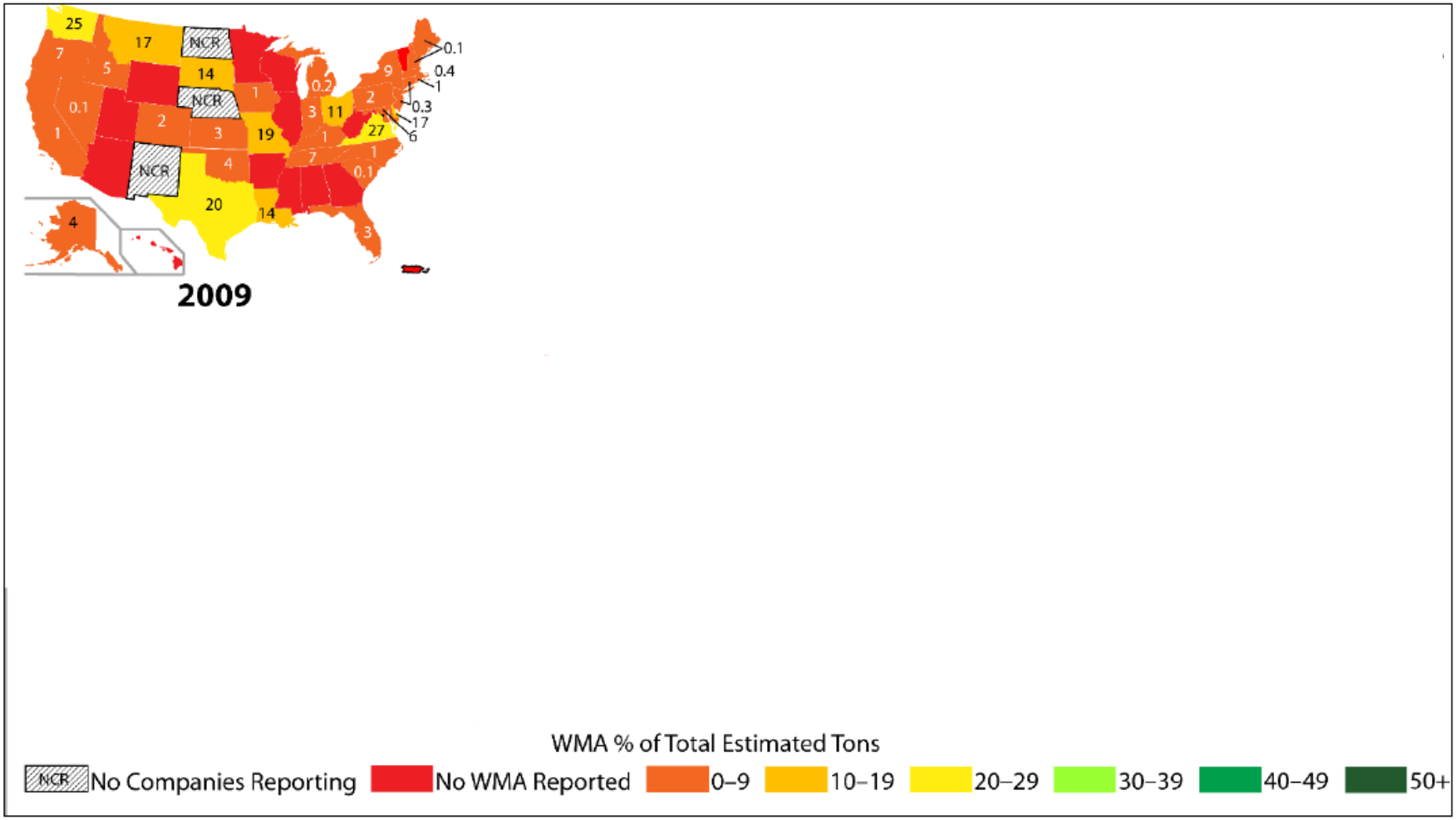
International Perspective - USA



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Inter spective – USA

164.5 million tons

Warm Mix 40%

2019

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Longer Life???

Binder Grade	Recovered Binder Penetration	
	Hot Mix	Warm Mix
40/60 Pen	36 Pen	44 Pen
70/100 Pen	55 Pen	73 Pen
100/150 Pen	93 Pen	110 Pen

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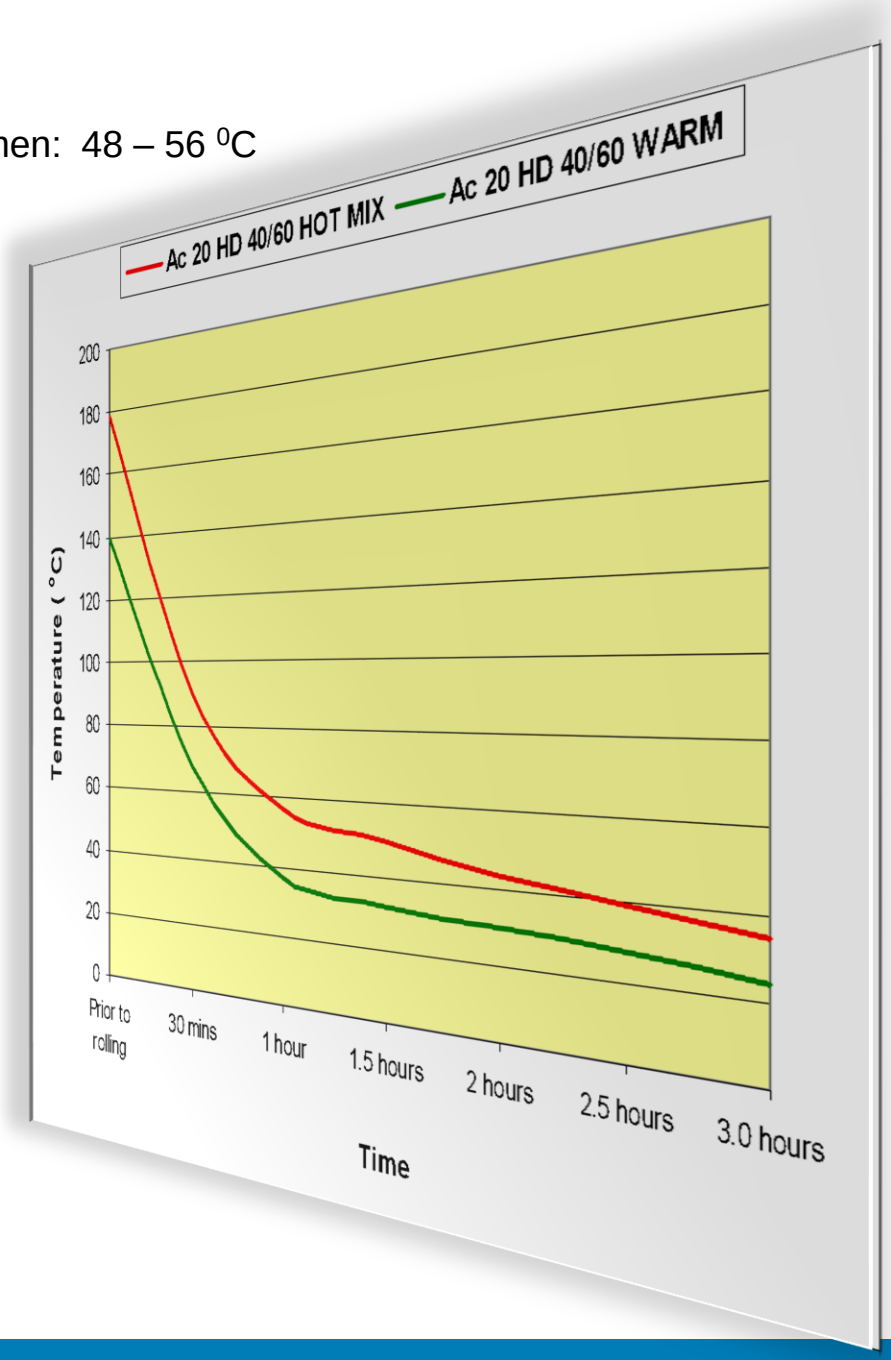
Softening Point 40/60 Bitumen: 48 – 56 ^{0}C

Elapsed Time	Temperature	Temperature
	AC 20 HDM 40/60 STANDARD	*Ac 20 HDM 40/60 WARM*
Rolling	179	140
5 mins	135	113
15 mins	127	104
20 mins	121	79
30 mins	90	68
40 mins	77	56
50 mins	60	42
1 hour	57	37
1.5 hours	50	32
2 hours	43	30
2.5 hours	39	28
3.0 hours	35	24




ULTILOW

Agenda

- Terminology
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- Processes & How does it work?
- Availability

Warm Mix additives

- Reduces surface tension of the bitumen allowing the mix to be compacted at lower temperatures
- Binder properties (Pen & Softening Point) virtually unchanged
- Can be used to reduce temperatures of PMB mixtures
- Supplied as a liquid additive, includes an adhesion agent
- Several products and processes are available
  - Liquid additive for mix modification
  - Pre-blended binder
  - Foamed bitumen

How the additive works….. compaction

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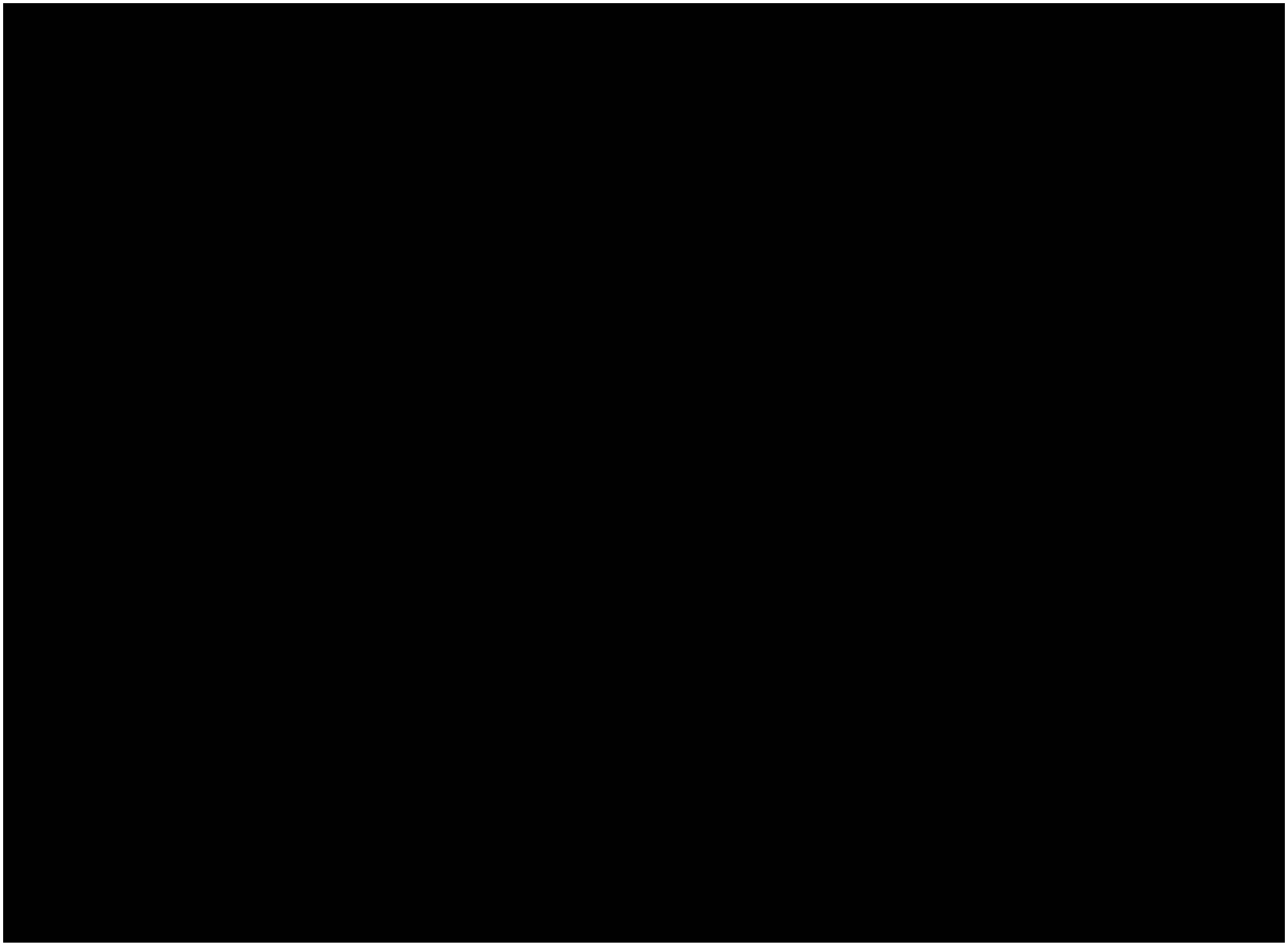
The Magic Drop…..



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What Materials are available in Warm Mix?

EN13108-1 ✓Dense Binder Course & Base ✓EME2 ✓Close Graded Surface Course ✓Open Graded	**EN13108-4** ✓HRA Binder Course & Base ✓HRA 55% Surface Course ✘HRA Surface Course & Chippings
EN13108-5 ✓SMA ✓SMA PMB ✓Low Texture - ULTILAYER	**Clause 942 Thin Surface Course** ✓ULTIPAVE & ULTIFLEX *(Both BBA approved in Jan 2015)* ✓ ULTIPAVE R (*BBA in April 21)*

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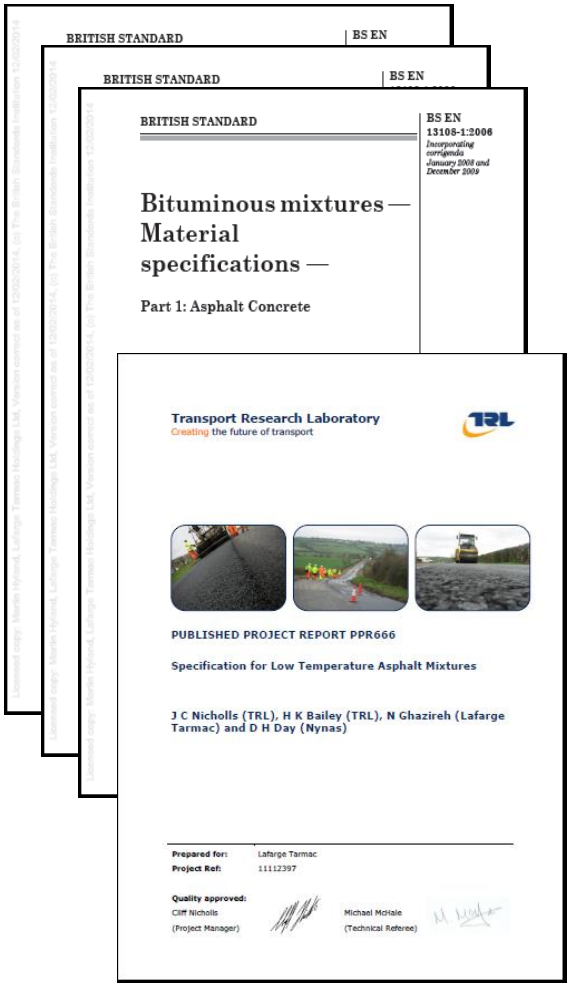
ULTILOW/WARM MIX MINIMUM TEMPERATURE GUIDE

Material Type		40/60 Pen		100/150 Pen	
		On arrival*	Initial Rolling	On arrival*	Initial Rolling
AC	Dense / Heavy Duty Binder Course & Base	110°C	90°C	100°C	80°C
	Close Graded Surface Course Dense Surface Course	115°C †	100°C †	105°C	90°C
	Open Graded Surface Course Open Graded Binder Course	110°C †	90°C †	100°C	80°C
HRA	Binder Course & Base 55% or 45% Surface Course	115°C	100°C	105°C	90°C
		125°C	100°C	115°C	90°C
SMA	Binder Course, Surface Course	115°C	100°C	105°C	90°C
Clause 942	ULTIPAVE & ULTIPHALT	115°C	100°C	105°C	90°C

Material Type		PMB	
		On arrival*	Initial Rolling
Clause 942	ULTIFLEX & ULTIPHALT P	135°C	120°C
	ULTIPAVE M & ULTIPHALT M	130°C	115°C

Compaction should commence without undue delay. Initial rolling temperatures provided are minimums.

All ULTILOW Warm Mixes comply with the requirements of BS EN 13108 and are CE Marked where appropriate.



- ✓ Warm mix asphalts can be manufactured in accordance with current EN 13108.
  - ➢ Can be CE marked like hot mix.

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✓ Now in the SHW 900

(07/19) **Warm Mix Asphalts (WMA)**

29 (07/19) WMAs are proposed to be delivered to site and rolled at lower temperatures than those recommended by Table A.1 of BS 594987:2015 + A1:2017 and in line with the producer's recommendations.

30 (07/19) WMA materials shall be produced in accordance with:

(i) Clause 906 Dense Base and Binder Course Asphalt Concrete with Paving Grade Bitumen (Recipe Mixtures);

(ii) Clause 912 Close Graded Asphalt Concrete Surface Course;

(iii) Clause 929 Dense Base and Binder Course Asphalt Concrete (Design Mixtures);

(iv) Clause 930 EME2 Base and Binder Course Asphalt Concrete;

(v) Clause 937 Stone Mastic Asphalt (SMA) Binder Course and Regulating Course;

(vi) Clause 942 Thin Surface Course Systems;

and shall comply with Clause 902 and 903.

31 (07/19) Water sensitivity of the Clause 942 Thin Surface Course System mixtures shall be assessed in accordance with BS EN 12697-12 (Method A) prior to the commencement of works. The Indirect Tensile Strength Ratio (ITSR) obtained shall be greater than or equal to ITSRmin80.

32 (07/19) Warm mixtures conforming to Clause 942 shall have Product Acceptance Scheme certification for their installation in compliance with sub-Clause 104.16 and Clause 942 to demonstrate their performance.

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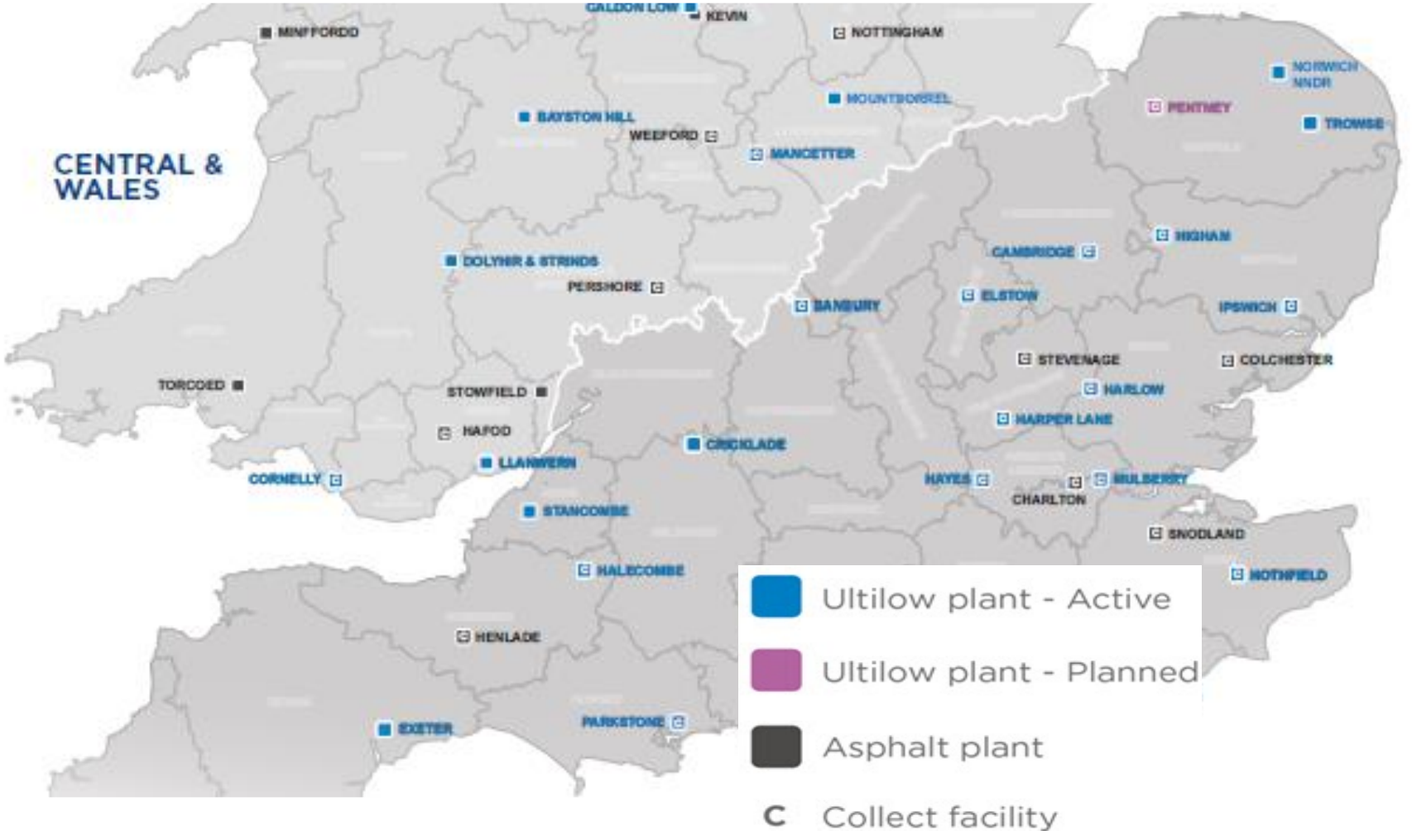
ULTILOW

The ultimate low temperature asphalt solution for faster completion and enhanced sustainability

Availability



Low Temperature Asphalt Benefits

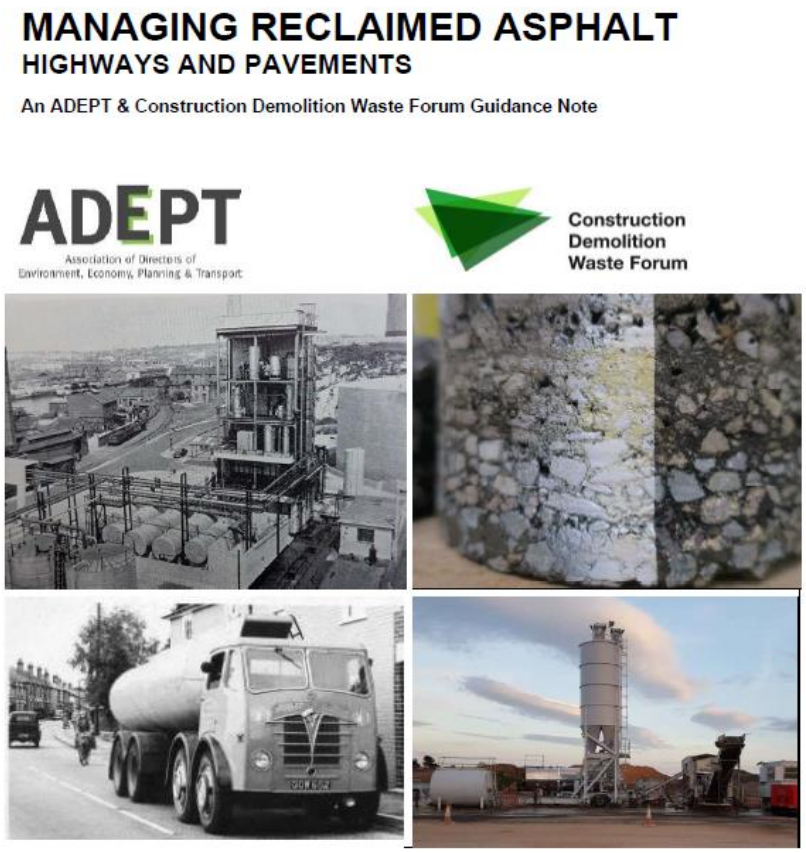
- **Reduced carbon footprint, typically 8-12%**
- **Reduced programme duration/earlier re-opening**
- **Reduced public disruption**
- **Lower on site costs help restricted budgets**
- **Potential extended pavement life**
- **No extra cost when supplied by Tarmac**
- **Why would you not specify Warm Mix???**

<10%
RAP in surface courses

<50%
RAP in binder and base courses

Sourced from preferred suppliers (generally SRN/Local Authorities)

- tar bound material not accepted
- inspection on arrival at the plant



2.0 The Regulators Position

2.1 Definition of Waste

'…all arisings from construction processes should be classed as waste. As such, anyone carrying these materials, recycling them, or reprocessing them, must possess all appropriate permits and licences.'

2.2 Duty of Care

'If you have waste you have a legal 'Duty of Care'. The Duty of Care applies to everyone involved in handling the waste: from the person who produces it to the person who finally disposes of or recovers it.'

'If any form of excavation in a bituminous pavement is required the Designer or scheme complier has a duty under the regulations to determine whether or not any materials encountered could be hazardous waste.'

Control of Recycled Asphalt Planings (RAP)

Laboratory testing every 500 tonnes;

- Binder recovery test
  - % of bitumen content
  - Penetration grade
- Aggregate
  - shape and size
  - stone count for classification
- Stored undercover to remove moisture

Results give a controlled product;

- Bitumen addition adjusted in production
  - blend of low Pen (old) and high Pen (new)
  - achieves required grade for new asphalt


Any questions?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