

# From Technical Inventions to Profitable Innovations

Sharing a Vision to Create Road  
Innovations

J.E. Poirier. Colas

## Use of renewable materials

### Targets: replace

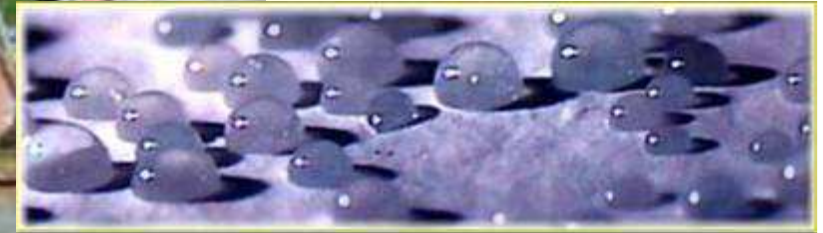
petroleum/petrochemical/organic chemistry fluxing agents (volatile fossil fuel resource), **by plant-based fluxing agents**

- Renewable resource
- Siccative products
- ➔ **no VOC**, gain in terms of material, no bad smell



# Road Marking Products

IRF 2010: Innovations et techniques



## Innovation: neither Invention nor Discovery

- To discover: to bring to light natural phenomenon
  - To invent: to find a new way of achieving something
  - To innovate: concrete outcome of an idea. It comes to fruition because it satisfies the expressed or latent needs of society.
- 
- *A. Y. Portnoff. « Pathways to innovation »*

## Research and innovation: a neither Direct nor Automatic Relationships

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- Innovation without Researchers:
  - Low cost Airlines
- From Knowing How to Knowing What to Do
- Social Change as Opportunity

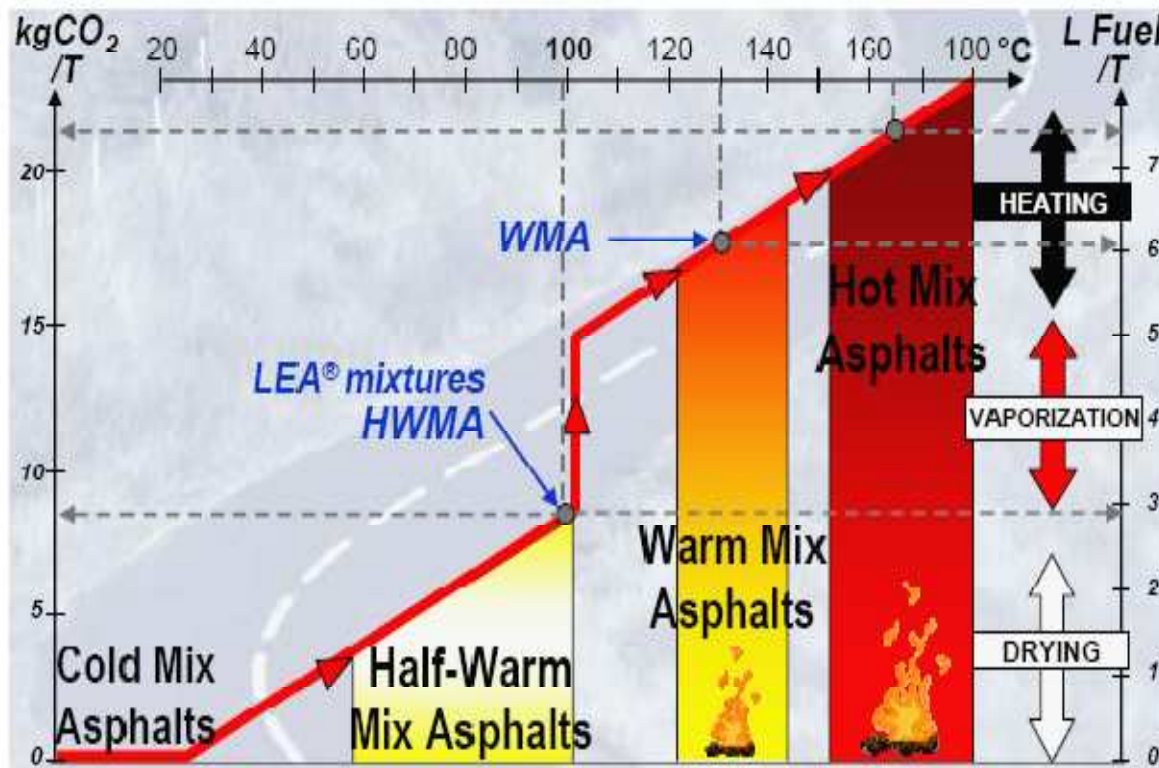


Figure 1: Fuel consumption and CO<sub>2</sub> emission for the heating of one ton of wet aggregates.

**LOW ENERGY ASPHALTS FOR SUSTAINABLE ROAD CONSTRUCTION**

*F. OLARD<sup>1</sup>, C. LE NOAN<sup>2</sup>, E. BEDUNEAU<sup>3</sup>, A. ROMIER<sup>4</sup>*

E&E, 2008



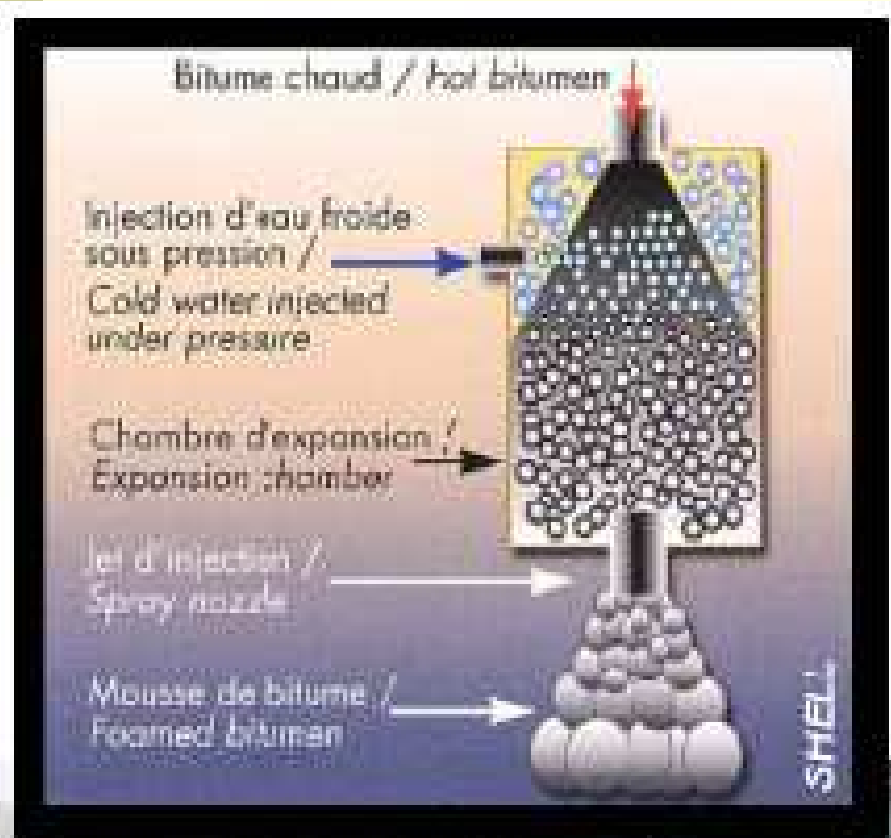
## WMA: Reduced Plant Emissions (%).

WMA European Practice. D'Angelo and al. 2008

Emission	Norway	Italy	France
CO <sub>2</sub>	31.5	30-40	23
SO <sub>2</sub>	NA	35	18
VOC	NA	50	19
CO	28.5	10-30	NA
NO <sub>x</sub>	61.5	60-70	18
Dust	54	25-55	NA

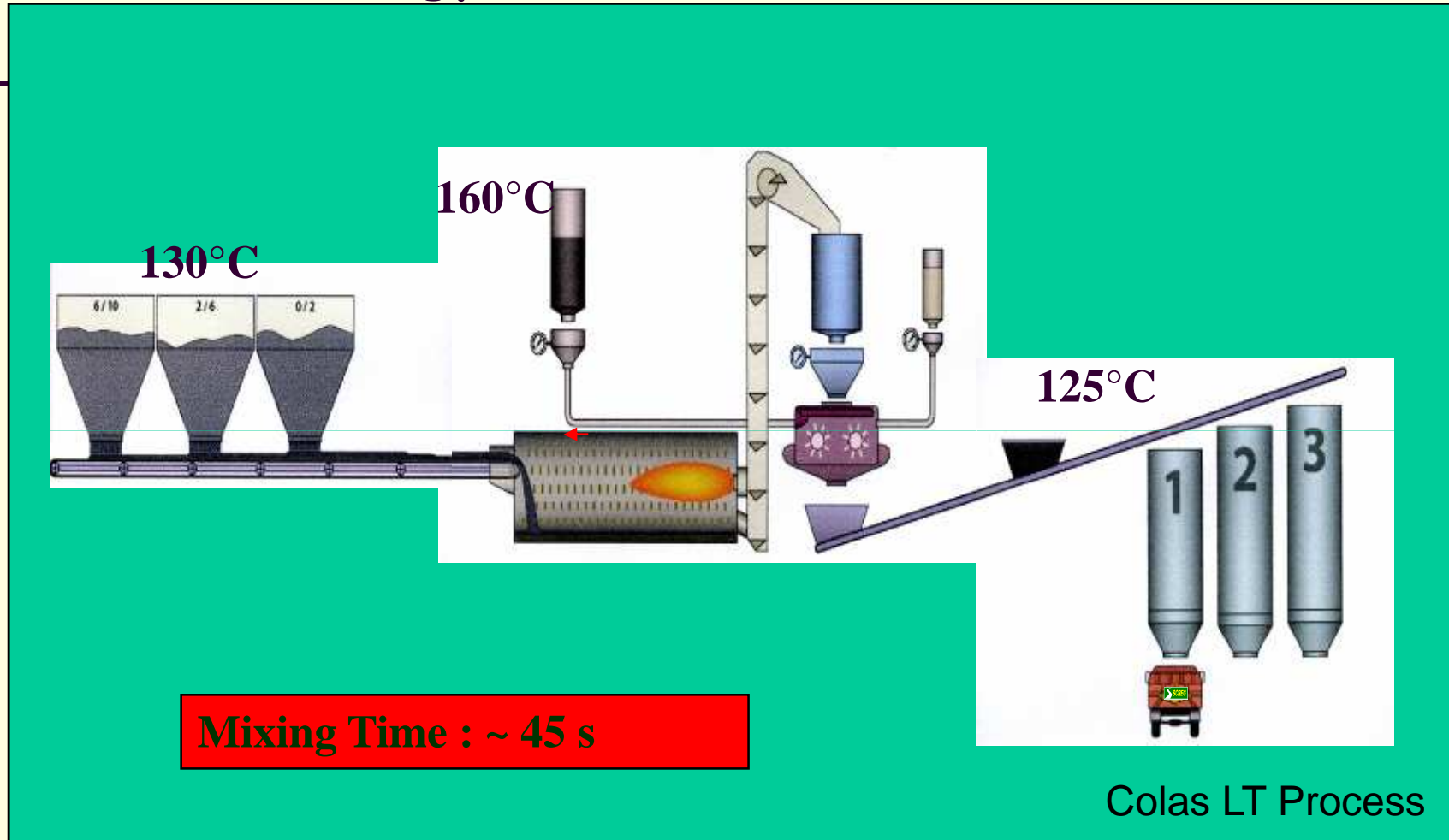
NA: Not Available

# Warm Mix: Foam Bitumen

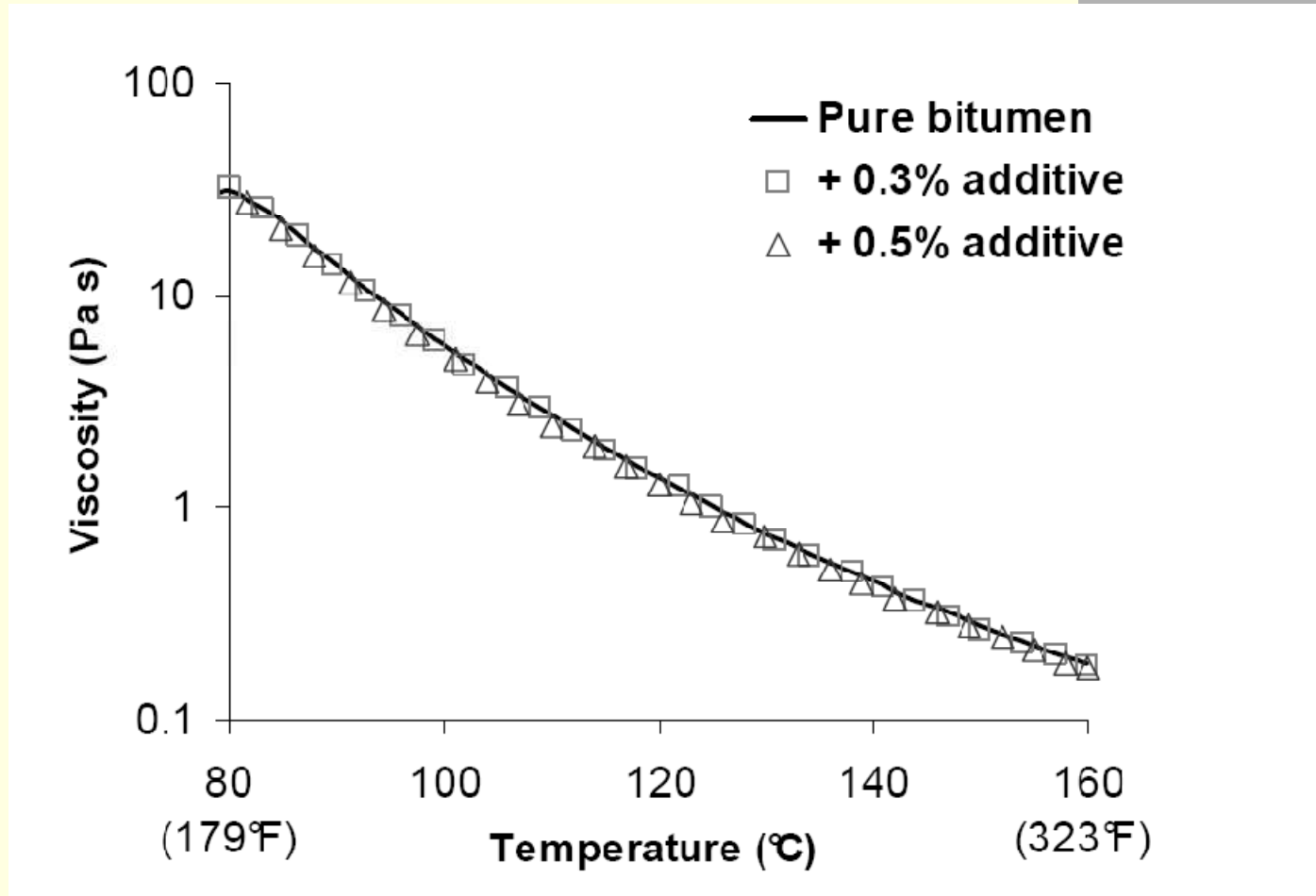




# WMA: Rheology Additives.



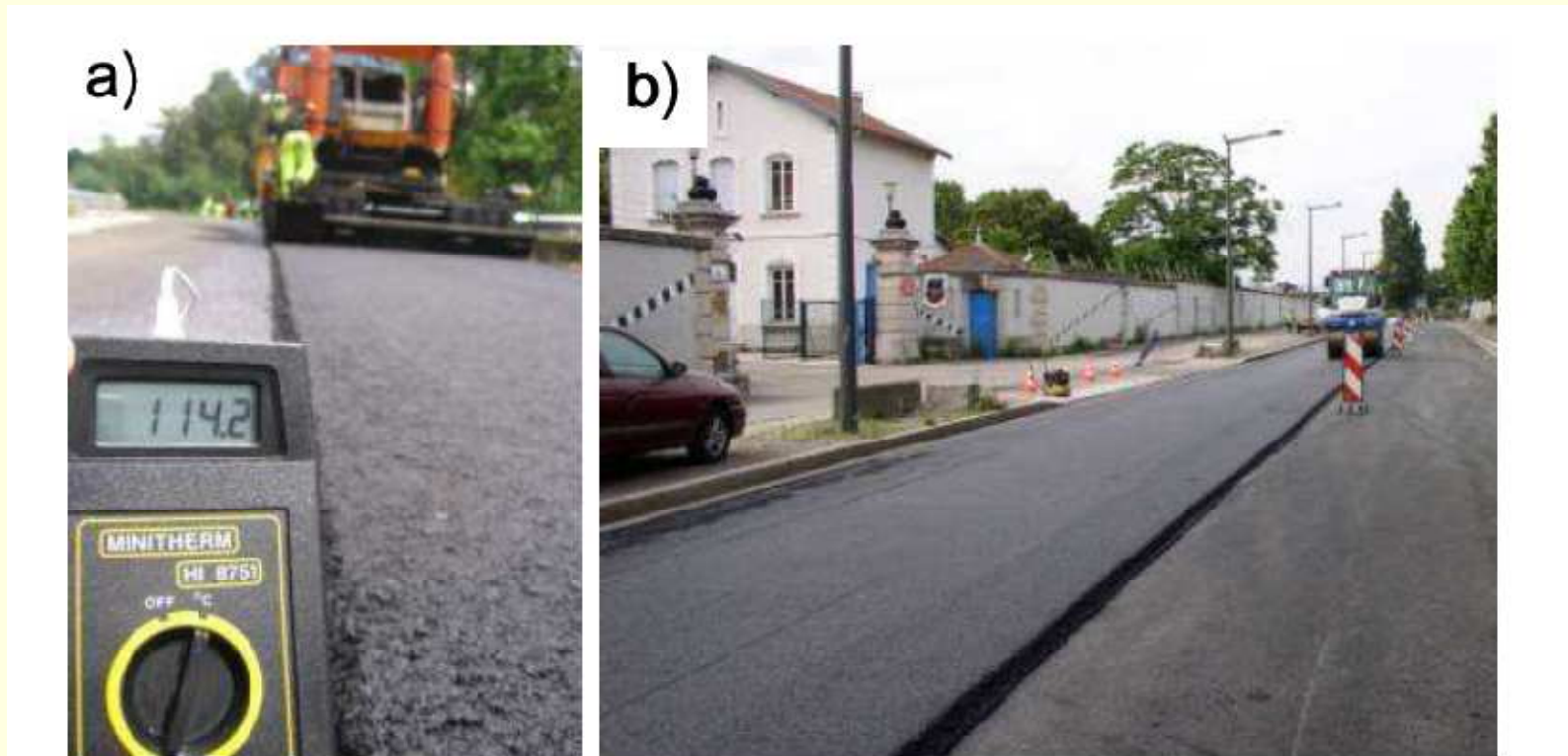
# WMA: Use of Surfactant



Juan A. González-León  
CECA/ARKEMA France

TRB, 2009

## WMA: Use of Surfactant



**FIGURE 2** Photographs of several WMA field tests carried out with Cecabase RT<sup>®</sup> additives: a) Field test with a 60/70 bitumen, b) Field test with RAP.



ENROBE CHAUD – 160°C

Conventional hot mix 150°C



ENROBE TIEDE – 120 °C

WAM 110° C



Energy savings

The invention originates in the mastic asphalt business

Low temperature mastic asphalt



Conventional mastic asphalt  
Temperature :  
230 to 250°C

**Neophalte**

application @ 150-160°C



# Lab equipment for Foaming Process studies



Foam Device

Pug Mill

## WAM Production (percent of total asphalt production)

	2008	2009
FRANCE	1.3	3-4
USA	0,5	5(*)

(\*) Guess from Colas Inc Figures



Look at mee!

You see what kind  
of mix you 'll  
design tomorrow  
??

Thanks to the imagination  
of the stakeholders, there  
is still space for innovation  
in the road business.