



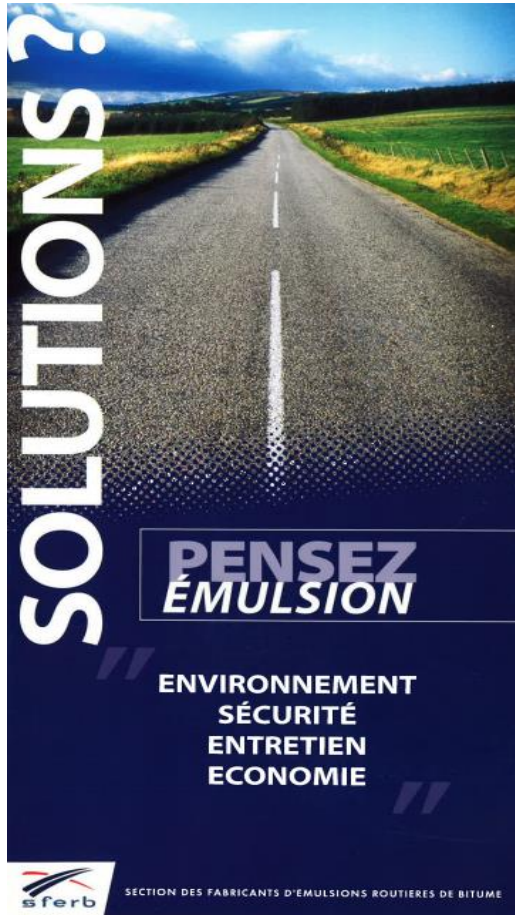
BITUMINOUS EMULSION TECHNIQUES: KEYS TO CIRCULAR ECONOMY AND SUSTAINIBILITY

”Worldwide Evolution of Bituminous Emulsion in Road
Construction and Maintenance”

Jean-Claude Roffé

IBEF former President - ERF Vice President

OVERVIEW OF BITUMEN EMULSIONS TECHNIQUES



Impregnation

Fog seal

Tack coat or bond coat

Surface treatments

Micro surfacing

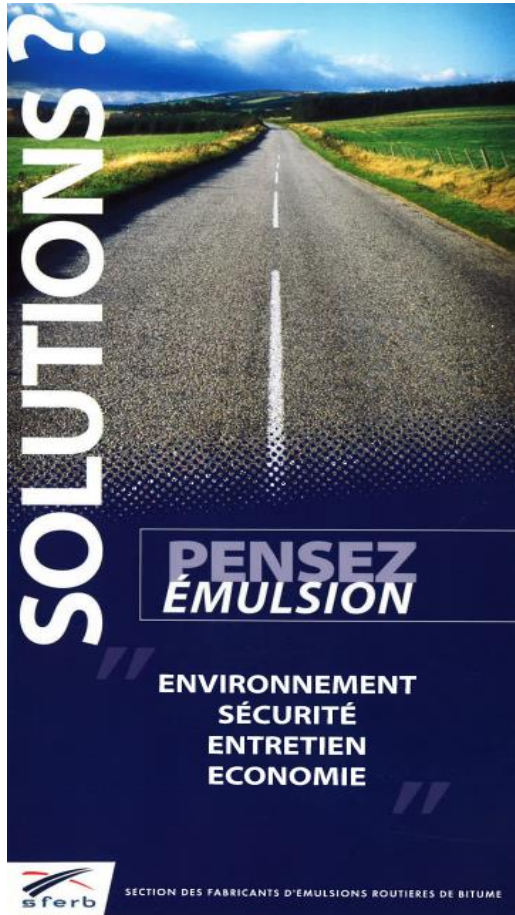
Cape seal

Cold mixes for base course and wearing course

Warm mixes

Soil stabilisation & Cold recycling...

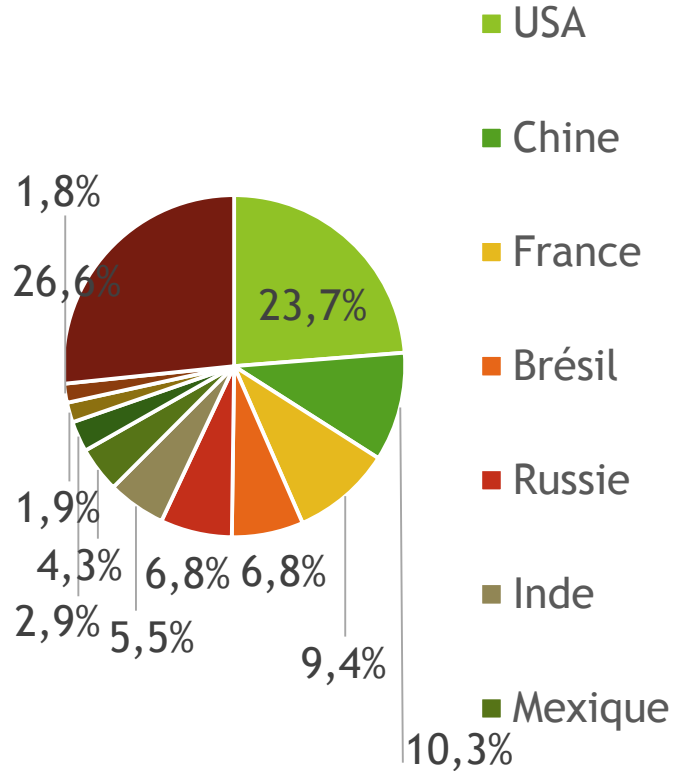
BITUMEN EMULSIONS "AN INDUSTRY AT THE SERVICE OF SUSTAINABLE ROADS



- ✓ What are the authorities and politicians doing?
- ✓ the road is still stigmatised, so demonstrating that bitumen emulsions contribute to a better environment is another way of restoring the road's image.....

THE WORLD BITUMINOUS EMULSIONS MARKET

8.2 MILLION TONS



- For PPRS Nice 2018, IBEF conducted a survey in 139 countries for bitumen and 96 countries for emulsions.
- In 2013, the market was 8.2 million tonnes of emulsions and 103 million tonnes of bitumen.
- Latest figures for 2016 + 3 % = 8.5 million tons
- There is a high degree of stability in global consumption, with a redistribution that reflects the setbacks suffered by developed countries as a result of the crisis that began in 2008.

BITUMINOUS EMULSIONS

**AFRICA 3.8%, AMERICA 40.1%, ASIA 25.5%, EUROPE 29.0%
AND OCEANIA 1.6%.**

- ✓ An interesting indicator is the emulsion/bitumen ratio. It averages 8% worldwide but reaches or even exceeds 25% in some countries with a strong tradition of preventive maintenance.
- ✓ It is not a question of replacing hot & warm mixes techniques with emulsion techniques, but of ensuring that emulsion techniques find their true place in a set of technologies for road maintenance.

ANALYSIS OF SUCCESS SHOWS THAT THEY ARE RELATED TO...

- ✓ THE SPECIFIC CHARACTERISTICS OF THE EMULSIONS
- ✓ CAPACITY OF THE INDUSTRY TO DEVELOP AND EXCHANGE
- ✓ INTEGRATION INTO THE SUSTAINABLE DEVELOPMENT APPROACH
- ✓ ABOVE ALL, THE WILLINGNESS OF THE AUTHORITIES TO DEVELOP A CULTURE OF PREVENTIVE MAINTENANCE AND ROAD ASSET MANAGEMENT AND SECURE ITS FUNDING
- ✓ AN ECONOMIC MODEL BASED ON PERIODIC ROAD DIAGNOSTICS
- ✓ CHOOSING "THE RIGHT PRODUCT, IN THE RIGHT PLACE, AT THE RIGHT TIME".

BRIEF SUMMARY OF BITUMINOUS EMULSION SPECIFIC CHARACTERISTICS



✓ WE MADE THESE LEAFLETS IN THE YEAR 2000

BRIEF SUMMARY OF BITUMINOUS EMULSION SPECIFIC CHARACTERISTICS



- ✓ ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
- ✓ PROTECTION OF NATURAL RESOURCES & PROMOTING RECYCLING
- ✓ SAVING ENERGY AND REDUCING EMISSIONS
- ✓ ADAPTATION TO CLIMATE CHANGE
- ✓ WE HAVE DEMONSTRATED THIS WITH THE EUROPEAN TRACC PROJECT (ROAD TECHNIQUES ADAPTED TO CLIMATE CHANGE)

BRIEF SUMMARY OF BITUMINOUS EMULSION SPECIFIC CHARACTERISTICS



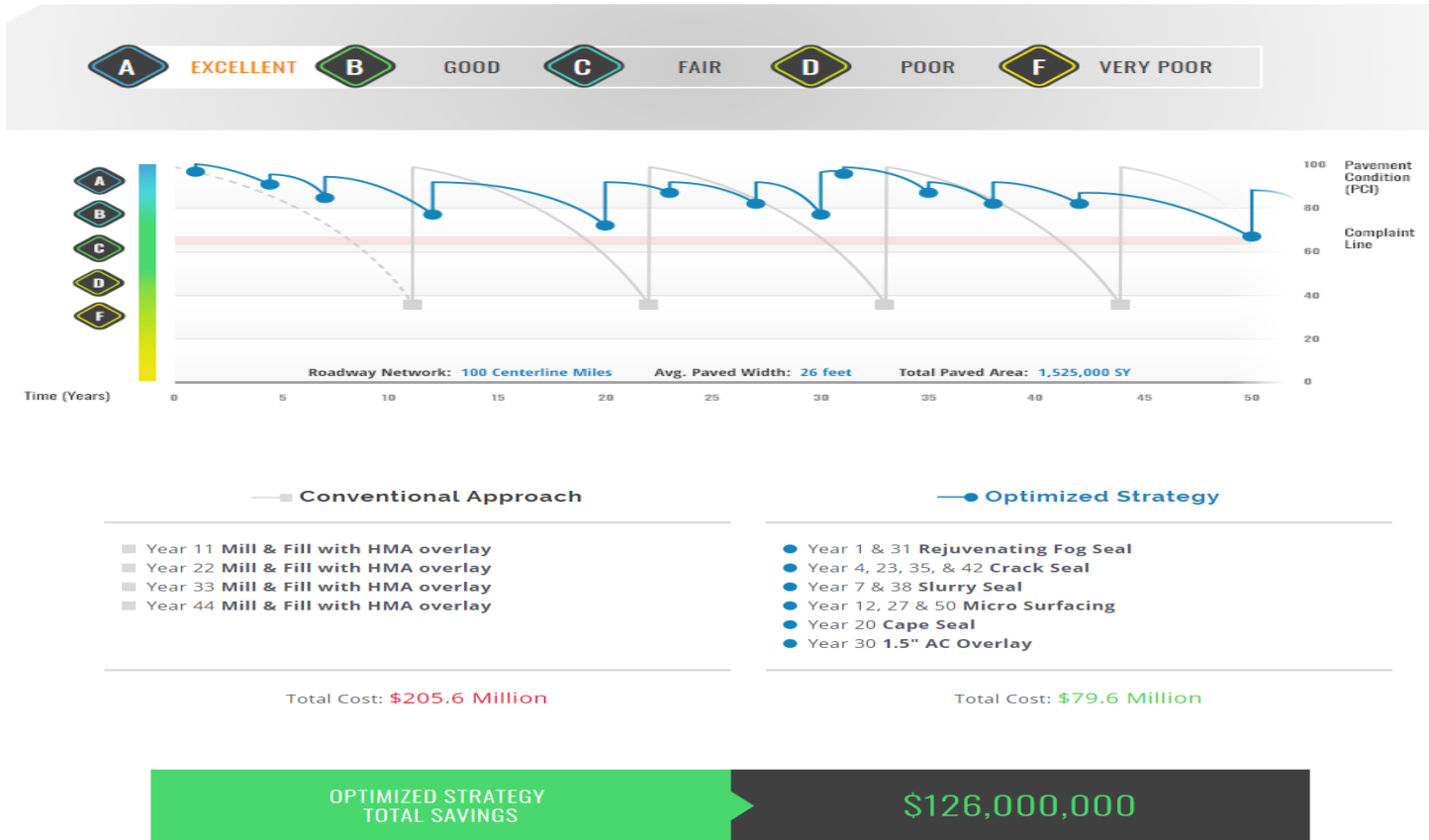
- ✓ IMPROVING THE SURFACE OF COATINGS = ROAD SAFETY
- ✓ ELIMINATION OF RISKS FOR WORKERS
- ✓ FLEXIBILITY, ADAPTABILITY AND FIELDS OF APPLICATION
- ✓ INCREASE SEASON OF WORKS
- ✓ INCREASE SERVICE LIFE BY 4 TO 5 TIMES OF THE PAVEMENTS WITH EFFECTIVE TACK COATS

BRIEF SUMMARY OF BITUMINOUS EMULSION SPECIFIC CHARACTERISTICS



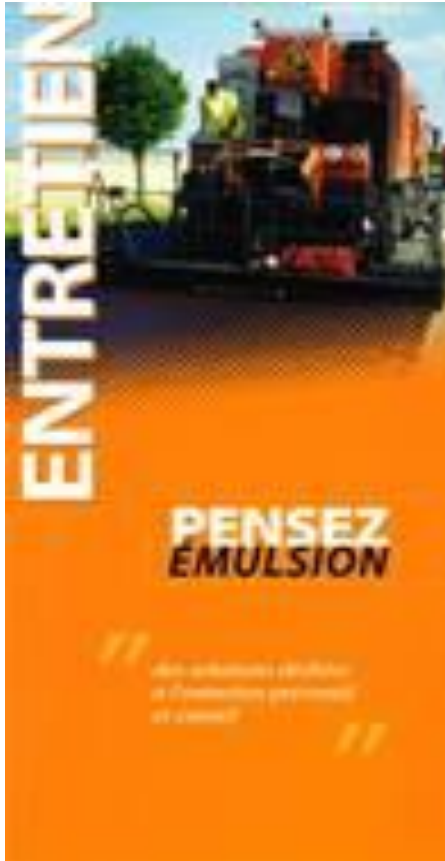
- ✓ OPTIMIZING THE USE OF AVAILABLE BUDGETS OR RESOURCES
- ✓ SAVING BUDGET FOR ROAD ASSET MANAGEMENT
- ✓ SAVING ENERGY
- ✓ REDUCING EMISSIONS
- ✓ IMPROVING THE SURFACE CHARACTERISTICS
- ✓ REDUCE THE VOLUME TO BE USED
- ✓ THE EXAMPLE OF “GRAVE EMULSION”

EDUCATE : PREVENTIVE MAINTENANCE AS AN ECONOMIC MODEL



✓ PROBLEM: SEVERE DETERIORATION OF ROADS DUE TO LACK OF BUDGETS FOR PREVENTIVE MAINTENANCE MEANS THAT SUPPORTS ARE NOT AS COMPATIBLE WITH ULTRA-THIN LAYERS.

BRIEF SUMMARY OF BITUMINOUS EMULSION SPECIFIC CHARACTERISTICS



- ✓ EDUCATION AND TRAINING IS THE KEY TO EMULSION TECHNIQUE SUCCESSES
- ✓ IT IS UNFORTUNATE THAT BITUMEN EMULSIONS TECHNIQUES ARE ALMOST NON-EXISTENT IN UNIVERSITY PROGRAMMES.
- ✓ EDUCATE ABOUT PREVENTIVE MAINTENANCE AND ROAD ASSET MANAGEMENT
- ✓ A RECENT PIARC BOOKLET IS AVAILABLE

Road network

is a tremendous asset to our country!

Let us think about its future!

Routine repairs, structural maintenance, wearing course maintenance...

Bitumen emulsion techniques can meet your needs to maintain the long term serviceability of your pavement. Emulsion techniques are energy-efficient and limit greenhouse gas emissions.

Emulsion asphalt mixes

Micro surfacing

Emulsion recycling of pavement materials

Chip seals



www.ibef.net

FLEXIBILITY AND DURABILITY



iberf
International Bitumen
Emulsion Federation

- ✓ Invented in 1920 emulsions have demonstrated their qualities & performances and continue their ongoing & constant development
- ✓ The contribution of information data and control systems = security and accuracy of processes
- ✓ Knowledge of physicochemical phenomena
- ✓ Contribute to this great reliability
- ✓ With all performances and qualities, why emulsion techniques are not widely used & spread ?

SEVERAL KEY FACTORS TO EXPLAIN THE LACK OF USE OF EMULSIONS



- ✓ Cultural deficit
- ✓ Technical deficit
- ✓ We have developed test methods to formulate, design and control emulsion techniques comparable to hot mixes.
- ✓ It is an economic model
- ✓ What should we teach in universities and how to educate local and national administrations?

Concluding Remarks

- ✓ In 2020 Bituminous emulsions will get 100 years
- ✓ Emulsion continues to be a surprisingly young and modern technique, in constant progress.
- ✓ All the actors involved meet regularly to share their knowledge and evolve their practices as today in this Croatian National Road Conference
 - ✓ We've got a lot of work to do!
 - ✓ Training, Promotion, Communication
- ✓ Open to innovation and focused on a Circular Economy
- ✓ All this is very exciting for your future and the future of emulsions.

BITUMINOUS EMULSION TECHNIQUES: KEYS TO CIRCULAR ECONOMY

Thank you so much for your attention
and for the translation

Puno vam hvala na pozornosti i
prijevodu



@jcroffe



@ibef_net