
# Sustainability : International Perspective

COLAS Inc.

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# The Agenda

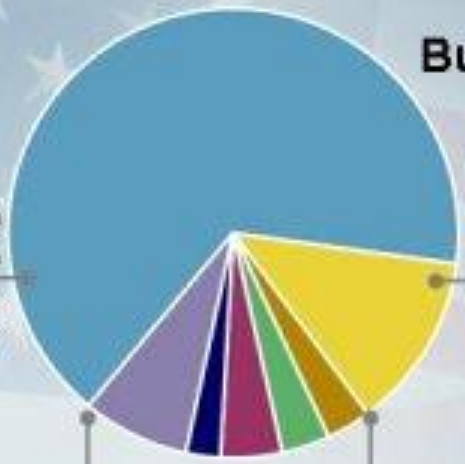
- Quick presentation of COLAS SA
  - R & D in COLAS
- Ecological
- In place recycling & treatment
- How to implement innovations or new techniques
- Conclusions

# COLAS (COLd ASphalt) in 2008

- ID Card
  - Turn Over 12.8 Billion Euros / 18 Billion $
  - 74 000 personnel in 40 countries
    - 8000 in North America
  - Aggregates 118 Mt
  - HMA 52 Mt
  - Emulsion 1.5 Mt

# Breakdown of Group activity

*in millions of €*



**Roads**

7,712
(66.1%)

**Building materials**

1,472
(12.6%)

Concessions:

16.7% Cofiroute
Adelac (A41)
Mars (Reims tramway)

2,489
(21.3%)

**Civil engineering, Pipes, Mains**

901

**Safety, Signing**

291

**Waterproofing**

517

**Building**

404

**Railways**

376

# 1,400 profit centers in 40+ countries

## 110,000 projects around the world

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# Scientific & Technical Campus
# South West of Paris

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# Research and Development

- Applied research network:
  - 1,000 engineers, research specialists and technicians worldwide
    - 250 in North America
  - 1 Campus for Science and Techniques, certified ISO 9001 and ISO 14000

# European Approach

- More and More Performance based compared to the USA
- Innovations are part of the business
- Some owners promote it
- Patents, trademarks,…

# Environment is part of our business

- Thin and ultra thin overlay
- No more tar use even for fuel resistant properties
- Noise abatements systems

- Quarries
- HMA plants
- Emulsion plants

- Recycling

# What about recycling?

- Cold in place recycling
- RAP
- Recycling centers (PCC, ballast, …)

# Positive actions

- What do we do?
  - Step by step
  - Contractor versus market
  - Recycling (no paper tools, RAP, PCC,…)
  - Ambassadors in every company in North America
  - Cars policy
  - Tracking of energy (fuel, gas, natural gas,…)
  - Training to save energy (moisture in ACP plant)

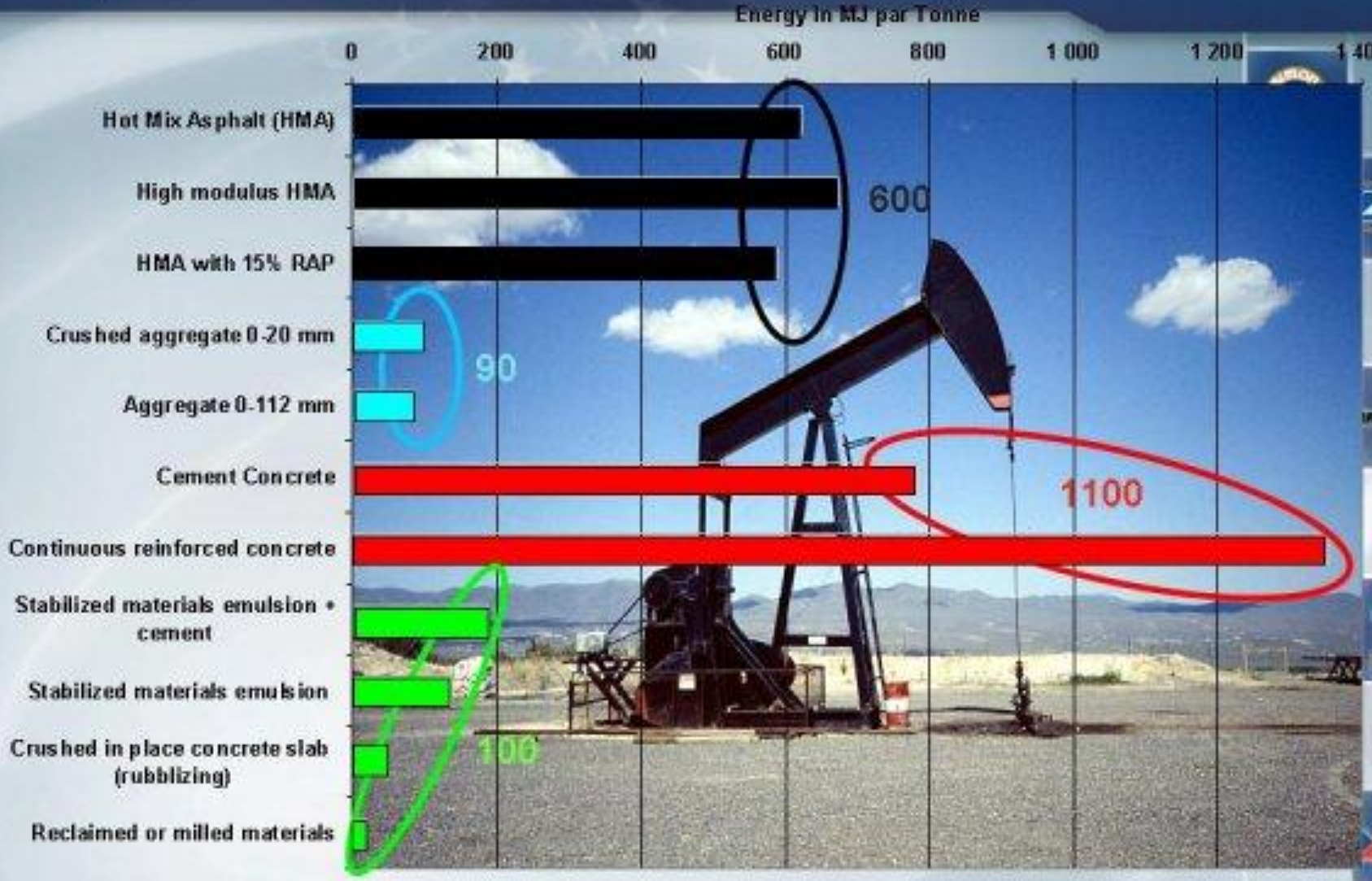
# Energy Efficiency and Innovative Construction Practices

- What do we do?
  - Step by step
  - Analyze road structures
    - Paper done in 2003 PIACR in Durban
    - The environmental road of the future
    - Recycling in place is the best technique
  - Ecologiciel
    - Calculation per m2 of two criteria
    - CO2 and Energy consumption

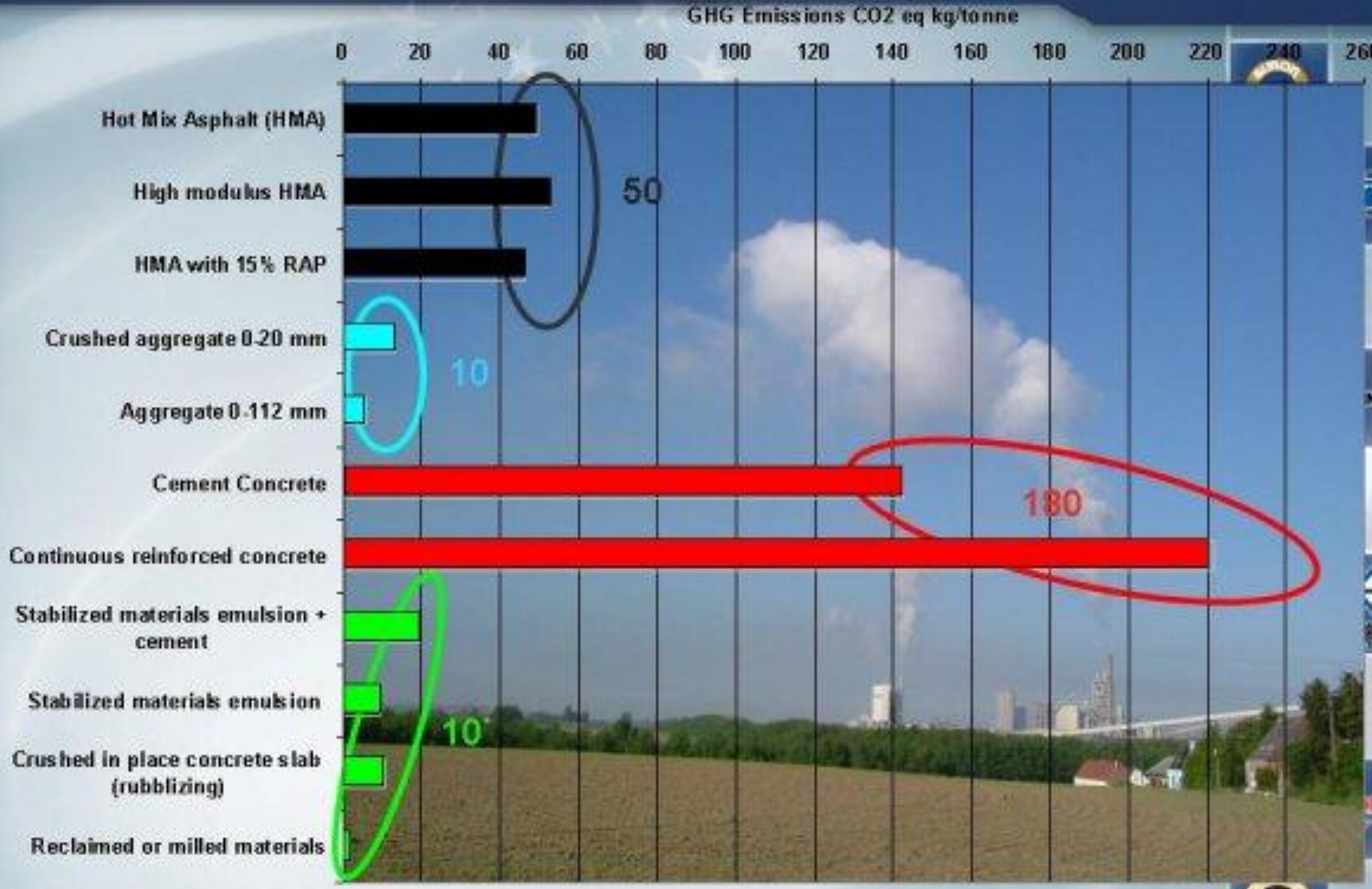
# How to evaluate the effect of recycling?

- 2003
- Paper on the environmental road for the future
  - Comparisons between techniques
- PIACR Durban

# Energy Consumption for the Manufacturing and placement of Main Road Technologies



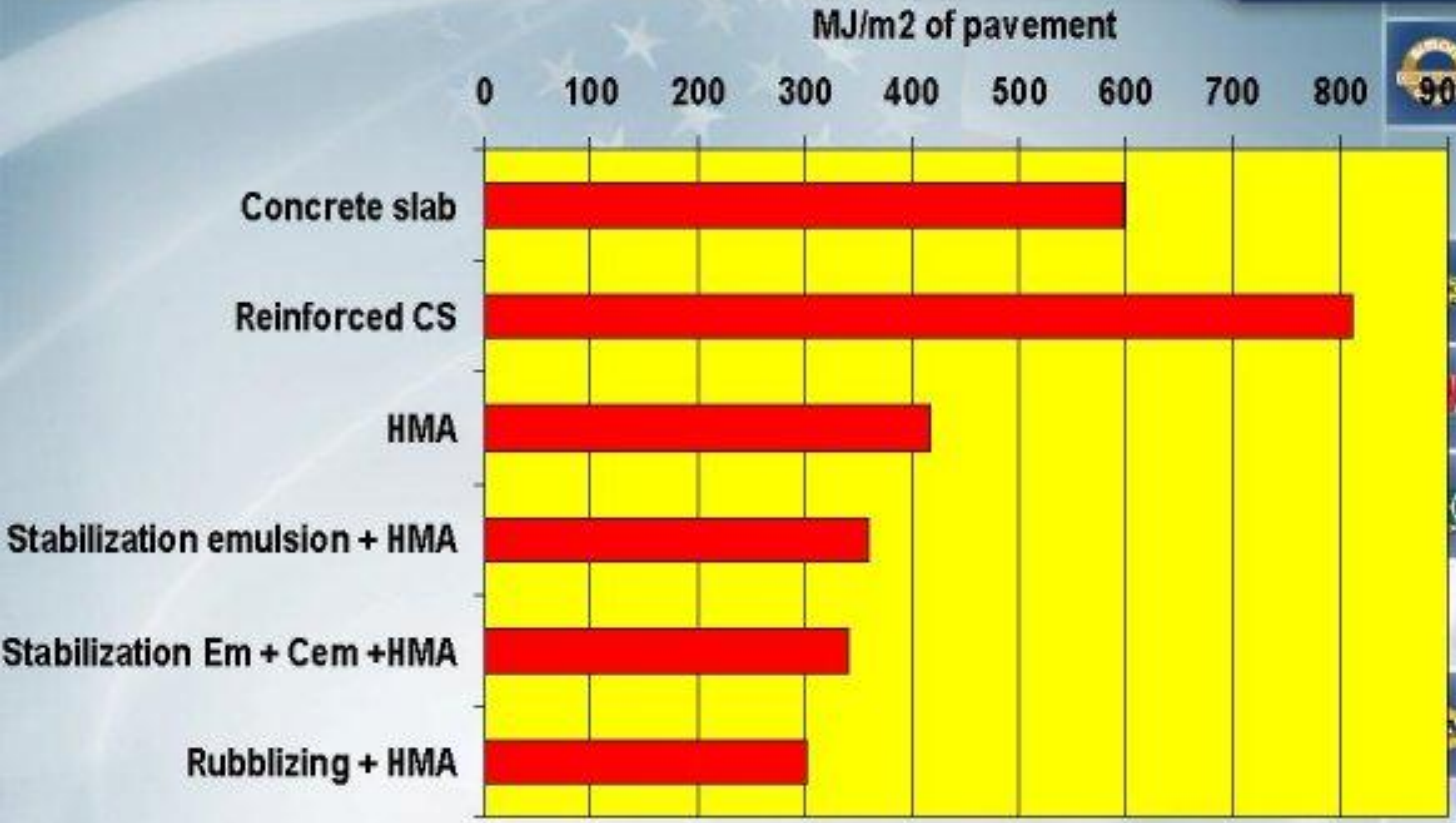
# GHG Emissions during Manufacture and Placement of Main Road Technologies



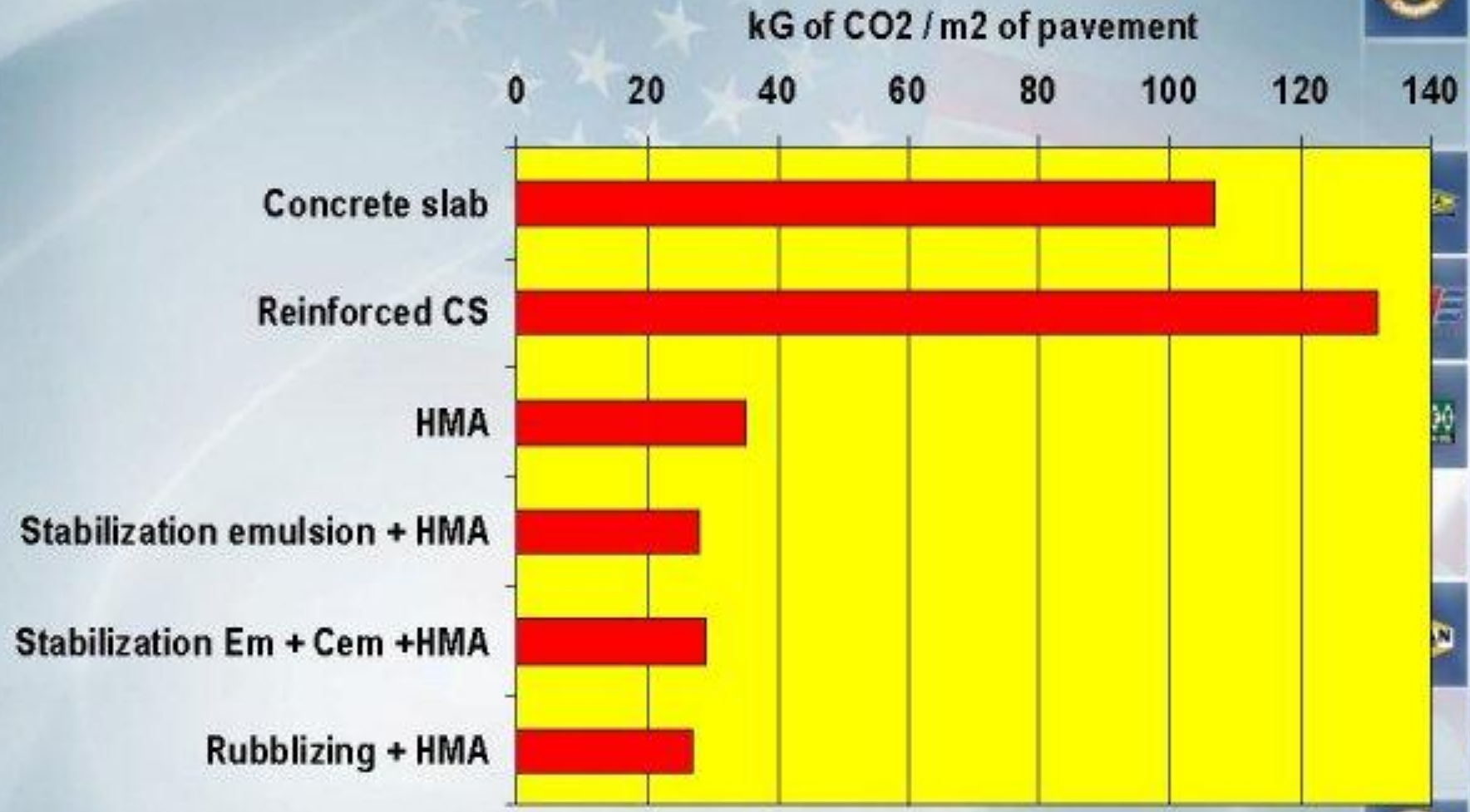
# How to evaluate the effect of recycling?

- **2006**
- Internal software ECOLOGICIEL
  - Eco alternatives
  - Optimization of RAP
  - $CO_2$ eq

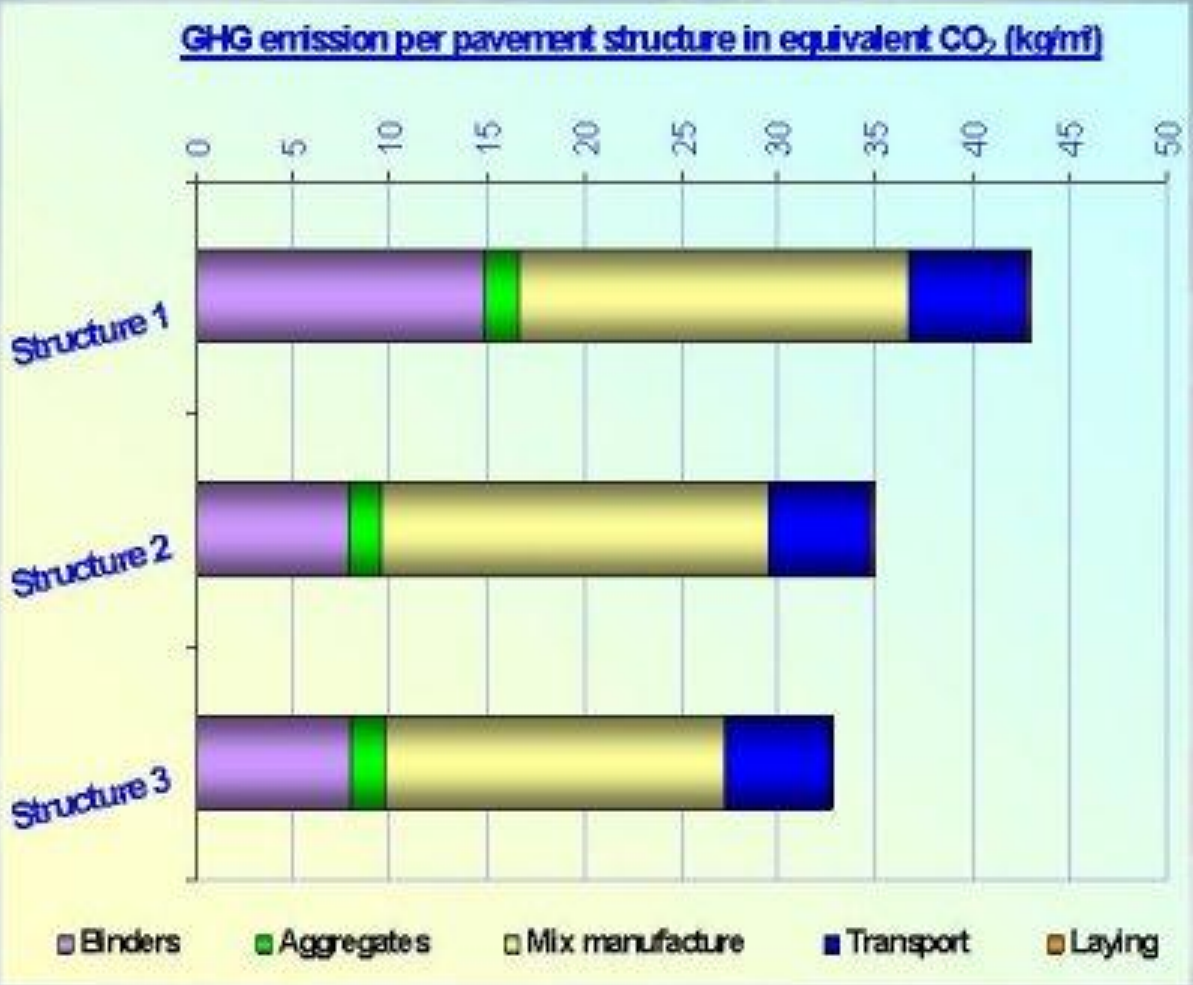
# Energy Consumption in MJ per m2 For the construction of the Pavement for 100,000 AADT over 30 years



# GHG Emission in $CO_{2eq}$ per m2
# For the construction of the Pavement for 100,000 AADT over 30 years

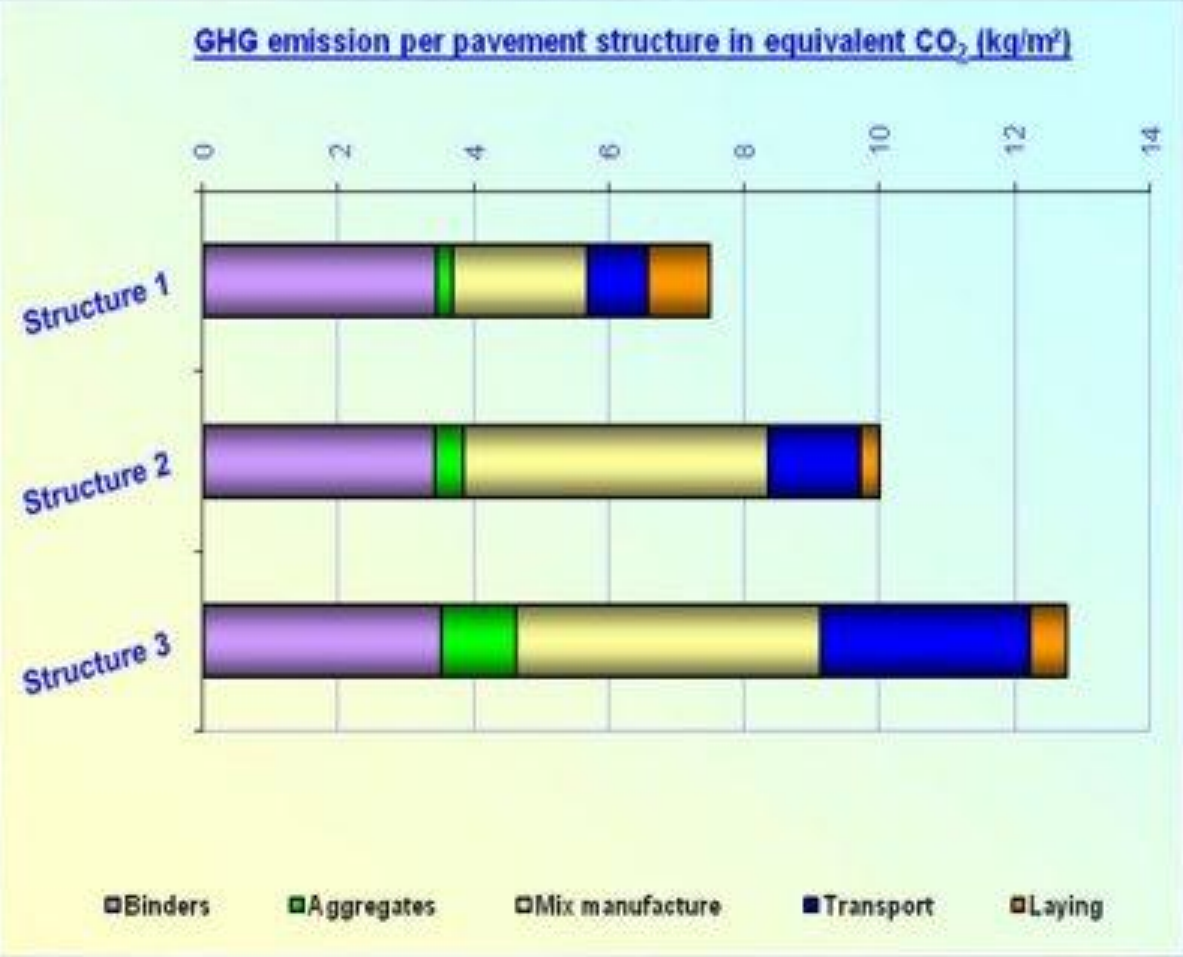


# Per ton of HMA applied




1. Virgin HMA
2. 25%RAP HMA
3. 25% RAP WMA

# Per ton of HMA applied




1. 1 ½" HMA+ 5" CIR
2. 3 ½" HMA
3. 3 ½ " HMA + 6" GB

# First approaches

- Eco alternatives
  - Alternatives represent 5-8% of the tenders
  - Using a design software and properties of components
  - To show the gain in GHG per sy on a job
- The owner must be involved
- How  to implement innovations or new techniques

# How to implement innovations or new techniques?

- In Europe
  - Create the needs
    - Contest tenders
    - Performance based tender
    - Technical response to issues
    - Charter for innovations with funding
- In Canada
  - Value engineering (after the tender)
  - Specific demands to answer issues
  - 5-7 years warrantee projects (design included) per m2
  - Promote actively a technique (environmentally friendly)

# How to implement innovations or new techniques?

- In Europe and elsewhere
  - Industry promote also R&D labs,….
  - Long term commitment in a new technique
    - High investment (CIR, FDR, …)
    - Difficult to invest for one job
  - Training to various PP techniques
  - Performance based contracts
    - Technical monitoring
    - Training
    - Training

# Initiatives

- Washington State
- New York State
- LEED for Building
- Green Highway
- PPP

# GREEN ROADS


**more sustainable roads for a better transportation future**

Green Roads is a rating system designed to distinguish high-performance sustainable new or redesigned/rehabilitated roads.

It awards credits for approved sustainable choices/practices and can be used to certify projects based on point value.

# GREEN ROADS

## Green Roads Categories

| Category | Goal | Credits |
|---|---|---|
| **Sustainable Design** | Reduce impacts due to alignment of the road. | 10 |
| **Material & Resources** | Reduce impacts from material extraction, processing and transport. | 11 |
| **Stormwater Management** | Reduce impacts of polluted stormwater and treatment devices. | 8 |
| **Energy & Environmental Control** | Improve human and wildlife health. | 12 |
| **Construction Activities** | Reduce impacts from construction activities. | 9 |
| **Innovation** | Encourage innovation in design. | 4 |
| | Total | 54 |

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# GREEN ROADS CATEGORY

## Materials & Resources (MR)

| Description | Credits |
|---|---|
| Construction Waste Management | 1 |
| Reuse of Pavement | 2 |
| Recycled Content | 4 |
| Pavement Life Cycle Analysis | 3 |
| Regionally Provided Material | 1 |
| **Total Credits Available** | **11** |

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# Example MR Credit

## Recycled Content — 4 Credits

**One credit**: Use recycled content to a minimum of 20% in the HMA/PCC and 40% of the total material in the structure if base course is included in the project.

**Two credits**: Use recycled content to a minimum of 30% in the HMA/PCC and 50% of the total material in the structure if base course is included in the project.

**Three credits**: Use recycled content to a minimum of 40% in the HMA/PCC and 60% of the total material in the structure if base course is included in the project.

**Four credits**: Use recycled content to a minimum of 50% in the HMA/PCC and 70% of the total material in the structure if base course is included in the project.

# GREEN ROADS

## Certification Levels

| Green Road certified | Green Road certified SILVER | Green Road certified GOLD | Green Road certified EVERGREEN |
|---|---|---|---|
| 19-25 credits | 26-31 credits | 32-37 credits | 38+ credits |

# Green LITES Labelling – *NYSDOT*
*9/25/08*

New York State Department of Transportation

Green LITES ***Project Design Certification Program***

**Recognizing Outstanding Leadership In Transportation and Environmental Sustainability**

September 2008

* * * * * * *

**Certification Program for NYSDOT Designs Meeting Criteria for Sustainable Transportation Infrastructure using Environmentally Friendly Practices**

# Industry Response - *HMA*



- Leading America in Recycling
- Warm Mix Asphalt
- Quiet Pavement
- Perpetual Pavement
- Porous Pavement
- Lower GHG & fuel

# Industry Response - *Concrete*


# Industry Response – *AEMA*


- Emulsion techniques
  - may be handled safely
  - no odors, fumes, smoke or dust
  - preserve the environment
    - protects air quality
    - recyclable
  - low cost techniques
    - quick application time
    - low energy consumption
  - many pavement preservatio


# Industry Response – *ISSA*

- **ISSA Outlook**
  - "Environmentalists, taxpayers and legislators will be pleased to know that ISSA member contractors are responsible for making their roads last longer, keeping them safer, and requiring the use of fewer raw materials".

# Industry Response - *ARRA*

- ARRA techniques
  - most environmental friendly flexible pavement rehabilitation technique.
  - reuse existing non-renewable material
  - heating of material is not required
  - haulage of material on or off site is not required, i.e. less disturbance to traffic

## Environmental Benefits

- Per 2-lane km, CIR/CIREAM emits approximately 50% less GHG, consumes 62% less aggregates, and costs 40-50% less when compared to a conventional mill and overlay treatments
- Since the implementation of CIR/CIREAM contracts, MTO has reduced GHG emissions by:
  - **54,000 t** of $CO_2$
  - **440 t** of $NO_x$
  - **9,400 t** of $SO_2$

And saved 740,000 tonnes of aggregates

Ontario

# Pavement Preservation

***"long-term strategy that enhances pavement performance by using an integrated cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations"***

| | Type of Activity | Increase Capacity | Increase Strength | Reduce Aging | Restore Serviceability |
|---|---|---|---|---|---|
| | New Construction | X | X | X | X |
| | Reconstruction | X | X | X | X |
| | Major (Heavy) Rehabilitation | | X | X | X |
| | Structural Overlay | | X | X | X |
| Pavement Preservation | Minor (Light) Rehabilitation | | | X | X |
| | Preventive Maintenance | | | X | X |
| | Routine Maintenance | | | | X |
| | Corrective (Reactive) Maintenance | | | | X |
| | Catastrophic Maintenance | | | | X |

*Table 1- Pavement Preservation Guidelines*

The **Right** treatment, to the **Right** road at the **Right** time

# Conclusions

- Environment should be more than permits
  - Included in the pre tender or engineering approach
  - Consultants: awareness and training
- Numerous initiatives in the USA
  - In place recycling should be more used!
  - Promotion of innovations / training (DOT and Industry)
- Industry needs long term commitment
- Quality must be there
  - Needs for the road networks
  - Budget

# Conclusions

- Vegetal binders at 250F


FDR in the UK