

ROAD INDUSTRY:

AN ENVIRONMENTALLY COMMITTED SECTOR





Paver and vibrating roller



What exactly is a road?

A road is a **stock of several layers** [several cm thick] of rocky quarry materials called “aggregates” to the **wearing course** [a few cm thick] composed of “asphalt mixes” consisting of 95% aggregates and 5% bitumen [from petroleum].



Energy transition

Allowing choices for other, more energy-sparing production and consumption methods is an essential requirement. This energy transition is characterised in particular by **the reduction of greenhouse gas emissions, lower energy consumption and greater use of renewable energy sources.**

An environmentally committed sector

Road builders who design, build and maintain a road network of over one million km in France are aware of current day climatic issues. They have been investing in research and development for decades in order to propose technical solutions aimed at reducing the environmental impact of road construction.

→ A responsible industry

As France’s “**First social network,**” the road industry seeks to be exemplary [with regard] to environmental matters. Its stakeholders, represented by the **USIRF (French Union of Road Industry Associations)**, are engaged in concrete action in favour of **energy transition** and a **circular economy**. The results of their efforts are in keeping with their aspirations.



USIRF

The French Union of Road Industry Associations (USIRF) is a trade organisation representing French road construction firms. It brings together 90,000 employees who perform work functions related to roads, to urban roadways and to correlated spatial planning over the entire French territory. This represents annual revenue of 14 billion Euros in France.



Circular economy

In this new concept of economic circuits, waste (non-hazardous) generated by some areas or industries becomes raw material for others. The keywords of circular economy are the **reemployment and reuse** [of materials], as well as **gainful repurposing and recycling** [of waste].

→ Strong commitments and results

In regard to the environment, two main objectives guide the actions of the sector: reduction of **greenhouse gas emissions** [GHGE] and **preservation of non-renewable resources** [quarry materials, bitumen, etc.]. These two objectives fall within the framework of a **voluntary commitment agreement** [CEV] signed in 2009 by more than 60 of the country's local communities, including 52 metropolitan departments [county-like divisions].



Greenhouse gas emissions

Industrial activity and our ways of life generate increasingly greater amounts of greenhouse gases, CO₂ in particular. Beyond a certain threshold, nature can no longer absorb them: this is what is meant by greenhouse gas emissions, which contribute climate warming.



Voluntary commitment agreement

In March 2009, following the Grenelle of the environment, the FNTP, USIRF, SPTF and Syntec Ingénierie signed a voluntary commitment agreement [CEV] with the State and Assembly of Departments [county-like territories] of France. This document includes a series of quantised commitments which should make it possible to reduce the ecological footprint during road construction and maintenance.

FNTP: *Fédération Nationale des Travaux Publics* [National Public Works Federation]
SPTF: *Syndicat Professionnel des Terrassiers de France* [French Earthmovers Trade Union]



Cold in-place recycling

Warm-mix asphalt

The materials making up our roads consist in most cases of asphalt mixes manufactured in industrial installations, most often at high temperature. Compared with “hot-mix” asphalt, so-called “warm-mix” asphalt is manufactured [and applied on road] at a temperature 30°C lower. The use of this technique, the broader extension of which is advocated by USIRF, allows a significant reduction in energy consumption and CO₂ emissions, hence improving working conditions on worksites.



Asphalt mixing plant

Cold-mix systems

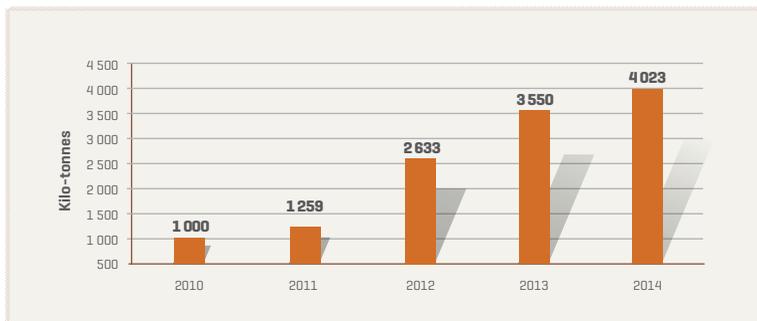
Still only marginally used, emulsion based mixes are valuable from the environmental standpoint because they allow cold mixing. Four techniques exist: emulsion-treated roadbase asphalt, cold asphalt concrete, slurry surfacing mixes and surface dressings. These techniques are being increasingly used and also techniques like cold in-place recycling.

→ Lower GHGE

Lowering greenhouse gas emissions is essential for keeping average temperature rises at a sustainable level. Road builders are committed to a **33% reduction** of these emissions by the year 2020. This aim will be reached and even exceeded thanks to:

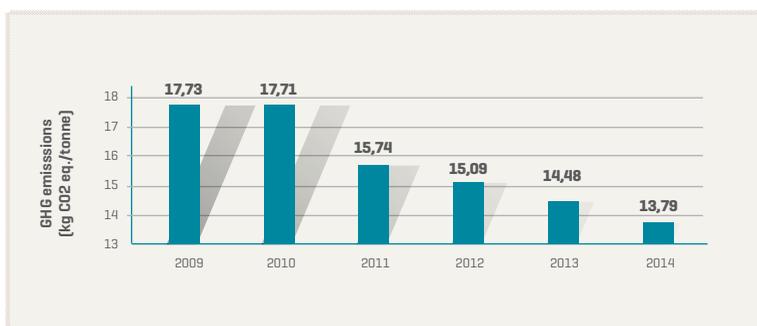
- **The broad extension of techniques** allowing lower manufacturing temperatures for asphalt mixes used in the construction and maintenance of roads. Such techniques use **warm and cold mix asphalt**.

Tonnage of Warm-Mix/Semi-Warm Mix Asphalt France (kilo.tonnes)



- The growing use of maintenance techniques based on [cold] **bitumen emulsions or cold mix asphalt**.
- The reduction of greenhouse gas emissions at burner level in **asphalt mixing plants**.

Evolution of greenhouse gas emissions [burners] / tonne of asphalt mix produced



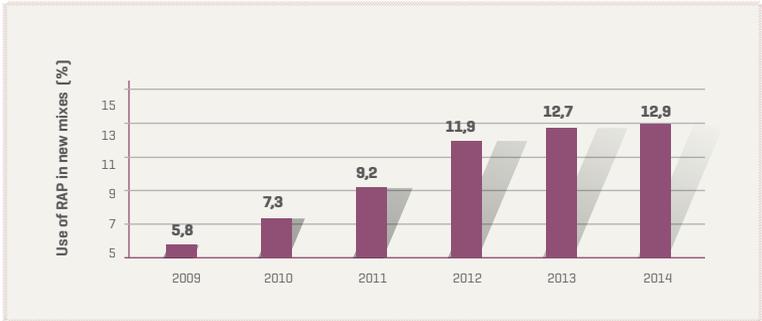


→ Spared natural resources

Reducing the ecological footprint is of primary importance. Road builders seek to save non-renewable resources by the gainful use or re-use of salvaged worksite materials, namely:

- **Recycling of materials** from public worksites.
- **Recycling of materials from the deconstruction** of existing structures (such as the crushing of concrete from demolished buildings).
- **Reclaimed Asphalt Pavement** recovered from road deconstruction projects is used in a new asphalt mix (for example, from the milling of wearing courses prior to laying a new course).

Rate of RAP (Reclaimed Asphalt Pavement) reintroduced in new mix (%)



Gainful used and reuse

Recycling and reuse of rejects and waste from construction and deconstruction (roads, buildings) enable **the sparing of non-renewable natural resources, waste reduction and budgetary savings.**





The LIFE programme

LIFE is a programme initiated by the European Union in 1992 to support the emergence of projects favouring better environmental quality. The LIFE 2014-2020 programme stresses especially the issues relative to climate change.



→ SEVE: a tool for environmental efficiency

The System for Evaluating Environmental Variants (SEVE) is an eco-comparator intended for all stakeholders [contractors, companies,...] and especially project owners [department, commune, etc.] dealing with calls for tenders relative to the maintenance, modernisation or construction of road networks. It enable them compare, from an environmental viewpoint, technically equivalent solutions proposed by contracting firms.

Based on an Internet platform, this easy-to-use tool is intended for all the stakeholders involved in a road construction project. They are thus able to compare the environmental variants at each stage [nature of layers, components, pavement production conditions, makeup of application teams, transport distances and modes, etc.] and make the best suited decisions based five indicators:



<http://international.seve-tp.com>

→ From France to Europe

Following its successful deployment in France, USIRF proposes the extension of SEVE to all of Europe **within the framework of the LIFE+ "SustainEuroRoad" project**. Thanks to the financial support of the European Union, USIRF is working on a European version of the software, contributing to more trustworthy practices relative to road construction and maintenance continent-wide.



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