



# ENVIRONMENTAL REPORT 2015

May 2016

## The voluntary commitment agreement (CEV - *convention d'engagement volontaire*) for road infrastructures...

Following the Environment and Energy Transition Round Table a voluntary commitment agreement involving the main actors in designing, constructing, and maintaining road infrastructures, streets, and urban public spaces was signed on 25 March 2009.

By this agreement the **excavation and road construction** enterprises together with their partners (Assemblée des Départements de France and Syntec Ingénierie) under the aegis of the FNTP (Fédération Nationale des Travaux Publics - National Federation of Public Works) and their speciality syndicates undertook – among other commitments - to:

- **reduce greenhouse gas emissions by 33% by 2020 through:**
  - generalising warm mixes
  - increasing the use of maintenance solutions based on bitumen emulsion
  - reducing emissions at the level of asphalt plant production
- **reuse or recycle 100% of the materials excavated on the work sites** by 2020 and preserve the non-renewable resources, especially through:
  - increased recycling of surpluses and waste from work sites
  - increasing the rate at which bituminous materials from road deconstruction are reused
- Reach an **industrial tools certification** rate of 50 %
- Create and develop an environmental software common to the public works enterprises in order to assess the impact of public works: **SEVE** Eco-comparator

This environmental report for 2015 shows the road construction enterprises' renewed efforts to attain these principal objectives.

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## CONTENTS

1	Reminder: the national production of asphalt concrete .....	2
1.1	The tonnage .....	2
1.2	Evolution of the distribution of production .....	3
2	National production of warm and semi-warm mixes.....	3
3	National production of bitumen emulsions.....	4
3.1	Spreading Emulsions .....	5
3.2	Coating Emulsions.....	5
4	Recovering recycled materials .....	6
5	Reclaimed Asphalt Pavement (RAP) in the asphalt concrete.....	6
6	In place recycling .....	7
7	Greenhouse gas emissions (kg CO <sub>2</sub> eq.) .....	8
8	ISO 14001 certified asphalt concrete plants and bituminous emulsion factories .....	9
9	Deploying SEVE Eco-comparator .....	10
10	Conclusion.....	11



# 1 Reminder: the national production of asphalt concrete

## 1.1 The tonnage

This refers to the whole tonnage manufactured (Table 1) for hot, warm / semi-warm, and cold coatings (by calculating their proportions). The proportions are calculated according to the following formula:

$$\text{Enterprise tonnage} = \sum p_i \times t_i$$

$p_i$ : participation of the enterprise in entry  $i$   
 $t_i$ : tonnage produced in entry  $i$

Asphalt concrete tonnage in France				
Year	Hot mixes	Warm mixes	Cold mixes <sup>1</sup>	Total France
2011	36,100,000	1,259,000	1,600,000	38,959,000
2012	31,733,000	2,633,000	1,460,000	35,826,000
2013	31,850,000	3,550,000	1,550,000	36,950,000
2014	28,698,500	4,023,300	1,418,300	34,140,100
<b>2015</b>	<b>25,916,000</b>	<b>4,552,000</b>	<b>1,808,000</b>	<b>32,276,100</b>

Table 1 – Detailed trends of the tonnage of asphalt concrete in France from 2011 to 2015

The Figure 1 shows the trend of the French asphalt concrete production since 2011.

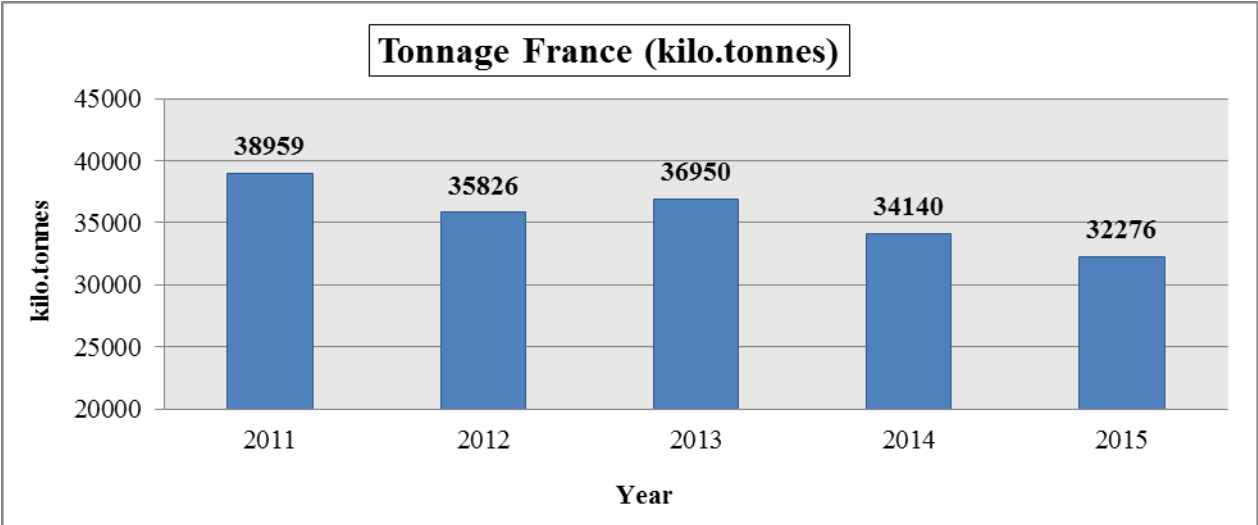


Figure 1 – Trend of tonnage of asphalt concrete in France

<sup>1</sup> This figure includes all the grave emulsions and cold bituminous concretes.



## 1.2 Evolution of the distribution of production

The Figure 2 shows the distribution of the production of hot, warm, and cold mixes in 2015.

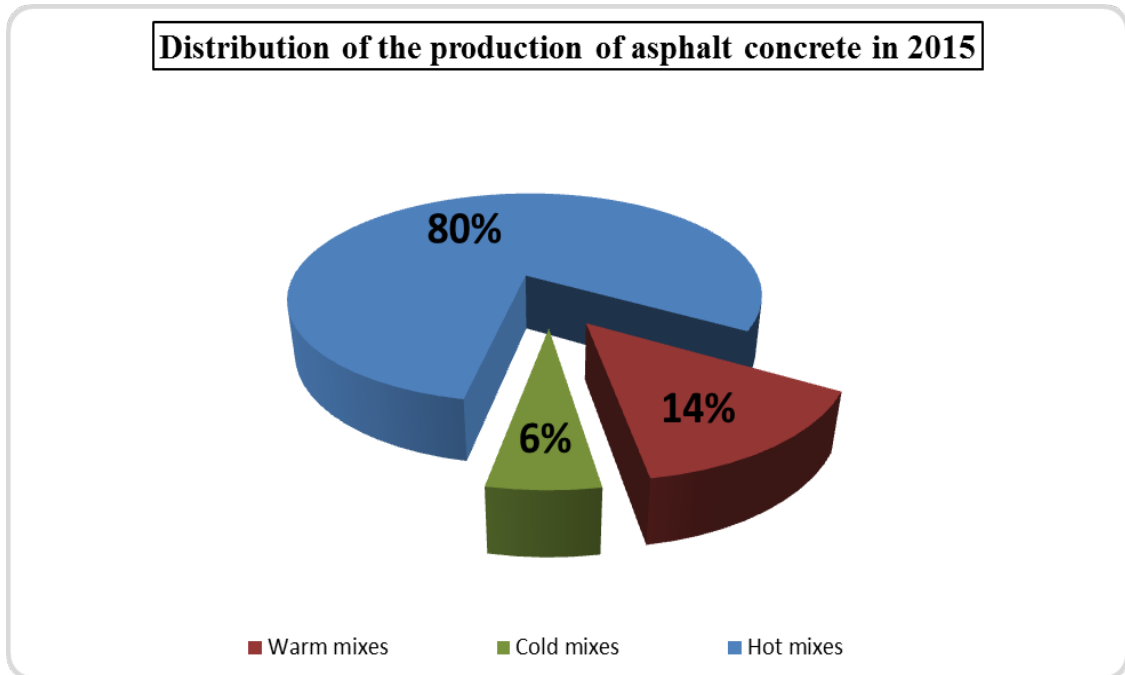


Figure 2 – Distribution of the production of asphalt concrete in 2015

The Figure 3 shows the distribution of the production of hot, warm and cold mixes in 2014.

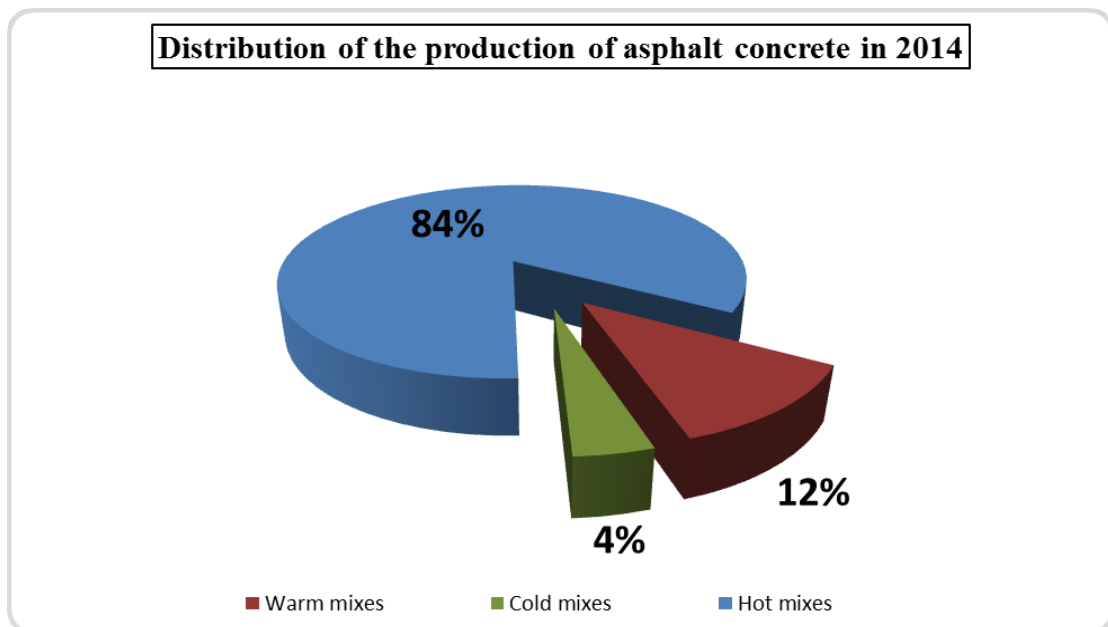


Figure 3 - Distribution of asphalt concrete production



## 2 National production of warm and semi-warm mixes

An asphalt concrete is called a warm mix asphalt when – for a given usual road bitumen, a hard bitumen or special bitumen – the process enables the coating temperature to be diminished by at least 30°C below the maximum acceptable temperature for the bitumen while still being above 100°C. The asphalt concrete is a semi-warm mix when the process allows production at a temperature between 85°C and 100°C<sup>2</sup>.

The CEV’s target for 2012 was to reach a tonnage of **1,500,000 tonnes**; with a tonnage of **2,633,000 tonnes** the target was met by a wide margin.

**In 2015** the production of warm and semi-warm mixes has been very largely exceeded the 2012 target to reach a tonnage of **4,552,000 tonnes**, i.e. an **increase of +72%** in relation to 2012 and +13% in relation to 2014. The Figure 4 shows how this tonnage has evolved since 2011.

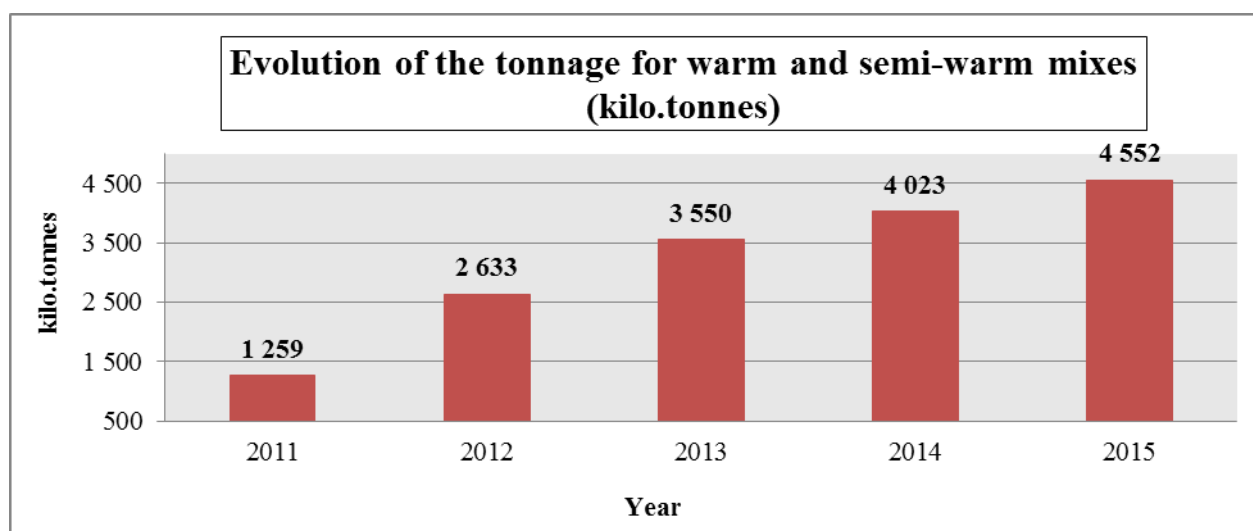


Figure 4 - Evolution of the tonnage for warm and semi-warm mixes

## 3 National production of bitumen emulsions

The tonnage for the emulsions below only concerns the members of the SFERB<sup>3</sup>

	SFERB emulsions tonnage (coating + spreading)
<b>2015</b>	<b>715,680</b>
<b>2014</b>	<b>731,100</b>
<b>2013</b>	<b>801,600</b>
<b>2012</b>	<b>747,780</b>

Table 2 - Emulsions tonnage (coating + spreading) of SFERB members

The production for the factories other than SFERB members is estimated at 53,000 tonnes for 2015 and 67,000 tonnes for 2014. These data are not considered in this report because it is not possible to differentiate their practices in coating or spreading techniques.

<sup>2</sup> According to the definition of the Guide IDRRIM “Enrobés Tièdes (Warm Coatings)” (2015)

<sup>3</sup> Section des fabricants d’émulsions routières de bitume (Association of French Road Bitumen Emulsion Manufacturers)



### 3.1 Spreading Emulsions

In this category all the tonnages for emulsions for tack coats, curing and sealing works as well as for Surface Dressing (ESU - *Enduits Superficiels d'Usure*) are considered. The Table 3 gives these tonnages in detail.

	Tonnes of emulsions for tack coats	Tonnes of emulsions for surface dressing	Tonnes of emulsions for curing / sealing	Total tonnes of spreading emulsion
	108,000	334,000	108,000	<b>550,000</b>
<b>2014</b>	115,000	326,000	115,000	<b>556,000</b>
<b>2013</b>	131,000	356,000	131,000	<b>618,000</b>
<b>2012</b>	130,000	325,000	130,000	<b>585,000</b>

Table 3 - Detailed tonnage for spreading emulsions of SFERB members

Thus for the year 2015 the surface covered by Surface Dressing (ESU) with emulsion may be estimated at 163 millions m<sup>2</sup>. Surface covered by Surface Dressing (ESU) with fluxed bitumen is estimated at 33 millions m<sup>2</sup> in constant decrease. All techniques taken together Surface Dressing (ESU) represents 200 millions m<sup>2</sup>.

### 3.2 Coating Emulsions

In this category all the tonnages for emulsions produced for manufacturing emulsion coatings (gravel emulsion, cold mix asphalt and in place coldmix surfacing (ECF)) are considered. The Table 4 gives these same tonnages in more detail.

	Tonnes of emulsions for Gravel Emulsion and Cold Mix Asphalt	Tonnes of emulsions for In place cold mix surfacing	Total tonnes – coating emulsions
<b>2015</b>	119,350	54,350	<b>173,700</b>
<b>2014</b>	98,000	77,100	<b>175,100</b>
<b>2013</b>	107,800	75,800	<b>183,600</b>
<b>2012</b>	102,200	70,600	<b>172,800</b>

Table 4 - Detailed tonnage for coating emulsions of SFERB members

As a reminder, the tonnage for cold mixes manufactured in plant (Gravel Emulsion and cold mix asphalt) for 2015 is 1,808,000 tonnes.

The tonnage of emulsions used for in place coldmix surfacing (ECF) is estimated at 54,337 tonnes, i.e. about 36 million m<sup>2</sup> of road surface covered by this technique.



## 4 Recovering recycled materials

This comprises the tonnage for all the recycled materials (bituminous chippings and crushed crust and concrete for subsequent use). The Table 5 gives these tonnages since 2012.

	Tonnage for recycled materials
2015	12,131,000
2014	13,658,000
2013	14,650,000
2012	14,550,000

Table 5 - Tonnage for recycled materials

In 2015 the tonnage for recycled materials decreases by 12% in relation to 2013, nearly 1.5 million tonnes of recycled materials less.

## 5 Reclaimed Asphalt Pavement (RAP) in the asphalt concrete

The CEV's target for 2017 is to reach a rate for reintroducing RAP in the formulas of at least **15%**. The average rate for reintroducing RAP in asphalt concrete (hot&warm mixes) is around 13.4% for 2015. Thus this rate has grown considerably between 2010 and 2013 but has stagnated since 2014 with a very little increase in 2015 as the Figure 5 shows:

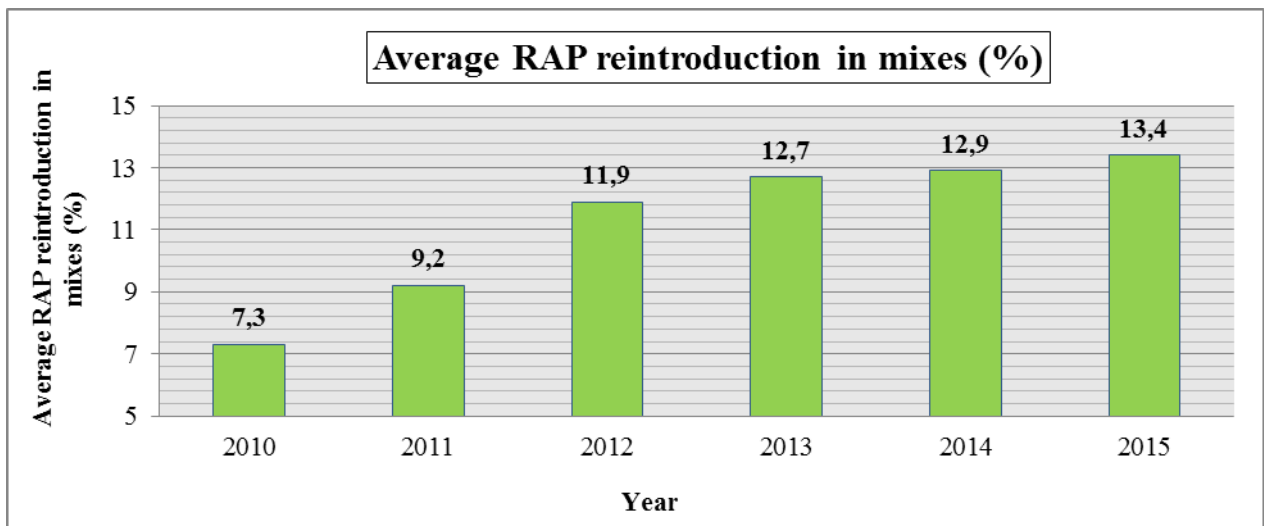


Figure 5 – Evolution of the rate of RAP in asphalt concrete (%)



## 6 In place recycling

This indicator corresponds to all the tonnes of road surfaces in-place recycled by bituminous emulsion techniques or road hydraulic binders. The monitoring of this indicator started in 2012 with its introduction in the CEV's monitoring survey. In the Table 6 the indicator is expressed in m<sup>2</sup> and tonnes<sup>4</sup>.

		In place cold recycling with bituminous emulsion or foam bitumen	In place recycling with road hydraulic binders
<b>2015</b>	tonnes	167 172	562 314
	m <sup>2</sup>	<b>928 700</b>	<b>1 249 600</b>
<b>2014</b>	tonnes	114 700	486 500
	m <sup>2</sup>	<b>637 500</b>	<b>1 081 200</b>
<b>2013</b>	tonnes	94 750	390 120
	m <sup>2</sup>	<b>526 400</b>	<b>867 000</b>
<b>2012</b>	tonnes	75 290	293 740
	m <sup>2</sup>	<b>418 800</b>	<b>652 800</b>

Table 6 - Tonnage for in place recycling (emulsions or hydraulic binders)

<sup>4</sup> The values in m<sup>2</sup> of road surfaces recycled in place are calculated on the following hypotheses: 8cm thickness for the emulsion technique and 20cm thickness for the technique using road hydraulic binders.



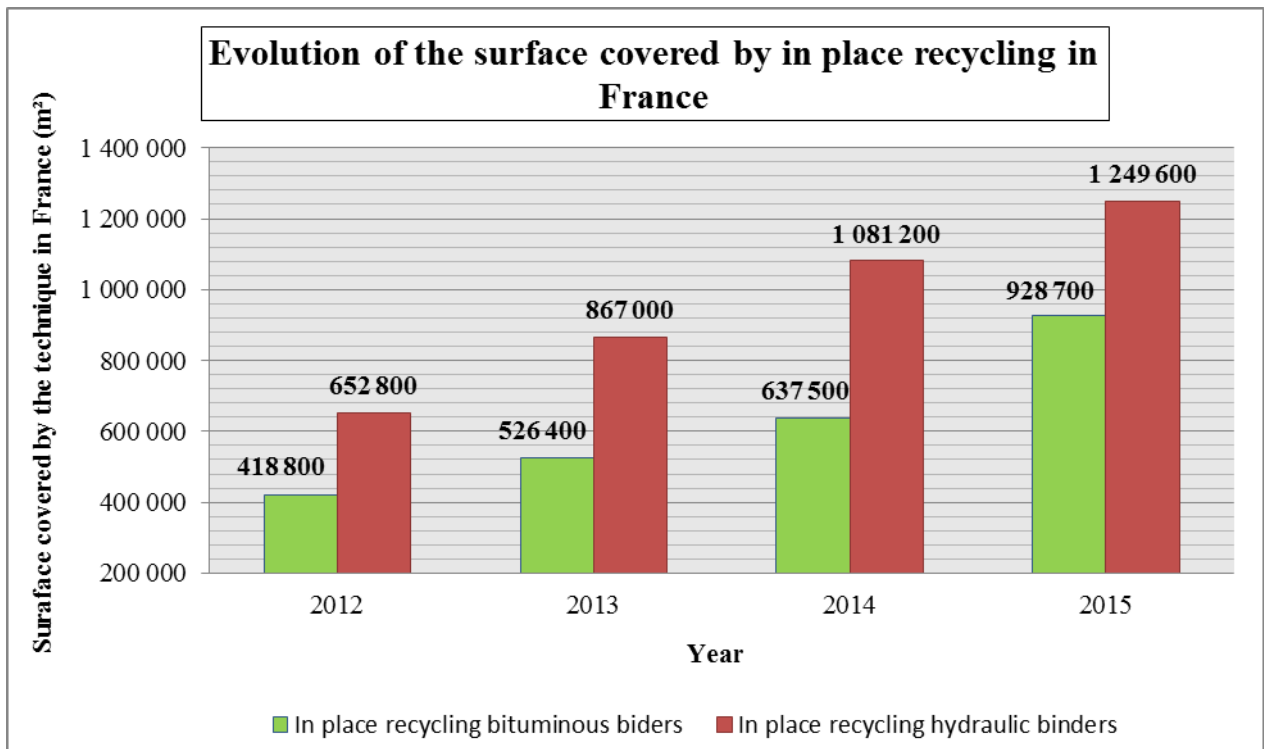


Figure 6 - Evolution of surface covered by in place recycling

We see a fairly steady trend since 2012 about 200 000m<sup>2</sup> more each year.

The interest of these techniques is two-fold:

- Preserving the new materials resource
- Reducing the transport of new materials

## 7 Greenhouse gas emissions (kg CO<sub>2</sub> eq.)

This indicator corresponds to the greenhouse gas emissions expressed in kilogramme CO<sub>2</sub> equivalent per tonne of asphalt concrete produced. This calculation only takes into account the consumption of burner fuel (fuel-oil, natural gas, or lignite).

The CEV's target for the year 2012 was **16.84 kg CO<sub>2</sub> eq. / asphalt concrete tonne produced**.

With an average value of **15.09 kg CO<sub>2</sub> eq. / asphalt concrete tonne produced** in 2012 **the target fixed was reached**. The aim for 2015 was to improve the value of 2014. With **12.41 kg CO<sub>2</sub> eq. / asphalt concrete tonne produced**, this value is improved. The aim for 2020 is to decrease by 33% GHG compare to 2009, in 2015 the objective is almost achieved, indeed we see a decrease of 30% compare to 2009. The Figure 7 shows the trend for greenhouse emissions since 2009.

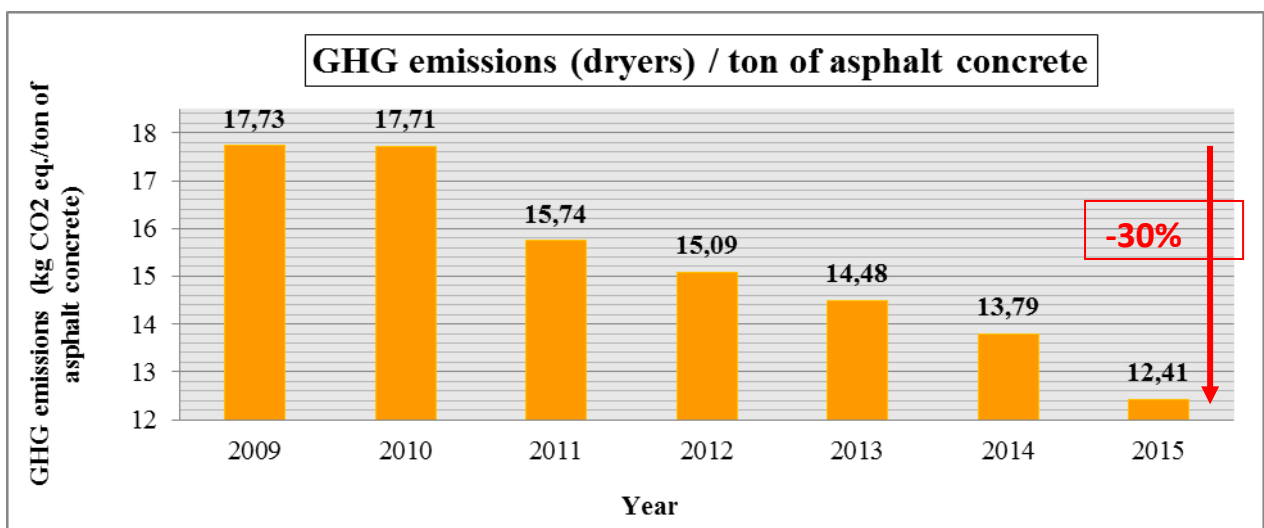


Figure 7 – Evolution of greenhouse emissions (dryers consumption)/ asphalt concrete tonne produced



## 8 ISO 14001 certified asphalt concrete plants and bituminous emulsion factories

The CEV's target for 2012 is to reach a certification rate for industrial tools of **50%**. **The target fixed was reached.** Of course, the target for 2015 was to do better than this figure. With 63% of plants and factories certified ISO 14001 we can see that the road sector has kept a good level. The Table 7 shows the trend since 2012 for ISO 14001 certified asphalt concrete plants and bituminous emulsion factories:

<b>2015</b>	Exclusively owned asphalt concrete plants and bituminous emulsion factories	<b>63 %</b> of plants certified ISO 14001
<b>2014</b>	Exclusively owned asphalt concrete plants and bituminous emulsion factories	<b>63 %</b> of plants certified ISO 14001
<b>2013</b>	Exclusively owned asphalt concrete plants and bituminous emulsion factories	<b>62 %</b> of plants certified ISO 14001
<b>2012</b>	Exclusively owned asphalt concrete plants and bituminous emulsion factories	<b>61 %</b> of plants certified ISO 14001

Table 7 - Trend of ISO 14001 certification of plants and factories



## 9 Deploying SEVE Eco-comparator

SEVE is one of the tools of the voluntary commitment agreement signed by the Profession in 2009. The Table 8 shows the trend for deploying SEVE in France since its launch in 2012.



SEVE Statistics	2012	2013	2014	2015	2016 <sup>5</sup>
contracting authorities subscribed	13	23	26	30	<b>30</b>
Enterprises Subscribed	43	60	68	70	<b>70</b>
Universities / colleges subscribed	< 6	< 10	< 10	12	<b>11</b>
Users	2165	2214	2420	2651	<b>2851</b>
Projects	3279	3852	4526	5631	<b>6605</b>
Average number of monthly users	295	335	415	621	<b>602</b>
Number of monthly visits	868	1090	1101	1735	<b>1729</b>

Table 8 - Trend for deployment of SEVE Eco-comparator since 2012

The table 8 shows the little stagnation between 2015 and 2016 of the number of users. Web application SEVE is going to evolve from June 2016 to a version 3 with a specific earth moving module and new indicators illustrated with the Figure 8.

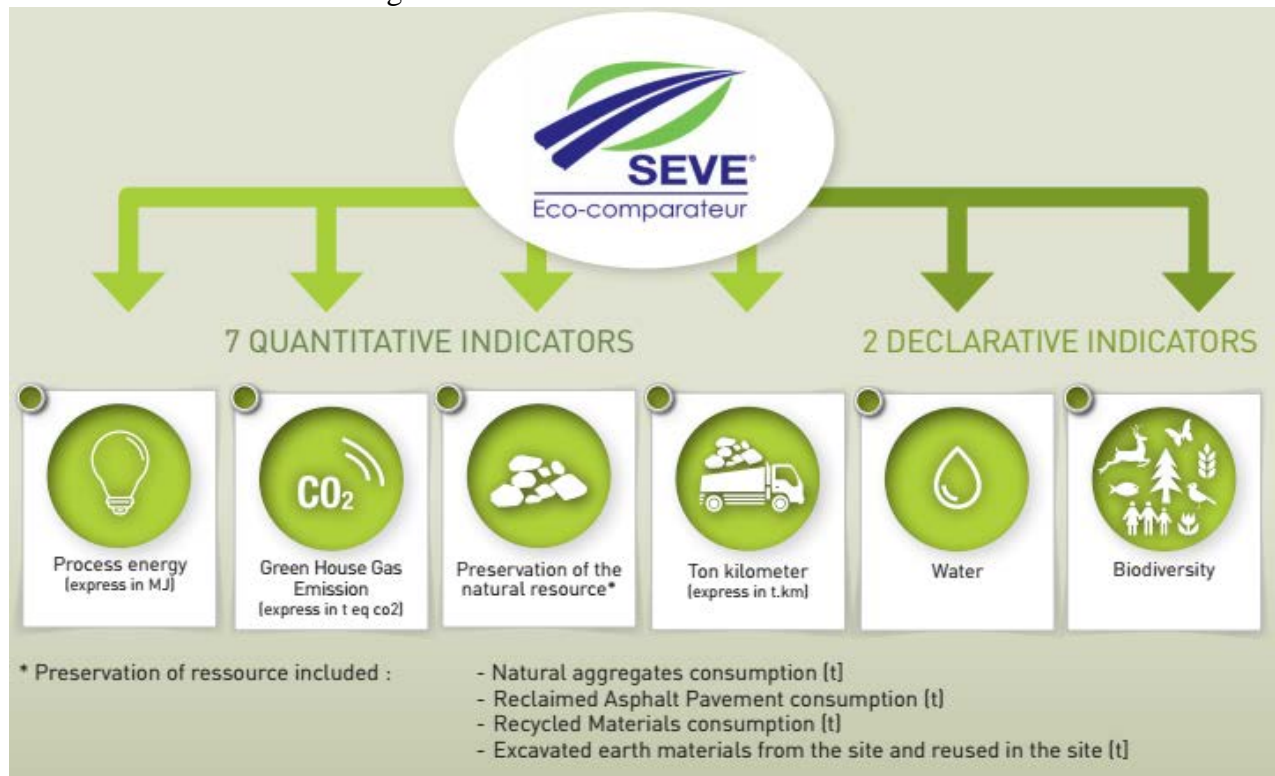


Figure 8 - Evolution to a version 3 of SEVE

<sup>5</sup> At 21/04/2016



## 10 Conclusion

As a reminder, here are the main targets **to reach by 2017**:

- 2017: To attain a rate for reintroducing RAP in the formulas of at least **15%** (*2015: 13.4% RAP*)
- 2020: To decrease by 33% GHG emissions compare to 2009 (*2015: 12,41 kg CO<sub>2</sub>/ asphalt concrete tonne*)
- 2017: To attain a proportion of warm mixes in the total production of **30%** (*2015: 14% of the total tonnage*)
  - *As a reminder (warm and cold mixes) attain 20% in 2015*
- To deploy the eco-comparator SEVE

Given these results the road construction sector has reached the targets fixed for it and continues to improve them. Nevertheless, an effort is still necessary concerning warm mixes in total asphalt concrete production in order to reach the rate of 30% in 2017.





Union des Syndicats de l'Industrie Routière Française - USIRF  
9, rue de Berri  
75 008 Paris  
Tel: + 33(0)1 44 13 32 90  
E-mail: [ismail.cavagnol@usirf.com](mailto:ismail.cavagnol@usirf.com)

