
Take the green approach; why replace it when you can restore it?

The greening of the asphalt pavement rehabilitation industry - A real opportunity?

Many industries are being encouraged by government and environmental warriors to reduce the carbon-foot-print of their products and services. This is a result of international pressures from environmental organizations, including the UN, which is trying to force larger industrial nations with carbon-based economies, to reduce emissions. Because emissions=jobs, government is looking for other economic activities to offset the emissions from oil and gas.

Asphalt producers and equipment suppliers are keenly aware of this and have been identifying areas where emissions can be reduced without substantial reductions in efficiency or productivity. A combined EPA and Environment Canada initiative has produced studies and guidelines on the emissions emanating from asphalt during its life-cycle, covering source- reduction, manufacture, distribution, and disposal and landfilling for both virgin and recycled asphalt product. *The total GHG loading of a single ton of hot mix asphalt from cradle to grave, is an incredible 110kG of CO₂e*!* But translating these data into meaningful emission mitigation procedures, remains a problem. Other than a few government-created initiatives to reduce emissions during production of HMA, such as low temperature binders, double-curtain asphalt heaters, greener binder-composition and the use of recycled asphalt product, no *real* incentives exist to promote the rapid expansion of emission-saving methodologies in the rehabilitation side (90% of HMA produced) of HMA applications. The combined effect of these initiatives is dismal in real terms, since the opportunity to become greener, is limited to large companies and large organizations, and “greenness” does not necessarily correlate with profitability!

By contrast, the power-generation industry has had great success in reducing overall emissions. Government initiative and funding, has created **real financial incentives** to use greener or alternative fuels, or alternative technologies such as micro-hydro, and both producers and consumers have access to these initiatives, resulting in the creation of an array of entirely new industries. The bonus has seen the creation of thousands of new jobs and with meaningful contributions to GNP and GDP. Government pressure, and special funding, has made access to this opportunity in the power generation field, a major producer of emissions, possible for the little guys and even small micro-hydro power stations can contribute to reducing the dependence on dirt fossil fuels for power.

The North American annual consumption of HMA is 550 million metric tonnes /annum, of which 90 Mt is Canadian demand. Applying the EPA/Env. Canada numbers, results in the production of some **60.5 million metric tonnes of greenhouse gases annually!** Seen in a different context, this is equivalent to the emissions from some 12 million light vehicles!

The asphalt pavement market comprises “new construction” and “rehabilitation “the latter incorporating repair and maintenance of existing infrastructure. The percentage of new construction has shrunk steadily to a steady level of about 10% in terms of annual consumption of asphalt mix in recent years since new transport infrastructure is well past its peak. This market-change has resulted in an emphasis-shift from construction to rehabilitation and this change in market-mix is reflected in the change from road-building to pavement maintenance equipment, a change which started in the late 70’s. New construction is obviously limited to large, established companies, with intensive investments in the capital equipment necessary to perform these functions, but the rehabilitation part of the equation, is well within the reach of smaller companies, or even individuals, armed with the right equipment.

So what is this “right equipment”? Advances in infrared heating technology have made it possible for small asphalt crews to cost-effective permanent repairs to pavement using hot-in-place restoration methods which avoid the need for cutting and filling large areas of pavement as well as the array of equipment needed to cut, load, transport or dispose of large amounts of new and removed material. Not only are significant source-reductions GHG savings achieved, but considerable vehicle and engine emissions are avoided as well. Infrared is not limited to the restoration of damaged pavement, it is used successfully in the drying and heating of recycled asphalt, as well as eliminating one of the most expensive road-maintenance causes, in terms of both cost and emissions, namely the longitudinal joint between lanes, which precipitates almost all premature pavement failures.

Over 90% of used asphalt product can be recycled and again, infrared technology can be applied to realize significant reductions in GHGs by virtue of the fact that radiant energy is transported *directly and without loss*, to the target material. Conventional reclaimers, even the most modern and technologically advanced ones, still use air as a transport medium for heat, and this heat is exhausted straight into atmosphere after the RAP has been heated!! Infrared avoids this.

With the correct incentive-package, there is no reason that the model set by the power-generation industry cannot be applied to the asphalt industry.

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*CO_{2e} is the number reflecting the combined **effect** of other GHGs emitted when hydrocarbon-based fuels are converted, such as NO_x, CO, SO_x, CH₄ etc., *added* to the *actual* CO₂ emitted, to provide a truer picture of the total amount of atmospheric contamination! For example, a kg unburnt methane, (CH₄), has a CO_{2e} value of 21!!