Interest in issues around climate change and carbon dioxide emissions has intensified over the past year. The scientific evidence has mounted up, Al Gore has been on a high-profile campaign and reports from Sir Nicholas Stern and the UN’s Intergovernmental Panel on Climate Change have all added their weight to the argument that the climate is changing and the threat this poses requires immediate action.

As a result, the environment has become a concern few business or politicians dare ignore. And as the attention intensifies, the focus will inevitably spread to local authorities and how they power the lights and control systems on street.

Street lighting can account for around a fifth of a council’s CO2 emissions. And as the UK Energy Research Centre has found, a country-wide switch to LED lights could save 57,000 tonnes of carbon dioxide a year.

With these figures in mind, there are signs that councils are stepping up to the mark and announcing schemes to replace power-hungry technology with more energy-efficient alternatives.

While the technology that can enable this switch is hardly new – the benefits of LED technology with its lower power consumption and reduced maintenance have been known to the industry for years – new developments in technology are helping to present more of a business case.

As Dave Stoner, Kent County Council’s Intelligent Transport Systems manager says, the environmental benefits that LED signals could offer was the ‘tipping point’ that forced the decision behind this major project.

With issues of climate, environment and energy efficiency today’s front line news, councillors are seeing political capital in the introduction of energy efficient products, he says. ‘Our department combines environment, highways and waste so this was a result of some joined up thinking. The opportunity was there to make a statement that Kent was doing its bit for the environment.’

The new LED signals guarantee a 70% saving in power usage that will equate to a saving of £360,000 pounds (£534,568) a year for the council.

As Kent County Council prepares to commit £1.8m (£2.6m) to replace every traffic signal head with LED heads, delivering a 70% reduction in power usage, Emma Clarke asks whether Councils are getting behind the ‘green’ agenda.

Mark Pleydell of TSUK says well-thought-through lamp monitoring has been as important as developments in LED technology.
Energy efficiency shows off the new ELV controller at the products for increase as the authorities test themselves. He expects demand, but he doesn’t think this is from Swarco is glad to see an uptake in the country and enquiries are already coming in from other authorities about the benefits. The ‘statement’ is also reaching traffic and highway professionals and councillors across the country and enquiries are already coming in from other authorities about the project.

Swarco Central Services has been promoting the benefits of its LED signal heads to the industry for years. Consequently, Richard Neumann from Swarco is glad to see an uptake in demand, but he doesn’t think this is important as developments in LED technology, he adds.

As a result of these developments, TSUK can now offer customers the comfort of a 6-year warranty. And because this exceeds the payback period, Mark says the decision to move to LED signals should be an easy one.

Every signal head and illuminated push button will be changed in Kent and the intention is to complete the 600 plus sites by the end of this financial year. As Dave says, it is a ‘logistical headache’ managing such a large-scale project and he believes a more staggered approach could also have benefits. But that said, ‘the sooner you get it converted, the sooner you can start accruing the benefits’.

What’s more, such an all-encompassing effort has extra benefits for politicians who are keen to make a public statement. The ‘statement’ is also reaching traffic and highway professionals and councillors across the country and enquiries are already coming in from other authorities about the project.

Swarco Central Services has been promoting the benefits of its LED signal heads to the industry for years. Consequently, Richard Neumann from Swarco is glad to see an uptake in demand, but he doesn’t think this is driven by environmental awareness but rather by the other advantages LEDs bring such as better light output, less maintenance, longevity, reliability and reduced energy costs. That said, he says: ‘reduced CO₂ emissions are a welcome side-effect’.

Keith Manston, Marketing Manager, Products at Siemens agrees that environmental credentials of extra low voltage traffic control systems are really a secondary benefit. And he says that the impetus behind the development of Siemens’ ST900 ELV controller actually came down to safety considerations but this led naturally to energy saving and environmental benefits.

The new controller, currently undergoing trials in Poole, Newcastle and Hampshire, reduces the voltage on the street from around 230 volts (‘which can kill you,’ says Manston) to 48 volts (‘which cannot’). Safety benefits will not only be for the public in case of damage to signals, but also staff working on or around intersections.

In solving the safety issue by reducing power, they were naturally led towards the use of LED signals. Reduced power then logically can lead to reduced energy cost as well as environmental benefits.

While LEDs have been in widespread use across mainland Europe for a number of years, the UK has been slower on uptake due to the levels of light output required for signal head specifications over here. Now that LED efficiency has improved, fewer LEDs can achieve this level of light output. ‘This not only means a lower initial outlay, but also improved reliability.’

On average the ELV signal head consumes only eight watts over the normal dim/bright cycle. Power consumption is therefore reduced by something like 75%. ‘If you spread that across a big intersection and multiply it by the number of intersections of an authority, you end up with a pretty huge power saving overall,’ says Keith.

The full system includes a 48-volt ELV traffic signal controller and range of ELV street furniture including signal heads, regulatory signs and solar sensors. Improved lamp monitoring has also been achieved as a result of technology built into the ELV controller unit.

One barrier to the implementation of LED signals in the past has been upfront cost. But as Keith says, this shouldn’t be an issue for the ELV controller as a result of advances in LED technology.

As he puts it, the interest is out there ‘without any doubt’, though he doesn’t expect to see a sudden rush in orders. Instead he expects installations will increase as authorities test the products for themselves.

**ALTERNATIVE ENERGY SIGNS**

Westcotec’s solar and wind-powered vehicle activated signs were initially used in rural locations by authorities that wanted to avoid high costs of getting mains power to the sign’s site. But now that the political agenda has shifted, more customers are installing solar-powered signs in locations even where there is mains electricity available. As Tim Jarvis, general manager from Westcotec explains, this is because some customers are keen to flaunt their green credentials.

As he says, a solar panel is a clear and graphic advertisement. ‘Even though it is just a flat sheet, the solar panel is considered a thing of beauty and stirs certain emotions in people. So as a logo it works very well for local authorities.’

And because these signs require no further investment beyond the initial outlay, they can help councils to budget more efficiently. ‘Future energy costs in relation to street equipment are a huge issue for local authorities and their PFI partners now,’ says Tim. ‘But installing solar powered signs allows you to guarantee future costs.’

Variable message sign supplier Dambach is also seeing increase in demand for its solar-powered signs. As Peter Dyer, managing director at Dambach, says, ‘in the early years of solar and wind power signs there was a focus on the cost saving aspects, however as environmental awareness has grown within the local authority sector we are now seeing solar and wind powered signs adopted for their benefit to the environment as opposed to solely financial considerations.’

Westcotec also provides signs powered by wind, though as Tim says, the future is in solar panels mainly due to their lower cost of installation. ‘To get effective wind power you need to mount the turbine very high, which means you need a taller column and access platforms to install the equipment. Solar panels are much easier to install.’

The efficiency of solar panels continues to improve, he adds, and the availability of polycrystalline panels, that are more efficient at varying angles of...
sun, makes them more of a viable option for the UK. In fact, he says, the only signs that cannot be powered alternatively are those under a tree where there is neither wind or sun.

He thinks there could be an even wider uptake of solar powered signs if the UK relaxed legislation so normal plate signs did not have to be illuminated all night.

This issue of turning lights off or reducing how long they are on is now being considered by councils across the country as a means of reducing their carbon footprint.

One of the main focus areas of Oxfordshire County Council’s Carbon Action Plan to reduce energy usage by 18% by 2012 that was launched this year, is on energy use in street lighting. It forecasts that 20 per cent of the county’s CO₂ emissions come through the use of traffic lights, street lights, road signs and bollards. This equates to 12,000 tonnes of CO₂ a year and costs the council £1.6 million (€2.3m).

As part of the action plan, the council plans to standardise the use of LEDs for all new zebra crossing beacons and school signals, install solar powered signs and instigate a programme of de-illuminating signs and bollards. This will involve reducing the number of street lights and turning street lights off earlier.

Buckinghamshire County Council is also re-considering the necessity of some of its lighting on rural roads. The council started a trial in April where energy-hungry streetlights on rural and semi-rural traffic routes and junctions are being replaced with environmentally-friendly alternatives.

These alternatives include electroluminescent traffic signs and improved road delineation and ‘intelligent’ road studs from Astucia. These use solar-powered LEDs that provide up to a ten-fold increase in visibility than traditional road studs.

As the council points out, energy expenditure has risen by approximately 102% since 2003/2004. The primary reason behind the scheme will, therefore, be to save energy and therefore money. But other motives, they say are to reduce carbon emission and light pollution.

It is estimated that switching off the 300 or so streetlights involved in the first phase on seven sites in Aylesbury, Chiltern, South Bucks and Wycombe will save £15,000 (€22,270) a year in energy costs alone. The council is looking to implement further programmes on routes and junctions.

County Council Cabinet Member for Transportation, Val Letheren, said: ‘Today’s cars are fitted with far superior headlights than before and road safety measures have improved. Bearing this in mind, we had to ask ourselves - are streetlights necessary along rural traffic routes and at rural junctions and roundabouts in the county? We feel there are alternatives available, which will not only enable considerable energy savings, but reductions in carbon emissions as well. It’s a win-win situation.’

While environmental concerns may still come behind cost savings as the main driver behind the adoption of energy-efficient schemes, they are certainly rising in importance. And with the issue set to become even more pressing for politicians and the media in the future, now might be the time for authorities and their suppliers to concentrate minds to consider the environmental impact of traffic control schemes.