

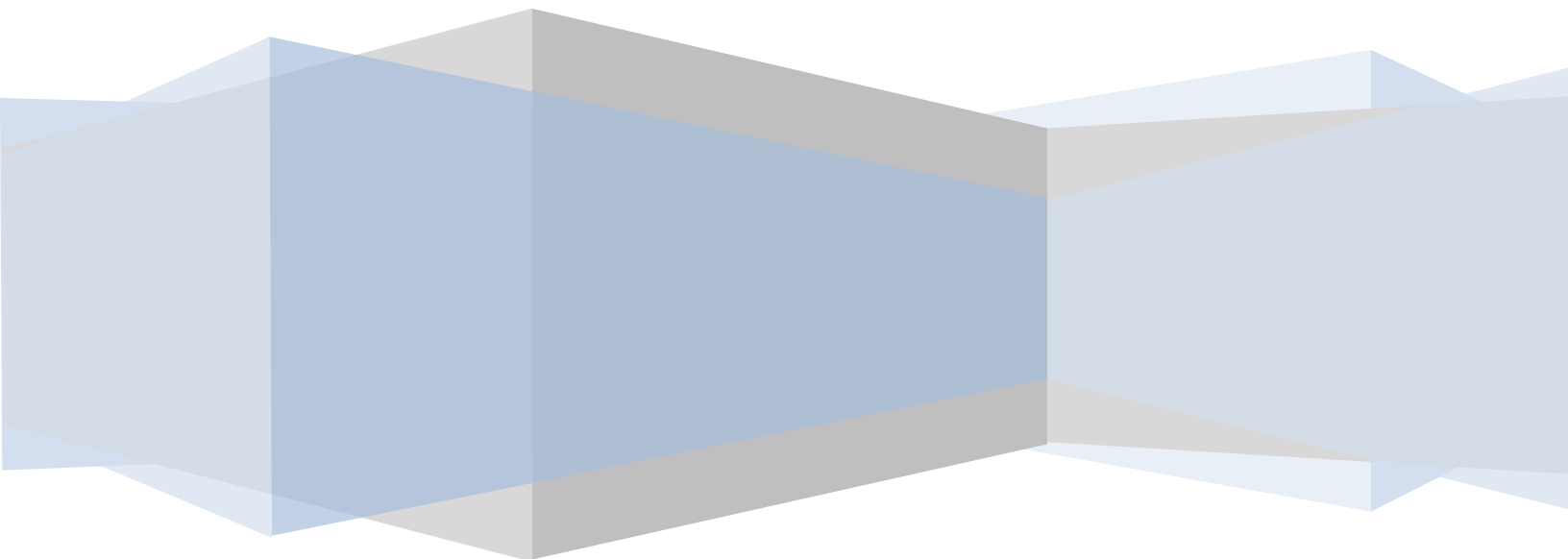


Government of Gibraltar

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# **Time Extension Notification applications and Air Quality Action Plan Update**

*September 2011*



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# Time Extension Notification (TEN) applications and Air Quality Action Plan Update

## 1. Introduction

Air Quality Directive 2008/50/EC allows Member States to apply for time extensions where, in a given zone or agglomeration, conformity with the limit values cannot be achieved by the given deadlines. Gibraltar exceeded the limit values for both PM<sub>10</sub> (2007 & 2008) and NO<sub>2</sub> (2009). As a result, Government submitted Time Extension Notifications (TEN) for each of these pollutants. This would have enabled us to postpone the obligation to meet the limit value deadlines of those pollutants by a maximum of five years, in the case of PM<sub>10</sub> to July 2011 and for NO<sub>2</sub> to July 2015. This postponement would be granted on condition that an air quality plan had to be established for the zone or agglomeration to which the postponement would apply.

2010 has again seen an exceedance of the PM<sub>10</sub> daily mean limit value despite the application of all available natural correction methodologies to the dataset recorded. In 2010, 64 daily exceedances of 50 µg m<sup>-3</sup> were recorded. This was amended to 51 following correction for natural sources, still in excess of the 35 permitted by the European Air Quality Directive (2008/50/EC).

Nitrogen dioxide (NO<sub>2</sub>) annual mean for 2010 has also been exceeded.

## **2. Status of PM<sub>10</sub> in Gibraltar**

In accordance with the 'Clean Air for Europe' Air Quality Directive 2008/50/EC, in 2010 the Government of Gibraltar applied for a time extension for the PM<sub>10</sub> 24-hr metric. In March 2011, the 'TEN' application was rejected by the European Commission<sup>1</sup> on the grounds that the 2009 PM<sub>10</sub> concentrations (reported to the Commission in September 2010) demonstrated compliance with the limit value after the natural corrections had been applied (African Dust correction only).

If the PM<sub>10</sub> TEN application had been granted this would have resulted in a postponement from the obligation to apply the daily limit value for PM<sub>10</sub> of 50 µg m<sup>-3</sup> (35 days permissible) for the 2010 reported concentrations from the Gibraltar Air Quality Monitoring Network. A comparison with the daily Limit Value + maximum Margin of Tolerance (LV+MOT) of 75 µg m<sup>-3</sup> which is the limit value that would have applied had the application been granted shows that Gibraltar would have been compliant with this limit in 2010 with only 9 exceedances recorded .

The Commission was advised, through DEFRA, that there was a risk of continued exceedance in 2010 due to the unavoidable need to undertake critical works in the

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<sup>1</sup> Commission Decision C(2011)1592 Final refers

immediate vicinity of the monitoring station. The Government of Gibraltar informed the Commission that:-

1. The rejection of the PM<sub>10</sub> application for Gibraltar was unfortunate because compliance in 2009 was achieved through correction for natural contributions. However the uncertainty/variability in this approach clearly meant that an annual correction would not guarantee compliance in 2010 – especially where the case is borderline. Indeed in 2010 the influence of transboundary biomass burning means that several days of natural dust events cannot be defensibly corrected (we cannot disentangle the two different sources within the monitoring data used to undertake the correction with the EU’s approved method). Gibraltar is too small to have regional background stations and therefore is heavily reliant on regional background data from Spain to apply the Commission endorsed correction methodology. Some sea salt measurements have been gathered for 2010 showing further natural contributions of between 3-6 ug m<sup>-3</sup> which we expect to make a significant impact on compliance but, in 2010, there will not be enough robust data to make a defensible correction for sea salt.
2. The Commission decision on the Gibraltar PM<sub>10</sub> incorrectly states that “Traffic seems to be the main domestic anthropogenic source contributing...” This is not the case – the modelling supporting the source apportionment identified wind-blown dusts from a construction site where essential bulk handling operations took place and also where critical infrastructure works were being undertaken, as the major source (hence the measure to address this in the Gibraltar Air Quality Action Plan). This source has been deemed to be anthropogenic rather than natural as we have presumed that no correction for this can be made under the Directive. The infrastructure works relate to flood defense works and improvements to services infrastructure vital to support the central measure for NO<sub>2</sub> compliance (a new power station). These works have delayed the implementation of the most significant element of the PM<sub>10</sub> action plan measures which has also subsequently contributed to further daily PM<sub>10</sub> exceedances. If there was scope to address both pollutants together on a more flexible timescale, policy synergies and cost efficiencies could be realised

### **2.1. Reasons for PM<sub>10</sub> Exceedances**

The policy measures detailed in the Gibraltar Air Quality Action Plan have been put into effect but unavoidable delay in implementing the main policy measure has led to this breach.

The main policy measure with respect to PM<sub>10</sub> abatement was to cease bulk handling operations on the old GunWharf Site, an area of unmade land in close proximity to the Rosia Road monitoring site, and to convert it into a car park (according to the Air Quality Plan the measure had a completion date of December 2010). Rather than the cessation of bulk handling operations on this unmade land it has inevitably had to continue its use in the short to medium term due to the lack of alternative usable space for this activity. Pressure to continue this activity has been further compounded by the need to undertake

significant infrastructure improvements/construction not least in order to achieve the longer term measures in the Air Quality Action Plan (e.g. the new power station for NO<sub>2</sub>).

Specifically, the reasons for this delay were principally the following:

- **Essential sea defence improvement/repair.** The construction in Algeciras, Spain, on the opposite side of the Bay of Gibraltar, of a new breakwater had resulted in an increase in wave height at the northern harbour entrance to the Gibraltar Port estimated to be in the range of 10-20% and at the southern entrance by an estimated 20-30%. Within the harbour itself, the increase was estimated to be in the range of 5-50% (strongly dependent on the location). A storm in late 2008 had resulted in extensive and widespread damage of Gibraltar's sea defences along practically the entirety of its western coastline. This necessitated not just the repairs to the same but a complete up-grading of the entire defence system, preceding which there had been a need to undertake detailed modelling and design work. Gibraltar's geographical limitations and the high population concentrations along the west meant that the only available open space suitable for the bulk handling of material for this work was the old Gun Wharf site, the area of unmade ground in question. The entirety of this project has taken over two years to complete with this site having had to be used intermittently throughout for said purpose.
- **Infrastructure improvements for new power station measure.** Gibraltar's EU obligations in relation to its commitments under the EU Air Quality Directive are being met by the decommissioning of three existing old generating stations located at locations along the western side of Gibraltar; two of which are close to each other and also near to the monitoring site. Since Gibraltar is not connected into an infinite electricity grid and neither is it on an internal ring system, there is a need to undertake major infrastructure works throughout the City to lay new electrical ducts and cables to facilitate this measure. Some of these works had to be undertaken across this section of unmade ground and this operation could not naturally occur until the sea defences work had been completed as there simply does not exist the physical space on the site to accommodate both activities concurrently and neither was it possible to identify an alternative route. This project is now nearing completion but has moved away sufficiently from the unmade area to allow for the construction of the car park, as had originally been envisaged, works that are currently underway.
- **Traffic Management Plan measures.** In addition to the foregoing, there have been a number of other traffic flow improvements projects in the vicinity of the Rosia Road Monitoring station, such as the Trafalgar interchange. All of these projects have been subject to a very strict application of the Dust Control Regulations in an effort to minimise the PM<sub>10</sub> impact but even with the rigorous application of the dust control measures, these projects have impacted on occasions.

Mandatory Dust protocols with financial penalties were introduced by Government and have been enforced by the Environmental Agency. Dust abatement measures have been put in place to reduce the impact of bulk handling and construction in support of the other Action Plan measures as far as is possible.

## 2.2 PM<sub>10</sub> Natural Correction 2010

The other main consideration that will impact on PM<sub>10</sub> is the monitoring of chloride and sodium in order to derive sea salt contributions. This has informed a further correction for natural contributions. From autumn 2010 onwards monthly denuder data has been gathered and from March 2011 onwards daily data has been measured to allow for a formal correction in line with the Commission guidance. For 2010 the monthly denuder data was not enough to use for a defensible correction for sea salt. However, for 2010 a correction has been made using a combination of daily data from the Spanish site at La Linea from January to August and the monthly denuder data for September to December, when data were available. This resulted in the corrected 51 daily exceedances in 2010. Given the limitations of the data available in 2010 this was the most representative method. Efforts are underway to apply a daily correction for 2011 across the year. Indicative values shown in Table 1 below show that the contribution to sea salt at Rosia Road are consistent with sea salt concentrations around the Bay of Gibraltar area and specifically Spanish data at nearby La Linea<sup>2</sup>, just across the frontier. The indicative concentrations at Rosia Road are on average ~6 µg m<sup>-3</sup>. In 2011 a reliable daily sea salt correction will be applied, the indicative monthly denuder concentrations provide encouraging evidence that compliance could be within reach.

**Table 1 Indicative monthly sea salt concentrations in Gibraltar**

<b>Exposure period</b>	<b>Rosia Road -<sup>3</sup> (µg m )</b>	<b>Bleak House -<sup>3</sup> (µg m )</b>
01/09/2010 - 01/10/2010	4.8	6.7
01/10/2010 - 01/11/2010	3.9	5.3
01/11/2010 - 30/11/2010	2.2	3.5
30/11/2010 - 31/12/2010	6.8	10.6
31/12/2010 - 01/02/2011	5.7	11.6
01/02/2011 - 01/03/2011	5.9	8.3
01/03/2011 - 01/04/2011	10.1	19.9
01/04/2011 - 03/05/2011	6.3	4.3
<b>Average</b>	<b>5.7</b>	<b>8.8</b>

The Government of Gibraltar has been gathering scientific information on sea salt and will be bringing it to bear in a robust and defensible assessment (for calendar year 2011) before a decision is passed on the compliance status for PM<sub>10</sub>.

<sup>2</sup> Querol, X., Alastuey, A., Moreno, T., Viana, M.M, Castillo, S., Pey, J., Rodriguez, S., Artinano, B., Salvador, P., Sanchez, M., Garcia Dos Santos, S., HecceGarraleta, M.D., Fernandez-Patier, R., Moreno-Grau, S., Negral, L., Minguillon, M.C., Monfort, E., Sanz, M.J., Palomo-Marin, R., Pinilla-Gil, E., Cuevas, E., de la Rosa, J., and Sanchez de la Campa, A.: Spatial and temporal variations in airborne particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) across Spain 1999-2005, Atmospheric Environment, 42(17), 3964-3979, doi: 10.1016/j.atmosenv.2006.10.071, 2006.

### **3. Status of NO<sub>2</sub> in Gibraltar**

In October 2010, the Government of Gibraltar also applied for a ‘TEN’ for the NO<sub>2</sub> annual mean metric in accordance with the ‘Clean Air for Europe’ Air Quality Directive 2008/50/EC. The European Commission through Commission Decision C(2011)6208 Final found no objections to Gibraltar’s application for the postponement of the deadline for attaining the annual limit value for NO<sub>2</sub> and has granted the time extension until 1<sup>st</sup> January 2015.

There are two air quality objectives for NO<sub>2</sub>: a long-term annual mean objective, set to protect against long-term exposure to elevated NO<sub>2</sub> concentrations; and a short-term 1-hour objective set to protect against short-term elevated NO<sub>2</sub> concentrations.

*The annual mean air quality objective for NO<sub>2</sub> is 40 µg m<sup>-3</sup> by 2010. This metric, following the Commission’s decision of the postponement of the application of this objective and deadline, will now be increased to 60 µg m<sup>-3</sup> i.e. the NO<sub>2</sub> annual mean limit value plus the maximum margin of tolerance and will apply until 1<sup>st</sup> January 2015. This in effect means that the NO<sub>2</sub> annual mean recorded during the calendar year of 2014 must comply with the existing objective of 40 µg m<sup>-3</sup> by 2010.*

#### **3.1 2010 NO<sub>2</sub> Levels**

<b>Air Quality Objective for NO<sub>2</sub></b>	<b>2010 Recorded Annual Mean</b>
<b>40 µg m<sup>-3</sup></b>	<b>48 µg m<sup>-3</sup> (Rosia Road)</b> <b>55 µg m<sup>-3</sup> (Witham’s Road)</b> <b>26 µg m<sup>-3</sup> (Bleak House)</b>

Nitrogen dioxide exceeded the annual mean objective of 40 µg m<sup>-3</sup> at both Witham’s Road and Rosia Road. The annual mean at Rosia Road automatic monitoring station was 48 µg m<sup>-3</sup>; unchanged from 2009. The annual mean for 2010 was therefore exceeded at this monitoring station. The annual mean at Witham’s Road monitoring station was 55 µg m<sup>-3</sup> slightly down on 2009, but still above the limit value.

Data provided by the nitrogen dioxide diffusion tube network in the south district, especially around the Jumpers area, and the new monitoring station at Witham’s Road confirm that elevated nitrogen dioxide levels are the result of emissions from the OESCO power station and the Inter Services Generating Station. Modelling carried out also confirmed that these elevated levels are attributable to these power stations. It is expected that the closure of these stations in the near future will result in lower levels in compliance with the Directive. The closure of these two stations plus Gibelec and the building of a modern, cleaner power station formed the basis of our successful TEN application.

## **4. Air Quality Action Plan Measures - progress**

The air quality legislation allows Member States to apply for time extensions in a given zone or agglomeration, on condition that an air quality plan be established for the zone or agglomeration to which the postponement would apply.

Accordingly, the Gibraltar Air Quality Action Plan was produced, comprising of actions and measures intended to reduce levels of PM<sub>10</sub> and NO<sub>2</sub> in Gibraltar. Once the proposed actions are carried out, it is believed that the measured concentrations of both pollutants will be well below the EU limit values.

Some of the principal actions included within the plan are:

- The control of dust from unmade lands
- The control of re-suspended particulate matter from roads
- The control of dust emissions from demolition and construction
- The expansion of the air monitoring programme to include analysis for sea salt

It also includes the implementation of the Government's existing traffic management plan and the building of a new power station to replace the existing ones.

The policy measures that were listed in the Air Quality Plan have been reproduced below, those in **blue** are completed; measures in **red** are outstanding; measures in **purple** are work in progress. Other than those mentioned earlier in this paper, the outstanding measures relate to the reduction of nitrogen dioxide. This demonstrates the wide range of policy measures underway and evidences the significant progress in Gibraltar to attain compliance as soon as possible for both PM<sub>10</sub> and NO<sub>2</sub>.

### **Policy 1 – reducing dust from unmade land**

#### **Vision**

Responsibly managed unmade lands that pose no health risk to people working or living nearby.

#### **Policy**

Government will instruct its Departments and Agencies, it will also encourage land owners to apply the best solution to unmade lands on a case by case basis to ensure that its vision is met. To that end:-

#### **Proposals**

- introduction of dust mitigation measures (**DONE**)

These last three bullet points relate to the old Gun Wharf site at Ragged Staff where GJBS are currently carrying out a project but has been at a standstill for some time. This area was highlighted to the EC as the main reason why Gibraltar breached the PM10 Limit Values in 2007 & 2008. These works need to be finished as soon as possible. **WORKS NOW PROGRESSING**

- provision of ground cover/landscaping
- covering the land with hard standing
- creation of a public amenity site such as a park or car park



**Outputs**

Work has already started on the unmade land in question to convert it into a car park and is expected to finish before the end of December 2010. There are some additional ancillary works which will be carried out simultaneously. The total cost of the project is estimated at £500,000.

**Policy 2 – reducing particulate matter emissions from uncontrolled fires****Vision**

Ban uncontrolled fires so as to reduce particulate matter emissions so that the health risk to people working or living nearby are minimised.

**Policy**

Government has instructed the Environmental Agency not to allow uncontrolled fires. To that end:- **(DONE)**

**Proposals**

- The Environmental Agency requires that all requests for burning be made through its waste licensing regime.
- All licences issued are subject to strict controls. The burning of garden waste, for example is not permitted.

**Outputs**

It is difficult to assess accurately the potential contribution to the reduction of the overall particulate matter level as a consequence of the banning of uncontrolled fires. There will be an increase in garden waste material being transhipped to Spain for treatment which would be met from existing financial provision, no extra costs are envisaged.

**Policy 3 – reducing re-suspended particulate matter from roads****Vision**

Responsibly managed roads so that the health risk from re-suspended dust to people working or living nearby is minimised or eliminated.

**Policy**

Government will, through a combination of street cleaning and flushing, control and minimise the amount of particulate matter available for re-suspension. To that end:-

**Proposals**

**(DONE)**

- increase in the frequency of cleaning of trafficked thoroughfares i.e. Within the town area street sweeping will be done on a daily basis and scrubbing, flushing, pressure jetting or rotawashing weekly; other areas, street sweeping three times a week and scrubbing, flushing, pressure jetting or rotawashing at least once a month or quarter.
- proper use and maintenance of mechanical road sweepers, especially their dust mitigation measures
- Increase in street flushing during the dry months (June to September), and changing from flushing with salt water to flushing with potable water

**Outputs**

This element of the action plan has already been put in place and has been achieved through a re-negotiation of Government's existing £2,300,000 Street Cleaning Contract.

<b>Policy 4 – reducing emissions from construction and demolition sites</b>	
<b>Vision</b>	Responsibly managed construction and demolition sites that pose no health risk to people working or living nearby.
<b>Policy</b>	Government will introduce new dedicated dust control legislation to ensure that dust control guidance is applied throughout the construction and demolition sites across Gibraltar. To that end:-
<b>Proposals</b>	<p style="text-align: center;"><b>(DONE)</b></p> <ul style="list-style-type: none"> <li>• Government will introduce Dust Regulations and implement abatement strategies to control emissions from these projects.</li> <li>• Environmental Agency will be charged with policing compliance of these Regulations. Any contravention of the regulations on summary conviction may render the offender liable to a £10,000 fine and to six months imprisonment and a further daily fine of £500 for each day the offence continues.</li> <li>• Government will review and keep updated the ‘Dust - Best Practice Guide’ for construction and demolition sites.</li> <li>• Government, through its Town Planning and Building Control Department, will advise all planning and building control applicants of the existence and the requirement to comply with the Dust Regulations.</li> <li>• Government will instruct all its Departments and Agencies that the ‘Dust - Best Practice Guide’ must be fully implemented and applied.</li> </ul>
<b>Outputs</b>	It is difficult to assess accurately the potential impact of measures to reduce emissions from construction and demolition sites, as the number of sites fluctuate, as do their size and nature. However, reducing emissions from these sites could reduce the concentration of PM <sub>10</sub> significantly at those locations.

<b>Policy 5 – reducing emissions from road transport.</b>	
<b>Vision</b>	Responsibly controlled and managed road transport which will then give rise to reduction in pollutant concentrations so that they pose no health risk to people working or living nearby.
<b>Policy</b>	Government through its Traffic Management Plan will control and manage emissions from road transport. The measures which will have the greatest impact, and which are already proposed or underway include:-
<b>Proposals</b>	<ul style="list-style-type: none"> <li>• Measures and facilities to encourage the greater use of pedal cycles (including the introduction of a ‘take, ride and leave’ facility. This is a scheme whereby the Government creates pods around Gibraltar from which bicycles provided by Government can be taken and deposited, and ridden around Gibraltar on a ‘point to point’ basis). <b>(Work in Progress nearing completion)</b></li> <li>• Improvements and expansion of the bus service, including:</li> </ul>

- Shortening of bus routes
  - Free bus service on most routes **(DONE)**
  - Increased frequency of services
  - New buses for the upper town route
- Bus emissions programme – The bus fleet is currently composed of 21 buses which have Euro 3 type engines. 4 buses are going to be replaced shortly with ones having Euro 5 engines. All new buses or replacement buses coming into the fleet will be required to have the latest approved Euro type engine. **(DONE)**
- Improving road maintenance to reduce the contribution of particulate matter to emissions from road surface wear. **(Ongoing)**
- Creation of ‘park and ride’ facilities in the vicinity of the border. Visitors to Gibraltar will be advised and encouraged to leave their vehicles at these facilities due to the general unavailability of street parking. **(Phase 1 Completed and open to the public, Phase 2 Work in Progress nearing completion)**
- Measures to incentivise, such as applying no import duty on pedal cycles and electric vehicles and import duty for dealers has been halved on hybrid vehicles ranging from 6.25-8.5%. Dis-incentivising the sale of 2-stroke motorcycles by increasing import duty rate from 6% to 30%. **(DONE)**
- Facilitating the use of electric vehicles by the provision of metered electricity feed points at the Devil’s Tower Road Park and Ride facility and at strategic locations within Gibraltar. **(OUTSTANDING)**
- Smoothing traffic through better traffic management and improving fluidity by creating additional, alternative routes and circulation space expanding the capacity of existing roads in order to minimise or eliminate where possible traffic congestion. **(Trafalgar interchange completed other phases pending)**
- Introduction of CCTV and other calming measures to ensure that Gibraltar’s national speed limit of 50 kmph on major roads, 30 kmph in built up areas and 20 kmph in special circumstances is adhered to. **(Works in Progress)**
- Creation of a City Centre Low Emission Zone – deliveries to commercial premises to be made by electric vehicles. **(OUTSTANDING)**
- New or replacement vehicles coming into the Government of Gibraltar’s own fleet will be either electric, hybrids or low emission vehicles. **(EAMP measure, the Procurement Department is already applying this through its tender requirements)**
- Emphasis on promoting public transport and low emission vehicle use is anticipated to reduce public dependence on high pollution vehicles such as two-stroke engined scooters/mopeds (estimated to contribute  $2 \mu\text{g m}^{-3}$  to measured annual mean concentrations – about 50% of all  $\text{PM}_{10}$  exhaust emission). **(Works in Progress)**

### Outputs

Elements of the above proposals are works in progress and other elements will be put in place shortly. It is the intention to complete all the proposals contained in the 2009 Integrated Traffic, Parking and Transport Plan by 2012. The proposals will cost an estimated £66,200,000.

**Policy 6 – reducing emissions from electricity power generating stations.**

**Vision**

Responsibly produce electricity in a manner that poses no health risk to people working or living nearby.

**Policy**

Government will close three existing power stations and replace them with a new purpose built electricity power station by no later than 2014. Although the intention is to close down all three existing stations as soon as the new one comes into operation, during the reliability trials for the new station, the old stations would be kept in reserve. The reliability trials are envisaged to last some months. To that end:-

**Proposals (CONTRACT ANNOUNCED, COMPLETION 2013 Ground works have started)**

- Government will ensure that the new power station will be fully IPPC compliant.
- The power station will be built in stages. In the first stage the power station will be capable of generating some 64 MW of electrical power. The plant will have the capability of being extended over the years to reach an eventual installed capacity of 88 MW by 2032. All necessary abatement infrastructure will be provided at the first stage.

**Outputs**

This element of the action plan has already been initiated and the necessary design and provision of the new power station have been put out to competitive tendering. It is estimated that the costs of providing this new power station will be in the region of £100,000,000.