

**PROPOSED RENEWABLE ENERGY PLANT  
SCAWBY BROOK, BRIGG, NORTH LINCOLNSHIRE**

**HIGHWAYS TECHNICAL NOTE 1**

**Preliminary ‘First Principles’ Review of Anticipated Traffic Generation & Proposed  
Transportation Assessment Scope**

**1.0 Introduction**

1.1 This Technical Note has been prepared to consider traffic demand levels predicted to be generated by the proposed development of a new Renewable Energy Plant (REP) at the former British Sugar site, Scawby Brook, North Lincolnshire. This facility is to be fed by straw from farms within a local catchment of the proposal site and is anticipated to be primarily served by large HGV's, thereby reducing overall vehicle numbers.

1.2 This Technical Note provides a preliminary estimate of traffic demand and is based on a ‘first principles’ approach calculated via reference to key site operating assumptions such as anticipated site processing capacity, site operating / delivery hours and anticipated input / export vehicle tonnages. Base information and operating assumptions have been provided by the developer, eco2, and are based on operational experience at similar facilities in the UK.

1.3 The daily traffic levels predicted by the methodology adopted within this report are guideline figures only and have been prepared to provide the Local Authority with a ‘feel’ for future site operational traffic levels. The first principles approach can only provide a ‘flat’ profile estimate of future demand and ultimately the site will need to demonstrate some operational flexibility on a day to day or week to week basis. The extent of such flexibility, however, will ultimately be controlled by operational constraints (see section 4 to this report).

**2.0 Proposed Development Scheme**

2.1 The proposed REP development will comprise:

- The main REP facility, which would be comprised of linked structures including the boiler house and straw storage barns; and

- Associated infrastructure including a separate office, external hardstandings for vehicle manoeuvring / parking, a weighbridge, electricity sub-station, a surface water drainage scheme and perimeter landscaping.
- 2.2 It is proposed that the REP site would be accessed via the existing British Sugar access junction connection to B1206 Scawby Road.
- 2.3 The REP site will be designed to process in the order of 240,000 tonnes per annum (tpa) of straw from contracted local farms. The site will operate for 50 weeks of the year (allowing for a 2 week shutdown / maintenance period during the summer) requiring straw at a rate of 30 tonnes per hour. The storage barns will allow for the storage of up to 3 days straw input - allowing for uninterrupted operation over weekend periods (when product input movements will be restricted) and some operational flexibility.
- 2.4 Physical waste arisings from the REP site will effectively be limited to ash from the burn process. Ash waste arisings can be separated into:
- Bottom Ash - making up approximately three quarters of all ash arisings;
  - Fly Ash – making up the remainder of ash waste.
- 2.5 Input product and waste exports will be transported to / from the site in suitable maximum articulated HGVs - which will allow for maximum input / export tonnages per vehicle. The use of highest capacity vehicles will increase the delivery performance of the site and reduce overall vehicle demand. Straw input vehicles to the site will be unloaded by four grab cranes, with a vehicle unloading time of the order of 30 minute per crane.
- 3.0 **First Principles Assessment: ‘Typical’ Operational Traffic Demand Levels**
- 3.1 Calculation of the ‘first principles’ estimation of anticipated ‘typical’ daily vehicle trip movements to / from the proposed REP plant is outlined in Appendix A to this note and is based on the following key assumptions.
- Site Operation & Anticipated Delivery Practice*
- 3.2 The proposed Biomass facility will operate 24 hours a day, 7 days a week over a 50 week period. On the basis of maximum operation of the site at 240,000 tpa, this will require of the order of 4800 tonnes of straw input to be delivered per week and 500 tonnes of total ash export (comprising ash, a small amount of residual char and conditioning water).

- 3.3 Straw input / ash waste export to / from the site will be restricted to 5.5 days per week, with a weekday delivery window of 12hrs per day (6 hours on a Saturday). Typical weekday delivery hours would be of the order of 07:00 – 19:00.

*Vehicle Operating Assumptions*

- 3.4 The following operating vehicle loading tonnages can be expected to be achieved to / from the proposed REP. These tonnage estimates have been generated based on experience at other locations and the carrying capacity of proposed vehicles;

- HGV Straw Input: 19 tonnes per vehicle;
- Lime Input: 30 tonnes per vehicle;
- Bottom Ash Export: 23 tonnes per vehicle;
- Fly Ash Export: 16 tonnes per vehicle.

- 3.5 All vehicles will operate full in one direction only (i.e. either arrive full / leave empty or vice versa). No 'back-loading' will take place on site.

*Staffing Levels*

- 3.6 It is anticipated that the site will be operated according to the following staffing levels:

- Day Staff – 10 members of staff;
- Shift Staff (12hr shifts) – 4 staff per shift.

- 3.7 For the purposes of this preliminary assessment it has been assumed that all staff will access the site via the use of the private car. No account has been taken for any opportunities to encourage sustainable transport practice to reduce private vehicle demand such as car sharing, public transport or cycle usage (although sustainable transport will be encouraged as part of the transport plans).

*Predicted daily traffic demand levels*

- 3.8 Application of the predicted 'first principle' assumptions over the core delivery hours, suggests the following one way trip demand levels for a typical operational day:

Input:  
Straw: 44 HGV movements per day

Output:  
Bottom Ash: 4 HGV movements per day  
Fly Ash: 2 HGV movement per day

Other:

Staff Vehicles: 18 private car vehicle movements per day.

3.9 Assuming no backloading of trips, operation of the REP facility can therefore be anticipated to generate the following total number of vehicle movements (in + out):

- HGV's: 100 trips per day
- Private Car: 36 trips per day.

#### 4.0 **First Principles Assessment: Maximum Theoretical Operational Traffic Demand Levels**

4.1 As noted above, predicted two-way trip movements to / from the site for a typical operational day are not anticipated to be in excess of 150 vehicle movements per day.

4.2 Maximum 'worst case' HGV demand at the site is not anticipated to reach a 200 vehicle per day threshold, due to vehicle unloading operating constraints at the site. As noted above, straw delivery unloading at the site would be undertaken by four grab cranes, each of which operate with a 30 minute vehicle unloading capacity. Such operation will therefore restrict theoretical maximum HGV input demand to 96 vehicles per day (based on a 'worst case operation of 8 HGV vehicles an hour, across the full 12 hour window) or 192 vehicles per day (in + out). Hourly input levels above this maximum rate could not be processed by site input cranes and would result in significant vehicle unloading delays and would effectively be unsustainable. Moreover, there remains an over-riding input limitation which is the grate's maximum capacity to burn fuel. This will be only around 5% higher than the 30 tonnes per hour design capacity. The maximum delivery rate would very soon fill the storage barns and thereafter would have to reduce because the grate would not be able to keep up with deliveries.

4.3 It should be noted, that the above identified maximum theoretical vehicle demand is considered highly unlikely to occur in practice – as the REP facility is designed to allow for on-site storage of straw input materials to provide for up to three days operating supply. In addition, straw materials will be covered and stored at origin locations and will not be subject to seasonal supply issues. Such practice will result in a strictly limited requirement for 'intensive' delivery operation.

## 5.0 Trip Distribution and Assignment

5.1 As noted above, straw input materials will be generated from farms within an appropriate local catchment area.

5.2 It is anticipated that the vast majority of straw delivery movements will travel to / from the site via either the M180 or A15 corridors. Due to the nature of the immediate network to the proposal site and the existing constraints to large HGV movements at both Scawby village and B1206 Scawby Road level crossing, it is anticipated that HGV movements will typically pass through M180 junction 4 and utilise the local A18 / B1206 corridor to approach the site. On-site observations would suggest that the B1206 / A18 route corridor is of a standard suitable to accommodate regular large HGV movements.

5.3 It is anticipated that final agreed local HGV haulage routes could be supported by a suitable HGV routing agreement to / from the site and the implementation of weight restrictions / supporting signage to deter traffic from utilising inappropriate routes. It is proposed that a substantial proportion of straw input to the site will be transported via contract haulage agreements which can be directly controlled by the REP site operator.

## 6.0 Formal Assessment Scope

6.1 Highways and traffic impact issues will ultimately be considered within a formal Transportation Assessment report. Such a report would be prepared on the basis of the new Guidelines for Transport Assessment published by DfT in March 2007. Following discussions with Local Highway Authority officers, it is proposed that such an approach would result in the drafting of a final report which would include consideration of the following key issues:

### ***Appraisal of Existing Network:***

- Review of existing traffic demand along B1206 at the development frontage and at other key network locations (eg: B1206 / A18 roundabout and A18 corridor towards M180 J4);
- Review of existing local accident history on key network sections;
- Review of available local public transport services and walking / cycling opportunities within the vicinity of the site;
- Understanding of other committed local development proposals / local highway schemes which could impact on the future background operation of the local network.

### ***Review of Development Scheme:***

- Review of design of site access junction via reference to prevailing local and national highway design standards;
- Review of internal site design including vehicle manoeuvring areas, car parking, HGV storage, etc;
- Review of opportunities to provide suitable walking / cycling access to the development scheme.

### ***Estimate of REP Development Trip Generation and Distribution***

#### *Trip Generation*

- Estimate of anticipated daily operational HGV trip generation levels to / from the site via reference to a 'first principles' traffic demand model similar to that set out in Section 3 above;
- Sensitivity test including for 'worst case' maximum theoretical daily HGV demand levels;
- Estimate of staff vehicle trip movements similar to that set out in Section 3 above;

#### *Trip Distribution / Assignment*

- Estimate of trip distribution / assignment via reference to predicted straw catchment and available local HGV standard route corridors;
- Final assessment assignment to be identified following discussions with LHA to identify agreed HGV routing corridors.

### ***Identification of Network Impact***

- Consideration of estimated traffic impact of development proposals via operational assessment of key network links (via an assessment of percentage increase in background traffic levels) and junction capacity (using appropriate local modelling software (ARCADY, PICADY, etc);
- Junction operational assessments to include the following key locations:
  1. Site access / B1206 Scawby Road crossroads;
  2. B1206 / A18 Scawby Brook mini-roundabout.
- Impact assessment to be undertaken at proposed project opening year and a suitable future design year date (10 years after opening year);
- Background traffic growth on local road network to be calculated based on combined NRTF / TEMPRO growth;
- Comparison of predicted development traffic demand levels to key environmental impact thresholds set out in Institute of Environmental Assessment (IEA) document "Guidelines for the environmental assessment of road traffic".