

ANALYSIS OF COSTINGS OF OVERHEAD LINE v UNDERGROUND CABLE.

Capital

SP Manweb have stated that their average cost of installing 132kv cable to be £1.23m and that a range of £1.1m installed in roadside verges to £1.6m in the case of man made ground such as roads should be used as a comparison.

Most evidence suggests that under grounding the cable within (or near) to the preferred corridor would be significantly less than this if figures are based on similar projects. The route corridor is mostly agricultural land. Similar project noted-

RWE – Gwynt y Mor (£15M)

JSM – Fullabrook Windfarm (8km £4.5m, £565,000 per km)

Norwich – Earlham 132kv (12km supplied and installed £708,000 per km)

Brechfa 132kv (feasibility study for WPD) £986,000per km.

The above projects included significant directional drilling with bigger roads, junctions and even bridges encountered.

As a worse case scenario the figure for Brechfa Connection could be used at £986,000 per km (this went under several A roads and major road junction).

There is no technical reason that an underground line could not be placed through agricultural land and minor roads so that the total distance would be no greater than that of the overhead line. Landowners are indeed willing to facilitate placing of the underground cable through their land. There are certain areas of the route such as Hafod Dingle which cannot be cabled but it could easily be redirected with very little increase in length. There are a number of areas where a cable route could take a more direct route than that of an overhead line.

For a life time cost analysis comparison then the underground and over ground should be compared on the same distance of 19.6km (17.4 overhead).

THE ADDITIONAL CAPITAL COST OF A FULLY UNDERGROUND CABLE VERUS 17.4 OVERHEAD AND PARTIAL UNDERGROUND WOULD BE (£986,000-£340,000)*17.4km = £11, 240,000.

Continued

LOSSES

As SP have stated the cost of losses on an overhead line over 25yrs would be £2,219,808 versus £1,079,542 for all cable underground.

If we accept that the 132kv line is likely to be in existence for 50yrs or 100yrs then losses need to be adjusted giving the following figures –

50yrs

Overhead losses £4,439,616 Underground £2,159,084

100yrs

Overhead losses £8,879,232 Underground £4,318,168

LOSSES FROM OVERHEAD LINE VERSUS UNDERGROUND WOULD COST AN ADDITIONAL £2,280,532 (50YR LIFE), £4,561,064 (100YR LIFE).

OPERATION AND MAINTENANCE.

SP have based their costing on a fault rate of 0.03 faults per km with a typical cost of £600,000 per incident. They have stated that the cost per km would be £17,739 per km per year based on their existing costs (which includes tree cutting!). These costing are grossly misleading for the following reasons –

SP in their own submission (chapter 7 5.20.5) with regards to the cable length to the north of the route state- *‘generally 132kv cable systems are maintenance free other than for non-invasive periodic electricity test. Future work is only likely to be required in the event the cable is damaged and in this case, dependant upon the extent, either the cable will be exposed to carry out a local repair or a new cable will be pulled into the duct’*

The fault rate is based on SP entire cable 132kv cable asset age which on average is 38 yrs old and includes oil and gas filled cables that need replacing. The modern type of cable that would be installed has much lower fault rate which are nearer 0.03 faults per 100km (landverd, 2013). This would give less than one fault in a 50yr lifespan. Network Power UK state that the vast majority of faults are due to age and wear and tare.

Western Power Distribution (Brechfa feasibility) estimated the cost of operation and maintenance is estimated to be 25% higher for underground than overground (£1250per km per annum versus £1000per km per annum).

Any damage done by 3rd party to the cable is likely to be covered by their insurance rather than a cost carried by SP.

OPERATION AND MAINTENANCE COST BASED ON BEING 25% MORE FOR CABLE WOULD EQUATE TO AN ADDITIONAL £377,071 OVER 50YRS LIFE OF THE UNDERGROUND CABLE.

CONCLUSION - LIFETIME COST ANALYSIS

Over 50 yr lifetime

Additional capital cost	11,240,000
Savings in losses	2,280,532
Additional maintenance/operational costs	377,071
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The additional Net Lifetime Cost of wholly Underground line v Overhead line	£9,336,539
Per annum over 50yrs	£186,730

DECOMMISSIONING

SP have stated that decommissioning an overhead line is (Chapter 7 5.23.1)
'a similar process to remove the connection will be required as for construction'

For underground cable SP have stated (Chapter 7 5.23.5)
'generally electricity cables deemed to have no future need are abandoned but left in situ'

The conclusion for this is that the cost of decommissioning the overhead line would be £340,000km less the cost of cable and post structures, which we assume would leave a figure circa £250,000 per km or £4,350,000. In contrast the underground line could be left where it is.

Taking decommissioning at 50yrs into account would bring the additional lifetime cost down to circa £5,000,000 or £100,000 per annum.

After 50yrs it is likely that both overhead and underground lines would need replacing. As underground cables would be ducted the difference in capital costs would be narrowed compared to the initial construction phase.

ANNUAL SOCIO-ECONOMIC COSTS TO THE AREA

TOURISM

There are potentially a number of losses to tourism business, some are easier to quantify than others.

There are at least 10 self catering establishments which are within the study area as already stated depend on the landscape to attract customers and repeat customers. Many of these are towards the higher end of the market and a rough estimate is that the average week would cost £500. On the assumption of a 65% occupancy rate this would give an annual income of £16,500. If they were to lose 8% of their business this would equate to a total loss of **£13,200 per annum.**

The caravan sites are around 60 pitches (touring/static) between them and again using a 65% occupancy rate on an 8 month season at £18 per night would give a total loss of **£13,500 per annum based on 8% reduction.**

Eriviatt Hall which is a high class wedding venue and holiday home charges circa 4,500-10,000 per weekend on a similar 65% occupancy rate at £6,500 week. Losing 10% (rated as being significantly affected) would be a loss of **£21,400 per annum.**

Other local establishments such as shops and cafes will suffer as a consequence of the reduced bookings and whilst hard to quantify it could easily be assumed to be a further 50% the value of the above losses giving another loss of over **£20,000 per annum.**

TOTAL DIRECT LOSSES £68,000 per annum. (just in local vicinity)

There are a number of other enterprises which will lose income and these include the shoot on the Gwaenynog Estate and the Pen Parc Llwyd Centre. Again these could easily run into thousands per year.

What is hard to quantify is the effect it will have on tourism that passes through the area or who visit the area for walks but stay outside the study area. It has been stated that the A543 is one of the principal routes into Conwy and is a popular tourist route to Snowdonia and especially the Brenig which attracts 175,000 visitors per annum. The Tour of Britain regularly pass on the A543 as do the thousands who go to the Wales Rally GB stages at Brenig.

Given that between Conwy and Denbighshire around £300m is spent by tourists if we only assume that 5% of tourists will see the line during their visit and of those 5% it will only put 1 in every 100 tourists from coming here or returning it would still give a loss of income of **£150,000 per annum.**

LOSSES THAT ARE HARD TO PUT A FINANCIAL VALUES TO THEM.

There are a number of costs to the local area that are hard to put a financial value to them these include –

The enjoyment of local people of their landscape when walking or travelling to work.

The effect on biodiversity and wildlife especially as the line will need rebuilding in circa 40years.

Health and Safety risks to farmers and farm workers of having to work with posts/stays in the fields.

Future diversification of farm and other businesses into tourism and other enterprises such as renewables.

The effect of the construction process on the landscape, road accesses etc which could effect events such as the Tour of Britain.

Annual crop/time losses for farmers of having to farm around the apparatus.

The possible spread of TB from the Northern area of the corridor into clean areas by the creating of a ‘corridor’ where habitats have been removed and made it easier for wildlife to migrate into other areas.

SOCIO-ECONOMIC LOSSES TO THE AREA OF AN OVERHEAD LINE.

REDUCTION IN HOUSE VALUES

Whilst 100 houses are within roughly 400m of the line we accept that most of these will only experience a minor reduction in value due to the distance from the line or position. However, there are thirty houses that in our view will experience a more substantial reduction in valuation. Surveys suggest that the homes hardest hit in terms of valuation are countryside houses with greater percentage losses with higher priced houses.

As a conservative estimate we have estimated these houses to lose 5-10% of their value, on average we believe the value of these houses to be in excess of £300,000 and taking an average loss of 7.5% this would give us a loss of £675,000. The other 70 houses would conservatively lose 1-2% of their value and on the same basis would generate a loss in value of –

(300,000*1.5%)* 70 houses = £315,000

The losses to residential property values therefore would be circa £990,000

REDUCTION IN CAPITAL VALUE OF TOURISM BUSINESSES.

In our view there are over 100 businesses involved in tourism within the study area, most of which we accept will only experience minor reductions in business. However, there are 10 self catering outlets (Segrwyd Mill, Tywysog, Bwlch, Bryn Awel, Cefn Berain Uchaf, Hen Dy Pen Bwlch, Bryn Uchaf, Pen y Gaer, Caer Mynydd x 2, Dyffryn Maelor.), three caravan sites and Eriaviatt Hall which are located roughly 1km or less from the development and are highly dependant on the landscape features of the area and countryside activities in attracting business and securing repeat business. As I will later quantify these businesses are likely to lose between 5-15% of their business and therefore it is logical to expect a similar reduction in value.

A number of the self catering units are towards to upper end of the market and a conservative valuation on them would be an average of £250,000, assuming a loss in valuation of 8% would give a total loss of £200,000. Working on a similar basis for the three caravan sites would give a loss circa £40,000. Eriaviatt Hall which was briefly marketed in the last few years at a price in excess of £3m could reasonably reduce in value (as a wedding venue and high class holiday home) by £250,000.

Therefore the loss in value of tourist businesses (not accounting ones further away) would be in the region of £490,000.

REDUCTION IN VALUE OF FARMLAND.

It is widely stated that the presence of significant electricity apparatus in a field reduced the value of that field should it be sold or rented. My estimation is that some 700-800 acres will be effected by the presence of the line within field boundaries. Farmland in the area has historically sold above national averages with most fields selling for between £10 -£15,000 acre even in the southern end of the corridor. Taking an average price of £12,000 acre and a reduction in value of 10% would give a £1200 loss per acre. If this is then multiplied by 750 acres it gives a total loss in farmland value of £900,000.

**TOTAL LOSS IN VALUATION OF PROPERTIES
DIRECTLY AFFECTED WILL BE AROUND
£2,380,000**

If this total is then subtracted from the cost differentiation between an overhead line and underground this gives us £6.95m or £2.6m if decommissioning is costed in. This is before any calculation of the annual costs to the area.