Q1

Wireless Internet Service Provider

Community Broadband

Wireless Data Collection for Renewables (Water/Wind Turbines & Solar Farms)

All Rural Scotland

Q2

Choice driving Factors would be the astronomical cost of installing fibre to these remote areas some small businesses have been quoted over £1 million installation in areas we can deliver a service for a few thousand pounds that will meet or exceed the performance.

We can control contention issues because we are not trying to line our shareholders' pockets and are more customer focused than large providers, unfortunately ALL providers of internet seem to be in a race to the bottom in terms of performance except leased lines which are perfect but too expensive especially the further you are from the exchange.

4G and satellite providers do not provide proper routable internet services ie static ip addresses or even port forwarding.

Fibre is still delivered by overhead lines in many places (rural) and therefore affected by storms or infrastructure damage which then takes weeks or months to get repaired and is often done with very little thought to prevent it happening again.

Is it really ever going to be cost effective to run a land based service in areas where there may be 50 properties with 10 miles between them and customers who only want to pay a small amount per month?

Remember we are the 1% some of the areas we cover do not even have mobile signal yet and I would think that by now millions have been spent with EE on the ESSN network which is effectively out of date before its even up and running and the Scottish government through their R100 scheme are giving money away to installers that are supposed to be providing gigabit capable connections and are not and are creating businesses providing wireless services that will be un viable to operate once the equipment starts to fail in the future due to the cost of materials versus monthly revenue.

We are not using any external funding and have developed a large self-sustaining WISP that provides customers with exactly what they are paying for without the use of contracts and we have less than 1% of our client base that have left for alternative solutions in a period of over 7 years.

Over the next 5 years I do not see any major change unless the money for improving connectivity across the board is used properly and actually allocated by people who have an understanding of the constraints and realities of this type of service along with what customers actually need, the idea of Gigabit connections to all is not the answer, we need stability not speed and that is only achieved by reducing contention which will reduce the profits of the big providers, good luck.

Q3

The current spectrum available is reasonably sound.

Having the weather satellites sharing the same frequency (5Ghz) is a bit silly

The cost of 7, 13 & 18 Ghz is prohibitive from a cost point of view for domestic customers and E band (70/80 Ghz) is too weather affected for long distance.

It would be good to have a cost effective/low cost spectrum allocation with narrow beam transmitters that can handle co location properly with a licence cost of £250 per year and an availability of 99.96 or more in poor weather over 10-15 miles otherwise rural customers will continue to bear an unreasonable cost difference from those in the towns or cities.

Q4

Service level of 40 days approximately is fine.

We have had instances where it has taken 6 months to get licence applications through this is not acceptable and I hope that Ofcom do not follow the theme of streamlining their service by getting rid of staff.

Q5

We have increased our use of wireless links since 2016 due to increased demand from customers mainly facilitated by the poor performance of other service options including fibre, 4G, LEO Satellites etc.

We have where viable transitioned from 5 Ghz to 7/13/18/80 Ghz to increase speeds and move away from interference caused by poorly set up 5Ghz links and the lack of knowledge associated with their use by ignorant installers.

The customer service received by clients of small operators like us is the largest attraction after the performance and cost benefits of a fixed wireless service.

Q6

We are seeing no major effect from alternative services at the moment, we have customers who have access to all types of service including fibre and leased lines and they still choose fixed wireless, we expect more links and more bandwidth to be allocated in our area and so long as we have cost effective Spectrum and suitable equipment it would be hard to argue that any other provision especially land based fibre or copper could ever be cost effective for them (Rural).

We are seeing a small increase in the amount of bandwidth required by larger organisations, it should be expected that more 500Mb/s or above connections will be required going forward however this will only be a very small percentage of clients.

Q7

The cost of Spectrum will have the largest effect on what choices are made.

We are only interested in Rural supply

Stability and performance of other types of service if it were to improve may alter decisions of customers but do not under estimate how much of a change this would be for the big providers.

Q7A

Satellites including LEO (Low Earth Orbit) are too high latency, affected by weather and will never be suitable due to the laws of physics and in my opinion is the downfall of Rural 4G as most masts are fed by satellite.

Too much emphasis is being made on speed where in fact latency reduction is the key, latency and contention are the real issues that must be addressed everywhere.

Q8

Alternative transport options are Fibre and Ethernet type delivery currently 1% of customers.

Im not sure it will change much due to the fact that running 25 miles of fibre for example to connect 50 houses randomly spread along is length over fields, rivers and mountains including digging and maintaining for example will be very hard to justify when most services are sold in the £20-£30 per month region.

Climate change is already playing a major role in making fixed wireless a good option also due to the fact that infrastructure is being washed away and blown to pieces by extreme flooding and wind.

Q9

I am sorry but even searching the Ofcom website brings no results that help me determine what BCA actually stands for.

Q10

W and D bands appear to be satellite bands; I do not think we will ever use this in our capacity.

Q11

We would only use upper 6 if 7 was fully allocated, we use 7Ghz currently only for very long wireless backhaul due to cost of bandwidth.

Q12

Interference from LEO systems??

Badly coordinated spectrum allocation for example Wi-Fi is the same frequency as weather radar