

Scottish Government R100 Program, CMNet, CMNet subscribers and non subscribers

Background

Phil attended a workshop run by CBS (Community Broadband Scotland) covering the R100 programme. Mary, Joe and Phil also attended a meeting with CBS specifically to discuss R100 and how it will affect CMNet and broadband subscribers in the area. We have also been in contact with the R100 team and have received their documentation and replied to their requests.

The impact of the R100 programme on broadband in the area is very difficult to predict. The following document is our understanding of the main issues and the consequences for all of us - **not just CMNet subscribers. Please feel free to forward this document to anyone that is interested in broadband in the area.**

CMNet has decided that it is not feasible to apply to the R100 team for NGA status unless the R100 team take a more realistic approach to the information requested of CMNet.

CMNet will connect anyone that has already asked to join and CMNet will continue to operate until at least the spring of 2019 when the position regarding alternate suppliers through R100 will become clear.

What is R100?

R100 (Reaching 100%) is an initiative by the Scottish Government to make sure that every premise in Scotland has the potential to receive broadband speeds of at least 30 Mbps by 2021. 30 Mbps is designated NGA (Next Generation Access). It is designed to cover the premises where fast broadband is not available because it is not commercially viable and has not been covered by the existing public funded programmes.

Companies will be asked to tender to provide a service and the capital costs of the new networks and equipment will be met by the Scottish taxpayer.

However if premises currently have speeds of 24 Mbps or more then companies will not be given taxpayers money to increase speeds to 30 Mbps.

What does it mean for CMNet?

Community Broadband Groups can take the opportunity to close their operation.

Or they can continue without applying for NGA status.

Or they can apply to be considered as a Superfast Broadband Provider to be part of the R100 programme.

When we met with CBS on the 8th September we were told it is very unlikely CMNet will be accepted as a NGA provider. However this appears to be contradicted by the R100 team themselves who contacted us on the 13th September and suggested that Community groups would be welcomed as NGA providers. The R100 team state they do not want to double fund networks through taxpayers' money but do not appear to recognise that Community Broadband Groups do not have the resources to provide the information they request. The email from the R100 team on the 13th September requested a response by the 18th September i.e. giving just 5 days notice. On receipt of our response saying we could not produce the information required in the timescales requested we have been told we have until November to lodge a further response but at the moment it appears **no concession on the amount of information will be provided.**

We think it is fair to say the situation is confused.

To be a Superfast Broadband Provider a supplier must provide a lot of very detailed information.

These are the major items:-

1. Provide a detailed list of every premise currently covered and every premise planned to be covered in the next three years.
2. Provide an analysis of every component and every link within their network showing industry recognised data to support a claim to be NGA compliant. This is particularly onerous for fixed radio broadband.
3. For fixed radio broadband provide radio plans, interference analysis of the spectrum to be used and the geography of the premises covered. Show the Fresnel zone interference, RSSI (Received Signal Strength Indication) and speeds for each connection. Which antenna is to be used and its coverage capacity. The pairing of subscribers to access points and the number per access point. Frequencies and power levels of each link. Subscriber availability, modulation level, channel, threshold, service offering subscriber antenna height requirements.
4. For fixed radio broadband provide backhaul frequency and number of hops, for declared latency, resilience and throughput. Frequency interference plans and allocation of channels using dynamic frequency selection radar detection and avoidance.
5. Full network end to end capacity information by link and by device for access backhaul core network and internet transit showing that there are no bottlenecks in the network that would limit performance below NGA.
6. Provide evidence of upload and download speeds.
7. Provide evidence of latency (time for a request to receive a response) and jitter (variation of latency) and show that these will permit video conferencing / telephony.
8. Show the network can support download speeds of at least 30 Mbps and that it has been sized to deliver a minimum of 15 Mbps to subscribers for 90% of the time during the peak periods.
9. Provide supporting evidence of contention ratios and bandwidth allocation
10. Using industry defined projections and tools show that there is a growth path available that can accommodate predicted changes over the next seven years. The standard model is 27% compound annual growth per subscriber. I.e. during a seven year period an increase of over 5 fold in capacity.
11. Revisit every component and link listed in 2 above and show it's usage for each of the seven years with the projected 27% growth. List when any component will need to be upgraded, what equipment will be required and how it will be funded.
12. Supply a full list of the equipment used with manufacturers data sheets, operating and service manuals.
13. Provide notes on equipment used in the network configuration.
14. Provide a business plan covering the current and planned operations (effectively for the next 20 years).
15. List subscriber product offerings
16. Provide an example of a subscriber contract with terms and conditions

You may be surprised to find out that we already have done, or will do, most of the above when we plan the addition of new subscribers to the network. This is why there is a delay between subscribers applying to join CMNet and connections being made.

However the R100 team have asked for this level of detail for **every premise** within the areas covered by CMNet including those that have **not asked** to join the system. Most of these properties were not part of the original survey and to provide a realistic response to the R100 team we would have to survey every premise

and decide on access point locations. We would then have to obtain landowners permission to install relays and calculate the cost of equipment. This is a considerable amount of work in its own right.

We have been informed by CBS that Community Broadband Groups like CMNet will have to provide the same information as large companies such as Openreach and that the deadline is likely to be September - November this year.

To provide the R100 team with this volume of detailed information, within the timescales involved, with the resources available to CMNet is quite simply impossible.

What would it mean for CMNet subscribers if we could apply and be accepted as NGA compliant?

No taxpayers' money will be available to another provider for the premises covered by CMNet which means it is very unlikely there will ever be any alternative to CMNet.

There will probably be a demand to add more subscribers than have currently "signed up" and it is very unlikely there will be any taxpayers' funding available to upgrade or extend the network. (The additional funding issue was not explained clearly at the R100 workshop but there will certainly be no additional funding through CBS.)

R100 will probably impose a timescale on the roll-out (at least by 2021) and this may cause problems as it often takes a long time to finalise relay hosting agreements. Unlike commercial operations we do not have the inducement of large payments. E.g. remember the months lost in 2015 due to the delays receiving an agreement from the Forestry and the lack of the landowner's response at Ardaneaskan.

CMNet does not have the resources and cannot afford to hire in expertise to meet imposed deadlines.

If CMNet was in receipt of public funds as part of the R100 programme it would have to open up its network to other ISP's so they can provide a rival service. This means CMNet will have to publish a wholesale and retail pricelist. By law the wholesale charges must be lower than the retail charges which would mean we have to increase subscriber charges as we cannot provide a wholesale tariff that doesn't at least break even.

We will be in breach of our contract with landowners and others acting as hosts for our relays if other providers use our network and operate on a commercial basis. Quite reasonably they will expect fair compensation if the network is run on a commercial basis and will therefore want to renegotiate agreements.

It won't go down well with unpaid volunteers to provide a network from which others make a profit.

CMNet will be making a commitment to provide a service for the very long term which means others in the area will have to be prepared to step in and support the system when the current directors are too feeble to type at a keyboard.

What does it mean for CMNet subscribers if we do not apply for NGA status or if we apply and are rejected?

Taxpayers' money will be available to another provider for the premises covered by CMNet which means taxpayers money may be wasted through double funding.

However there is no guarantee that anyone will tender to provide a service to replace CMNet. Indeed it is very unlikely that anyone will tender to connect all the premises in the area. The most likely scenario is a small extension to those expected to be covered by the proposed installation of the new BT cabinet in Achmore.

We have already been told that there will be no additional funding through CBS. Our date to make the last claim through CBS is the end of December 2017. Anyone that has not committed to CMNet by then may be left without any improved broadband if another provider doesn't come along.

If another provider does come along then under the R100 rules they must provide a service "for all premises in the area they cover". However it is not clear that this means that they will have to support Achmore **and** Ardaneaskan or any other group of premises. Indeed there is no guarantee that they will cover all the premises within a postcode. It is more than likely that a provider will cherry pick the premises they supply based on profitability. The clause "for all premises in the area they cover" simply means that if they cover a street with houses on one side only numbered 1 - 10 and they provide a service to houses 1 and 5 they must also supply 2, 3 and 4. They do not have to supply 6 to 10.

This could mean only part of the CMNet network is covered by an alternative, where a supplier leaves all the "difficult" premises off their supported premises list.

For example we could be in a situation where there is an alternative for all properties within a radius of 1 km from the new cabinet in the centre of Achmore but nowhere else. If everyone in this catchment area switches to the new supplier then CMNet would be left providing a service to the outlying premises which are not commercially viable to an alternate provider even if a capital grant is available.

Any alternate provider to CMNet will almost certainly be more expensive. Because Openreach are not upgrading the local exchange there will probably be no option for an ADSL service. The only options are likely to be VDSL connections; there is usually a set up fee for this. The connection to the premises will still be through copper wires and to get NGA speeds of 30 Mbps the premises cannot be more than 1 km from the cabinet (assuming the wires are in good condition). A domestic unlimited VDSL (fibre package) from Zen costs around £32 a month in addition to the line rental; this will deliver download speeds up to 38 Mbps and upload speeds up to 9.5 Mbps. (CMNet speeds are just under 30 Mbps download and just under 15 Mbps upload.) Other similar packages have lower initial prices but once the introductory discount has been exhausted the prices are within a few pounds of Zen.

See appendix 1 for more details on ADSL and VDSL.

Although CMNet charges by usage, £32 will buy a quota of 360 GB a month or 11.6 GB per day (enough to watch about three hours of HD video streaming per day). This volume is effectively the equivalent of unlimited usage since CMNet's current highest usage subscribers use half of this and pay just £18.50 per month. Of course CMNet also provides packages for lower volume users at reduced rates. (The examples above are using the CMNet year four tariff which starts in December 2017 and assume the new joiner's premium has been paid.)

The risk for CMNet subscribers is that some subscribers may move to an alternate supplier. This will mean that the total volume of quotas sold will drop and so the unit cost will increase as CMNet charges on a cost recovery basis.

Once the unit costs get close to the alternate providers then there is little point CMNet continuing and CMNet will be wound up.

What would it mean for broadband users who have not requested a connection to CMNet if CMNet could be accepted as NGA compliant?

No taxpayers' money will be available to another provider for the premises covered by CMNet which means it is very unlikely there will be any alternative provider.

There may be no taxpayers' money available for CMNet to buy equipment for new subscribers.

Therefore to receive NGA broadband users will have to join CMNet and will probably have to fund their equipment themselves.

What does it mean for broadband users who have not requested a connection to CMNet if CMNet does not apply for NGA status or applies and is not granted NGA status?

Taxpayers' money will be available to another provider for the premises covered by CMNet which means tax payers money will be wasted through double funding.

There is no guarantee that anyone will tender to provide a service to rival CMNet.

We have already been told that there will be no additional funding through CBS. If no other provider provides a rival service anyone who has not committed to CMNet will either be left without NGA broadband or they will have to fund the equipment needed to connect to CMNet themselves (possibly through a grant available in "R100 - 2" see below).

Any alternate provider to CMNet will almost certainly be more expensive than the current CMNet rates even for unlimited usage.

What are the next steps?

- 1) Current providers must decide whether to apply for NGA status - it is unlikely CMNet will be accepted
- 2) The R100 team will determine which premises do not have NGA broadband - this will include all premises in our area with the possible exception of premises within 1 km of proposed new cabinet to be located close to the existing exchange as these should have the potential for speeds of at least 24 Mbps.
- 3) Invitations to tender will be issued to cover all premises that do not have NGA broadband
- 4) In early 2019 contracts will be issued and we will then know which premises will not be upgraded to NGA by R100.
- 5) Premises not covered in 4 above will fall into "R100 - 2" which will cover the remainder of the premises not covered by R100.
- 6) It is not clear exactly what shape "R100 - 2" will take but one possibility is a reformed CBS to help add more subscribers to new or existing Community Broadband Groups such as CMNet.
- 7) Public money will be available to fund these new connections but :-
 - a. If the money goes directly to groups such as CMNet they will have to be NGA compliant which raises all the issues detailed above under "To be a Superfast Broadband Provider...".
 - b. The money (likely to be in the order of £1,000 or more) will go directly to the potential subscriber who can then choose a provider and pay them to extend their network. It is possible the rules for NGA compliance may be reduced to allow satellite connections or perhaps this money could be used to buy equipment to connect to CMNet. In some cases money would probably have to be pooled from several subscribers to pay for backbone upgrades.

It is not at all clear what will happen once the contracts have been signed in 2019 and the list of premises not covered by NGA has been finalised “R100 - 2” is very much undefined.

Recommendation / Conclusion

The impact of the R100 project was debated at the last two meetings of CMNet directors and it was decided:-

- We will not apply for R100 status. We simply do not have the resources available to provide the information requested in the timescales demanded.
- We will continue to roll out CMNet to all those who want a connection and make a commitment to join before our last CBS claim is finalised.
- We will support CMNet until the spring of 2019 when the alternate R100 providers will be announced.
- Depending on what happens with R100 and what is announced in the spring of 2019 CMNet will review its future.

CMNet directors October 2017

Appendix 1) ADSL and VDSL

ADSL (Asymmetrical Digital Subscriber Line) is a series of **exchange** based broadband technologies that can give theoretical speeds up to 24 Mbps download and 3.3 Mbps upload. Our original lines in Plockton were ADSL lines and these had real speeds of 7.2 Mbps download and 0.6 Mbps upload. Our original line in Lochcarron was ADSL2+ and had speeds of 19 Mbps and 1.2 Mbps.

VDSL (Very high bit rate Digital Subscriber Line) is a series of **cabinet** based broadband technologies that can give theoretical speeds up to 300 Mbps download and 100 Mbps upload. Our lines in Plockton and Lochcarron have now been moved from ADSL to VDSL2 and Plockton has real speeds of 60 Mbps download and 20 Mbps upload. Lochcarron speeds are still under test.

VDSL and ADSL use different standards so you cannot have both in use at the same time over the same wires.

There is usually an installation charge for ADSL and VDSL services. If the ADSL service is improved from ADSL to ADSL2+ there is not usually an addition charge. However to migrate from ADSL to VDSL does require an engineer to visit the cabinet and there is usually a charge for this

Both ADSL and VDSL speeds deteriorate due to interference in the copper wires and connections. VDSL deteriorates at a much higher rate than ADSL which is why it is implemented via cabinets and not exchanges; the link back from the cabinet to the rest of the Openreach network is by fibre which has next to no loss of signal quality. At 1 km from the cabinet / exchange a 24 Mbps ADSL2+ connection is down to 22 Mbps, an 80 Mbps VDSL2 connection is down to 28 Mbps (in both cases it is assumed the copper wires and connections are in perfect condition).

The Strome Ferry exchange is a special case of ADSL - Exchange Activate. This is capped at 0.5 Mbps download speed in the exchange even though the copper wires could support higher speeds.

The Lochcarron exchange already supports ADSL2+ at 24 Mbps the poor speeds in North Strome and Ardaneaskan are caused by the length of the copper wires.