I wish to respond to question 1 of the consultation.

Question 1:

Overall Targets for Digital Connectivity

➢ All Irish households and businesses will be covered by a Gigabit network no later than 2028

➢ All populated areas covered by 5G by no later than 2030

I believe that this is partially appropriate. Part 1 states that all households should be covered by a Gigabit network. I too recognise the need for high quality communications and information technology networks and wholeheartedly support the current rollout of fibre broadband, which is reliable and safe to the best of my knowledge.

Part 2 which deals with 5g is where I feel that the objective is inappropriate. Firstly, let us look at the limitations of the proposed technology. Mobile internet is slower, more susceptible to weather elements and I believe is not as secure in terms of hacking when compared to fibre broadband. From a practical viewpoint, shouldn't we place more emphasis on speed and safety of fibre broadband rather than the inconsistency of wireless? Although faster than 4G 5G has many limitations and , "the trade-off for speed at mmWave frequencies is limited range. Testing of 5G service range in mmWave has produced results **approximately 500 meters** from the tower, meaning a huge propagation of MIMO-enabled antenna arrays would be required for pure standalone 5G deployment. In addition, the inability of millimeter wave signals to penetrate obstructions further limits the range potential because these obstructions would need to be factored into network designs for mobile users."(source: https://www.viavisolutions.com/en-us/5g-technology). Trees, buildings, vehicles and even rain can influence how 5G signals propagate. Frequently, the environmental impact is of significance as trees are cut down because they block 5G signals and, in addition to this, more space is required for new transmitter antennas.

"One of the main drawbacks of millimeter wave-based 5G is that wireless high-band technology does not work well indoors. This is because millimeter wave, or MM wave, signals struggle to penetrate building walls and certain types of glass, thus hobbling indoor 5G performance." (source: https://www.techtarget.com/searchnetworking/tip/Indoor-5G-gets-a-boost-as-small-cells-come-to-the-rescue).

My main concern is the health implications. For those residing in the vicinity of Mobile Phone Base Station Tower. For instance, the dna damage caused by these structures, is detailed, "A cross-sectional case control study on genetic damage in individuals residing in the vicinity of a mobile phone base station" (ref: https://pubmed.ncbi.nlm.nih.gov/25006864/). This states, "Genetic damage parameters of DNA migration length, damage frequency (DF) and damage index were significantly ($p = 0.000$) elevated in the sample group compared to respective values in healthy controls." The study also states, "The genetic damage evident in the participants of this study needs to be addressed against future disease-risk, which in addition to neurodegenerative disorders, may lead to cancer." The health risks are evident.

The blood is another area of concern. A 2017 study on the "Impact of radiofrequency radiation on DNA damage and antioxidants in peripheral blood lymphocytes of humans residing in the vicinity of mobile phone base stations (Reference: http://dx.doi.org/10.1080/15368378.2017.1350584) demonstrates the following:

"The RF power density of the exposed individuals was significantly higher ($p < 0.0001$) when compared to the control group. The HPBLs were cultured and the DNA damage was assessed by cytokinesis blocked micronucleus (MN) assay in the binucleate lymphocytes. The analyses of data from the exposed group ($n = 40$), residing within a perimeter of 80 m of mobile base stations, showed significantly ($p < 0.0001$) higher frequency of micronuclei when compared to the control group, residing 300maway from the mobile base station/s."

The study concludes that staying near the mobile base stations may have an adverse effect in the long run and that "The persistence of DNA unrepaired damage leads to genomic instability which may lead to several health disorders including the induction of cancer."

I would also like to highlight potential impact on students in particular. Independent studies on the full health impacts of wireless technologies are not easy to come by, and even studies related to a range of evolving analogous germane mobile technologies (over a range of the main wireless generations) reveal a trend of worrying effects. A 2019 study (https://pubmed.ncbi.nlm.nih.gov/30526242/) entitled "Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health" is particularly alarming. It states, "A study of Mobile Phone Base Station Tower settings adjacent to school buildings has found that high exposure of male students to RFR from these towers was associated with delayed fine and gross motor skills, spatial working memory, and attention in adolescent students, compared with students who were exposed to low RFR". Researchers have observe that biological changes occur within minutes of exposure to mobile phone masts.

5G brings with it another level of risk. As is well known, there have been numerous calls for the halting of 5G around the world by scientists, doctors, citizens. I believe it has been halted in Brussels and some parts of Italy and USA and I understand that a number of councils in Ireland passed motions to halt 5G in their counties until safety testing was completed. The International Commission on Non-Ionising Radiation Protection ("ICNIRP") published a paper in 2018 entitled, "5G: Great risk for EU, U.S. and International Health! Compelling Evidence for Eight Distinct Types of Great Harm Caused by Electromagnetic Field (EMF) Exposures and the Mechanism that Causes Them". This was written and compiled by Martin L. Pall, PhD, Professor Emeritus of Biochemistry and Basic Medical Sciences, Washington State University.

The International Commission on Non-Ionising Radiation Protection ("ICNIRP") recommends exposure limits for NIR in areas accessible by the general public. The main objective of this is to "establish guidelines for limiting EMF exposure that will provide protection against known adverse health effects". How can the public tell if telecommunications companies are complying with these regulations if it is not published? For instance, how can we tell if the exclusion zones are being observed when masts are being erected, particularly in residential areas? For clarity, the exclusion zones are zones around the base station which are there to ensure that members of the public and workers are not exposed above the respective ICNIRP general public and occupational guidelines. These exclusion zones vary with height as well as distance from the antenna, for example, a 5G transmitter might need an exclusion zone of 50m or more from the front of the antennae and also a small area to the rear. The public has no way to determine if this is being complied with when planning permission is sought as that information is not released to the public.

- How many studies have been commissioned by the Irish government to determine the long- term health effects of 5G technology?
- Furthermore, how frequently are the relevant areas tested to check for levels of radiation?
- Why does our health not matter when it comes to planning permission for masts or for the expansion of 4G, 5G technology?

I am not against technological advances and I am certainly not anti-internet, but I would urge you to protect our health above all. I look forward to any feedback you may have.