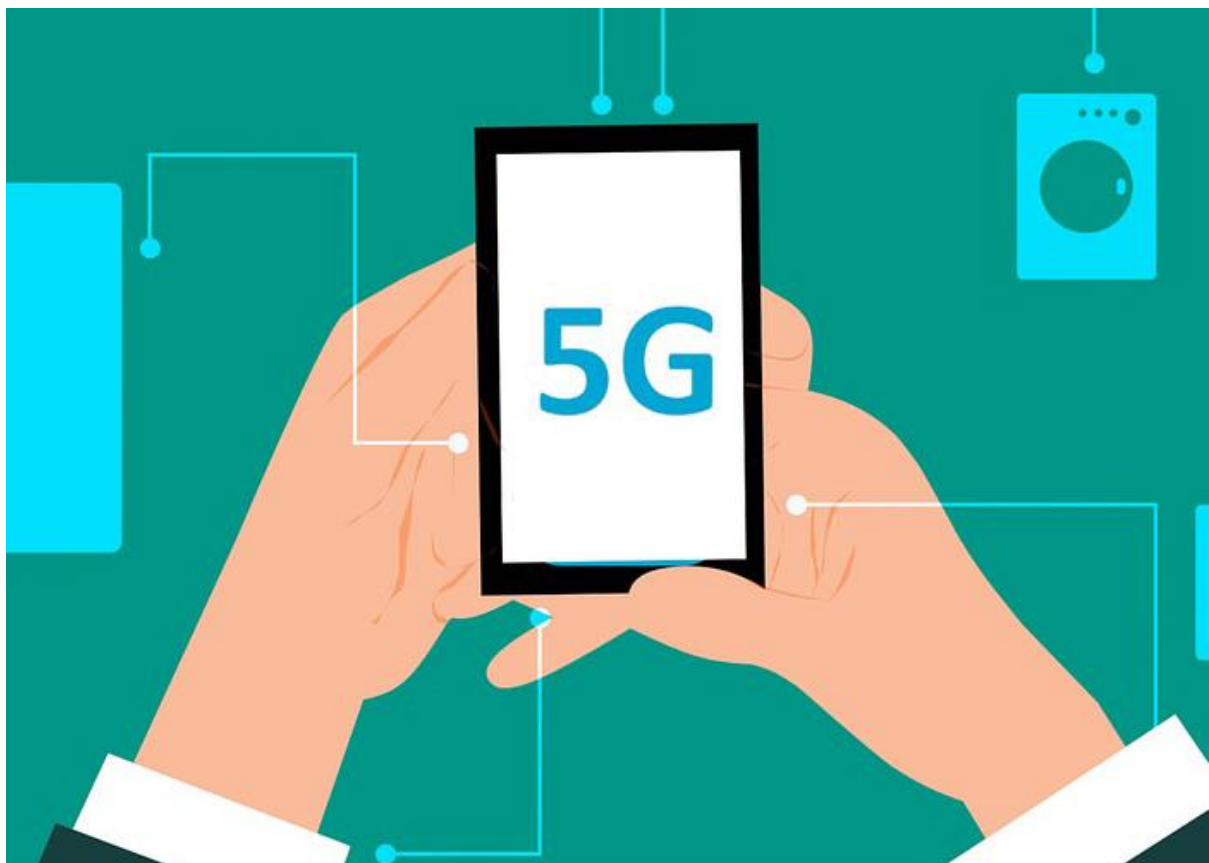




Report and Recommendations from Glastonbury Town Council's 5G Advisory Committee Executive Summary



April 2020



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Report and Recommendations from Glastonbury Town Council's 5G Advisory Committee Executive Summary

Introduction by Chair, Cllr. Jon Cousins.

Glastonbury has been described as “*a town that punches above its weight*”, influencing other councils and levels of government both locally and nationally.

This is something that Glastonbury Town Council is mindful of when passing significant resolutions – be it anti-fracking, declaring ‘climate emergency’, banning Glyphosate, or acquiring ‘Earth Protector’ status – and it is certainly true of our resolution to adopt the Precautionary Principle with regard to concerns about the safety of fifth generation cellular network technology (5G) and its roll-out.

Indeed, within a week of our resolution, Parliament held a Westminster Debate on the subject; Hansard records the opening statement by Tonia Antoniazzi MP: “*This Westminster Hall debate is timely. It comes on the back of an historic decision by Glastonbury Town Council to oppose the roll-out of 5G because of a severe lack of evidence about its effect on the health of those living and working around 5G sites.*” [Hansard 25th June 2019, Volume 662].

In an attempt to explore the merit of our position, Glastonbury Town Council convened a ‘5G Advisory Committee’ comprising of both councillors and non-council members, to report back to the council – with recommendations – during the Spring of 2020.

The Town Council is greatly indebted to the members of this advisory committee, who have met regularly; collected and studied a large volume of literature – and received presentations from a number of academics and professionals, including the Director of Mobile UK, the organisation overseeing the roll-out of 5G in the UK.

As chair of Glastonbury Town Council’s 5G Advisory Committee, I can say that this has been one of the most interesting times I have experienced as a councillor. I’ve also been impressed by the number of councils and local authorities who have contacted me to request copies of the committee’s report and recommendations... The deliberations of Glastonbury’s committee no doubt a microcosm of the wider debate yet to unfold on a national scale!

On a personal note, I would like to thank Glastonbury’s Town Clerk, Gerard Tucker, for his untiring patience, commitment, and dedication to the committee and the process; without which, our task would have been infinitely more difficult.

Cllr. Jon Cousins
Deputy Mayor of Glastonbury

April 2020.

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Section 1: The Report

The 5G Advisory Committee was convened in accordance with:

- a) Glastonbury Town Council's Standing Order 46; and
- b) Glastonbury Town Council's resolution of the following motion on Tuesday, 11th June 2019:

Proposer: Cllr. Mike Smyth; seconder: Cllr. Jon Cousins.

This council has a social responsibility to protect the public and environment from exposure to harm, albeit unpredictable in the current state of scientific knowledge, and therefore opposes the roll-out of 5G in the Parish of Glastonbury – based on the precautionary principle – until further information is revealed from a newly convened 5G Advisory Committee (working group).

Background information for the resolution:

- For many months, members of the public have spoken to this council of their concerns about the safety of fifth generation cellular network technology (5G) informing Glastonbury councillors that this technology is hazardous to human health and the environment due to the higher radiofrequency, which can interfere with small cells, like those in the body and in plants.
- In April this year [2019], 5G internet roll-out was postponed in Brussels when Celine Fremault, Environment And Energy Minister, identified that 5G was not compatible with Belgian radiation safety standards of 9 V/m, or 95 mW/m².5.

Celine Fremault stated: "I cannot welcome such technology if the radiation standards, which must protect the citizen, are not respected, 5G or not. The people of Brussels are not guinea pigs whose health I can sell at a profit. We cannot leave anything to doubt."

- Also, in April [2019], a planned upgrade to 5G in Geneva was stopped through the application of the precautionary principle, until independent findings on possible health damage become available.
- On 1st May [2019], more than 230 scientists and doctors from 40 countries appealed to the World Health Organisation calling for a moratorium on 5G wireless technology and that the 5G wireless signal should be moved from a Group 2B Carcinogen to a Group 1, the same as asbestos and arsenic.

Their appeal states: "We, the undersigned scientists, recommend a moratorium on the roll-out of the fifth generation, 5G, for telecommunication until potential hazards for human health and the environment have been fully investigated by scientists independent from industry. 5G will substantially increase exposure to radiofrequency electromagnetic fields (RF-EMF) on top of the 2G, 3G, 4G, Wi-Fi, etc. for telecommunications already in place. RF-EMF has been proven to be harmful for humans and the environment."

Establishing the 5G Advisory Committee:

The purpose of the 5G Advisory Committee being to:

1. Write a report – to be presented to Glastonbury Town Council – about
 - a) the committee's findings and conclusions on the safety or otherwise of 5G cellular network technology, and
 - b) any proposed actions that the Town Council should undertake as a result of the report.
2. Reinforce, or not, Glastonbury Town Council's resolution to oppose the roll-out of 5G.

On Monday, 1st July 2019, the following eight Glastonbury Town Councillors committed to becoming members of the 5G Advisory Committee:

Cllr. Sue Barnet

Cllr. Jon Cousins

Cllr. Paul Lund

Cllr. Lindsay MacDougall

Cllr. Brian Outten

Cllr. Mike Smyth

Cllr. Ian Tucker

Cllr. Nick Cottle [*who subsequently resigned due to commitments as a Portfolio Holder in the Cabinet of Mendip District Council*]

By virtue of Standing Order 39 – the Mayor, Cllr. Denise Michell became an *ex-officio*, ninth voting member of the committee.

The 5G Advisory Committee's terms of reference were approved at the Town Council meeting of Tuesday, 9th July 2019.

The powers of the 5G Advisory Committee agreed by Council resolution were:

1. Lobbying:
 - a. Establish who has the regulatory power to approve the rollout of 5G in the Mendip District, with particular focus on Glastonbury.
 - b. Lobby the regulatory power to impose a moratorium on the rollout of 5G in the Mendip District by adopting the Precautionary Principle.
2. Research:
 - a. Approach experts to give presentations and specialist advice to the committee on the safety or otherwise of 5G cellular network technology.
 - b. Collect evidence demonstrating the safety or otherwise of 5G cellular network technology from robust sources.

On Sunday, 14th July 2019, Glastonbury Town Council published a call, inviting members of the public with an interest and/or expertise in the subject to apply to join the 5G Advisory Committee by sending a written expression-of-interest to the Glastonbury Town Clerk, Gerard Tucker by Monday, 29th July 2019.

All applicants were sent the agreed Terms of Reference together with Glastonbury Town Council's Code of Conduct that all town councillors and town council meetings are required to follow.

From the 20 expression-of-interest applications received, in the first week of August 2019, the nine town councillor members selected the nine members of the public to be invited to join the 5G Advisory Committee and asked to confirm their acceptance by Friday, 16th August 2019.

The non-councillor members of the 5G Advisory Committee:

Christopher Baker
Derek Cooper
Toby Hall
Susan Jones
Roy Procter
Carol Roberts
Sandra Spearing
David Swain
Mark Swann

The initial meeting of the 5G Advisory Committee was held on Monday, 2nd September 2019.

A total of 13 meetings were held over the next six months, the final meeting being held on Wednesday, 4th March 2020.

Library of evidence:

A library of evidence – containing 57 documents – was collected and curated by members of the committee to demonstrate the safety or otherwise of 5G cellular network technology.

This library was stored electronically and made available for members of the 5G Advisory Committee to use as a learning and reference resource.

Expert presentations were given to the 5G Advisory Committee by:

Prof. Martin Pall, Professor Emeritus, School of Molecular Biosciences, Biotech, Washington State University [from USA via video conference] – who gave evidence in support of Glastonbury Town Council’s resolution to oppose the roll-out of 5G.

Dr. Andrew Tresidder, MB BS MRCP Cert Med Ed. A GP based in Chard, Dr. Tresidder is practitioner health south-west clinical lead, a GP educator, Somerset clinical commissioning group GP patient safety lead, and GP appraiser – who gave evidence in support of Glastonbury Town Council’s resolution to oppose the roll-out of 5G, and raised concerns around the impact on people who present as electro-sensitive or have Electromagnetic Hypersensitivity [EHS].

Hamish MacLeod, Director of Mobile UK and **Gareth Elliott**, Head of Policy and Communications at Mobile UK: Representing the trade association for the UK’s mobile network operators – EE, O2, Three, and Vodafone – who both gave evidence against Glastonbury Town Council’s resolution to oppose the roll-out of 5G.

Dr. Frank de Vocht, Reader in Epidemiology and Public Health at the University of Bristol; area of research (Radiation) Epidemiology and Public Health Research – who gave evidence against Glastonbury Town Council’s resolution to oppose the roll-out of 5G but raised some interesting points about the issue of electro-sensitivity or Electromagnetic Hypersensitivity [EHS].

Prof. Tom Butler, Professor in Business Information Systems at University College Cork and a former IRCHSS Government of Ireland Research Fellow. Prof. Butler is the Principal Investigator of Ireland’s Governance Risk and Compliance Technology Centre. [from Ireland via video conference] – who gave evidence in support of Glastonbury Town Council’s resolution to oppose the roll-out of 5G.

Presentations were also given by the five of the Non-Councillor members of the 5G Advisory Committee:

Derek Cooper – who gave evidence against Glastonbury Town Council’s resolution to oppose the roll-out of 5G.

Mark Swann BSC – who gave evidence against Glastonbury Town Council’s resolution to oppose the roll-out of 5G.

Roy G. Procter C.Eng F.R.Ae.S – who gave evidence in support of Glastonbury Town Council’s resolution to oppose the roll-out of 5G and raised concerns around the impact on people who present as electro-sensitive or have Electromagnetic Hypersensitivity [EHS].

Christopher Baker – who gave evidence in support of Glastonbury Town Council’s resolution to oppose the roll-out of 5G.

Susan Jones – who gave evidence in support of Glastonbury Town Council’s resolution to oppose the roll-out of 5G; raising some legal issues and concerns.

Section 2: Conclusions

The Glastonbury 5G Advisory Committee has been unable to come to a unanimous conclusion with regard to the safety or otherwise of fifth generation cellular network technology.

Issues:

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines on Limiting Exposure to Electromagnetic Fields

There was much debate concerning the International Commission on Non-Ionizing Radiation Protection (ICNIRP) [Guidelines on Limiting Exposure to Electromagnetic Fields](#), which fell into three areas:

- 1) Questions around the integrity, transparency, and bias of the Commission's membership – with the proposition that ICNIRP members were not suitably independent of other regulatory bodies, the mobile phone network providers, and communications industry, and therefore had a conflict of interest.

Opinion on the validity of these questions and the evidence presented to the advisory committee was strongly contested by some of its members – and answers to the questions remain unresolved.

According to [their website](#), ICNIRP is an independent non-profit scientific organization; its members being scientists employed typically by universities or radiation protection agencies – who do not represent their country of origin, nor their institute and cannot be employed by commercial companies.

[<https://www.icnirp.org/en/about-icnirp/commission/index.html>]

- 2) Debate concerning the robustness of the ICNIRP Guidelines with regard to the **thermal effects** of radiofrequency EMFs, which generate heat in the body and can cause burns.

Although it's generally accepted by the councillor-members of 5G Advisory Committee that ICNIRP guidelines are attempting to keep heat to a safe level, some councillors question the exposure intensity and exposure duration of the tests used to determine what constitutes 'suitable protection' against the adverse thermal effects of non-ionizing radiation.

- 3) Deliberation over the **non-thermal effects** of radiofrequency EMFs. This was a source of much controversy during the committee's meetings – and was a key issue for the committee. The contention being whether or not EMFs could stimulate 'voltage-gated ion channels' found in the membrane of cells.

In his presentation to the committee, Professor Pall described the "*EMF activation of voltage-gated calcium channels*" as a mechanism that allows an excess of calcium ions into cells creating 'free radicals' (aka reactive oxygen species) ...a hypothesis which was subject to a strong, robust rebuttal by one of 5G Advisory Committee's members.

However, the subject came up again in a later presentation, when Professor Butler also proposed to the committee that there was a potential for the non-thermal effects of radiofrequency radiation to “*over stimulate an influx of calcium ions into cells, creating free radicals.*”

Professor Butler suggested that the resultant ‘oxidative stress’ caused by these free radicals could be an important factor in the progression of chronic conditions – such as “*cancer, Alzheimer’s, and other neurodegenerative diseases.*”

When questioned about the validity of this non-thermal effect by the committee, Professor Butler suggested that one way to resolve the question would be to undertake an independent scientific study into the impact of high frequency, long duration exposure to radiofrequency EMFs on the levels of free radicals and antioxidants – biomarkers of neurodegeneration – in human subjects.

Interestingly, the potential for an unidentified “*non-thermal mechanism*” – which caused a “*doubling the lymphoma incidence in mice exposed to a low intensity 900 MHz radiofrequency field pulsed at 217 Hz*” – was reported in ICNIRP’s ‘[Guidelines for limiting exposure to time-varying electric, magnetic, and electromagnetic fields \(up to 300 GHz\)](#)’ [Repacholi, et al. (1997), in Health Physics, p.506, Volume 74, Number 4 – April 1998].

The current ICNIRP Guidelines do reference “*a number of studies of potential adverse effects of radiofrequency EMFs on physiological functions that could adversely affect health*” including “*membrane ion channel currents and input resistance, Ca²⁺ [calcium ions] dynamics... biomarkers of neurodegeneration... and oxidative stress-related processes*” – but discounts them as “*their relevance to health has also not been demonstrated.*” However, the councillor-members of 5G Advisory Committee generally accept this is an area which needs to be investigated further.

Electromagnetic Hypersensitivity (EHS):

During the six months in which the 5G Advisory Committee met, the subject of electro-sensitivity or Electromagnetic Hypersensitivity (EHS) came up numerous times.

The World Health Organization acknowledges that the symptoms of EHS are “*certainly real and can vary widely in their severity [and] can be a disabling problem for the affected individual.*” However, they also state that “*EHS has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF exposure.*”

This was another issue which proved controversial with some members of the committee – however, during his presentation to the committee, Dr. de Vocht asserted the merit in pursuing research into EHS, and – in general – the councillor members of the 5G Advisory Committee support his view. Public Health England, being the lead advisory body in this sphere, would be best placed to take responsibility for this research.

Recommendations:

That this Council:

- 1) Writes to identified MPs and asks them to establish a Select Committee or Committee Inquiry into the safety or otherwise of fifth generation cellular network technology – building upon the work already undertaken by the Glastonbury's 5G Advisory Committee investigation.
- 2) Writes to Public Health England and the UK Government asking them to convene an independent scientific study into the non-thermal effects of fifth generation cellular network technology – particularly the impact of high frequency, long duration exposure on the levels of reactive oxygen species and antioxidants biomarkers – in human subjects [see Appendix 2].
- 3) Writes to Public Health England and ask them to commission research into Electromagnetic Hypersensitivity (EHS).
- 4) Lobbies the International Commission on Non-Ionizing Radiation Protection (ICNIRP) to take into account the non-thermal effects of radiofrequency EMFs in their Guidelines on Limiting Exposure to Electromagnetic Fields.

Section 3: Appendices

APPENDIX 1 – Councillor Reflections and Conclusions:

Please note:

- *The personal reflections, views, and opinions of the council members of the advisory committee – presented below – do not necessarily reflect the official policy or position of Glastonbury Town Council.*
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Cllr. Brian Outten Reflection:

Firstly, I would like to express my gratitude and appreciation to Sandra Spearing, Chris Baker, Toby Hall, Roy Proctor, and Susan Jones for their dedication to the process of the Committee together with their professionalism and hard work in presenting their reports to the Committee at this challenging time.

Secondly, it is an opportunity missed that Mark Swann, Derek Cooper, and Carol Roberts all decided to leave the Committee after initially providing many important opinions as well as reports to the 'Reference Library'. Mr. Swann and Mr. Cooper offered painstaking contributions to the evidence provided to the Committee, including presentations. Their chance to affect the outcome of the Committee report to offer a more 'balanced' and 'broad spectrum' picture has therefore been sadly compromised.

Nevertheless, all the contributions that have been made to the Committee from Committee members and visiting speakers have been assimilated into my own personal conclusions and I would like to share these.

5G as a new technology according to the evidence provided by representatives of the Telecoms industry (Hamish McLeod – from Mobile UK) and Frank de Vocht (Specialist in Epidemiological Research at Bristol University); 5G has the potential to be less powerful than 4G, but nowhere could this be borne out in any contextual form, as other studies have stated that 5G signals will need to be more powerful in order to pass through walls and windows.

According to 5 of the 6 reports submitted by the non-councillor members – there is an agreement that 5G is likely to be deleterious to human health in the long term and that further research on the non-ionising effects on living tissue be carried out.

My assimilation from all of the documents that I read in the 'Reference Library' is that 5G (or even 3G or 4G) is not proven to be safe and that more and more studies and evidence is emerging over time questioning the safety and health implications of all 5G technology.

My findings from attending the meetings, listening to the presentations and debates was that there is a lack of clear evidence (in terms of the science) of pulse HF 5G radiation being trialled effectively to categorically assure the committee that it was tested to assure appropriate safety. In fact, Dr. de Vocht even agreed in the post presentation discussion that it should be tested in a wide ranging and long-term manner to identify the impact 5G (and even 4G) could have in terms of electro-sensitivity and that currently this is an area that lacks credible research.

My conclusions are that the technology is potentially unsafe and not suitable for implementation in the public domain until sufficient tests have been completed and evidence compiled.

I do not feel that ICNIRP's guidelines are robust or sufficient to protect people and nature. I believe that the agenda for 5G telecom companies is to ride roughshod over any health concerns and evidence to question the safety of the technology. I've also been unsure about the impartiality of ICNIRP and the validity and pertinence of their safety guidelines and limits. This has been argued well by the committee, and questions about the group's leanings towards the Telecoms industry are valid.

I feel that the thermal effects are not sufficiently tested, particularly at higher frequencies (above 3.5GHz), and that the likely proliferation of 'smart grid' devices and their associated high frequency emissions in the home is a real concern. This, together with the recent guidance from HM Government about limiting the amount of time using devices by children gives a clear message about how untriated and potentially unsafe this technology is. (I am also aware of industry trials with members of the public 'keen' on this new technology observing the excessive 'heat' being given off by their devices whilst using 5G!). It is possible that thermal effects are the least of the concerns, yet out of prudence, they should be studied and scrutinized.

I feel that ICNIRP should be lobbied to take into account the non-thermal effects of radiofrequency EMFs in their Guidelines on Limiting Exposure to Electromagnetic Fields. The evidence and scientific explanation is certainly plausible and supports further research and investigation. There are many reasons why we need to exercise caution and prudence and not take unnecessary risks with a technology that is neither tested or required by the majority of the population, as optical fibre is capable of delivering the speed that is needed for broadband and advanced telecommunications.

Non-thermal effects are more insidious than thermal effects and more liable to cause harm in the long term, which is and has been established by the evidence and discussions put forward in the meetings and some of the presentations.

I believe that there is merit in conducting research into non-thermal effects of high frequency on free radicals and oxygen as well the effects on melatonin production which is essential for breaking down free radicals. The effects should be verifiable by appropriate tests, which may be possible to ascertain in less time than

As Dr. de Vocht asserted, I felt that there is merit in pursuing research into EHS. Public Health England, being the lead advisory body in this sphere should take responsibility for this research. This will not be simple, as the electromagnetic field effects and the electrosensitive individual is an area where science has shied away from, as it requires use of equipment not normally attributed to human health (such as external mV meters and sensors and resistance / impedance measurements, which detect fluctuations in the human electromagnetic field). Nevertheless, where this is a will, there is a way, and this could and should be achievable.

Furthermore, just because as the WHO states: “EHS has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF exposure”, this should not deter the investigation into conducting valid scientific investigations, as the scientific approach can be modified and adapted to look at ways to study it appropriately. It just requires far-reaching and innovative approaches, probably best achieved by collaboration with a wide range of scientific and holistic disciplines.

Subnote: I am also concerned that numerous planning applications have been made through the national media to allow telecoms companies to ‘side-step’ local planning permission to install technology which has been opposed by experts in the field as well as many of the residents in the community. There are many reasons why this should be taken seriously by Glastonbury Town Council.

Cllr. Sue Barnett's reflection:

Setting up the 5G Advisory Committee was a step into the unknown on many levels. There was a lot of information in the presentations, documents, and research papers, some very technical. I would like to thank the members and presenters who communicated the science in an understandable fashion. This gave me heart as it is important to the Town Council, residents, and the wider community.

There were difficult discussions as some members’ ‘listening ears’ were not on when views other than their own were expressed. Reminded of my Grandmother’s words: *“just because we can does not mean we should.”*

Due to the lack of research of 5G – Health, Well-being, and Environmental issues concerned me. Evasive answers from Industry did not help. Knowledge expands and evolves all the time. The self-interest from a commercial viewpoint only was worrying.

We have one Planet; many Species and Life Forms whose welfare did not appear to be taken into account or respected. Arrogance? Lack of Democracy? Abuse of Power?

How can Scientific Knowledge expand, and the welfare of the whole Planet be safeguarded in this restricted environment?

Cllr. Lindsay McDougall Reflection:

I feel that the current International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines on Limiting Exposure to Electromagnetic Fields are acceptable with regard to the **thermal effects** of radiofrequency EMFs, but a 6-minute test on a rat or grown man is not the same as a child with a thinner skull making a 20-minute call to their parent.

I agree that we should lobby for investigation into the **non-thermal effects** of radiofrequency EMFs.

Although Professor Butler suggested that there was a potential for the non-thermal effects of radiofrequency radiation to “*over stimulate an influx of calcium ions into cells, creating free radicals*”, from my ‘A’ level physics, any +ve/-ve imbalance might cause this, so this needs further investigation.

I am not convinced 4G/5G technology is completely non-ionising, just much less intensively dangerous than e.g. x-rays, but could be a danger over a longer period of exposure, especially to more vulnerable groups, e.g. children and those with chronic illness. A computer in use even causes ionization!

Re: Electromagnetic Hypersensitivity, I would like to offer here my own personal testimony. I have, though not tested as such, clearly had a bout of this pandemic virus (v mild symptoms, but confirmed as highly likely by doctor friends), due to exposure some 4 weeks ago now. One of the effects is a reduced immune system, which has made me electro-sensitive. Recently I was in the vicinity of the telecoms mast at Bridies Yard in Glastonbury, and very distinctly felt unwell (general weakness, and more of a desire to clear my airways) when exposed to it (perhaps 100 yards away), and well when a v large tree (50 -100 feet high) was between me and the mast, or when I was protected by Brides Mound itself. I have always been concerned for the minority of the population who are electro-sensitive, but now I am convinced we should be more careful.

Deputy Chair’s Reflection – Cllr. Mike Smyth:

I wish to acknowledge with great respect the contributions made by the members of our committee and invited speakers to completion of our difficult task. In particular, I wish to thank our Town Clerk and Deputy Mayor in devoting time and effort to do the same.

Throughout the six months enquiry, I have been contacted by a number of councillors and individuals throughout the UK – from the Shetland Isles to St. Ives, Cornwall – who have sought advice. Many of these councils await the outcome of our report.

We/I will continue to recognise a duty of care towards our electorate and attempt to provide solutions for the common good and well-being of our people however limited or otherwise our legislative powers are at the local level.

In summary, with regard to the **thermal effects**, I believe that the current international ICNIRP guidelines on limited exposure to EMFs are acceptable. However, I believe that ICNIPR should be lobbied to take into account the **non-thermal effects** of EMFs in their guidelines, presently there is no reference to this.

I feel there is merit in recommending Glastonbury Town Council writes to Public Health England and the UK Government asking them to convene an independent scientific study into the **non-thermal effects** of fifth generation cellular network technology – particularly the impact of high frequency, long duration exposure to radiofrequency EMFs/radiation on the levels of free radicals and antioxidants in the human body. In addition, for Public Health England to commission research into Electromagnetic Hypersensitivity.

Chair's Reflection – Cllr Jon Cousins:

5G proved to be such a complex, contentious, and divisive subject that probity and the committee's capacity for fair, impartial, and transparent debate was, at times, difficult to maintain.

On occasion, balancing competing interests and the ability of some members of the advisory committee to make non-prejudicial decisions gave way to predisposition and entrenched, opposing views – strongly held by those involved.

It must be stressed that councillor and non-councillor members of an advisory committee have different but complementary roles, and throughout the business of the committee, the council members kept within the parameters of the Third Report of the Committee on Standards in Public Life and adhered to the principles of Glastonbury Town Council's Code of Conduct.

Over the course of six months, I reflect that the subject produces a classic dichotomy. The division based upon the ability or not of the technology to impact on human health and wellbeing.

The crux of the matter being whether or not non-ionizing radiation is harmless below exposure levels where heating first occurs – principally, the possible biological response to the **non-thermal** (or 'a-thermal') effects.

While there is a strong scientific case for the safety of fifth generation cellular network technology – as presented to the committee by Dr. de Vocht and Mark Swann, supported by the evidence of Mobile UK's Hamish MacLeod and Gareth Elliott – there was also evidence presented that raised concerns; suggesting the need for more exploration and research.

Particularly poignant was Prof. Butler's assertion that 3,400 studies in Medline – the peer review library of journals – indicate quite strongly that radio frequency radiation is not only a carcinogen, but "*a neurotoxin and has other deleterious effects on humankind*".

APPENDIX 2 – Recommendation 2: further information.

The second recommendation of the advisory committee is that Glastonbury Town Council write to Public Health England and the UK Government asking them to convene an independent scientific study into the non-thermal effects of fifth generation cellular network technology – particularly the impact of high frequency, long duration exposure on the levels of reactive oxygen species and antioxidants biomarkers – in human subjects.

During his presentation to the committee, Professor Tom Butler reflected that: “*the scientist fall into two groups, one is: ‘absolutely no non thermal effects’, the other group: ‘significant non-thermal effects’...*”

This apparently irreconcilable difference of opinion was evident to councillor members during the six months in which the committee met. It permeated the investigation – the dichotomy contributing to the advisory committee being unable to come to a unanimous conclusion with regard to the safety or otherwise of fifth generation cellular network technology.

Fundamental to the dichotomy is the controversial, contested, but persistent claim that high frequency, long duration exposure to radiofrequency EMFs stimulates ‘voltage-gated ion channels’ found in the membrane of cells; impacting on levels of reactive oxygen species (free radicals) and antioxidants – biomarkers of neurodegeneration – potentially causing oxidative stress.

If an independent scientific study *were* to be conducted, imperative to the advisory committee’s recommendation is that the scientists involved must be both independent and ‘in the middle ground’. If such scientists could be identified, then – in the words of Professor Butler – the research would “*be acceptable to both camps*”.

Speaking about the potential of such a study, Professor Butler proposed: “*a control group of humans not exposed or with very low levels of exposure and another group of humans with a relatively high level of exposure*”.

Professor Butler suggested that, at the end of the research, if non-thermal effects are evident: “*we should see a comparative difference in the biomarkers. In the exposed group, I would expect that they are at very high risk and that the levels of reactive oxygen species would be, relatively speaking, quite high; and I would expect to find that the levels of antioxidants would be relatively much lower...*”

Professor Butler went on to say: “*I think the time is ripe for such a study. It is that type of study would be extremely helpful in furthering politicians and policy-makers understanding, and I can’t understand for the life of me why such a study has not been done!*”

