Commentary on smart meters, 60 Ghz technology and 4G

P32 Line 42 - P33 Line 16:
A detailed expert-witness report I prepared on smart meters and issues related to them can be downloaded at:
https://www.dropbox.com/s/njrbcbglv0gkpfx/BC0130124A_IAJ%282%29.pdf
It discusses health and environmental issues in detail for smart meters and for other wireless technologies. It also covers the pros and cons of wireless, PLC and fiberoptics, human rights, energy theft and national security issues.

P32 Line 38:
Though 60GHz radiation can cause oxygen molecule resonance, little thought appears to have been given to possible health and environmental effects.

A. "More than 90% of the transmitted power is absorbed by the skin" (Zhadobov et al. 2011). Will long-term exposure promote an increase in skin cancers or cause eye damage?
- "… we cannot neglect possible synergistic effects and eliminate the possibility that other exposure parameters, like frequency, exposure time, or field polarization may have effects on biosystems" (Zhadobov et al. 2009).
- Bellossi et al. (2000), DBA/2 mice irradiated with 60 GHz waves for 30 minutes a day, for 5 consecutive days a week at 500 $\mu W/cm^2$. Exposed mice grafted with Lewis tumor cells exhibited accelerated tumor growth.

B. It is predicted by the present author that its use for backhaul purposes on street furniture (particularly streetlights) may prove harmful to birds who alight there (skin cancer around the beak, eyes, wing tips or toes?) and insects who are attracted to light at night. RF is already shown to cause infertility in insects (Chavdoula et al. 2010). The light from the streetlight will draw them to it. Avian insectivores could be greatly affected by this.

C. Higher plants could be badly affected in situations where molecular resonance of oxygen occurs as their system of air spaces would put many of their cells in direct contact with the resonating oxygen molecules, particularly near the surfaces of leaves and other aerial parts of plants that are exposed to such radiation (Goldsworthy 2013).

D. How may 60GHz affect air quality and levels of O_2, H_2O_2, CO_2, CO and O_3?
- Will it create O_3 from O_2?;
- H_2O_2 in rain has preservative & antimicrobial properties that help prevent decay on damaged or infected parts of flora & fauna. Will those levels be reduced?;
- Will an atom in CO_2 be dissociated to create more toxic CO?].

Assessments should be made to see if risks might be lessened by using Li-Fi instead of 60 GHz.

Refs:
Bellossi et al. (2000), IEEE Transactions on Microwave Theory and Techniques, 48(11), 2104-2110.
Chavdoula et al. (2010), Mutation Research/Genetic Toxicology and Environmental Mutagenesis, 700(1-2), 51-61.
Goldsworthy, A. (2013), Personal discussion between Dr Andrew Goldsworthy and present author.
Zhadobov et al. (2011), International Journal of Microwave and Wireless Technologies, 3(SI 02), 237-247.
Zhadobov et al. (2009), IEEE Transactions on Antennas and Propagation, 57(10), 2949-2956.

P11 Line 6:
"*… even the emerging 4G systems, do not significantly increase the measured fields in the environment*." As mentioned above, discussing 60 GHz backhaul, these systems will increase RF fields directly next where the emitter is positioned.

In instances where units are installed on streetlights, birds may experience harmful exposures whilst alighted on them. There are numerous studies available documenting detrimental effects through increased exposure (Balmori 2005, Tanner & Romero-Sierra 1982, Bigu Del Blanco et al., 1973). "… prolonged irradiation at seemingly low power densities may be harmful" (DOE/NASA 1978).

Again as mentioned earlier, there is the problem that RF can cause sterility in insects, and as insects are attracted to streetlights during the hours of darkness, this RF exposure is likely to further decimate their numbers and severely weaken an important part of the food chain. Avian insectivores and insects (including insect pollinators) are likely to suffer most from such rollouts.

Refs:
Balmori (2005), Electromagnetic Biology and Medicine, 24, 109-119.
Bigu del Blanco et al. (1973), IEEE International Electromagnetic Compatibility Symposium Record. New York, June 20-22, 1973, pp. 54-59.
DOE/NASA (1978), Compilation and Assessment of Microwave Bioeffects: Final Report 105 pp.
Tanner & Romero-Sierra (1982), Electromagnetic Biology and Medicine, 1(2), 195-205.