Power lines and people



Perhaps longest in the line of electric and magnetic fields impact is the supply of electricty by high tension lines. Other sites have the full story of the studies and interpretations of power lines, and indeed the fields from domestic appliances and feeds into homes.

None of us can imagine life without electric power, but once again, it is the way we use it that matters. Is a 50 or 60 Hz alternating current a good thing for us? Can better wiring and wiring codes reduce the effects, even before a precise definition of the problem is found? This mode of transmission was developed to enable transformers to be used to raise voltages at the expense of current and so to deliver electricity with less loss over great distances; is this position ever likely to change with greater variety in methods of electricity generation?

Since power lines also join most dwellings in Europe and America, there is a natural desire to make use of the connection for communication. RF signals can be sent over power lines, and a suggestion has been made that broadband Internet can be delivered this way. Whether unshielded cables are suitable for keeping RF from 'leaking' into other devices and living spaces, is another matter. Already, especially in the US, the issue of 'dirty electricity' is being addressed; high frequencies being carried on the back of power seem to be a cause of serious health problems. These are problems that can be addressed with the right recognition of what needs to be done.

Where we stand now is an interesting position:

- Many studies show very clearly indeed a correlation between high tension lines and childhood leukaemias.
- Many people show an intolerance or sensitivity towards electric fields, and electromagnetic fields and find modern apliances and environments increasingly difficult to live with.
- If we have not already reached 'Peak Oil', and with it Peak Gas, we very soon will, and the situation of global supplies of primary fuels is becoming politically intense. Global political and economic power is still centred on oil, and looks set to stay firmly on energy. Alliances over new oil pipelines are shaping relations in Asia as much as the Middle East, and whilst we are not here to make political comment, it is these interests and the burgeoning demand for energy in the Indian subcontinet and China that will shape the frictions and struggles of the next few decades. The result could be a reappraisal of centralised energy delivery.
- The pressure is on with climate change. Increasingly dirty fuels (eg shales and coals), and those demanding more energy for extraction, will compete with 'renewables', and monolithic centralised supplies with varied and distributed supplies. This could set the scene for discovery of local electricity supplies and the obviation of high tension, but simultaneously find some antagonism with the big suppliers' economic and lobbying muscle. Will a national grid survive? Is it really necessary if we can discover regional best-sources?
- Opportunities for tackling the problems of power frequency fields (better design, shielding, or even a revolution in frequency?) may still be lost, because avoidance of blame may coincide with movement away from a national network, or with a discovered convenience in underground cables instead.
- Economic necessity may at last oblige us all to simply use less energy. If we could admit to the immense losses of energy through a national grid and break down into regions and localities, power lines may become less of an issue. We can all live on a small fraction of our current electricity consumption. We could reduce voltages, change frequencies, improve wiring codes and avoid what has been seem by many for a long time as a subtle threat to many people.
- Finally, as with all NIEMR or fields issues, progress in bioelectromagnetics is struggling after decades of discovery, to restore what we already know: that the human body is itself subtly and complexly electric and responds to external fields, charges and frequencies: electric, magnetic and electromagnetic.

Certainly it has never been more important to re-evaluate what we have taken for granted for a century. Electricity is a wonder and a convenience. But we still understand it only very partially. How it behaves, where it flows, how it mixes, 'what' it is, are still quite elusive, despite the complex mathematics from James Clark Maxwell onwards that 'explains' it. It is one thing to be an electrical engineer, another to stand on the ground of quantum physics and explain it over again. And to find anyone who

appreciates both stances and who is also a biophysicist specialising in bioelectromagnetics is asking a great deal. Yet this cross-disciplinarity is essential for our future well-being. Each traditional stance tends to reduce the picture to a one-way view, and each misses the whole. We hope that in these pages we can round the view.

We will therefore be presenting not the argument and campaign on power lines so much as facets on being electric in a world of distorted electric charges, and of fields in general.

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