

WIRELESS SMART METERS AND PEOPLE WITH ELECTRO-SENSITIVITY

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A *Electro-sensitivity and wireless Smart Meters*

What are the short-term symptoms from wireless Smart Meters?

Symptoms from the radiation emitted by wireless Smart Meters are: headaches, dizziness, short-term memory loss, a fuzzy head, irritability, itchiness, aches, sleep disturbance, digestive problems, heart-rate changes, and many more. Both children and adults can suffer.

How many people are likely to be ill from wireless Smart Meters?

People's exposure to wireless Smart Meter radiation varies considerably between properties. Therefore the number of people affected by short-term symptoms will also vary according to individual conditions. Surveys suggest that about 30% of the population are slightly allergic to radio exposure, usually without knowing it, 3% moderately, and under 1% severely.

Is the number people suffering from Electro-sensitivity rising or falling?

Doctors around the world report a steady increase in the number of people being sensitised. Some scientists estimate that up to half the population could be sensitised to some extent by 2017 to 2065, depending on the growth in electro-pollution, including wireless Smart Meters.

What do the WHO and scientific studies say about Electro-sensitivity?

In 2000 the Nordic Council of Ministers categorised "EI-allergy" as IDI-10-R68. In 2005 the WHO stated that the symptoms are "certainly real" and it can be a "disabling condition". Increasing numbers of studies show a link between EM exposure and autonomic responses.

What are the long-term health problems from wireless Smart Meters?

Long-term or high-level exposure to similar radiation is linked with cancers and neurological diseases. UK wireless Smart Meter trials began in 2009 so there are no long-term studies.

What do the WHO and scientific studies say about wireless Smart Meters?

In 2011 the World Health Organisation's IARC classified radiation such as from wireless Smart Meters as a 2B possible carcinogen. Mobile phone radiation and Wi-Fi change brain functions and can harm male fertility. This radiation is linked with neurological diseases and cancers.

How do wireless Smart Meters cause ill health?

Electromagnetic radiation can affect the autonomic nervous system, protein expression and the thyroid. Mechanisms include calcium efflux at ion cyclotron resonance on cell membranes, reduced melatonin, mast cell degranulation, free radicals, DNA effects, biogenic magnetite, cryptochromes and metal implants. Some genetic variants are more sensitive to EM radiation.

How similar are health effects from radio frequency and from ionising radiation?

"Electrosmog ELF changes are similar to ionizing radiation from Chernobyl or Fukushima's ionizing radioisotope particles, with health deterioration and behavioral problems, premature illness and death." (Dr. Bill Deagle)

B Radiation from wireless Smart Meters

How many wireless transmitters does a wireless Smart Meter have?

A wireless Smart Meter has at least two transmitters for operating on two networks:

1. The Wide Area Network (WAN) links individual houses to a base station.
If wireless, this can use mobile phone networks, Wi-Fi, or special frequencies. Some special frequencies are low so as to penetrate further through concrete and into cellars.
2. Home Area Network (HAN) links the meter and appliances in the house.
If wireless, this may use ZigBee, Z-wave or Wi-Fi radiation systems.

Both systems receive incoming wireless signals too; these typically penetrate the whole house.

3. Some wireless Smart Meter systems use a 'mesh' or 'grid' network, where each WAN transmitter can relay information to another, allowing a single nodal access point to communicate with the base station. Although this system is used in the UK for controlling some street lamps and other equipment, at present it seems that every property which opts for a wireless Smart Meter will send and receive individual signals to and from the base station.

How powerful are wireless Smart Meters?

The power depends on the system and the location of the wireless Smart Meter and mast.

1. Most wireless Smart Meters are as powerful as a mobile phone, or sometimes more powerful. If the meter is in the cellar, under the stairs or in the centre of a house, or deep inside a block of flats and a long way from the nearest mast, it operates at higher levels than if the meter is outside and with an uninterrupted line to a mast nearby.
2. A wireless Home Area Network has to penetrate walls, floors and ceilings.
3. A block of flats or houses built close together produce wireless Smart Meter signals penetrating the whole area strong enough to cut through the increasing levels of general electro-magnetic pollution, including the Home Area Networks' radiation.

See sections C and D below for typical measurements.

How frequently does a wireless Smart Meter transmit?

This depends on whether the meter is for gas, water or electricity, and other factors, especially if there is a "mesh network". Each signal may last for a few seconds or less but this will vary.

1. Gas and water may send data outwards once a week or more frequently.
2. Electricity may send data outwards and controls inwards once per hour or half hour, with more signals at busy times, such as morning, early evening and weekends.
3. The Home Area Network may operate continuously. Some domestic appliances have built-in radio transmitters and receivers which cannot be turned off.
4. A block of flats or houses built close together have high numbers of wireless Smart Meter signals penetrating the whole area.
5. A "mesh network", where meters relay information to each other, as used in California, can produce up to 22,500 separate digital pulses daily. Although the stated time is 45 seconds of wireless transmissions per day, this is for the 4-6 times daily that energy usage information is transmitted. The other pulses are part of the "mesh network".

Why is "time-averaging" the wrong measurement for ill health from wireless Smart Meters?

- (a) Wireless meters send short bursts of radiation, often for under 1% of the time. If the levels of these short bursts are averaged over the whole time ("time-averaging"), including when the meter is not transmitting, the average can be about 100 times lower than the actual radiation level. At present, all UK standards are for "heating" and these are time-averaged over six minutes.
- (b) Many scientists think the peak electrical pulses are particularly bio-active. Time-averaging can reduce the peaks for pulsed and digital radiation.

C "Non-thermal" and "heating" limits

Why is "non-thermal" important for ill health from wireless Smart Meters?

Wireless meters send short bursts of radiation which do not have heating or "thermal" effects on human tissue, but are still bio-active at "non-thermal" levels. The UK's safety levels are based on heating and not on the established "non-thermal" effects of radiation.

What is the UK government's view on "non-thermal" effects from wireless Smart Meters?

- (a) Part of the UK government accepts ill health from "non-thermal" radiation. In 2011 the UK government's Department for Energy and Climate Change made wireless Smart Meters voluntary, accepting "non-thermal" health effects. The UK government accepted the Stewart Report of 2000 and still advises that children should not use mobile phones except in an emergency. Any wireless Smart Meters using mobile phone radiation, therefore, contravenes the government's advice, since they are not an "emergency".
- (b) The UK government's Health Protection Agency, however, claimed in 2011 that the only health effect of radiation like that from wireless Smart Meters is "thermal" or heating, as in a microwave oven. The HPA also claims that there is no "consistent" evidence ("no evidence" until 2008) of ill health in the "general" population from such radiation. The National Health Service, however, uses procedures which operate with "non-thermal" radiation and most scientists now accept adverse effects from "non-thermal" radiation.

What is the view of other authorities on "non-thermal" effects from wireless transmitters?

The problem of ill health at "non-thermal" levels was discovered among radio and radar workers in the 1930s, but it has now spread into the general population. Russia accepted ill health at "non-thermal" levels in 1958 when it set much lower safety limits than the UK. The US National Academy of Sciences' National Research Council accepted "non-thermal" effects in 1986. Many organisations, such as the International Commission for Electromagnetic Safety, the EU Environmental Agency, the EU Parliament, and the Council of Europe, regard the UK's "heating" limits as obsolete and call for "non-thermal" limits in the UK. Denis Henshaw, emeritus professor of Human Radiation Effects at Bristol University, says that the UK government is "poorly advised".

How does wireless Smart Meter radiation compare with "non-thermal" and "heating" safety limits?

Location	Electric fields	Nature	"Non-thermal" limit	"Heating" limit*
Near transmitter	mV/m	mV/m	mV/m	mV/m
				61,000 (61.0 V/m)
mobile phone/Wi-Fi router	6,000 (6.0 V/m)			
phone mast	900 (0.9 V/m)			
			194 (0.19 V/m)	
		0.02 (0.00002V/m)		

*1,925,000 (1,925 V/m) peaks allowed

How do wireless Smart Meters compare with mobile phones, and "non-thermal" and "heating" safety limits (800-900 MHz)?

Location	Power density	Nature	"Non-thermal" limit		"Heating" limit*
Near transmitter	uW/cm2	uW/cm2	uW/cm2		uW/cm2
					5,800 (UK)
some mobiles	3-400				
*wireless Smart Meter, bank	5-200				
*wireless Smart Meter, single	5-70				
mobile phone mast	5-40				
mobile phone	3-40				
			Russia, Italy outdoors	10	
			China outdoors	6	
			Switzerland outdoors	4	
			Bioinitiative indoors	0.1	
		0.00001			

*These power density figures are based on measurements in North America. There are few published measurements available for the UK.

What do other countries advise on wireless Smart Meters?

Many countries like the USA and Canada are facing the problem of members of the general populations suffering ill health from wireless Smart Meters and Wi-Fi. Some US states now make wireless Smart Meters voluntary because of these health problems. Other countries have avoided wireless Smart Meters and opted for wired Smart Meters because of health problems. In addition Germany and Israel advise against Wi-Fi. The Council of Europe in 2011 advised that radiation from devices like wireless Smart Meters and Wi-Fi should be avoided where possible, especially in schools. This is the view of many doctors' associations and international experts on biological effects of EM radiation.

D Protecting people with electro-sensitivity from wireless Smart Meters

Should Electro-sensitive people be shielded from a neighbour's wireless Smart Meters?

Yes. Doctors advise that the first priority for people sensitive to electro-magnetic fields is to avoid radiation. It is difficult and expensive, however, to shield a whole house from a neighbour's wireless Smart Meter and Wi-Fi, and almost impossible to shield the garden. Wireless Smart Meter and Wi-Fi radiation can be strong for 30 to 100 metres and it goes through walls. Although some people protect themselves with silver-lined netting, used for military protection in electro-magnetic warfare, this is expensive.

Are children, pregnant women and elderly people especially vulnerable to wireless Smart Meters?

Yes. Long-term exposure to electro-magnetic radiation weakens the immune system. The depth radiation penetrates into the body depends on body size and tissue. Children absorb 60% more radiation than adults. Current UK guidelines protect a healthy adult male from heating, averaged over six minutes, but not a child or elderly person from the biological effects of long-term exposure. Children, pregnant women and elderly people should not sleep or sit for long near a wireless Smart Meter or a Wi-Fi router or a neighbour's wireless Smart Meter or Wi-Fi. A foetus is especially sensitive to EMR.

How do other countries protect Electro-sensitive people while providing data communication and control for Smart Meters?

Parts of France use fibre optic cables which do not emit harmful radiation. Italy and Idaho use power lines; these give off small amounts of radiation, but far less than wireless meters.

How can a customer change from a wireless to a wired Smart Meter?

They ask their utility company to retain, or to change to, a wired meter. It is not an offence to refuse a wireless Smart Meter for health reasons or other reasons such as privacy.

How much will utilities charge for a wired Smart Meter?

This has not been decided. Since people already functionally disabled by radio transmissions need wired Smart Meters on health grounds, it seems reasonable to assume that there should be no extra charge. This will also allow utility companies to comply with the Equality Act of 2010 which prohibits discrimination on the grounds of disability.

Should people with Electro-sensitivity have neighbours using wireless Smart Meters?

No. People already allergic to radio transmissions should avoid radiation from neighbours' wireless Smart Meters. Usually, therefore, close neighbours should not have wireless Smart Meters, especially if a person's property is between a neighbours' meter and the nearest phone mast. The utility company needs to provide the neighbours with wired Meters.

How can a utility prevent radiation from a neighbour's wireless Smart Meters from entering the property of a person with Electro-sensitivity?

This appears to be the responsibility of each utility company. The utility company should arrange for the neighbours' wireless Smart Meters to be replaced with wired ones, or provide effective shielding for the house and garden of the person with Electro-sensitivity.

Can a person with Electro-sensitivity shield his/her house and garden from a neighbour's wireless Smart Meter?

It is difficult and expensive to shield a whole house, and almost impossible to shield a garden, from a neighbour's wireless Smart Meter. Mobile phone radiation can remain strong for over 1 Km in semi-rural areas and it goes through walls. Unless the house can be built from scratch, it is usually better to start with a single room, using special carbon paint. Some people have tried lining walls with high quality kitchen aluminium foil. These need to be earthed. An easier solution is protective silver-lined netting, as used by the military for electromagnetic warfare, but this can be expensive.

How much difference does the location make for a wireless Smart Meter?

The closer a person sleeps or sits to a wireless Smart Meter, the stronger the signal and the more likely that person is to suffer ill health. A person with Electro-sensitivity needs to take especial care if a wireless Smart Meter is on the other side of a wall, or where the radiation will pass through the wall(s) and room(s) to reach the mast directly.

Can children, or pregnant or elderly people be protected from wireless Smart Meters?

It is especially important to ensure that a wireless Smart Meter is not located close to a child's bedroom or to where an elderly person spends much time. This can include a room close to a neighbour's house if the neighbour's wireless Smart Meter is nearby. Carefully check the location of wireless Smart Meters in a block of flats. If all the wireless Smart Meters are ranked on the exterior wall of one room, that room could have high levels of radiation.

Do wireless Smart Meters add to "hot-spots" in a house?

Yes. All electromagnetic radiation can create interference patterns. There are two main factors in creating a "hot-spot" in a property.

- (a) The constructive interference of two sources of radiation can create small areas in a house or garden with levels of radiation much higher than the surrounding area. This is becoming increasingly common as different neighbours beam different sources of Wi-Fi into a given property and these mix together, and also interfere with radiation from nearby phone masts, depending on frequencies.
- (b) The structure of the house, such as thick walls, steel beams or reflective metal sheeting in kitchen fittings, can significantly distort radiation patterns.

It is very hard for most property owners to locate these hot-spots, even with the help of an appropriate meter. They can appear as narrow beams through rooms, or areas a few feet across in the middle of a room. They can be more common upstairs where there is often more exposure to masts and neighbours' radiation. This is a concern for sleeping areas, where doctors advise minimum electromagnetic pollution. Since neighbours' wireless Smart Meters are in fixed locations, each time they transmit they may create a hot-spot in the same place in the property. It may be difficult to find out whether such a hot-spot is in a sleeping area.

Are animals and plants affected by wireless Smart Meters?

Yes. As with people, the degree of exposure will vary greatly. Pets like dogs can be sensitive to electro-magnetic radiation and the growth of plants close to transmitters can be effected.

What distance from a wireless Smart Meter prevents all health effects?

Many leading experts on the non-thermal health effects of man-made radiation state that there are no safe limits. To avoid all the health effects of wireless Smart Meters using mobile technology, therefore, the mobile phone and the mobile phone mast should be up to five miles away. Since the radiation power decreases by the inverse of the square of the distance, by about five miles it should be down to background levels for most mobiles. The further a wireless Smart Meter using mobile technology is from the mast, the greater the radiation levels from both the meter and the mast while they are both in range.

What distance from a wireless Smart Meter prevents short-term health effects?

This depends on:

- (a) how sensitive a person's whole body is to the toxic effects of electro-magnetic pollution,
- (b) whether the person has particular susceptibilities, such as metal implants, mercury amalgam dental fillings, or some genetic conditions,
- (c) how much other electro-magnetic pollution there is in the area,
- (d) how frequently the person is, and has been, exposed to the radiation,
- (e) where the mast and transmitter are sited in relation to the person,
- (f) the type of transmitter and signal, and
- (g) the atmospheric conditions, since mobile phone masts can increase power in each cell when rain attenuates the signal.

Many people with electro-sensitivity can feel mobile phones within several metres, such as when a mobile sends a text message. Some can feel even the charge in the phone's battery. In some circumstances people with and without electro-sensitivity can suffer electro-sensitivity symptoms a mile or more away from both the mobile phones and the masts if the atmospheric

and geographical conditions mean, for instance, that all the radiation has to pass over the brow of a hill where you are sleeping or standing.

THRESHOLDS AND LIMITS: BIOLOGICAL AND HEATING								
(Electric fields: Volts/metre, peak to peak)								
NB: for most toxins safety limits are usually 10 times lower than the human threshold								
nature	biological response threshold	Non-thermal, biological limit Burger-form proposed	Non-thermal, biological limit Salzburg indoors	conscious symptom threshold (some EHS)	conscious symptom threshold (30% gen. population)	Non-thermal, biological limit Bio-initiative indoors	Non-thermal, biological limit Bio-initiative outdoors	Heating, 6 minute average, limit HPA UK, ICNIRP
<0.00002	0.0001	0.002	0.02	0.02 - 0.05	< 0.06	0.2	0.6	*61.0

* 1,952 V/m peaks

The Itron RF WAN transmitter is said to produce 304mW at 902 MHz, and the ZigBee HAN transmitter 78 mW at 2.4 GHz. Measured exposures vary considerably.

TYPICAL MEASURED EXPOSURE LEVELS			
(Electric fields: Volts/metre, peak to peak)			
distance (metres)	transmitter power (milliWatts)		
	25 mW	ZigBee HAN	Mobile phone WAN
		*100 mW	
		Minimum	Maximum
0	(3)	(2)	(7)
0.5	0.14	1.1	4.9
1	0.07	0.7	2.8
2	0.03	0.4	1.5
5	0.01	0.1	0.7
10	0.007	0.05	0.4
20	0.003	0.03	0.2
50	0.002	0.01	0.1
100	0.001	0.006	0.05

*Some 100 milliWatt values come from the Swiss government report *Electrosmog in the Environment* (2005, p.54).

How do other countries provide data communication and control for Smart Meters while protecting people with Electro-sensitivity?

Parts of France use fibre optic cables. There is no harmful radiation from fibre optic cables. Italy and Idaho use power lines; these give off some radiation, but less than wireless meters.

How relevant are SAR data from mobiles to wireless Smart Meter radiation?

The Specific Absorption Rate for mobile phones has two serious limitations.

- (a) SAR is designed to prevent heating. For wireless Smart Meters the danger is from “non-thermal” biological effects. This needs to be set at a much lower safety level.
- (b) SAR is particularly designed to prevent heating in the head. For wireless Smart Meters the danger is from “whole body” exposure. This should be set at a lower safety level.

Do wireless Smart Meters emit radiation on house wiring (transients or “Dirty electricity”)?

Wireless Smart Meters with Switching Mode Power Supply may add radio frequency spikes at 4-60 kHz with 2 V amplitude on house wiring, even with the radio transmitters switched off. These frequencies are particularly bio-active and have been linked with many serious illnesses.

Who is responsible for ill health to people with Electro-sensitivity and to other people from wireless Smart Meters?

The owner of the wireless Smart Meter and the utility using it seem responsible for ill health caused. Most insurers now refuse to underwrite ill health from electro-magnetic radiation.

E Experiences of Electro-sensitivity from wireless Smart Meters

Examples of people made ill in the north America by a wireless Smart Meter.

- "I developed electro-sensitivity after my smart meter was installed ... The wireless smart meter was placed on my bedroom wall near the head of the bed, by my pillow, on the outside of the building. For six months I tried to sleep in my usual spot, unaware of the danger. By the time I was very ill, I found out it was the meter from my doctor. Now I can't go near it; I have become extremely sensitive, have endured painful loud clicking and ringing in the ears, ice-pick pain in the ears, severe headaches and more."
- "After activation of our wireless electricity meter, tinnitus was activated in me for the first time. I "heard" one meter transmit at 9, 24, 39 and 54 minutes after every hour, with this microwave auditory (Frey) effect hearing rising and falling many times per hour."
- "I have been suffering from chronic headaches for at least six weeks and this coincides with the installation of three wireless meters in the basement of my residence eight weeks ago. The headaches are moderate but constant, all day. I sometimes wake up at night feeling a cap of lead around my skull. I notice that the peak of pain is usually on Monday. I assume that is because I am exposed longer on weekends than during the week, since I work elsewhere. I have had memory lapses and difficulty concentrating over the last few weeks and I feel slightly irritable even when everything in my life is going very well."
- A resident returned home to find a wireless smart meter installed against her wishes, "it set off a 17-day hell ride" that turned her strong constitution upside down. She felt so weak she couldn't even pack her bags to get away from the house. "I am never dizzy. I never get headaches. I never had heart palpitations or any of these things. And sure enough, I just about had everything that can go wrong. And this was the moment that thing was installed." After standing close to the wireless meter for 10 minutes or so, she began to get a headache unlike anything she'd dealt with before in her life. "I said to my husband, 'It's as though you get electrocuted and your brain gets electrocuted.' It is very, very strange, and it's very strong." After 17 days of dizziness, nausea, and virtually no sleep, the utility company removed the smart meter and replaced it with an analogue meter.
- When a local utility company installed a wireless smart meter in the summer of 2009, the resident thought little of it. Then she began to feel odd. She was a practiced sculptor, but now she could not sculpt. "I couldn't concentrate, I couldn't sleep, I couldn't even finish sentences." She experienced "incredible memory loss" and, at the age of 51, feared she had come down with Alzheimer's. One night during a snowstorm in 2010 her house lost power, and when it came back on her head exploded with a ringing sound – "a terrible piercing." The buzzing in her head persisted. She took to sleeping on the floor of her kitchen that winter, where the refrigerator drowned out the noise. There were other symptoms: headaches, nausea and dizziness, persistent and always worsening. "Sometimes I'd wake up with my heart pounding uncontrollably," she said. "I thought I would have a heart attack." She told the utility company to remove the wireless meter: "I will die if you do not install an analogue meter." When the analogue meter was installed her symptoms disappeared. But her exposure to the meters has super-sensitized her to all kinds of other EMF sources. "The smart meters threw me over the electronic edge." A mobile phone switched on in the same room now gives her a headache. Stepping into a house with Wi-Fi is intolerable. Passing a mobile phone mast on the street hurts. "Sometimes, if the radiation is very strong, my fingers curl up," she says. "I can now hear cell phones ringing on silent. Life has dramatically changed."
- Dr Karl Maret: "These symptoms often coincide with the installation of their SmartMeters" - ringing in the ears, headaches, anxiety and difficulty using one's limbs.

F Human rights and people with Electro-sensitivity from wireless Smart Meters

What are the basic Human Health Rights as regards ill health from wireless Smart Meters?

1. The right to homeostasis in our own bodies.
2. The right to normal central nervous system function.
3. The right to natural environmental cues which synchronize our circadian rhythms.
4. The right to sleep.
5. The right to heal.
6. The right to hear.
7. The right to reproduce.
8. The right to learn and retain memories.
9. The right to an intact genome.

If one of these rights is at risk from involuntary wireless Smart Meter exposure, it is a breach of human health rights and the wireless Smart Meters should be removed.

Does the United Nations' Universal Declaration of Human Rights apply to people with Electro-sensitivity harmed by wireless Smart Meters?

The following Articles which form the Declaration seem to apply to people with electro-sensitivity whose enjoyment of health is compromised by willful environmental pollution.

3: "Everyone has the right to ... security of person."

5: "No one shall be subjected to ... degrading treatment."

7: "All are equal before the law and ... all are entitled to equal protection against any discrimination in violation of this Declaration."

13. "Everyone has the right to freedom of movement and residence with the borders of each state."

21. "Everyone has the right of equal access to public service in his country."

23. "Everyone has the right to work, to free choice of employment, to ... favourable conditions of work."

25. "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including housing."

27: "Everyone has the right freely to participate in the cultural life of the community."

Should the polluter pay for harm from wireless Smart Meters?

Under the Rio Declaration, principle 16, the polluter should pay for environmental damage.

If some governments and mobile manufacturers are now warning users to reduce exposure to radiation from mobile phones and putting warnings on mobiles, surely Smart Meters should not use mobile phone radiation?

This appears a logical argument. Smart Meters should be wired, as in some other countries. If it is found that ill health from mobile phone usage continues to increase, all wireless Smart Meters using mobiles may have to be replaced with wired meters for health reasons anyway.

G More information on Electro-sensitivity and wireless Smart Meters

Where can I find out more about ill health from wireless Smart Meters?

The most wide-ranging report on health and other problems with wireless Smart Meters is by Dr Jamieson (256 pages); it includes numerous references to the scientific literature.

Documents and reports on health problems of wireless Smart Meters:

- American Academy of Environmental Medicine (2012) Statement opposing wireless Smart Meters, www.es-uk.info/news/20120203-american-academy-view.pdf
- Deagle, Dr Bill (2011) "Smart Meters – A Call for Public Outrage" www.nutrimedical.com/conditions.jhtml?method=view&conditions.id=486
- Hirsch, Daniel (2011) www.committeetobridgethegap.org/pdf/110212_RFrad_comments.pdf
- Jamieson, Dr Isaac (2011) "Smart Meters: Smarter Practices", Radiation Research Trust, www.radiationresearch.org/index.php?option=com_content&view=article&id=173&Itemid=19
- Maret, Dr Karl (2011) "Commentary on the California Council on Science and Technology Report "Health Impacts of Radio Frequency from Smart Meters"", http://sagereports.com/smart-meter-rf/docs/letters/Maret - CCST Commentary 1-31-2011_final.pdf
- Oceanside Coalition (2011) "Smart Meters and Grid: Separating Fact from Fiction" www.oceansidecoalition.org/web_documents/sm-separatingfactfromfictionsept2.pdf
- Powerwatch: www.powerwatch.org.uk/library/downloads/smart-meters-20110714.pdf
- Sage Associates (2011) "Assessment Radio Frequency Microwave Radiation Emissions from Smart Meters", <http://sagereports.com/smart-meter-rf/>
- Santa Cruz (2011) Public Health Department: demand for moratorium on wireless Smart Meters, www.es-uk.info/news/20120203-santa-cruz-report.pdf
- UK groups warning of ill health from wireless Smart Meters: <http://smartmeterpetition.org/>
<http://stopsmartmeters.org.uk/>

Videos: health effects of wireless Smart Meters

- Carpenter, Dr David: (2011) "Public Health Physician Warns of Smart Meter Dangers, Stresses Need for Analog Option" www.youtube.com/watch?v=n7L21XOC2wA
- Gendron, Diane (2012) Developing electro-sensitivity from a wireless Smart Meter (in French) www.youtube.com/watch?v=LowZqsKXbuk
- EMF Safety Network: Smart Meter Health Complaints: http://emfsafetynetwork.org/?page_id=2292
- Film trailer (2011) "Stop Smart Meters" <http://smartmeterfilm.com/>
- Hirsch, Daniel (2011) "Smart Meters 100x Radiation Exposure of a Cell Phone" www.youtube.com/watch?v=IsT-pN-5uWQ&feature=related
- Stratford Smart Meter Killing Shrub (2010) http://www.youtube.com/watch?v=lsuP_WBBr2c

Videos etc: measurements of radiation from wireless Smart Meters:

- (2010) "Stratford Smart Meter 1", measuring a wireless Smart Meter outside and inside a property. www.youtube.com/watch?v=uRejDxBE6OE
- (2011) "Smart" meters: Higher pulses of RF than a cell antenna" www.youtube.com/watch?v=N6VwYPL9aE4
- Measurements from wireless Smart Meters, and safety limits: <http://smartmeterfilm.com/documents/smart%20meter%20radiation%20vs%20international%20RF%20safety%20standards.pdf>

Videos and books: people sensitive to electro-magnetic radiation

- Havas, Dr Magda (2010) "DECT Phone affects the Heart" www.youtube.com/watch?v=EI9fZX4iww

- Havas, Dr Magda (2010) "Diabetes and Electrosensitivity"
www.youtube.com/watch?v=gJcM6RZwyfA
- Havas, Dr Magda (2010) "Evidence of Electrosensitivity"
www.youtube.com/watch?v=k5xFLi-ip_g
- Havas, Dr Magda (2010) "Live Blood and Electromog"
www.youtube.com/watch?v=L7E36zGHxRw&feature=related
- (2011) "Symptoms of electrosensitivity" www.youtube.com/watch?v=DskKap_1Po4
- Bevington, Michael (2010) "Electromagnetic Sensitivity and Electromagnetic HyperSensitivity: A Summary" (ISBN: 9781872072203)
- Philips, Alasdair & Jean (2006) "Electrical Hypersensitivity, A Modern Illness" (ISBN: 0952450348) <http://www.powerwatch.org.uk/library/index.asp>

How can I measure radiation from wireless Smart Meters?

You can hire or purchase a meter. A professional measurer is helpful but can be expensive.

www.es-uk.info/docs/20110111_products_services.pdf

ElectroSensitivity UK (ES-UK) 2012