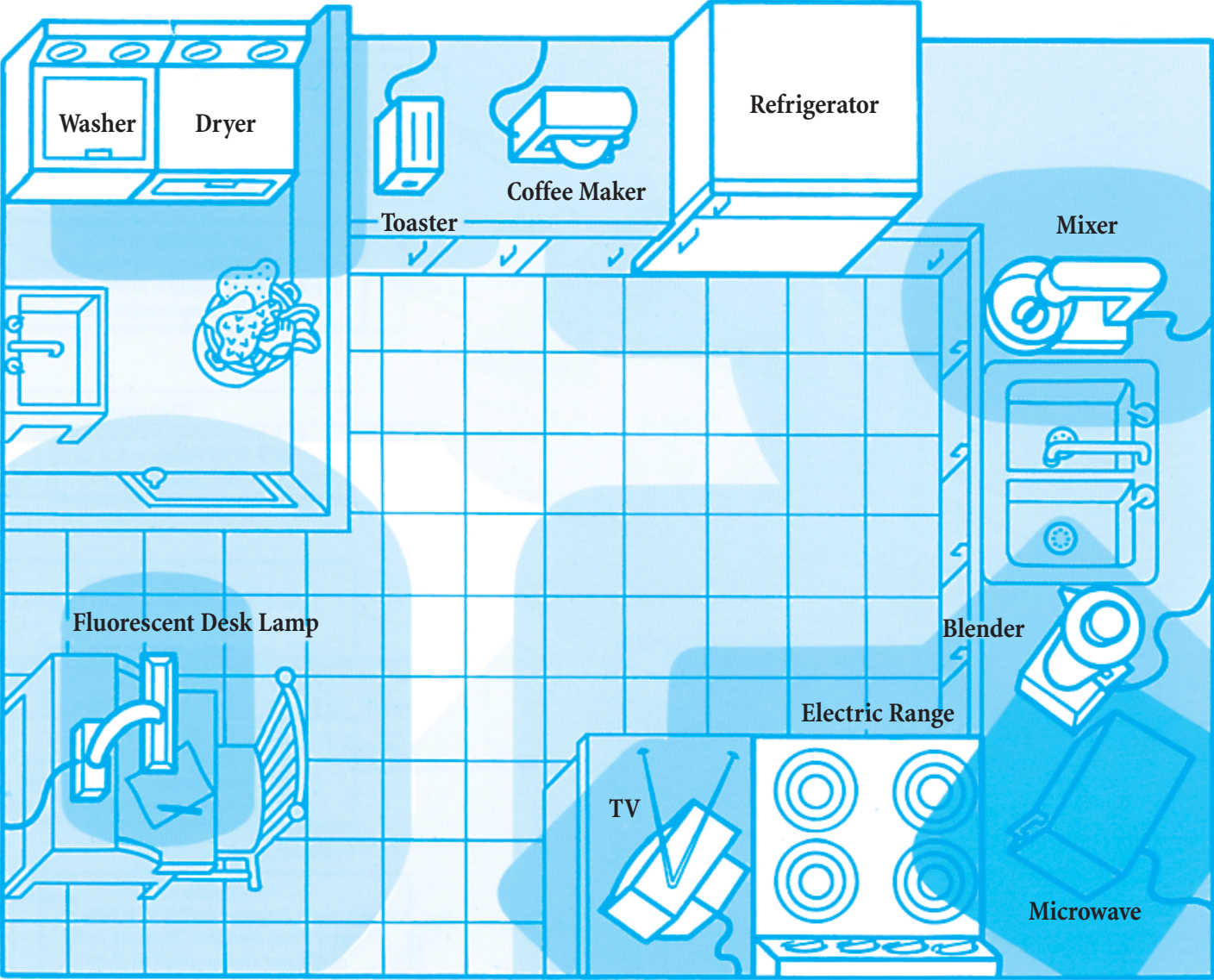


Magnetic Field Levels of Common Kitchen Appliances



<1 mG 1-10 mG 11-50 mG >50 mG

	(in mG) Mid-point 1 ft.	(in mG) Mid-point 3 ft.		(in mG) Mid-point 1 ft.	(in mG) Mid-point 3 ft.
Clothes Dryer	15	<1	Blender	11.1	1
Clothes Washer	1.9	<1	TV	10.2	<1
Coffee Maker	1.05	<1	Fluorescent		
Toaster	3.8	<1	Desk Lamp	13	1.15
Can Opener	115.5	3.75	Microwave	60	5.5
Mixer	52.5	1.08	Electric Range	22	3.55
Refrigerator	1.5	<1			

- Notes:
- 1. Field intensity values in the original source documents were expressed in a range of upper and lower values (e.g. 40 to 80 milligauss). For illustrative purposes, mid-point values were used in this chart. Actual values may be higher or lower.
 - 2. Field levels decrease continuously with distance from appliances. Field values at one foot and three feet are used here to simplify the illustration.
 - 3. A milligauss is a unit of measurement of the density of a magnetic field. Magnetic fields depend on current.
 - 4. Chart illustrates only magnetic field levels from appliances; fields from other sources will also be present within buildings.

Sources:
Gauger, J.R., IEEE Transactions on Power Apparatus and Systems, PA-104, Sept, 1985; Silva, M. *et al*, IEEE/PES 1988 Winter Meeting, 88-WM-101-8.



Magnetic Field Levels Around Homes

The transmission, distribution and use of electric power results in weak electric and magnetic fields. An electric magnetic field is an invisible force field that occurs naturally, such as lightning and the Earth's magnetic field; and also as a byproduct of technology. Electric magnetic fields surround any electrical device including power lines, house wiring and appliances. Compare the magnetic field levels of appliances to electric transmission and distribution lines. You will see that many common items are higher than LIPA's transmission and distribution system.

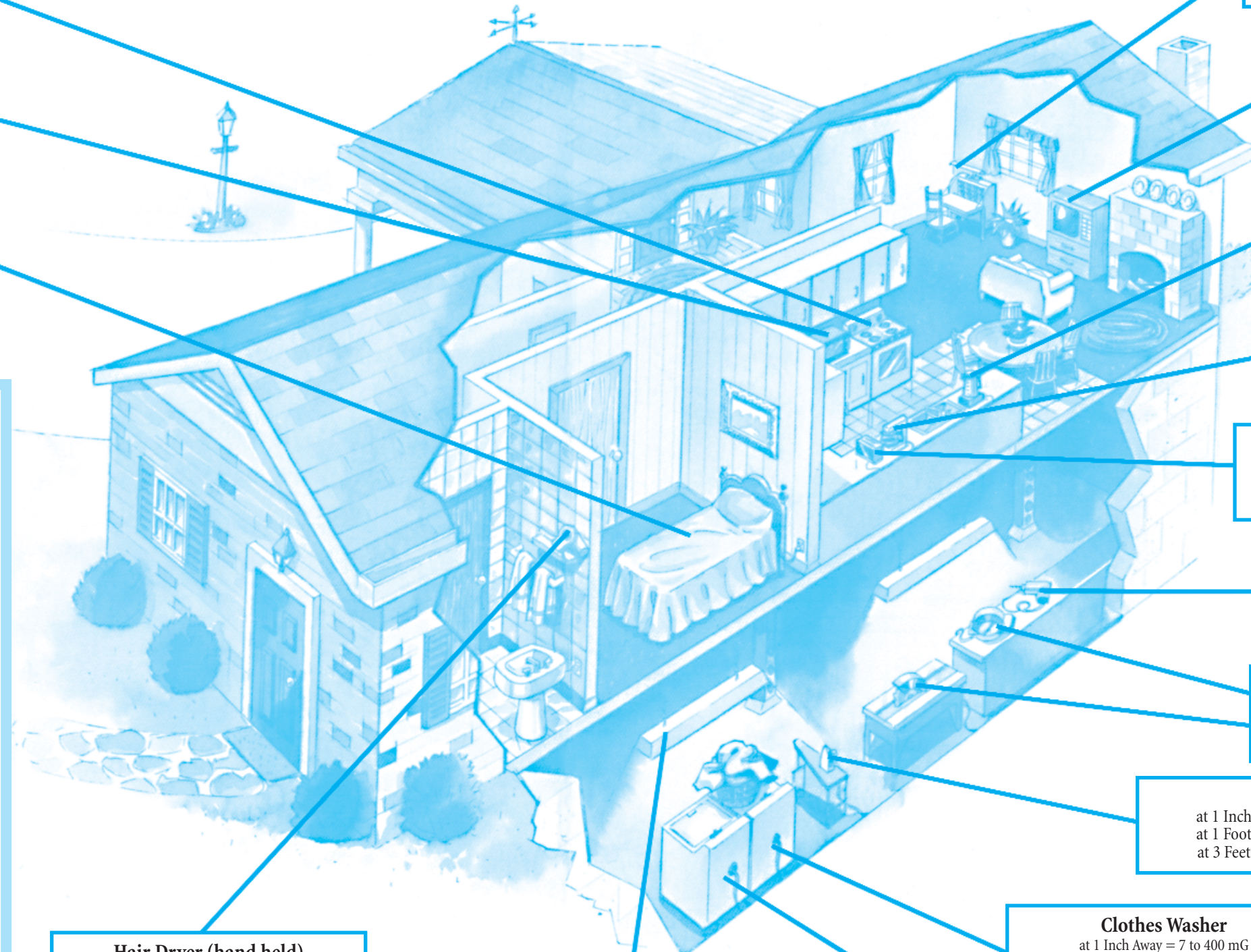


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Magnetic Field Levels Around Homes

(Measured in milligauss, mG)



Electric Range

at 1 Inch Away = 60 to 2,000 mG
at 1 Foot Away = 4 to 40 mG
at 3 Feet Away = <0.1 to 7 mG

Microwave

at 1 Inch Away = 750 to 2,000 mG
at 1 Foot Away = 40 to 80 mG
at 3 Feet Away = 3 to 8 mG

Electric Blanket

at 1 Inch Away = 3 to 50 mG

Fluorescent Desk Lamp

at 1 Inch Away = 400 to 4,000 mG
at 1 Foot Away = 6 to 20 mG
at 3 Feet Away = 0.2 to 2.1 mG

Television

at 1 Inch Away = 25 to 500 mG
at 1 Foot Away = 0.4 to 20 mG
at 3 Feet Away = <0.1 to 1.5 mG

Blenders

at 1 Inch Away = 200 to 1,200 mG
at 1 Foot Away = 5.2 to 17 mG
at 3 Feet Away = 0.3 to 1.1 mG

Coffee Makers

at 1 Inch Away = 15 to 250 mG
at 1 Foot Away = 0.9 to 1.2 mG
at 3 Feet Away = <0.1 mG

Toasters

at 1 Inch Away = 70 to 150 mG
at 1 Foot Away = 0.6 to 7 mG
at 3 Feet Away = <0.1 to 0.11 mG

Drills

at 1 Inch Away = 4,000 to 8,000 mG
at 1 Foot Away = 22 to 31 mG
at 3 Feet Away = 0.8 to 2 mG

Saber & Circular Saws

at 1 Inch Away = 2,100 to 10,000 mG
at 1 Foot Away = 9 to 210 mG
at 3 Feet Away = 0.2 to 10 mG

Irons

at 1 Inch Away = 80 to 300 mG
at 1 Foot Away = 1.2 to 3.1 mG
at 3 Feet Away = 0.1 to 0.2 mG

Clothes Washer

at 1 Inch Away = 7 to 400 mG
at 1 Foot Away = 0.8 to 3 mG
at 3 Feet Away = 0.2 to 0.48 mG

Clothes Dryer

at 1 Inch Away = 3 to 70 mG
at 1 Foot Away = 1.5 to 29 mG
at 3 Feet Away = 0.1 to 1 mG

Hair Dryer (hand held)

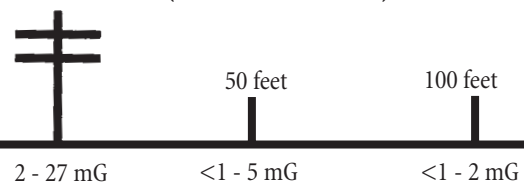
at 1 Inch Away = 60 to 200 mG
at 1 Foot Away = <0.1 to 1.5 mG
at 3 Feet Away = <0.1

Fluorescent Fixtures

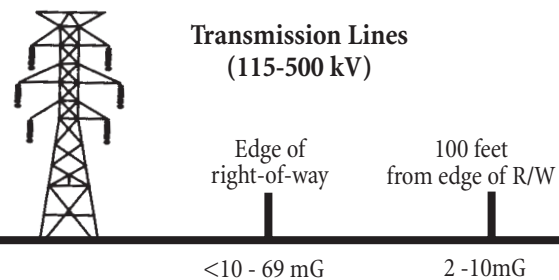
at 1 Inch Away = 130 to 2,000 mG
at 1 Foot Away = 2 to 32 mG
at 3 Feet Away = <0.1 to 2.8 mG

Measured Magnetic Fields Around Power Lines

Distribution Lines (34.5 kV and under)



Transmission Lines (115-500 kV)



Notes:

- Sources of magnetic fields found in homes have been measured at:
 - household wiring <1 to 10 mG
 - ground currents on cold water pipe up to 5 mG
 - distribution lines <1 to 10 mG
- Under peak load conditions, we calculate that the magnetic fields at the edge of right-of-way for transmission lines would not exceed 150 mG.



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Understanding EMF

Answers to the most commonly asked questions about electromagnetic fields (EMF).

What are electric and magnetic fields?

Electric and magnetic fields, or EMF, are created by both natural and manmade sources, and occur all around us in our everyday lives. Electric fields are associated with the voltage or strength of an electrical source. Magnetic fields are present when current flows through various appliances, motors and conductors such as wiring and pipes. Together, these two fields are commonly referred to as EMF.

Where do they come from?

There are many sources of electric and magnetic fields, including many common household appliances. Examples include electric blankets, televisions, refrigerators, kitchen appliances, hair dryers, computers, home wiring and electric power lines. EMF levels decrease in strength quickly as you move away from the source.

Is exposure to EMF harmful?

Extensive studies have been conducted over the last 35 years to broaden scientific knowledge of EMF. After examining all of the scientific evidence, scientists have not been able to link biological responses on cells found in some laboratory experiments to adverse effects on the human body.

Also, after reviewing 500 studies spanning nearly two decades the National Academy of Sciences concluded that “no clear, convincing evidence exists to show that residential exposures to EMFs are a threat to human health.”

In 2007, the World Health Organization – in a presentation at an EMF conference in Washington, D.C. -- stated that current research does not show enough evidence to alter the way in which utilities provide electricity to their customers.

What is being done?

America’s electric industry, including SCE&G, has devoted and continues to devote a substantial amount of time and money supporting research conducted by independent firms and universities. The funds are administered by the Electric Power Research Institute (EPRI). EPRI is a non-profit research organization supported by utilities that has invested approximately \$150 million in EMF research since 1973.

Typical magnetic field measurements:

Magnetic fields are present everywhere and can be measured in units called milligauss. Here are some typical magnetic field readings in milligauss:*

Typical 60 hertz magnetic fields measured at various distances. Magnetic fields are measured in milligauss.			
Typical items in the home	1 inch	1 foot	3 feet
Microwave oven	140.0	65.0	10.0
Refrigerator	6.0	4.0	1.2
Electric stove	250.0	25.0	2.0
Electric razor	500.0	-	-
Hair dryer	100.0	30.0	-
Electric can opener	5000.0	470.0	24.0
Computer terminal/TV	26.0	3.4	1.2
Electric clock	130.0	15.5	2.5
Transmission lines*	Under line	Edge of right of way	50 ft. from edge
100kV	2.1-19.3	0.6-3.4	0.3-1.9
Distribution lines*	0.1-35		
Substation	Measured at the fence, readings typically do not exceed those of distribution lines: 0.1-35.		
* These are typical readings under normal operating conditions at moderate load.			

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UNDERSTANDING EMF - ELECTRIC AND MAGNETIC FIELDS

Questions have been raised about the possible health effects of 60-hertz (power frequency) electric and magnetic fields (EMF*), which are found wherever you have electric power. This article contains information that will help you understand the EMF issue, plus practical tips you can use if you want to reduce your exposure at home and at work.

Campos Eléctricos y Magnéticos (EMF): Si desea recibir información en español, comuníquese con SCE al 1-800-441-2233.

*The term EMF in this publication refers to extremely low frequency (ELF) 60-hertz electric and magnetic fields associated with power delivered by electric utilities does not refer to radio frequency (RF) waves associated with wireless communications such as cell phones.

Can EMF Harm Your Health?

Electric and magnetic fields are present wherever electricity flows—around appliances and power lines, and in offices, schools and homes. Many researchers believe that if there is a risk of adverse health effects from usual residential exposures to EMF, it is probably just at the detection limit of human health studies; nonetheless, the possible risk warrants further investigation. The varying results from epidemiological studies, which looked at estimated EMF exposures and childhood leukemia, are consistent with a weak link. Laboratory studies, including studies investigating a possible mechanism for health effects (mechanistic studies), provide little or no evidence to support this weak link.

The results from many research studies have been evaluated by international, national and California EMF research programs to determine whether EMF poses any health risk. Given the uncertainty of the issue, the medical and scientific communities have been unable to conclude that usual residential exposures to EMF cause health effects, or to establish any standard or level of residential exposure that is known to be either safe or harmful. These conclusions remain unchanged by recent studies.

World Health Organization Findings

The World Health Organization (WHO) completed a review of the potential health implications of extremely low frequency (ELF) EMF, which includes power-frequency fields. Their conclusions and recommendations were presented in June 2007 in a report known as the Extremely Low Frequency Fields, Environmental Health Criteria Monograph No. 238.

The WHO report concluded that evidence for a link between ELF magnetic fields and childhood leukemia "is not strong enough to be considered causal but sufficiently strong to remain a concern." "Virtually all of the laboratory evidence and the mechanistic evidence fail to support" this reported association. For all other diseases, there is inadequate or no evidence of health effects at low exposure levels.

The report emphasized that, given the weakness of the evidence for health effects, the health benefits of exposure reduction are unclear and adopting policies based on arbitrary low exposure limits is not warranted. In light of this situation, WHO made these and other recommendations:

- National authorities should implement communication programs with all stakeholders to enable informed decision-making, including how individuals can reduce their own exposure.

- Policy makers and community planners should implement very low-cost measures to reduce exposures when constructing new facilities and designing new equipment, including appliances.
- Policy makers should establish guidelines for ELF field exposure for both the general public and workers. The best source of guidance for both exposure levels and the principles of scientific review are the international guidelines.
- Government and industry should promote research to reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure. Several recommended research projects are already under way through the Electric Power Research Institute, of which SCE is a member.

To view the full report and a fact sheet summarizing it, visit www.who.int/peh-emf/publications/elf_ehc/en/index.html www.who.int/peh-emf/publications/facts/fs322/en/index.html

Magnetic Fields at Home

(Measurements are in milligauss.)

	1.2" away	12" away	36" away
 Microwave Oven	750 to 2,000	40 to 80	3 to 8
 Clothes Washer	8 to 400	2 to 30	0.1 to 2
 Electric Range	60 to 2,000	4 to 40	0.1 to 1
 Compact Fluorescent Bulb	0 to 32.8	0 to 0.1	0
 Hair Dryer	60 to 20,000	1 to 70	0.1 to 3
 LCD/Plasma TV	1.1 to 73.6	0 to 2.5	0 to 2.2

Source: Adapted from Gauger 1985 & EPRI Appliance Measurement Study 2010.

Magnetic Fields Outside

(Maximum values may be lower for some California utilities.)

 Distribution Lines	1 to 80 milligauss under the line
 Transmission Lines	1 to 300 milligauss edge of right-of-way

Continued on back

Continued from front

Understanding EMF

What You Can Do

In a situation of scientific uncertainty and public concern, WHO recommended that utilities explore "very low-cost" ways to reduce EMF exposure from new or upgraded facilities. SCE and other California public utilities have been pursuing no-cost and low-cost measures to reduce EMF levels from new utility transmission lines and substation projects. You, too, may want to take no-cost and low-cost measures to reduce your EMF exposure at home and at work.

Human studies have not produced a consensus about any health benefits from changing the way people use electric appliances. But, if you feel reducing your EMF exposure would be beneficial, you can increase your distance from electric appliances and/or limit the amount of time you use appliances at home or at work.

For instance, you can place phone answering machines and electric clocks away from the head of your bed. Increasing your distance from these and other appliances such as televisions, computer monitors and microwave ovens can reduce your EMF exposure.

You can also reduce your EMF exposure by limiting the time you spend using personal appliances such as hair dryers, electric razors, heating pads and electric blankets. You may also want to limit the time you spend using electric cooking appliances.

You can locate the sources of EMF in your work environment, and spend break time in lower-field areas.

It is not known whether such actions will have any impact on your health.

Additional Information Is Available

SCE provides free EMF information packages and home/business measurements upon request. We also invite you to attend a workshop on EMF at our EMF Education Center located in Irwindale. For any of these services, please call us at 1-800-200-4SCE.

Additional information is also available at these links:

EMF Basics:

www.who.int/peh-emf/about/WhatIsEMF/en/
www.niehs.nih.gov/health/assets/docs_p_z/emf-02.pdf

World Health Organization International EMF Project:

www.who.int/peh-emf/en/

National Institute of Environmental Health Sciences:

www.niehs.nih.gov/health/topics/agents/emf/

California Department of Health Services:

www.ehib.org/emf/

California Public Utilities Commission:

www.cpuc.ca.gov/PUC/energy/Environment/ElectroMagnetic+Fields/action.htm

Reviewed by: California Public Utilities Commission (CPUC)

POWER CONTENT LABEL

ENERGY RESOURCES	2012 SCE POWER MIX (Actual)	2011 CA POWER MIX**
Eligible Renewable	20%	14%
-- Biomass & waste	1%	2%
-- Geothermal	9%	5%
-- Small hydroelectric	1%	2%
-- Solar	1%	0%
-- Wind	8%	5%
Coal	7%	8%
Large Hydroelectric	4%	13%
Natural Gas	21%	37%
Nuclear	7%	16%
Other	0%	0%
Unspecified sources of power*	41%	12%
TOTAL	100%	100%

* "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources.

** Percentages are estimated annually by the California Energy Commission based on the electricity sold to California consumers during the previous year.

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