

GRAND FORKS UTILITY METERS

Both electric meters and water meters used in Grand Forks are **AMR (Automated Meter Reading)** systems, not AMI (Advanced Metering Infrastructure) or "smart meters"; both emit Radio Frequencies (RF).

AMR = **one-way** communications technology

AMI = **two-way** communications technology

Not until "smart grid" initiatives were established were these meters and systems referred to as "smart meters". Functionally, a "smart grid" is an automated electric power system that monitors and controls grid activities, ensuring the efficient and reliable **two-way** flow of information between power plants and consumers - and all points in between. Grand Forks does not have this type of system.

Because most of the interest in recent years has revolved around "smart meters", the following is the only information available regarding meter RF emissions:

Health Canada has stated that:

"Unlike cellular phones, where the transmitter is held close to the head and much of the RF energy that is absorbed is localised to one specific area, RF energy from **smart meters** is typically transmitted at a much greater distance from the human body. This results in very low RF exposure levels across the entire body, **much like exposure to AM or FM radio broadcast signals.**"

"In cases where **multiple smart meters** are installed together, as in some townhouses or high-rise buildings, the total exposure levels from multiple smart meters **will still be far below** Health Canada's RF exposure limits, due to the infrequent nature of transmissions."

Smart meters compared to other sources of RF emissions:

RF from smart meters is much lower than and/or comparable to common everyday items that are considered safe: cell phones, cordless phones, Walkie-Talkies, Wi-Fi wireless routers, laptop computers, microwaves, garage door openers, remote keyless car entry devices, baby monitors, etc...

- Smart meter exposures even at close range and with exaggerated duty cycle are many times less than other household devices and are compliant with FCC limitations.
- RF exposure comparison of a person talking on a cell phone and a person 3-10 feet from a continuously-operating smart meter would result in smart meter RF exposure of 125-1250 times less exposure than the cell phone.
- Exposure to four minutes of Wi-Fi to connect to the internet from a computer is the equivalent of one year of a smart meter.
- For a convention delegate at a four day conference, the exposure to wireless networks in hotels/convention centres would be approximately 4590 minutes - that's the equivalent of standing next to a smart meter for more than 1,147 years.
- RF power density decreases very rapidly as the energy moves away from the meter.

Daily transmission times:

The **electric meters** used in Grand Forks transmit a RF signal every 30 seconds for 126 milliseconds each time so the meter is transmitting a total of **363 seconds per day (6 minutes or 0.42% of the time)**.

The **water meters** used in Grand Forks transmit a RF signal every 14 seconds for 7 milliseconds each time so the meter is transmitting a total of **43 seconds per day (less than one minute or 0.05% of the time)**.

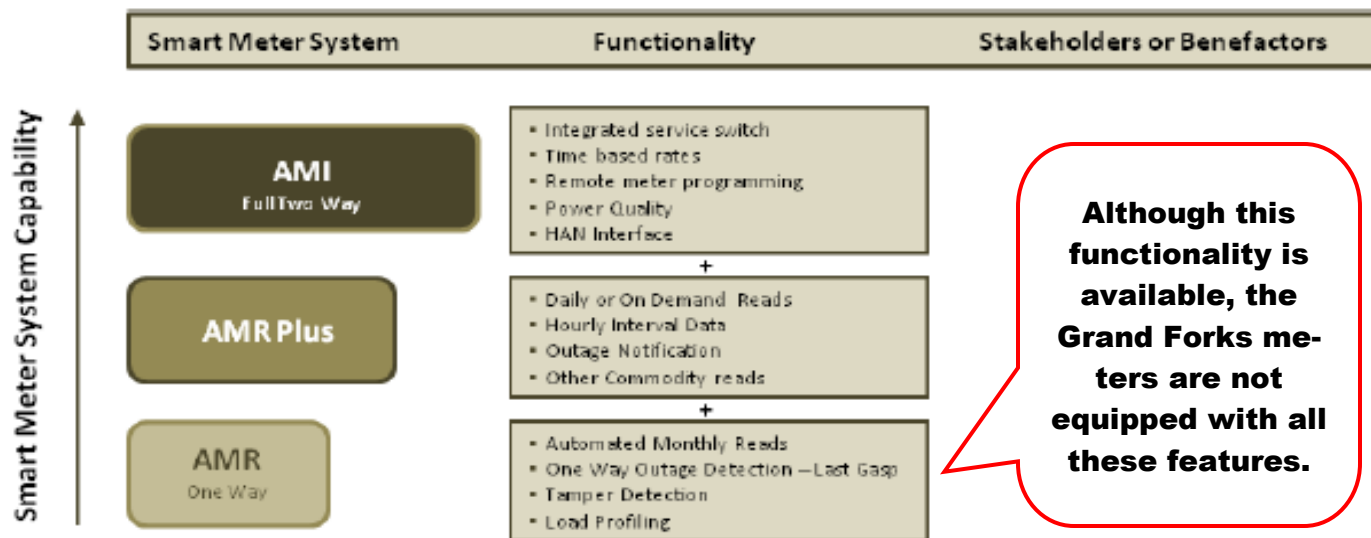
In regards to independent field measurements for RF, Industry Canada states:

"The person making such an assessment must: be knowledgeable in the area of RF measurements using Health Canada's "Technical Guide" for interpretation and compliance assessment; have the appropriate instruments to perform a proper RF field survey; and be able to interpret the results."

"If you want to conduct your own measurements, be aware that, over the years, tools (RF survey meters) have been marketed directly to consumers by vendors for this purpose. However, most of these tools work only on selected frequencies and are not calibrated (against a known standard), and therefore **cannot provide reliable results**. Before buying or using such electronic instruments, make sure that you understand its specifications and limitations, as well as how the tool works."

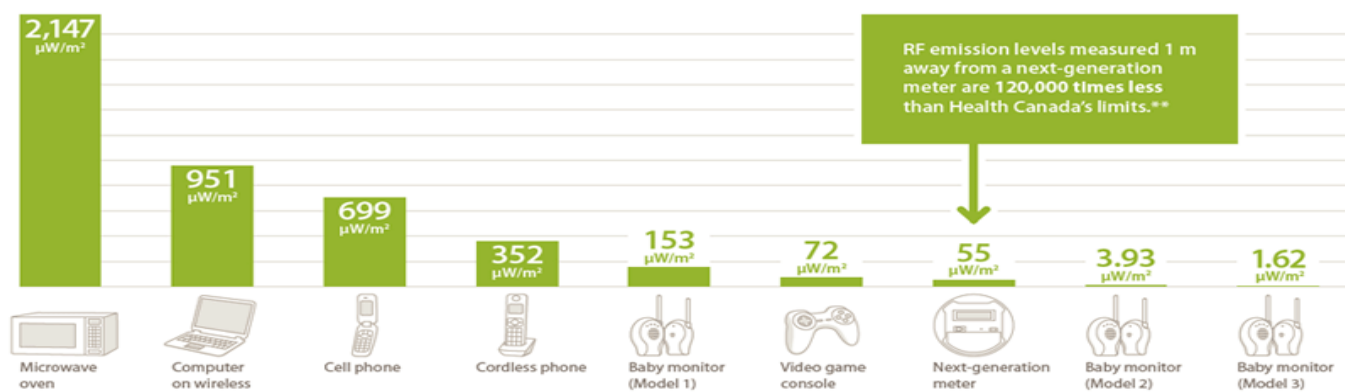
Also, **ambient levels** of RF from other devices in the vicinity of the meter would have to be accounted for. The meter would have to be turned off in order to measure the ambient level so that this could value could be deducted from the overall measurement.

Figure 1 – Smart Meter Technology Evolution



COMPARISON OF RADIOFREQUENCY EMISSION LEVELS

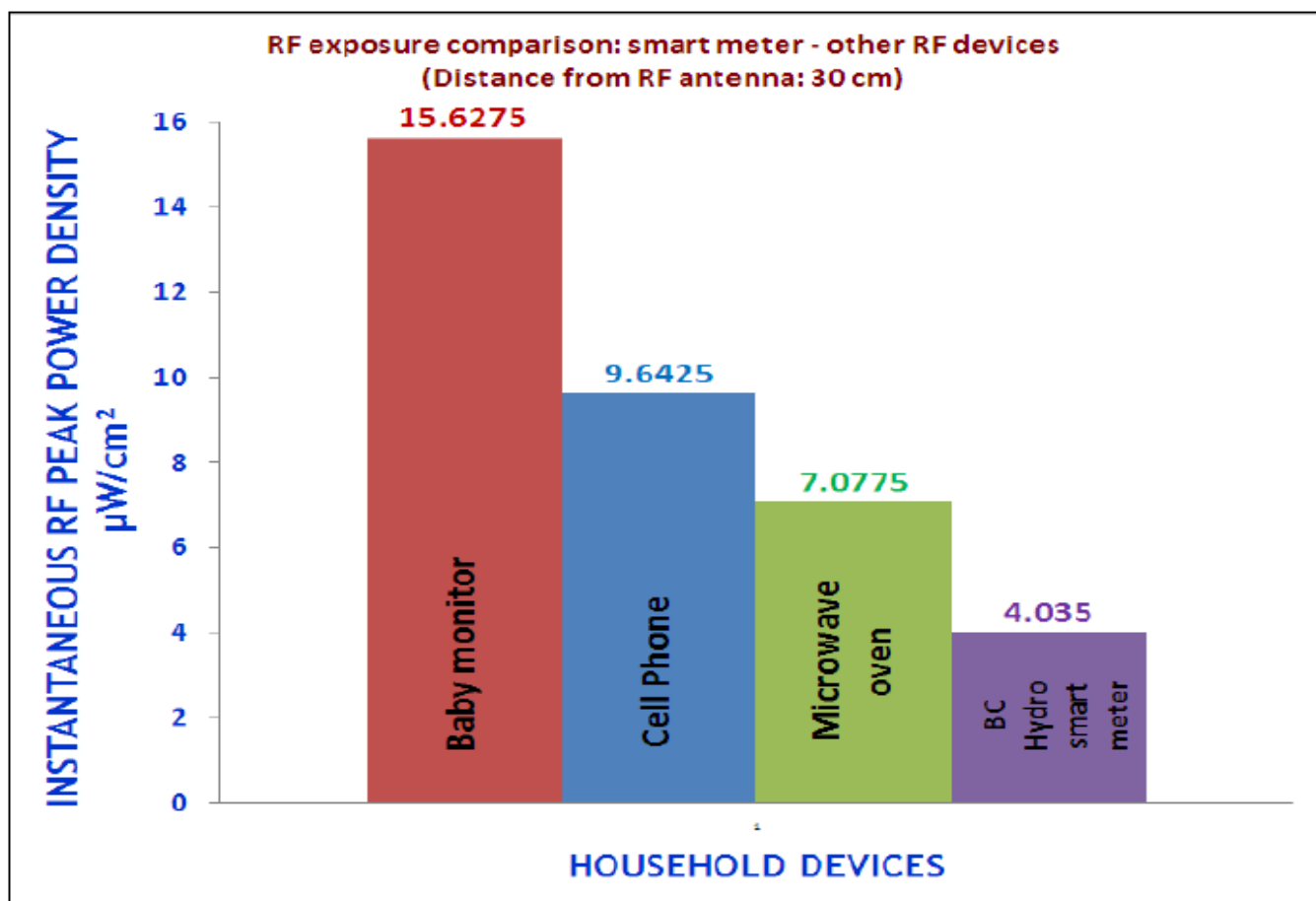
Mean power density measured near common household devices
Testing by the Centre de Recherche Industrielle du Québec (CRIQ)*



* For details on the measurement protocol used to obtain these values, see Rapport d'essais de compatibilité électromagnétique, Mesures comparatives des compteurs avancés, CRIQ file 670-43736-5.
** Limit recommended by Health Canada: 6,000,000 μW/m²



Figure 2 - Comparison of RF smart meter exposure to other RF devices



(Source: Ref. 2)

As shown in Figure 2, BC Hydro smart meter RF emissions outside homes are lower than the RF exposure associated with some household devices, e.g. baby monitors, cell phones, and microwave ovens.

REFERENCES

- 1,3,4 *"Smart Meters and Smart Meter Systems: A Metering Industry Perspective"*; Edison Electric Institute; March 2011
- 2 *"Health Concerns, Smart Meters, It's Your Health"*; Health Canada website; Accessed July 14, 2014
- 5, 6 *"UBCM 2011 Fact Sheet: Smart Meters and wireless networks"*; BC Hydro; Received September 28, 2011
- 7, 10 *"Spectrum Management and Telecommunications: Frequently Asked Questions (FAQ) on Radiofrequency (RF) Energy and Health"*; Industry Canada website; Accessed July 14, 2014
- 8 *"Memorandum: Smart Meter / AMR Meter Information Session"*; Alex Love, Utility Consultant; Received October 26, 2011
- 9 *"Frequently Asked Questions: R900 Radio Frequency (RF) Emissions"*; Neptune Technology Group Inc.; 2011

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