

As a home owner in the City of Madison, I am concerned about this project on many fronts. I have considered using the "opt-out" and retaining an internal meter. No reasonable person can make a decision without a complete understanding of all the policies related to the installation of a smart meter or the opting out of installing a smart meter. The Water Utility has not been able to supply that information. It also appears that the Utility plans to defer the finalizing of the policies for 6 months, which is after the major portion of the city will already be converted to the smart meters. There is a serious problem with the critical path in the timeline for this project which reflects poor project management by the City.

I believe the City should allow any customer with a concern about this project to defer their decision about selecting the "opt-out" option until all policies are completed by the Water Utility, approved by the City Council, and approved by the Public Service Commission. This deferral option should be publicized to all customers of the Water Utility and there should NOT be a penalty since no reasonable person can decide to continue without a clear understanding of the impacts of that decision.

To make myself clear here are the step you should add to your project plan:

- Notify all water utility customers that you are developing an option to allow customer to retain their current water meter and that the policy is not yet complete. You can tell them that there may be added cost to retain their current meter
- Make it clear that they can wait to decide whether to change their meter until after that policy is completed and approved by exercising a "Defer" option. Once the policies are final they will then be notified of the final policy and at that time they can either proceed with the installation of the smart meter or exercise their right to "opt-out".

TOM ESSER
4610 HAMLET PL
MADISON WI 53714

<http://maisonsaine.ca/smart-meters-correcting-the-gross-misinformation/>

Smart Meters: Correcting the Gross Misinformation

agfauteux | 11 juillet 2012 | 29 Commentaires

Quebec-based magazine *La Maison du 21e siecle* asked physician David O. Carpenter, former founding dean of the University at Albany (NY)'s School of Public Health, to comment on a letter published in the Montreal daily *Le Devoir* last May 24. This letter claimed wireless smart meters pose no risk to public health. Some forty international experts contributed to the following rebuttal.

We, the undersigned are a group of scientists and health professionals who together have coauthored hundreds of peer-reviewed studies



Dr David O. Carpenter, founder, University at Albany (NY) School of Public Health

on the health effects of electromagnetic fields (EMFs). We wish to correct some of the gross misinformation found in the letter regarding wireless "smart" meters that was published in the Montreal daily *Le Devoir* on May 24. Submitted by a group of Quebec engineers, physicists and chemists, the letter in question reflects an obvious lack of understanding of the science behind the health impacts of the radiofrequency (RF)/microwave EMFs emitted by these meters.

The statement that « Thousands of studies, both epidemiological and experimental in humans, show no increase in cancer cases as a result of exposure to radio waves of low intensity... » is false (1). In fact, only a few such studies — two dozen case-control studies of mobile phone use, certainly not thousands, have reported no elevations of cancer, and most were funded by the wireless industry. In addition, these reassuring studies contained significant experimental design flaws, mainly the fact that the populations followed were too small and were followed for a too short period of time.

Non industry-funded studies have clearly demonstrated a significant increase in cancer cases among individuals who have suffered from prolonged exposure to low-level microwaves, transmitted notably by radio antennas. The effects were best documented in meta-analyses that have been published and that include grouped results from several different studies: these analyses consistently showed an increased risk of brain cancer among regular users of a cell phone who have been exposed to microwaves for at least ten years.

Brain Cancer Rates

Furthermore, the argument that brain cancer rates do not indicate an overall increase in incidence is not evidence

that cell phones are safe: the latency for brain cancer in adults after environmental exposure can be long, up to 20-30 years. Most North Americans haven't used cell phones extensively for that long. The evidence of the link between long-term cell phone use and brain cancer comes primarily from Northern Europe, where cell phones have been commonly used since the 1990s.

Children are especially at risk. In May 2012, the U.K.'s Office of National Statistics reported a 50 percent increase in incidence of frontal and temporal lobe tumors in children between 1999 and 2009. This statistic is especially disturbing since in May 2011, after reviewing the published scientific literature regarding cancers affecting cell phone users, the International Agency for Research on Cancer (IARC) classified radiofrequency radiation as a 2B, possible human carcinogen. Despite the absence of scientific consensus, the evidence is sufficiently compelling for any cautious parent to want to reduce their loved one's exposure to RF/microwave emissions as much as possible, as recommended by various countries such as Austria, Belgium, Germany, Russia and the United Kingdom.

Electrosensitivity

Public fears about wireless smart meters are well-founded. They are backed by various medical authorities such as those of the Santa Cruz County (California) Public Health Department. These authorities are worried about the growing number of citizens who say they have developed electrohypersensitivity (EHS), especially since for many of them, the symptoms developed after the installation of such meters (it takes some time for most people to link the two events).

Since the turn of the millennium, people are increasingly affected by ambient microwaves due to the growing popularity of wireless devices such as cell phones and Wi-Fi Internet. Therefore, the mass deployment of smart grids could expose large chunks of the general population to alarming risk scenarios without their consent. According to seven surveys done in six European countries between 2002 and 2004, about 10% of Europeans have become electrosensitive, and experts fear that percentage could reach 50% by 2017. The most famous person to publicly reveal her electrosensitivity is Gro Harlem Brundtland, formerly Prime Minister of Norway and retired Director of the World Health Organization (WHO).

While there is no consensus on the origins and mechanisms of EHS, many physicians and other specialists around the world have become aware that EHS symptoms (neurological dermatological, acoustical, etc.) seem to be triggered by exposure to EMF levels well below current international exposure limits, which are established solely on short-term thermal effects (2). Organizations such as the Austrian Medical Association and the American Academy of Environmental Medicine have recognized that the ideal way to treat of EHS is to reduce EMF exposure.

Therefore, caution is warranted because the growing variety of RF/microwave emissions produced by many wireless devices such as smart meters have never been tested for their potential biological effects.

Well-known bioeffects

While the specific pathways to cancer are not fully understood, it is scientifically unacceptable to deny the weight of the evidence regarding the increase in cancer cases in humans that are exposed to high levels of RF/microwave radiation.

The statement that « there is no established mechanism by which a radio wave could induce an adverse effect on human tissue other than by heating » is incorrect, and reflects a lack of awareness and understanding of the scientific literature on the subject. In fact, more than a thousand studies done on low intensity, high frequency, non-ionizing radiation, going back at least fifty years, show that some biological mechanisms of effect do not involve heat. This radiation sends signals to living tissue that stimulate biochemical changes, which can generate various symptoms and may lead to diseases such as cancer.

Even though RF/microwaves don't have the energy to directly break chemical bonds, unlike ionizing radiation such as X-rays, there is scientific evidence that this energy can cause DNA damage indirectly leading to cancer by a combination of biological effects. Recent publications have documented the generation of free radicals, increased permeability of the blood brain barrier allowing potentially toxic chemicals to enter the brain, induction of genes, as well as altered electrical and metabolic activity in human brains upon application of cell phone RF/microwaves similar to those produced by smart meters.

These effects are cumulative and depend on many factors including RF/microwave levels, frequency, waveform, exposure time, biovariability between individuals and combination with other toxic agents. Clear evidence that these microwaves are indeed bioactive has been shown by the fact that low-intensity EMFs have proven clinically useful in some circumstances. Pulsed EMFs have long been used to successfully treat bone fractures that are resistant to other forms of therapy. More recently, frequency-specific, amplitude-modulated EMFs have been found useful to treat advanced carcinoma and chronic pain.

High frequency EMFs such as the microwaves used in cell phones, smart meters, Wi-Fi and cordless "DECT" phones, appear to be the most damaging when used commonly. Most of their biological effects, including symptoms of electrohypersensitivity, can be seen in the damage done to cellular membranes by the loss of structurally-important calcium ions. Prolonged exposure to these high frequencies may eventually lead to cellular malfunction and death.

Furthermore, malfunction of the parathyroid gland, located in the neck just inches from where one holds a cell phone, may actually cause electrohypersensitivity in some people by reducing the background level of calcium ions in the blood. RF/microwave radiation is also known to decrease the production of melatonin, which protects against cancer, and to promote the growth of existing cancer cells.

Early warning scientists attacked

In recommending that the Precautionary Principle be applied in EMF matters, the European Environment Agency's Director Jacqueline McGlade wrote in 2009: "We have noted from previous health hazard histories such as that of lead in petrol, and methyl mercury, that 'early warning' scientists frequently suffer from discrimination, from loss of research funds, and from unduly personal attacks on their scientific integrity. It would be surprising if this is not already a feature of the present EMF controversy... » Such unfortunate consequences have indeed occurred.

The statement in the *Le Devoir* letter that « if we consider that a debate should take place, it should focus exclusively on the effects of cell phones on health » is basically an acknowledgement that there is at least some reason to be concerned about cell phones. However, while the immediate exposure from a cell phone is of much greater intensity than the exposure from smart meters, cell phone use is temporary.

Smart meters

Wireless smart meters typically produce atypical, relatively potent and very short pulsed RF/microwaves whose biological effects have never been fully tested. They emit these millisecond-long RF bursts on average 9,600 times a day with a maximum of 190,000 daily transmissions and a peak level emission two and a half times higher than the stated safety signal, as the California utility Pacific Gas & Electric recognized before that State's Public Utilities Commission. Thus people in proximity to a smart meter are at risk of significantly greater aggregate exposure than with a cell phone, not to mention the cumulative levels of RF/microwaves that people living near several meters are exposed to.

People are exposed to cell phone microwaves primarily in the head and neck, and only when they use their device. With smart meters, the entire body is exposed to the microwaves, which increases the risk of overexposure to many organs.

In addition to these erratic bursts of modulated microwaves coming from smart meters that are transferring usage data to electric, gas and water utilities, wireless and wired smart (powerline communication) meters are also a major source of "dirty electricity" (electrical interference of high frequency voltage transients typically of kilohertz frequencies). Indeed, some scientists, such as American epidemiologist Sam Milham, believe that many of the health complaints about smart meters may also be caused by dirty electricity generated by the « switching » power supply activating all smart meters. Since the installation of filters to reduce dirty electricity circulating on house wiring has been found to relieve symptoms of EHS in some people, this method should be considered among the priorities aimed at reducing potential adverse impacts. Indeed, the Salzburg State (Austria) Public Health Department confirms its concern about the potential public health risk when in coming years almost every electric wire and device will emit such transient electric fields in the kilohertz-range due to wired smart meters.

Rather be safe than sorry

The apparent adverse health effects noted with smart meter exposure are likely to be further exacerbated if smart appliances that use wireless communications become the norm and further increase unwarranted exposure.

To date, there have been few independent studies of the health effects of such sources of more continuous but lower intensity microwaves. However, we know after decades of studies of hazardous chemical substances, that chronic exposure to low concentrations of microwaves can cause equal or even greater harm than an acute exposure to high concentrations of the same microwaves.

This is why so many scientists and medical experts urgently recommend that measures following the Precautionary Principle be applied immediately — such as using wired meters — to reduce biologically inappropriate microwave exposure. We are not advocating the abolishment of RF technologies, only the use of common sense and the development and implementation of best practices in using these technologies in order to reduce exposure and risk of health hazards.

1. Scientific papers on EMF health effects
 2. Explanation and studies on electrosensitivity
 3. Governments and organizations that ban or warn against wireless technology
- David O. Carpenter, MD, Director, Institute for Health & the Environment, University at Albany, USA
 - Jennifer Armstrong, MD, Past President, Canadian Society of Environmental Medicine, Founder, Ottawa Environmental Health Clinic, Ontario, Canada
 - Pierre L. Auger, M. D., FRCPC, Occupational medicine, Multiclinique des accidentés 1464, Montreal, Quebec, Canada
 - Fiorella Belpoggi, Director Cesare Maltoni Cancer Research Center, Ramazzini Institute, Bologna, Italy
 - Martin Blank, PhD, former President, Bioelectromagnetics Society, Special Lecturer, Department of Physiology and Cellular Biophysics, Columbia University Medical Center, New York, USA
 - Barry Breger, MD, Centre d'intégration somatosopique (orthomolecular medicine), Montreal, Quebec
 - John Cline, MD, Professor, Institute for Functional Medicine, Federal Way, WA, USA, Medical Director, Cline Medical Centre, Nanaimo, BC, Canada
 - Alvaro Augusto de Salles, PhD, Professor of Electrical Engineering, Federal University of Rio Grande do Sul, Porto Alegre, Brazil
 - Christos Georgiou, Prof. Biochemistry, Biology Department, University of Patras, Greece
 - Andrew Goldsworthy, PhD, Honorary lecturer in Biology, Imperial College, London, UK
 - Claudio Gómez-Perretta, MD, PhD, Director, Centro de Investigación, Hospital Universitario LA Fe, Valencia, Spain
 - Livio Giuliani, PhD, Senior Researcher, National Insurance Institute (INAIL), Chief of Radiation and Ultrasounds Research Unit, Rome, Italy
 - Yury Grigoriev, PhD, Chair Russian National Committee on Non-Ionizing Radiation Protection, Moscow, Russia

- Settimio Grimaldi, PhD, Director, Institute of Translational Pharmacology (Neurobiology and molecular medicine), National Research Council, Rome, Italy
- Magda Havas, PhD, Centre for Health Studies, Trent University, Canada
- Lennart Hardell, MD, Professor of Oncology, University Hospital, Örebro, Sweden
- Denis L. Henshaw, PhD, Professor of Physics, Head of The Human Radiation Effects Group, University of Bristol, UK
- Ronald B. Herberman, MD, Chairman of Board, Environmental Health Trust, and Founding Director emeritus, University of Pittsburgh Cancer Institute, USA
- Isaac Jamieson, PhD Environmental Science (electromagnetic phenomena in the built environment), independent architect, scientist and environmental consultant, Hertfordshire, UK
- Olle Johansson, PhD, Professor of Neuroscience (Experimental Dermatology Unit), Karolinska Institute, Stockholm, Sweden
- Yury Kronn, PhD, Soviet authority on physics of nonlinear vibrations and high frequency electromagnetic vibrations, founder of Energy Tools International, Oregon, USA
- Henry Lai, PhD, Professor of Bioengineering, University of Washington School of Medicine, Seattle, WA, USA
- Abraham R. Liboff, PhD, Professor Emeritus, Department of Physics, Oakland University, Rochester, Michigan, USA
- Don Maisch, PhD, Researcher on radiation exposure standards for telecommunications frequency, EMFacts Consultancy, Tasmania, Australia
- Andrew A. Marino, MD, PhD, JD, Professor of Neurology, LSU Health Sciences Center, Shreveport, LA, USA
- Karl Maret, MD, M.Eng., President, Dove Health Alliance, Aptos, CA, USA
- Sam Milham, MD, former chief epidemiologist, Washington State Department of Health, USA
- Joel M. Moskowitz, PhD, Director, Center for Family and Community Health, School of Public Health, University of California, Berkeley
- Gerd Oberfeld, MD, Public Health Department, Salzburg State Government, Austria
- Jerry L. Phillips, PhD, Director, Center for Excellence in Science, Department of Chemistry and Biochemistry, University of Colorado, USA
- John Podd, PhD, Professor of Psychology (experimental neuropsychology), Massey University, New-Zeland
- William J. Rea, MD, thoracic and cardiovascular surgeon, founder of the Environmental Health Center, Dallas, Tx, USA
- Elihu D. Richter, MD, Professor, Hebrew University-Hadassah School of Public Health and Community Medicine, Jerusalem, Israel
- Leif G. Salford, MD, Senior Professor of Neurosurgery, Lund University, Sweden
- Nesrin Seyhan, MD, Founder and Chair of Biophysics, Medical Faculty of Gazi University, Turkey
- Cyril W. Smith, PhD, lead author of "Electromagnetic Man", retired from Electronic and Electrical Engineering, University of Salford, UK
- Morando Soffritti, MD, Scientific Director of the European Foundation for Oncology and Environmental Sciences "B. Ramazzini" in Bologna, Italy
- Antoinette "Toni" Stein, PhD, Collaborative on Health and the Environment (CHE-EMF Working Group), Co-Coordinator, Berkeley, CA, USA
- Stanislaw Szmigielski, MD, PhD Professor of Pathophysiology, Consulting Expert, former director of Microwave Safety, Military Institute of Hygiene and Epidemiology, Warsaw, Poland
- Bradford S. Weeks, MD, Director, The Weeks Clinic, Clinton, WA, USA
- Stelios A. Zinelis, MD, Vice-President, Hellenic Cancer Society, Cefallonia, Greece

Coordination: André Fauteux, Publisher and Editor in chief, *la Maison du 21e siècle* magazine, Sainte-Adele, Quebec, Canada.

Pas d'articles similaires.

Mots-clé: brain cancer, cancer, microwaves, quebec, radiofrequency, smart meters

Catégorie: Archi Eco Saine

PROPOSED WATER UTILITY CUSTOMER OPT-OUT POLICY

by

Dolores Kester

Water Utility Board 7-24-12

SMART METERS; CUSTOMER RIGHTS

(a) **Definitions.** As used in this section, the following terms shall have the following meanings:

(1) **“Smart meter”** means a wired smart meter or a wireless smart meter.

(2) **“Wired smart meter”** means an advanced metering infrastructure device using a fixed wire for two-way communication between the device and a utility company.

(3) **“Wireless smart meter”** means an advanced metering infrastructure device using radio or other wireless means for two-way communication between the device and a utility company.

(4) **“Avoided cost”** is whatever cost or expenditure which a utility is able to avoid incurring as a result of a customer opting out of a smart meter.

(5) **“Incremental cost”** is the cost of additional resources that a utility must procure to provide a new or existing good or service.

(6) **“Carrying cost”** of a capital asset, such as a smart meter, is the utility’s approved return on rate base, plus the average depreciation rate of the asset, multiplied by the approved regulatory value of the asset in overall rate base.

(b) **Customer rights.** Notwithstanding any law, order, or agreement to the contrary, a utility company may install a wireless smart meter on a customer’s premises, provided the company:

(1) provides prior written notice to the customer thirty (30) days prior to any intended meter installation indicating that the meter will use radio or other wireless means for two-way communication between the meter and the company and informing the customer of the possible health and safety risks associated with the technology; as well as his or her rights under subdivisions (2) and (3) of this subsection;

(2) allows a customer to choose not to have a wireless smart meter installed, subject to the conditions in subdivisions (c), (d), and (e); and

(3) allows a customer to require removal of a previously installed wireless smart meter for any reason and at an agreed-upon time, without incurring any charge for such removal.

(c) Customers are not liable to pay for the smart meters they opt out of having, which are “avoided costs” for the utility.

(d) Customers may be liable to pay for the incremental cost of any additional activities required by the utility that directly result from their opting out, such as additional staff time for meter reading if required to verify energy usage; this incremental cost would be in the form of a surcharge.

(e) If a utility’s approved tariff for all residential customers includes the carrying costs of smart meters installed on the system, a customer who opts out of having a smart meter will receive an annual credit equal to the annual carrying cost of a smart meter.

(f) A utility may consolidate any avoided cost and incremental cost surcharge attributable to opting out as a net annual credit or debit for the customer.

(g) A utility shall submit their itemized calculation of the avoided and incremental costs on an annual basis to the Commission and to the customer.

INSTALLED WIRELESS SMART METERS

If a utility company has installed a wireless smart meter as defined above prior to the effective date of this act, the company shall provide notice of the installation to the applicable customers, and such notice shall include a statement of customer rights as described under Sections (b) through (g) above.



Fact Sheet Regarding the Smart Meter “Opt Out” Policy July 24, 2012 Meeting Madison Water Utility Board

- An appropriate opt-out policy should start with two straightforward and non-controversial principles
 - No customer who opts out of having a retrofitted smart meter should pay for the costs of the smart meter
 - MWU should be kept “whole” and compensated for any costs that result from a customer’s opt-out decision
- Both principles need to be satisfied if the costs of smart meter investments are to be recovered efficiently and fairly
- Each principle is related to a cost concept that is also relevant to designing an appropriate opt-out policy.
 - The first principle pertains to what is known as an *avoided cost*. When customers opt-out of having a smart meter on their premises, MWU avoids the costs of having to order and install these meters. Opting out of smart meters therefore leads to immediate cost savings, and these cost savings should be passed through directly to the customers who have opted out and are responsible for them.
 - The second principle is related to an *incremental cost*, or the costs of additional resources that firms must procure either to provide a new good or service, or additional units of an existing good or service. If MWU must incur additional costs to meter and bill customers who choose not to have smart meters, those customers should compensate MWU for these incremental costs.
- Both cost concepts should be incorporated in MWU’s opt out policy.
 - If customers choose to own smart meters, they should pay the costs of those smart meters.
 - If customers opt out of having smart meters, they should not pay the avoided costs of the smart meters, but they should pay for the incremental costs of additional activities MWU must undertake to meter these customers’ water consumption.
 - These principles are simple, straightforward, efficient, and fair, and they should be reflected directly in the financial terms of any opt-out provision.

- Since cost of service regulation will soon be used to recover the costs of MWU's smart meters, the opt out provision *must* include a credit to customers who have chosen not to have a smart meter; this is a direct consequence of the avoided cost principle
- The proper amount of this credit can be computed as the "carrying cost" of each smart meter; I estimate the value of this credit will be roughly \$25 per year
- The most substantial incremental cost associated with opting out is that MWU would have to send a manual meter reader out to read the meters of the opt-out customers, whose consumption would otherwise be recorded remotely
- In practice, however, it is not clear that meter reading would be an incremental activity since MWU is committed to employing its current Staff (including its current meter readers) even after the AMI rollout is complete
- While the specific financial parameters of an opt-out provision need to be finalized, the principles for designing an appropriate opt out policy are clear
 - Customers should *not* pay for the costs of smart meter assets they avoid by opting out, but they *should* pay for new activities and resources that MWU must incur to meter and bill customers after they opt out
 - Opt-out customers should receive a credit on their MWU bills to ensure that they do not pay for the costs they have avoided, but they should be billed for any incremental activities that result from opting out
 - Avoided cost credits and incremental cost surcharges can be consolidated as a net annual credit or debit, whose value should be determined using documented MWU data on the avoided and incremental costs associated with opting out
- An opt-out policy designed in this manner will recover MWU's costs fully and efficiently and be fair to all MWU customers, whether they elect to have new smart meters or not



Comments on Appropriate Policy for Opting Out of Smart Meters Meeting July 24, 2012

My name is Larry Kaufmann, and for the last 19 years I have been a professional economic consultant specializing in utility regulation. My remarks today concern the “opt out” provision being developed by the Madison Water Utility (MWU), which will apply to MWU customers who do not wish to have a retrofitted “smart meter” attached to their premises. I have been motivated to offer these remarks because of the discussion of the opt-out issue I observed at the July 10th meeting of the Water Utility Board. In particular, I thought the discussion that afternoon was somewhat unfocused and *ad hoc*, and I believe my experience in advising utilities and regulators on similar issues could help the Board and MWU design an opt-out policy that is efficient and fair to customers and MWU.

My approach to the opt-out issue starts with two straightforward and non-controversial principles. First, no customer who opts out of having a retrofitted smart meter should pay for the costs of the smart meter that they have explicitly directed MWU not to install on their premises. Second, MWU should be kept “whole” and compensated for any costs to the utility that result directly from a customer’s decision to opt-out of the new smart meters. Both principles need to be satisfied if the costs of smart meter investments are to be recovered as efficiently as possible. I also believe most stakeholders would agree that both principles need to be satisfied if the opt-out policy is to be fair to all parties.

Each of these principles is also related to a cost concept that is relevant to designing an appropriate opt-out policy. The first principle – customers should not have to pay for the smart meter that they’ve asked MWU not to install – pertains to what is known as an *avoided cost*. When customers opt-out of having a smart meter on their premises, MWU avoids the costs of having to order and install these meters. Opting out

of smart meters therefore leads to immediate cost savings for MWU. These cost savings should be passed through directly to the customers who are, effectively, responsible for the savings: the customers who have chosen to opt-out and not replace their existing analog meter. The cost savings that result from fewer purchases and installations of smart meters should not be “shared” with all MWU customers.

The second principle is related to what is known as an *incremental cost*. Incremental costs refer to the costs of additional resources that firms must procure either to provide a new good or service, or additional units of an existing good or service. In the current case, customers are not really requesting a new service; instead, they are asking MWU to continue to provide them with the same water delivery and metering service that they had before MWU decided to retrofit their meters. Nevertheless, it may be true that MWU’s existing metering service could require the utility to procure additional, metering-related resources compared with the scenario where *all* metering services would be provided by retrofitted smart meters. It should also be recognized that this is the scenario customers are essentially requesting to opt-out of when they ask MWU not to install a retrofitted smart meter on their premises. This means that, if MWU must incur additional costs to meter and bill customers who choose not to have smart meters, those customers should compensate MWU for these incremental costs.

Both cost concepts should be incorporated in MWU’s opt out policy. If customers choose to own smart meters, they should pay the costs of those smart meters. If customers opt out of having smart meters, they should not pay the costs of the smart meters, but they should pay for the costs of any additional activities that MWU needs to undertake to meter these customers’ water consumption. These principles are simple, straightforward, efficient, and fair, and they should be reflected directly in the financial terms of any opt-out provision.

Two other points should also be recognized when designing the opt-out provisions. One is that, when setting utility rates, the costs of new meter investments are typically “rolled in” to the utility’s overall “rate base.” The depreciation and capital costs of this updated rate base are then allocated to different customers using cost of service, utility ratemaking principles. Since this standard, cost of service regulatory process will soon be used to recover the costs of MWU’s smart meters (as well as other costs of

providing service), the opt out provision *must* include a credit to customers who have chosen not to have a smart meter. This flows directly from the avoided cost principle *i.e.*

- The opt-out customers have avoided the costs of smart meters;
- The prices that these customers pay for water delivery services should therefore not reflect the costs of the smart meters;
- BUT these smart meter costs *will* be reflected in the standard tariffs approved for all residential customers' water service;
- Therefore, there must be a credit back to the opt-out customers to ensure that the prices they pay for MWU water services do not recover the costs of smart meters they have deliberately avoided.

I believe the proper amount of this credit can be computed as the “carrying cost” of each smart meter. When this is the case, MWU water tariffs exactly recover the carrying costs of the smart meters from each MWU customer, whether that customer has opted for a smart meter or not. However, the customers who have opted out of having a smart meter will receive a credit on their bill exactly equal to the carrying costs of the smart meter. On balance, this means that customers who have opted out pay nothing for smart meters, and the costs of purchasing and installing smart meters are recovered entirely from the customers who have opted to use them. Using information presented in the *Madison AMI Business Case* and the Final Decision in MWU’s most recent decision before the PSC, I estimate that the value of the credit to customers who opt out will be roughly \$25 per year.¹ This credit should be in effect until customers either elect to have a smart meter, or until their existing analog meter is fully depreciated and needs to be replaced.

¹ This estimate was determined as follows: the AMI Business Case says that 66,000 retrofitted smart meters will be installed at a cost of \$13,902,000; this is equivalent to a cost of \$210.63 per meter. The annual carrying cost of capital is roughly equal to the “return on” and the “return of” capital, which in turn is equal to (MWU’s approved return on rate base + average depreciation rate of the assets) * cost of the assets. In its most recent rate case, MWU’s approved return on rate base was 6.9%; the retrofitted smart meters also reportedly have an expected life span of 20 years, which means the annual, straight line depreciation rate is 5%. The annual carrying cost of the smart meters is therefore $(.069 + .05) * \$210.63 = \25.07 . If customers are billed monthly, their effective monthly charge for the smart meters would be $(\$25.07/12) = \2.09 ; opting out customers could therefore receive either a \$2.09 credit on each bill or an annual check for \$25.07 to ensure that their approved water tariffs do not recover the costs of smart meters.

It is also important to consider what incremental activities MWU needs to undertake, or resources it needs to procure, to meter the water consumption of customers who have opted out of smart meters. Two sources of incremental costs seem apparent. The first is the cost of preparing adjusted bills to reflect the credit for avoided smart meter costs. Some incremental programming costs may be necessary to adjust bills, but I believe they would be minor, particularly since the billing software would already be updated when the prices for MWU services are changed to recover the costs of the smart meters.

The second, and perhaps more substantial, source of incremental costs is that MWU would have to send a manual meter reader out to read the meters of the opt-out customers. These meter reading costs would (in theory) vanish when retrofitted meters permit consumption to be recorded remotely, but MWU would still need to employ meter readers for the customers who opt out of smart meters. These meter reading costs stem directly from the decision to opt out of remote meter reading and are therefore an incremental cost associated with the opt-out customers.

In practice, however, it is not clear that meter-reading activities will necessarily be incremental for MWU after the smart meter rollout is complete. The *Madison AMI Business Case* (p. 33-34) makes it clear that MWU is committed to keeping its entire current staff. This appears to be the case even though the number of full time meter readers is eventually projected to decline from the current three full-time employees (FTEs) to no FTEs. Given this commitment by MWU, it may be reasonable to assume that one (or perhaps more) of the meter readers who were projected to be reassigned could instead continue to read meters for the customers who have opted out of smart meters. Doing so would reduce the incremental costs associated with smart metering.

In sum, while the specific financial parameters of an opt-out provision need to be finalized, the principles for designing an appropriate opt out policy are clear. Customers should *not* pay for the costs of smart meter assets they avoid by opting out, but they *should* pay for new activities and resources that MWU must incur to meter and bill customers after they opt out. Opt-out customers should receive a credit on their MWU bills to ensure that they do not pay for the costs they have avoided, but they should be billed for any incremental activities that result from opting out. Any avoided cost credit

and incremental cost surcharge can be consolidated as a net annual credit or debit, whose value should be determined using documented MWU data on the avoided and incremental costs associated with opting out. An opt-out policy designed in this manner will recover MWU's costs fully and efficiently and be fair to all MWU customers, whether they elect to have new smart meters or not.