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Dear President-Elect Obama and Vice President-Elect Biden,

Thank you for the opportunity to contribute to the discussion about change in the USA. I would like to suggest a low cost, high impact, simple change that, I believe, will not only have a massive impact on the USA, but also on the rest of the world. (Note: *Support for these views are contained in the references below.*)

The greatest thing you can do to support change in the USA is for you — personally — to openly embrace the use of the metric system. This simple act of leadership — declaring by your example that it is morally OK to use the metric system — would have a profound effect on the behaviour of your citizens and it would directly lead to cost reductions in every activity in the USA, every day.

Currently, many of your citizens appear to be in denial with respect to the metric system. The majority of your industries use metric measures internally, and then they convert the metric units to old pre-metric measures (dumb them down) to communicate with the public. This process is extremely inefficient and extremely costly. For example, the computer industry in the USA designs and makes all components and parts using metric units — and then sells computers as (say) the 17-inch model. To mentally accommodate this, all children in the USA then have to, quite unnecessarily, try to learn two different methods of measuring and how to convert between them.

If you were to openly embrace the metric system personally, you would directly support this statement from your acceptance speech:

*Today we begin in earnest the work of making sure that the world we leave our children is just a little bit better than the one we inhabit today.*

Except that your personal support for the metric system would provide huge benefits to all activities in the USA — every day — so when you reflect on this quotation you would have to change the words from, '*a little bit*' to '*a whole lot*'.

### **What do you need to do?**

In a word the USA needs leadership and, in the case of the metric system, all that is required is that you personally do two things.

**Firstly**, insist that the people who report to you do so honestly. This means they would need to use the measuring units that they actually use when they make and record their observations. If it is a report about Iraq or Afghanistan, insist that your military advisors tell you the truth using units such as kilometres for distance and kilograms of explosives, the same measuring units they use in Iraq. If it is a report about a Mars mission, insist on the truth in metres per second and kilograms of spacecraft fuel, as used at NASA Mission Control. If it is a medical issue, demand that your advisors use microlitres, millilitres, micrograms, and milligrams that they use in hospitals. Don't let anyone lie to you by dumbing down the metric units they actually use every day into old pre-metric measures, as they usually do when they report to the media and the public in the USA.

**Secondly**, ask your speechwriters to use metric measurements in your speeches, words such as grams for babies, grams and kilojoules for diets, megajoules and gigajoules for energy, kilowatts for power, and metres and kilometres for distance.

Based on my extensive travels in the USA in 2005 and 2007, I am confident that the time is now right for metrication leadership.

### **And that's it.**

There is no need for legislation or administrative orders as these have already been done (for example in 1866, 1893, 1975, and 1988); there is no need for large expenditure; and the task can be completed quickly with huge ongoing benefits.

Yours faithfully,

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A formatted copy of this letter can be found at <http://www.metricationmatters.com/docs/NaughtinToObamaBiden.pdf>

The following are some of the many benefits.

### **Renew American Global Leadership**

The USA once led the world on measurement issues. Political and intellectual pressure from your predecessors as presidents of the USA, George Washington and Thomas Jefferson, encouraged the French to make sure that the metric system became the 'decimal' metric system during the late 1780s and the 1790s when the USA led the world with decimal currency.

Now, on the issue of measurement the USA is lagging behind the rest of the world, and as a result it is extraordinarily isolated. The only other nations in the world that are comparable in their use of the metric system are Burma (Myanmar) and Liberia. Every other nation in the world has openly embraced it. The USA uses the metric system extensively, but unfortunately chooses to hide this fact, and in doing so waste trillions of dollars. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

### **Revitalise the economy**

The USA has limited its trade opportunities because its measuring methods are only appropriate internally within the USA, and conversions are necessary for international trade. There are massive gains to be made by not hiding the use of the metric system in the USA. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

### **Provide improved health care for all citizens of the USA**

At present, there is an average of about one error made in each hospital in the USA, each day, for each patient. About 98 000 patients die unnecessarily every year from errors made in hospitals. Many of these errors are related to faulty measuring methods that require constant conversions, with their attendant errors, and many people, young and old, die as a result of these errors. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

### **Protect America from many external threats**

Your customs and border patrol officers need to confront the world outside the USA every day as they interact with all of your visitors and traders. As all major nations have agreed to use the metric system to promote honest trading, and to reduce cheating through measurement obfuscation, your border protection staff waste incalculable hours trying to convert the metric measurements that are presented to them by your visitors into the old pre-metric measures used in the USA. This applies to all the issues they face, both legal in terms of cargoes that arrive by ship and plane, and illegal in terms of drugs and diseased animals. In all cases they would understand the issues better if they used the same metric units that all major nations have agreed upon. Requiring honest and open measurement is not a new issue (see Deuteronomy 25:13-14), yet border officials have to confront all of the possible deceptions they face armed with unnecessarily complex measures. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

### **Improve education standards**

All students in the USA have to learn about old pre-metric measures that are not used by most industries in the USA, and that are generally not used anywhere else in the world. Children in the USA must also try to learn to convert between the many thousands of old pre-metric measures and modern metric units. It is likely that about 10 % of the USA mathematics education budget could be saved by not teaching old pre-metric measures. Industry in the USA, desperate for young employees who can work with metric units for designing, making, and selling products for export, currently have to train them in the use of the metric system after they leave school. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

### **Reduce unnecessary international animosities**

It is hard to evaluate the cost of the animosity that arises when people in all nations of the world avoid working with citizens of the USA, because these USA citizens don't know how to measure simply, honestly, and openly using the worldwide standards incorporated in the metric system. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

## **Embrace the world community**

The USA is seen in so many ways as damaging to the infrastructure of so many other nations. For example, the computer hardware and software companies from the USA design in metric units and build in metric units, then dumb down their products with screen sizes and default margins in inches for the citizens of the USA. When these dumbed-down values are exported this means that all other nations have to teach children about old pre-metric measures to accommodate this practice. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

## **Understand energy issues better**

The USA leads the world in complexity when it comes to energy measurement. I have counted some 199 different measures for energy in the USA. These energy measures require some 39 402 conversion factors to be understood. Compare this with the single energy unit in the metric system, joule, that requires no conversion factors at all. This is a particularly worrying issue at a time when issues such as 'global warming' and 'peak oil' need to be considered urgently. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

## **Simplify many other domestic and foreign policy objectives.**

The present situation in the USA is that many people in the USA use the metric system every day — and then choose to hide this fact from other members of the public. All human activities have benefitted from metric measuring units in all nations of the world, but this benefit is hidden from the public in the USA. *This costs a great deal of money. Openly using the metric system would remove most of these problems.*

## **Of the People, By the People**

Abraham Lincoln concluded his Gettysburg Address by saying:

*— and that government of the people, by the people, for the people, shall not perish from the earth.*

In doing so, he probably nodded an attribution to similar lines by the abolitionist, Theodore Parker and the USA Senator Daniel Webster who had previously used similar lines in sermons and speeches.

However, what struck me was an even earlier line from a close personal friend of Thomas Jefferson (and principle author of the French Constitution), the Marquis Marie-Jean-Antoine-Nicolas de Caritat, known as de Condorcet, who when referring to the metric system in 1793 wrote that it was:

*For all time, for all people.*

We now know that de Condorcet was right. When we consider the issues you raise: Civil rights, Defense, Disabilities, Economy, Education, Energy & environment, Ethics, Faith, Family, Fiscal, Foreign policy, Healthcare, Homeland security, Immigration, Iraq, Poverty, Rural, Service, Seniors & social security, Taxes, Technology, Urban policy, Veterans, and Women's issues, it is clear that the metric system has proved itself to be the best possible choice in all areas of human activity. And this is true from the moment we are born and measured in grams and millimetres to the choice of temperature or depth just after we die. In all things the metric system has proved to be simpler, more honest, more open and more useful in all human activities and for international co-operation with all people. The reason for this can be summarised as follows:

## **SHOW the COST**

The metric system is **Simple, Honest, Open, and Worldwide.**

Old pre-metric measures are **Complex, Obscure, Secret, and Territorial.**

The USA is a large and great nation, and cannot afford not to openly embrace the metric system as soon as possible. I have estimated this cost to the USA as more than a trillion dollars each year and these trillions are not a one-off expense. Not going metric is an ongoing expense that goes on in the USA year after year. To paraphrase the USA Senator Everett McKinley Dirksen (1896/1969): **'a trillion dollars this year, and a trillion dollars next year, pretty soon adds up to real money'**.

To conclude as I began: *I have no doubt that the greatest thing you could do to support change in the USA would be to openly embrace the use of the metric system.*

## References:

See <http://sharp.sefora.org/innovation2008/#questions> to see the original questions posed by the Scientists and Engineers for America and see <http://www.worldwidewords.org/qa/qa-ele2.htm> for an insight on the idea of an elephant in the room.

The YouTube video at <http://www.youtube.com/watch?v=Omh8Ito-05M> will give you some insight as to how much it might cost if the design specifications of 180 millimetres at the front and 140 millimetres at the back are dumbed down for workers in the USA.

In an article, 'The Case for U.S. Metric Conversion Now' (1992, December 9) Richard P. Phelps states:

*'It (USA education system) teaches two systems of measurement in the schools and, the confusion from learning two systems aside, there is a cost to the time spent in teaching two systems. A full year of mathematics instruction is lost to the duplication of effort.'*

You can view Richard P. Phelps' article after you register on the Education Weekly database at: <http://www.edweek.org/ew/articles/1992/12/09/14phelps.h12.html>

In her paper presented to the National Math Panel, *Teach Only the Metric System*, Lorelle Young, President of the United States Metric Association (USMA), stated that industry in the USA is now more than 60 % metric. Lorelle Young's paper can be found at <http://www.scribd.com/doc/1233594/-description-tags-8-metric2osystem>

According to a report at <http://www.aarp.org/research/health/carequality/Articles/aresearch-import-711-IB35.html>

*'The average number of errors per patient per day was 1.7.'*

Go to <http://www.visicu.com/solving/research/mederrors.html> to see quotations like this:

*'... medical errors were estimated to kill up to 98,000 Americans each year and to be due to human error "60-80%" of the time. That is more people in one year than died in the entire Vietnam War. That is more people than die from automobile accidents, AIDS or breast cancer yearly.'*

Search for the names, Benjamin Franklin, Thomas Jefferson, and George Washington in 'A chronological history of the modern metric system' to see the part that these three played in the development of the international system of units – the modern metric system. Go to: <http://www.metricationmatters.com/docs/MetricationTimeline.pdf>

You can see Pat Naughtin's submission to the (USA) National Math Panel by doing an advanced search for 'Naughtin' at: <http://www.ed.gov/about/bdscomm/list/mathpanel/index.html>

See <http://lamar.colostate.edu/~hillger/laws/index.html> for a summary of the laws, reports, and treaties relevant to metrication in the USA.

Additional supporting material for all of the above can be found at <http://www.metricationmatters.com/articles> in these articles that are of particular interest to metrication in the USA.

### **SI metric units vs USA measures**

This is a one page comparison between the complete set of units for the modern metric system (SI) and some of the old pre-metric measures currently in use in the USA. It is a dramatic demonstration of the power of the metric system. This single page can be found at <http://www.metricationmatters.com/docs/SIMetricUnitsVsUSAMeasures.pdf>

### **Energy words poster**

The International System of Units has only one unit for measuring energy. However, if you use old pre-metric measuring words you can confuse and obfuscate with a wide choice of jargon words like BThU and calorie, each of which has a multiple choice of definitions. The problems of energy issues in understanding global warming are obvious in this small poster

<http://www.metricationmatters.com/docs/EnergyWords.pdf>

## **A metrication elephant**

Sixteen groups of scientist and engineers in the USA developed seven seemingly simple questions about science and engineering to ask of presidential candidates before the 2008 election. They wanted to ask about: innovation, climate change, energy, education, water, research, and health, without once referring to how any of these things could or should be measured! This struck me as completely astounding. It was as if there was an elephant in the room — a metrication elephant — that no-one wanted to recognise. See:

<http://www.metricationmatters.com/docs/AMetricationElephant.pdf>

## **Metric conversion**

To decide on 'metric conversion' looks like a correct decision because, on the surface, it looks simple. However, hidden behind this apparent simplicity are three quite separate and distinct learning paths. You and your companions will learn: about the metric system; more than you ever needed to know about old pre-metric measures, and a whole new world of conversion factors and how to use them. This 3 page article explores these three learning paths. This article is at

<http://www.metricationmatters.com/docs/MetricConversion.pdf>

## **Commentary on John Wilkins' 'Of Measure'**

This commentary places the work of John Wilkins, 'AN ESSAY Towards a REAL CHARACTER, And a PHILOSOPHICAL LANGUAGE.(1668)', into an historical context. It shows that the metric system and the International System of Units (SI) had their origins in England and that the development of the metric system in France in the 1790s was heavily influenced by thinkers in the USA especially Benjamin Franklin, Thomas Jefferson, and George Washington. Find this at

<http://www.metricationmatters.com/docs/CommentaryOnWilkinsOfMeasure.pdf>

## **centimetres or millimetres — which will you choose?**

This is an analysis of the arguments for and against using centimetres or millimetres. It is in the form of a discussion between three people and it also includes summaries of the main discussion points and a conclusion to suggest future policies and actions. This article can be found at

<http://www.metricationmatters.com/docs/centimetresORMillimetres.pdf>

## **What is metrication?**

Direct metrication is one of the ways nations choose to 'go metric'. The other main ways are phased metrication and metric conversion. Direct metrication is fast, smooth and so economical that most nations, industries, and companies profit immediately from their metrication upgrade. See

<http://www.metricationmatters.com/docs/WhatIsMetrication.pdf>

## **Approaches to metrication**

This article describes the four approaches that people take when they begin their metrication program. Some of these don't make a lot of sense — in hindsight — but their proponents don't see the problems when they are starting out. As a metrication leader, you should be aware of the various approaches to metrication and you can then choose the most appropriate for you and your group. By choosing the right approach you can dramatically reduce the time and resources needed for your metrication program. If you have already started on a metrication program and it is not going well, this may help you identify and correct some of the problems. This article is at

<http://www.metricationmatters.com/docs/ApproachesToMetrication.pdf>

## **A word about global warming**

This is a short – 3 page – suggestion of how metrication might help to solve the worldwide global warming problem. This article suggests that the single word, joule, is sufficient for us to begin our understanding of not only 'global warming' but also other issues such as 'peak oil'. It includes criticism of the ways that individual companies, industries and nations choose to use old measures for energy at the expense of our understanding of these global issues and lessens our ability to do anything about these pressing problems. You can view this article at:

<http://www.metricationmatters.com/docs/AWordAboutGlobalWarming.pdf>

## **Costs of non-metrication**

This article that uses a question and answer technique to discuss the costs of not changing to the metric system in the USA. It refers to small and large companies, the national education system,

and to the USA as a whole. For a summary of where these costs arise, see <http://www.metricationmatters.com/docs/CostOfNonMetrication.pdf>

### **And just for fun**

Some people from the USA have told me that they don't use the metric system. As an irregular visitor to the USA, I know that it is almost impossible not to use the metric system for almost everything that you do in the USA every day. So, in response to this denial and with my tongue firmly placed in my cheek, I wrote an article called, 'Don't use metric', and I have posted it at <http://www.metricationmatters.com/docs/DontUseMetric.pdf>

Cheers and best wishes for a metric future for the USA,

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P.S. I don't think that you have a choice about metrication. The change to the metric system has proved to be inevitable in every other nation in the world. Your only choice is whether this happens quickly, smoothly, and economically — or slowly, bitterly, and at great expense.

Pat Naughtin is a metrication consultant who has advised the Australian Government, the Canadian Metric Association, Google, NASA, NIST, the United States Metric Association (USMA), and the United Kingdom Metric Association (UKMA). He is based in Geelong, Australia.