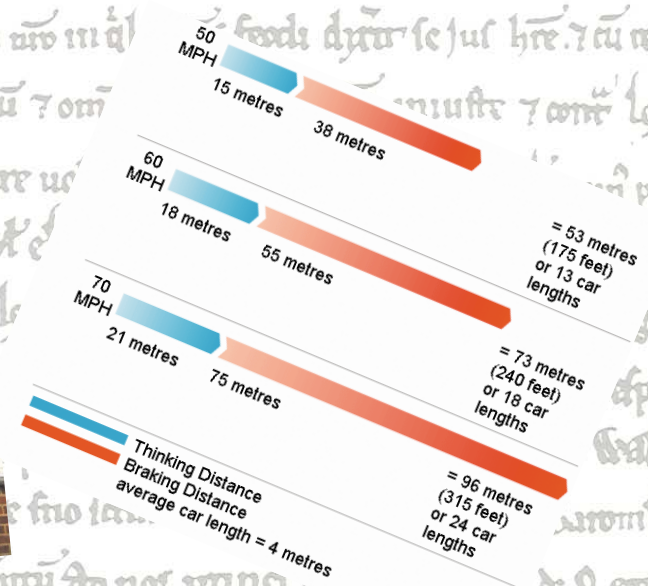




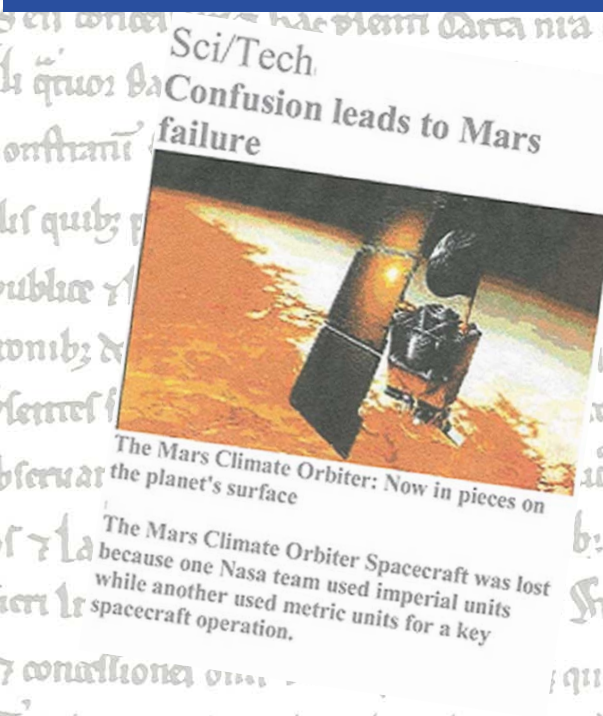
There shall be standard measures of wine, ale and corn (the London Quarter) throughout the kingdom. There shall also be a standard width of dyed cloth, russett, and haberdashery. Weights are to be standardised similarly.

Magna Carta, 1215

A very British mess



A report by the UK Metric Association



A very British mess

A response to the National Standardization Strategic Framework
by the United Kingdom Metric Association

www.ukma.org.uk



Acknowledgements

The UK Metric Association (UKMA) wishes to acknowledge with thanks the help and support of the Institute of Physics in the design and printing of this report.

The support of the Institute of Measurement and Control is also acknowledged.

UKMA is entirely responsible for the content of the report.

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Foreword by Lord Howe of Aberavon, CH, QC

British weights and measures are in a mess. Litres for petrol and fizzy drinks, pints for beer and milk. Metres and kilometres for athletics, miles per gallon for cars. The metric system for school and yet, all too often, still pounds and ounces in the market.

And this muddle does matter. It increases costs, confuses shoppers, leads to serious misunderstandings, causes accidents, wastes our children's education and, quite bluntly, puts us all to shame.

Almost 800 years ago, Britain's first charter of human rights - Magna Carta - proclaimed that there should be "one measure of wine throughout our whole realm...and one measure of corn...and one width of cloth". And before then and ever since, every civilized society has recognized the need for one set (and only one set) of standard measures.

So how did Britain get into this mess? Because we've been dithering for almost 150 years! As long ago as 1862, a House of Commons Select Committee unanimously recommended the adoption of the metric system. And a century later, in 1965 (years before we entered the Common Market), the decision was taken to go metric over the next ten years.

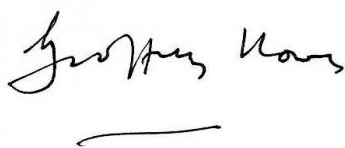
But in 1979, alas, the Government (of which I was a member) foolishly decided to go slow on the whole process. So we're still stuck half way. And the rest of the world has moved on. Australia, Kenya, New Zealand, South Africa, India, Jamaica - members of what we used to call the British Commonwealth - have all completed the change. By the end of the year, Ireland will have done the same.

Plainly we can't stay where we are, with two confused, competing systems. And it would be madness to go backwards. The only solution is to complete the changeover to metric - and as swiftly and cleanly as possible. It is long past time for us to summon up the will to get ourselves out of the present wasteful, untidy mess.

That explains the existence of the UK Metric Association, a small group of “ordinary people” (from every part of Great Britain), so fed up with the measurement muddle that they have decided to try and tackle it themselves. Teacher, nurse, architectural model maker, software expert, electronic engineer, cooking writer, office supplies manager, journalist, town planner, translator, librarian, police officer - all these are among our members. But not one politician - and no other hidden agenda!

So what am I doing here? Two or three years ago, I gladly accepted the invitation to serve as UKMA's Patron. I did so because I felt ashamed of my role in allowing the present shambles to develop. Having been responsible for Britain's metrification programme when I was Minister for Consumer Affairs, I didn't challenge the decision to abolish the Metrification Board, when I was Chancellor of the Exchequer. I didn't often run away from difficult decisions - but this is one that I did duck.

That's why I'm glad to commend this brave and sensible booklet. The authors argue that the time has come for all responsible opinion-formers - industrialists, consumers, academics, politicians (above all, perhaps, the younger generation) - to join together in recognizing that we are all collectively responsible for this “British mess”. In the end, of course, it will be for Government to give the lead but, hopefully, upon the basis of a consensus which we can all help to establish.



The purpose of this report by the UK Metric Association (UKMA) is to persuade responsible opinion formers that the UK should complete the changeover to exclusive use of the international metric system as soon as practicable.

Executive summary

- The purpose of this report by the UK Metric Association (UKMA) is to persuade responsible opinion formers that **the UK should complete the changeover to exclusive use of the international metric system as soon as practicable**. The UK is the only significant country in the world (apart from the USA) which has begun and then failed to carry through a metric conversion programme. UKMA calls upon the Government to demonstrate its commitment by announcing early completion dates for all remaining areas of national life, including retailing and road signs (paragraphs 1.1 - 1.4).
- The report is prompted by a recent publication by the National Standardization Strategic Framework (NSSF) - a joint project of the Confederation of British Industry (CBI), British Standards Institution (BSI) and the Department of Trade and Industry (DTI). The NSSF attempts to deal with harmonisation of standards in industry and commerce without confronting the central issue of measurement units. It is a map without a scale. Furthermore, the NSSF also tries to deal with standards in isolation from the rest of society. UKMA believes this to be a serious error of judgement, which has bedevilled and undermined the entire British metrication process. **The blame for this failure lies primarily with successive British governments since 1965** (paragraphs 2.1 - 2.9).
- **British weights and measures are in a mess**. This is because although many aspects of national life are metric (including most industry and building, school mathematics and science, athletics, rugby union and Ordnance Survey maps), many imperial relics remain (e.g. in road signs, football commentaries, estate agents' advertisements and most non-specialist media). The result is a confusing muddle (paragraphs 3.1 - 3.4).
- **This half metric, half imperial muddle matters**. It matters because it increases costs (dual pricing and marking of packages), prevents fair comparisons in shops, requires constant conversions, leads to misunderstandings, wastes our children's metric education, confuses overseas visitors, and, not least, frustrates one of the great advantages of metric units - that they constitute a proper coherent system in which all units are inter-related and easy to calculate in (paragraphs 3.5 - 3.6).
- We are in this mess because successive **British governments lacked the commitment and political courage to carry through a necessary reform in a decisive and co-ordinated manner**. Instead they have lapsed into a piecemeal, "voluntary/gradual" approach without attempting to explain the reasons for change or to win hearts and minds. The result has been that opponents of change have been able to exploit fears of the unknown and misrepresent metrication as though it were a foreign imposition. **The reform has therefore stalled** (paragraphs 4.1 - 4.24).
- UKMA contends that there is **a way out of this mess**. It involves moving on from the current "two systems" policy and standardising on one single system and as soon as possible. The idea of a single set of units has been regarded as essential for fair trade for centuries and is embodied in many important historic documents including Magna Carta and the Treaty of Union between England and Wales and Scotland. For many practical reasons it is not remotely desirable to revert to the imperial system, and the only solution therefore is to complete the changeover to metric. This would also have many other advantages as the metric system is inherently superior to imperial because it is decimal and

consistent. Metric completion would also bring the UK into line with most of the rest of the world (paragraphs 5.1 - 5.5).

- **Costs need not be a serious obstacle to completing metrication.** Indeed most of the costs have already been met. Yet, by failing to complete, Britain has not reaped the benefits of this expenditure. All Commonwealth countries which converted in the 1970s reported that benefits and savings far outweigh the costs (paragraphs 5.6 - 5.10).
- Although there is some popular resistance to change, UKMA believes that this **opposition is shallow and is based on fear of the unknown** and the feeling that unexplained change has hitherto been imposed by stealth. Objections based on civil liberties and “freedom of choice” do not withstand examination. These fears and unfounded objections can be overcome **by a proper campaign of public information** at the appropriate time (paragraphs 5.12 - 5.18).
- The metric changeover can be swiftly and painlessly completed provided that there is clear planning and management of the process. This will involve:
 - (a). The Government publicly declaring its support
 - (b). Explaining to the general public the benefits of the change
 - (c). Declaring unequivocally that all imperial measures will be phased out for official use
 - (d). Empowering a cross-departmental authority to manage the change
 - (e). Requiring public agencies to be fully metric
 - (f). Setting targets and timetables
 - (g). Enacting and enforcing any necessary legislation
 - (h). Campaigns of public education (paragraphs 6.2 - 6.5 and 7.1 - 7.4).
- Specific policy issues to be addressed include:
 - (a). In retailing, ending dual pricing and labelling (including in advertising) (paragraphs 7.7 - 7.13)
 - (b). Setting a date and a conversion plan for changing to metric road signage (paragraphs 7.14 - 7.22)
 - (c). Phasing out imperial units in property transactions, weather reports, the National Health Service, and clothing sizes (paragraphs 7.23 - 7.34)
 - (d). Encouraging the media to co-operate in the changeover plan (paragraphs 7.35 - 7.37)
- UKMA believes that, **given full and rapid commitment from the Government**, this programme could be achieved within three to five years so that the UK could be **a fully metric country by the end of 2009 or earlier** (paragraphs 8.1 - 8.5).

UKMA believes that, given full and rapid commitment from the Government, this programme could be achieved within three to five years so that the UK could be a fully metric country by the end of 2009 or earlier.



This statue of William Thomson (1824 – 1907), later Lord Kelvin, sits in front of Glasgow University, of which he was Vice Chancellor. Kelvin was a physicist and devised a temperature scale based on the absolute minimum possible temperature, which he had established.

Hence, the metric unit of temperature, the kelvin (K), is named after him.

Other British scientists and engineers whose names were adopted as metric units include:

- **James Watt – the unit of power is the watt (W)**
- **Isaac Newton – the unit of force is the newton (N)**
- **Michael Faraday – the unit of electrical capacitance is the farad (F)**
- **James Joule – the unit of energy is the joule (J)**
- **Louis Gray – the unit of absorbed dose of ionising radiation is the gray (Gy)**

1. Introduction - purpose of the report

1.1. The purpose of this report is to seek the support of responsible opinion-formers, especially in industry and commerce, the professions, the academic world, government and the media, for the view that the time is long overdue for the completion of the metric changeover which was begun in the UK in 1965. The report reviews the mistakes and indecision which have resulted in the current metric/imperial muddle and recommends that swift and decisive action is taken to bring this costly and embarrassing saga to an early end.

1.2. The authors of the report are the UK Metric Association (UKMA), an independent, non-party political, single issue organisation which advocates the full adoption of the international metric system ("Système International") for all official, trade, legal, contractual and other purposes in the United Kingdom as soon as practicable. UKMA is financed entirely by membership subscriptions and donations.

1.3. The timing of the report arises from a recent publication by the Confederation of British Industry (CBI) and the British Standards Institution (BSI) together with the Department of Trade and Industry (DTI) - the National Standardization Strategic Framework. This document, which is described in more detail in the following section, deals with the issue of standardisation in British industry and commerce. Yet - remarkably - it manages to discuss the many advantages to suppliers, producers and customers of having common and compatible standards without dealing with the central issue of measurement units. It is almost as if there is a conspiracy of silence to avoid uttering the dreaded "m-word". "Don't mention the metre" - as Basil Fawlty might have said.

1.4. UKMA hopes that its response to the NSSF will at last awaken interest in this unmentionable topic and that the competent authorities will respond by taking the necessary action to resolve the current unacceptable situation.

The purpose of this report is to seek the support of responsible opinion-formers, especially in industry and commerce, the professions, the academic world, government and the media, for the view that the time is long overdue for the completion of the metric changeover which was begun in the UK in 1965.

- Lengths available:
 - 900mm WAINSCOTT
 - 1800mm
 - 2100mm
 - 2400mm

Building and DIY materials are sold in metric. For example boards, pipes, worktops and cable are all sold in metric lengths.

The law requires building plans to be metric...



... yet metric-only measuring tapes are very hard to obtain in the UK. The commonly-available dual tapes have imperial on top and metric on the bottom - making it awkward to use the metric edge.

2. The National Standardization Strategic Framework

2.1. The National Standardization Strategic Framework (NSSF) is a joint attempt by the CBI, DTI and BSI (the sponsoring bodies) to improve the UK's economic performance, especially its international competitiveness, by harmonising standards (such as a reduced range of common components in manufacturing industry, or minimum levels of specification in service industry), and then raising those standards by technical innovation, improved specifications, training and codes of guidance.

2.2. The "Final Document" and its "Implementation Annex" (published in October 2003) are worthy documents with unexceptionable objectives. The introduction to the "Final Document" begins as follows:

"Standards are a fundamental building block for the economy and society. Basic standards such as weights and measures have existed since early civilisation and have always been a key to manufacturing and trade."

2.3. It goes on:

"Not only do standards underpin critical aspects of manufacturing and technological development, but they are increasingly applied to management, services and other areas of business and government including health, safety and the environment."

2.4. However, after several more paragraphs stressing the importance of standards, the section concludes that *"in order to avoid (the NSSF) becoming unwieldy"*, weights and measures *"which raise complex issues beyond the scope of this document"* are excluded from the exercise.

2.5. Thus the NSSF, remarkably, appears to sideline completely the central point that harmonised standards and improved specifications and codes of practice cannot be fully achieved as long as much of UK industry, trade, government, education and media - not to mention the general public - think and work in a different measurement system from the official system.

2.6. Although all British Standards are fully metric and most users of such standards are fluent in metric units, this usage does not necessarily reach the consumer. Some examples of this problem are given below:

(a). British Standards utilise the watt (W) as the unit of power. However, product documentation still frequently expresses power in horse power (HP) for engines or British thermal units per hour (BTU/h) for central heating boilers.

(b). Although the BSI recommends the international A sizes for paper (e.g. BS ISO 1008:1992 - Photography - paper dimensions), this standard has not been adopted by manufacturers of filing cards or photographic paper. Thus, commercially available photographic prints are commonly 6 × 4 inches (152 × 102 mm) rather than the recommended A6 size (148 × 105 mm). This apparently small difference is sufficient to make the standards mutually incompatible.

“Standards are a fundamental building block for the economy and society. Basic standards such as weights and measures have existed since early civilisation and have always been a key to manufacturing and trade.”

In its reluctance to confront the central issue of weights and measures, the NSSF is effectively repeating the fundamental mistake made at the outset of the UK's metric conversion campaign in the 1960s – the mistaken view that change could be achieved in industry in isolation from the rest of society, and that thereafter the general public and media would voluntarily fall into line.

(c). Following previous unsuccessful attempts to establish international standards for clothing sizes, which failed to be accepted by the clothing and retail industry, a renewed attempt is being made to develop a new Europe-wide standard based on body dimensions in centimetres (draft BS EN 13402). It is pleasing that this has been pioneered by the BSI, who carried out much of the research, but it remains to be seen whether the reform will be accepted by UK industry and consumers.

(d). In accordance with the Energy Information (Refrigerators and Freezers) Regulations 1994 (SI 1994/3076) (as amended), refrigerators and freezers are legally required to be labelled with standard information such as net usable internal volume in litres (L). However, many retailers confuse the consumer by giving **gross** internal volume in cubic feet (cu ft), making comparisons difficult.

(e). Although the British standard for measuring instruments (BS 4484-1 “Specification for Measuring Instruments for Constructional Works”) recommended as long ago as 1969 that folding and retractable steel rules and tapes should be exclusively metric, with the primary graduations at the top edge of the rule or tape, it is in fact virtually impossible to obtain such instruments in the UK from either trade or DIY suppliers unless the purchaser is prepared to trawl through the internet for foreign-made products. As a result, professional carpenters, bricklayers, furniture-makers etc, who work from exclusively metric drawings and specifications, are obliged to use dual measure (imperial/metric) instruments with feet and inches as the primary measure on the top edge of the rule or tape.

(f). The Passenger Car Fuel Consumption Order 1983 (SI 1983/1486) (as amended) requires the motor trade to give fuel consumption figures in litres per 100 kilometres (L/100 km), with the alternative of miles per gallon. Yet neither measure is of help to the motorist since, although fuel is sold exclusively in litres, road distance signage and car odometers display miles.

2.7. In its reluctance to confront the central issue of weights and measures, the NSSF is effectively repeating the fundamental mistake made at the outset of the UK's metric conversion campaign in the 1960s - the mistaken view that change could be achieved in industry in isolation from the rest of society, and that thereafter the general public and media would voluntarily fall into line. Needless to say, it has not worked out like this. Failure to explain and justify the change led to the perception that it was an alien imposition, and has simply aroused opposition to what could have been a smooth and quick transition (as in other more successful countries like Australia - see Appendix A).

2.8. However, it would be unfair to the CBI and the BSI to blame them for this lamentable situation. The primary responsibility lies with successive British governments who repeatedly ignored the pleadings of the CBI (1973, pp. 2 - 4) and others that the government should implement metrication in a way which was likely to be successful. By not following this advice and not learning from the experience of other countries, British governments ensured that metrication in the UK would be painful, slow and unpopular.

2.9. In the following pages the UK Metric Association therefore puts forward the case which we would have hoped the three sponsoring bodies would themselves have advanced - namely, that in order for the UK to reap the full benefits of standardisation, the muddle of measurement units must first be resolved.



The Department for Transport claims that drivers would be “confused” if metric-only signs were permitted. So how many different units are there on this congested sign? *[Answer at bottom of page]*



Clearly, the Forestry Commission takes a different view

Answer: *there are no less than four different units: yards, feet, inches and metres (assuming, of course that “m” has been used correctly to denote “metres” – not “miles”!)*

3. The mess we're in - and why it matters

3.1. British weights and measures are in a mess.

3.2. On the one hand, the international metric system (SI) is the official, legal system for most purposes in the UK. Hence:

(a). Most of British industry and government, including major companies, hospitals, general practitioners, pharmacists, the armed forces, the police and local authorities, use the metric system in their internal operations and in some of their public or official communications.

(b). Schools teach mathematics and science primarily in metric units.

(c). Many British sports (including rugby union, athletics and swimming) use metres and kilometres.

(d). Roads are designed and buildings constructed using exclusively metres.

(e). Petrol is sold by the litre

(f). Regulations for the dimensions of parking bays, road signs and road markings are given in metric units

(g). Commercial vehicles are required to be equipped with tachographs which record using kilometre-based units.

(h). Agricultural subsidies are calculated in metric units (litres, hectares, tonnes)

(i). Travellers taking a car to the Continent or Ireland by ferry or Channel Tunnel need to give their vehicle dimensions in metres

(j). Ordnance Survey maps use metric scales and grid and give distances and heights in kilometres and metres respectively.

(k). Most shops (especially larger stores and supermarkets) give prices per kilogram or litre.

(l). All British meteorological measurement, whether temperature, rainfall or visibility, uses metric units.

(m). Many weather reports and forecasts in the media give temperatures wholly or mainly in degrees Celsius.

(n). Court orders to restrain the movement of an individual are specified in metres.

(o). DIY and garden supplies are generally sold in metric quantities.

(p). Medical records are kept using metric units, dosages of drugs are determined by

Most of British industry and government, including major companies, hospitals, general practitioners, pharmacists, the armed forces, the police and local authorities, use the metric system in their internal operations and in some of their public or official communications.

3 THE MESS WE'RE IN - AND WHY IT MATTERS

The reality today is that Britain is trying to muddle through with a mixture of two incompatible systems: the metric system for official use within most organisations and for retail pricing at the point of sale, and the imperial system for communication with the public and in everyday conversation. The next paragraphs explain why this muddle matters.

body mass in kilograms and babies are weighed in grams. Medical professionals concerned about the increase in obesity in Britain encourage the use of the Body Mass Index (BMI). This is calculated from the patient's weight in kilograms and height in metres.

3.3. Yet, at the same time, much of British everyday life remains untouched by the metric system and continues to use imperial units. For example:

- (a).** Distance signs and speed limits are exclusively in miles, yards and miles per hour, whilst feet and inches predominate in height and width restrictions.
- (b).** Advertised petrol consumption is frequently given in miles per gallon
- (c).** Much of the non-specialist media give primarily imperial units (rarely with metric equivalents).
- (d).** Outside the maths or science lesson, many schoolteachers continue to use imperial units
- (e).** Football commentators refer to "the eighteen yard box".
- (f).** Estate agents give floorspace in square feet and room and garden dimensions in feet and inches.
- (g).** Many market traders and some small shopkeepers display weights in pounds and ounces - sometimes (in defiance of the law) without their metric equivalent.
- (h).** Many supermarkets advertise exclusively in imperial even though goods must be priced and weighed in metric at the checkout
- (i).** Holiday brochures often give summer temperatures in degrees Fahrenheit
- (j).** Descriptions of criminals wanted by the police are given by the media exclusively in imperial units.
- (k).** Despite working in metric units, medical professionals feel obliged to convert to imperial when communicating with patients. Thus, parents are told the weight of a newborn baby in pounds and ounces - converted from the actual measurement in kilograms.
- (l).** In everyday conversation, many British people freely use feet, stones, acres and miles per gallon, while even people who use metric units in their work (e.g. as designers, maths teachers or engineers) feel faintly uncomfortable or embarrassed at using metres, kilograms or hectares outside the workplace.

3.4. The reality today is that Britain is trying to muddle through with a mixture of two incompatible systems: the metric system for official use within most organisations and for retail pricing at the point of sale, and the imperial system for communication with the public and in everyday conversation. The next paragraphs explain why this muddle matters.

Why it matters

3.5. This situation - of being half metric, half imperial - causes a number of serious problems:

(a). Dual pricing (e.g. per kg and per lb) increases costs for manufacturers and retailers, and these costs are ultimately borne by the consumer.

(b). Similarly, the marking of package sizes in both metric and imperial has a cost implication.

(c). Consumers have difficulty in comparing prices, quantities and value for money when traders quote prices in different measures

(d). Similarly, consumers cannot compare the attributes of goods when some are specified in imperial and others in metric - or, for example, when the retailer's description of a refrigerator's gross capacity is given in cubic feet but the statutory Energy Label gives the net capacity in litres.

(e). Misunderstandings, mistakes and disputes can occur when parties to a transaction use different units of measurement (The failure of the Mars Climate Orbiter space probe in 1999 at a cost of \$125 million because a subcontractor failed to use metric is the best known and most spectacular example)

(f). People who use metric at work constantly have to adjust to the imperial environment outside the workplace

(g). Today's schools teach calculation exclusively in decimal numbers and metric units. However, much teaching of metric to schoolchildren is wasted since they have little opportunity to practise their skills outside school. When children leave school, they have to adapt to the imperial system, which - apart from rough equivalents - they have not been formally taught. Many soon forget what they learnt at school, yet, as they have not been taught, for example, how many ounces there are in a pound, have an imperfect grasp of and little or no ability to calculate in imperial measures

(h). The emphasis on conversions (from metric to imperial and vice versa) inhibits people from thinking easily and consistently in a single system.

(i). Standard derived measures, such as fuel consumption in miles per gallon or in litres per 100 kilometres, cannot easily be calculated when a mixture of units (litres and miles) is used.

(j). Road contractors have to convert metric design distances into imperial for signage with consequent costs and potential for error.

(k). People purchasing properties have to do extensive conversions from metric to imperial and vice versa if they wish to calculate the cost of carpets, fitted furniture or kitchens.

Much teaching of metric to schoolchildren is wasted since they have little opportunity to practise their skills outside school.

3 THE MESS WE'RE IN - AND WHY IT MATTERS

UKMA believes that this confused muddle of two incompatible systems is an unacceptable situation which cannot be allowed to continue indefinitely.

(l). Power output of different appliances cannot be compared when some (e.g. central heating boilers) are expressed in “British thermal units” (BTU/h) and others (such as electric heaters) are expressed in kilowatts.

(m). Overseas visitors are confused by the inconsistent mixture of measures used.

(n). Dosages of drugs have to be calculated by converting patients’ body mass from imperial into metric - risking a calculation error.

(o). The majority of the public cannot calculate their body mass index (BMI) - an essential measure of obesity - because they measure themselves in imperial rather than metric.

3.6. UKMA believes that this confused muddle of two incompatible systems is an unacceptable situation which cannot be allowed to continue indefinitely. Unfortunately, the present UK government (like its predecessors) appears unwilling to admit or address the problem and has no current plans to do anything to resolve the situation.



20p more on a gallon of petrol

Dan Atkinson, Mail on Sunday
5 January 2003



... but who buys
petrol by the
gallon?

4. How did we get into this mess?

History/analysis

4.1. How has Britain got into this mess? And why have successive British governments been so reluctant to bring the changeover saga (now lasting nearly 39 years and counting) to a conclusion? Why has it been so difficult to persuade British people to accept the obvious benefits of the changeover?

4.2. Regrettably, the answer must be that successive governments have lacked the political courage to carry through a necessary reform. By failing to argue the case for what they knew to be right, by pretending that the change could be made voluntarily without overt government backing, by sheltering behind European Directives, they have allowed opposition to grow and misconceptions to fester. They have done nothing to counter the mistaken perception (encouraged by the media and now very widely believed by the general population) that the metric system has been imposed on Britain by an undemocratic, foreign bureaucracy. They have failed to publicise adequately the truth - namely, that the decision to go metric was taken by the elected British government as long ago as 1965 (well before our entry to the EEC), that the European Directives were freely agreed by British ministers in the Council of Ministers, and that the necessary legislation (both primary and secondary) has been passed by the British Parliament.

4.3. Furthermore, even when making decisive changes such as introducing metric labelling on packages between 1975 and 1995 and metric weighing at the point of sale in 2000, governments have chosen not to organise significant information campaigns to prepare the public for change. As a result the public has often been ill-prepared and has felt that the changes were introduced by stealth.

4.4. British governments have systematically refused to learn from some highly successful metric conversions in Commonwealth countries and have adopted policies that are the opposite of those proven to be successful.

4.5. The effect of this over-cautious reliance on a voluntary and gradual approach has been that progress has been excruciatingly slow - and in some fields virtually imperceptible. **It is not too much to say that the voluntary approach has failed - a failure of government.**

Why did it fail?

4.6. There are a number of reasons why the UK approach to metric conversion has been (and continues to be) a failure. These are analysed below.

Lack of high level commitment

4.7. When the then President of the Board of Trade, Douglas Jay MP, announced to the House of Commons on 24 May 1965 (Hansard, 1965) that the UK was to go metric within a target period of 10 years, it might have been supposed that this important change had the full backing of the Government and that, like decimalisation of the currency, it would be carried through to a successful conclusion, as it was in other Commonwealth countries.

British governments have systematically refused to learn from some highly successful metric conversions in Commonwealth countries and have adopted policies that are the opposite of those proven to be successful.

4 HOW DID WE GET INTO THIS MESS?

With some honourable exceptions, when the going became difficult politicians took fright and lacked the conviction or the political courage (or both) to follow through the momentous change which their predecessors had started. This remains the position today.

4.8. In retrospect, however, it can be seen that the commitment was half-hearted. The announcement was left to a fairly junior member of the Cabinet; careful examination of Mr Jay's statement reveals that his statement was confined to areas within his Departmental brief; significantly, no mention was made of roads and signage. It was an example of lack of "joined-up government".

4.9. Worse was to follow. Although a Metrication Board was set up in 1968 to help manage the change, its powers were limited and progress was slow. By the early 1970s, it had become clear that the 1975 target would be missed, and in the late 1970s economic and political uncertainty paralysed decisive reforms. The programme was persistently criticised by a prominent Opposition MP, Mrs Sally Oppenheim, who actually opposed further progress. Following the change of governing party in 1979, Mrs Oppenheim was appointed to take charge of this portfolio, and the process came to a virtual halt with the abolition of the Metrication Board. (Humble, 1998). Since then governments of both parties have sought to slow down or impede the change. Derogations were negotiated with the EU to extend the life of certain imperial units and postpone as long as possible the full adoption of metric units. Where metric units finally have been adopted (as for price labelling and for weighing and measuring loose goods at the point of sale) the task has been left to junior ministers, who have made little attempt to support or explain the change.

4.10. It is clear from this short summary that there was never real commitment to metric conversion at the highest political level. With some honourable exceptions, when the going became difficult politicians took fright and lacked the conviction or the political courage (or both) to follow through the momentous change which their predecessors had started. This remains the position today.

Failure to win hearts and minds

4.11. A striking feature of those conversion programmes which were successful (for example, in Australia and New Zealand) was that all or most of the political, industrial and commercial establishment and the media supported the metrication programme. There was a consensus that the change was necessary and, once having been embarked upon, should be carried through as swiftly and decisively as possible (Wilks, 1992).

4.12. This contrasts significantly with the position in the UK, where the early decision to go metric was not the outcome of a widespread consensus but rather the recommendation of a limited coalition of industrial and commercial interests (initially, the Federation of British Industry and subsequently the Standing Joint Committee on Metrication, which reported in 1968). Whether the hearts and minds of a wider public could have been won over (if that had been attempted) cannot now be determined, but the failure to seek, let alone secure, popular support - or at least understanding - has been a major obstacle to progress.

Failure to educate the public

4.13. Rather than carry out a high profile campaign of public education about the metric changeover, successive governments have relied on the teaching of metric units in schools as a means of familiarising the general public with the metric system. Thus, the teaching of metric units has been mandatory in maths and science lessons in schools since 1974, and consequently any adult aged under 45 should have experienced some teaching in metric units.

4.14. However, the impact of this 30-year programme is believed to have been limited as it has been systematically undermined by the slow progress on metrication beyond the school gate. The generally imperial environment outside of school forces children to familiarise themselves with imperial units and then to use them in the adult world - often to the exclusion of metric units, which in many cases they then forget.

4.15. As a result much of the adult population, both young and old, has no ability to think or work in metric units. Moreover, as the younger generation has had little or no education in imperial units, we have as a nation allowed ourselves to become almost innumerate.

Piecemeal approach

4.16. The approach of successive governments since 1965 has been piecemeal, and this continues to be the case. Rather than fix a single date or short period during which all sectors of the economy and society would change simultaneously, governments have introduced changes in different areas at different times in an unco-ordinated manner. The 1972 White Paper on Metrication (Department of Trade and Industry, 1972, paragraph 12) proclaimed: "There will be no M-day for metrication".

4.17. Thus, Ordnance Survey maps went metric in the early 1970s, as did architectural and engineering design; schools went metric (albeit only partially) in 1974, petrol sales in the 1980s, packaging on various dates between 1975 and 1995, and sales of loose goods in 2000. Pints have been preserved for an indeterminate period for draught beer and cider and for milk in returnable containers, and there are no current plans to convert road signage in the near future.

4.18. In taking this piecemeal approach, governments have completely failed to capitalise on one of the great advantages of metric units - that they constitute a coherent, consistent, integrated system, rather than an incoherent collection of inconsistently related units.

Separating industry from the general population

4.19. As indicated above the original announcement in 1965 was confined initially to trade and industry, and there was no campaign of justification or explanation to the general public. This was despite the clearly expressed view of the CBI in 1970 that "All parts of the economy are interdependent, and whilst timing and method must be left to individual decision it is likely to be in the interests of all that the economy should move forward roughly in step together." (Department of Trade and Industry, 1972, paragraph 57)

"Voluntary gradualism"

4.20. The piecemeal approach (described above) is defended by the DTI and its predecessors on the grounds that a sudden, decisive change would be "confusing" for the general public. The policy of successive governments has therefore been one of long transitional periods and authorising "supplementary indications" (giving imperial equivalents of mandatory metric measures) on price labelling. Governments have also argued (e.g. in the 1972 White Paper (Department of Trade and Industry, 1972)) that conversion should be voluntary as well as gradual. The result has been that many traders and their customers have ignored the metric quantities and have in effect continued to operate in imperial.

Rather than fix a single date or short period during which all sectors of the economy and society would change simultaneously, governments have introduced changes in different areas at different times in an unco-ordinated manner.

4 HOW DID WE GET INTO THIS MESS?

However, UKMA believes that the project can still be salvaged from the current failure. In Section 5 below we suggest ways in which this can be done.

4.21. In passing, it is interesting to note that the Department for Transport (DfT) takes the opposite view from the DTI. Ministers have argued that any changeover of road signage to metric units must be rapid “in order to avoid confusion in a safety-critical environment” (letter from David Rowlands, Permanent Secretary at the DfT, to the Secretary of UKMA, 25 September 2003). Another example of non-joined-up government?

Customer-unfriendly units

4.22. One of the consequences of separating the metric conversion of industry from a wider programme involving the general public was that insufficient consideration was given to making the new system customer-friendly. Following the recommendations of the International Standards Organisation (ISO/R 1000, 1969) and the British Standards Institution (BS 4484, 1969 and BS 5555, 1981) the weight of industrial and scientific opinion in the 1960s was that that industry should follow the “rule of 1000” and hence avoid intermediate units such as the centimetre, even though it is fully within the definitions of SI and is widely used in metric countries.

4.23. Thus, while the ISO/BSI recommendation was appropriate for engineering or architectural drawings and specifications, it was disastrous for the public acceptance of metrification, which acquired an undeserved reputation for being scientific, over-precise and generally difficult.

Lessons

4.24. The lessons to be learnt from this history generally follow from the analysis of the mistakes - except that, of course, it is not possible to wipe the slate clean and go back to the situation which existed in 1965 and start again. It is clearly not now possible to achieve a smooth and rapid, comprehensive conversion of all sectors of the economy and society at the same time. However, UKMA believes that the project can still be salvaged from the current failure. In Section 5 below we suggest ways in which this can be done.

5 HOW CAN WE GET OUT OF THIS MESS?



Did the checkout assistant charge the correct price for these bananas?

| | | |
|------------------|-----------|------|
| MINCED LAMB | 2.58 | € |
| CARRS MELTS | 0.68 | |
| BANROCK MAT/SH * | 13.99 | |
| BANANAS LOOSE | | |
| 1.165 kg @ | £0.74/ kg | 0.86 |
| TOTAL | 18.11 | |
| CASH | 20.11 | |
| CHANGE DUE | 2.00 | |

Shoppers need to be good at mental arithmetic in those stores which advertise in imperial measures – as in the example above.

5. How can we get out of this mess?

The case for completing the changeover

5.1. If it is agreed that the continued use of two mutually incompatible systems is unacceptable, then clearly the only way to resolve the situation is to standardise on one single system and cease using the other system. The question which then arises is: which system should the UK standardise on?

5.2. In theory, the UK could choose either system. We could revert to using exclusively the imperial system and discontinue the use of metric units - that is, go back to the pre-1965 situation. Alternatively, we could complete the changeover to the metric system and discontinue the use of imperial units.

5.3. In practice, because there is already extensive “unseen” metric usage within industry and commerce, to revert to exclusive use of the imperial system would cause considerable problems:

- (a).** Industry would have to redesign many of its products and invest in new machinery, increasing production costs.
- (b).** British subsidiaries of foreign-based companies might be reluctant to change and could simply close down their British operation and relocate to metric countries.
- (c).** British-made goods would cease to meet international specifications, and exports would suffer - possibly catastrophically.
- (d).** Defence co-operation within NATO would be prejudiced [Since 1995, the USA’s Department of Defense has mandated metric units for new designs of military equipment (Ministry of Defence, 2004)]
- (e).** International obligations would have to be renegotiated - provided that other governments were willing to agree.
- (f).** A considerable part of the population would need to be educated in how to calculate using imperial units.
- (g).** Most mathematics and science textbooks and other teaching material would need to be replaced and syllabuses revised.

5.4. The reality is that reversion to exclusive use of the imperial system is not a practical alternative. If the current muddle of two systems is to be resolved, it can only realistically be done by completing the changeover to the metric system and ceasing to use imperial units.

5.5. Completion of the changeover would have many benefits in addition to resolving the current muddle.

- (a).** Once understood, the metric system is simple and easy to use. This is because it is

If the current muddle of two systems is to be resolved, it can only realistically be done by completing the changeover to the metric system and ceasing to use imperial units.

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Britain would also be using the same system as most of the rest of the world (apart from the United States of America). This would benefit both British travellers abroad and overseas visitors to Britain - neither of whom would need to keep converting.

primarily decimal (thus avoiding the need to calculate in multiples and submultiples of 3, 12, 14, 16, 20, 1760, 5280 etc - not to mention the squares and cubes of these values)

(b). It is consistent: the prefixes such as “k” (meaning kilo- or thousand) and “c” (meaning centi- or hundredth) have the same meaning for all weights and measures

(c). It enables people to use the same, consistent unit in different situations - e.g. litres for buying both petrol and beer and for measuring the capacity of a car boot or a refrigerator; or kilowatts for comparing the power output of electric fires, central heating systems and car engines.

(d). Britain would also be using the same system as most of the rest of the world (apart from the United States of America). This would benefit both British travellers abroad and overseas visitors to Britain - neither of whom would need to keep converting.

Costs and benefits of conversion

5.6. Opponents of completing the metrication programme often cite the cost of the change as a reason for abandoning the programme. Unfortunately, there are no recent reliable figures from independent sources to indicate the true costs.

5.7. However, the 1972 White Paper offered the following estimate in relation to road signage:

“The most expensive operation within the field of public administration will be the conversion of all road signs showing miles (or mph) to kilometres (or kph) [sic]. The cost of conversion of all road speed signs is likely to be about £2m and of all road signs indicating distance appreciably more.” (Department of Trade and Industry, 1972, paragraph 107) If this 1972 figure is grossed up for inflation, using the Retail Price Index, the estimate for changing speed limit signs is equivalent to rather less than £20 millions at 2004 prices. Even after taking account of the “appreciably” greater cost of changing distance signs, this cost appears modest in relation to total public expenditure. Furthermore, it is possible that advances in technology since 1972 have made it possible to use vinyl overlays, which would reduce the cost even further.

5.8. Although these figures may seem surprisingly low, they are consistent with the Irish Republic’s current estimate of the cost of changing their signage in 2004, which has been estimated at €8 million (less than £6 million) (Ireland, Republic of, 2003, paragraph 11.5)

5.9. What is clear, however, is that:

(a). much of the cost of metrication has already been met (in terms of industries re-designing products and retooling factories, retailers investing in new scales and computer systems, redesigning the school curriculum, etc)

(b). some of the costs already borne are being wasted since the programme has ground to a halt, and its benefits are not being fully realised (e.g. many children have no opportunity to use their metric education when they leave school)

(c). dual pricing and labelling continues to have significant costs, as does the retention of both metric and imperial package sizes. Many shop assistants and small traders struggle to cope with dual systems

(d). there will be one-off costs for converting speed limit signs - mainly because there must be a rapid changeover - but, as the 1972 White Paper pointed out (Department of Trade and Industry, 1972, paragraph 107), the replacement of distance signs could be spread over a longer period (as in Ireland) thus combining normal wear and tear replacement with metric introduction costs

(e). postponing the changeover still further will increase costs in real terms, especially as new imperial road signage is continuing to be erected

(f). the medium and long term financial and economic benefits of completing the programme will far outweigh the short term costs - in terms of easier calculation, reduction in mistakes and misunderstandings, economies of scale, etc

Britain has already invested nearly all the funds it needs to metricate, but has yet to reap the benefits of the metric system due to its failure to complete the process.

5.10. The conclusion from a study sponsored by the Institution of Electrical Engineers (Allen, Capistran and Runstrom, 1991, p. 92) is worthy of quotation in full:

“Although many have tried, none of the governments who have converted to the metric system has ever been able to put a cost on the process. They all agree, however, that the benefits of metricating far outweigh the costs. Britain has already invested nearly all the funds it needs to metricate, but has yet to reap the benefits of the metric system due to its failure to complete the process. The costs now do not lie so much in metricating, but in failing to do so.”

Myths and disinformation around the metric system

5.11. At this point, it is appropriate to deal with some of the myths and disinformation which have been created by opponents of change

(a). *“The metric system is unsuitable for everyday use”.*

Wrong! 94% of the world’s population live in officially metric countries where it is used daily without difficulty. Most people can calculate best in decimal.

(b). *“British people could not adapt to the metric system”*

Wrong! Experience from other countries which have converted shows that people can soon adapt to the metric system. There is no reason to believe that British people are uniquely incapable of adapting to change.

(c). *“Imperial units are natural”*

Wrong! There is nothing “natural” about imperial units. (People’s feet are not a standard length, and few people’s stride is as long as a yard)

(d). *“Imperial units are British”*

Wrong! Imperial units are not particularly British. The mile and the pound were imposed by the Romans, the Fahrenheit scale was invented by an obscure German scientist, and the acre was based on the size of a medieval Saxon strip field. These units were only

5 HOW CAN WE GET OUT OF THIS MESS?

Britain started to go metric in 1965 - well before we joined the European Economic Community in 1973. Other EU states are quite content for the UK to be disadvantaged by trying to cope with two systems.

standardised in the 19th century and indeed previously often had regional-specific variants. Both avoirdupois and troy ounces are of French origin.

(e). *“Metric units are foreign”*

Wrong! The metric system is not “foreign”: rather, it is international. British people participated in its modern definition, and some metric units (such as the watt, newton, farad, kelvin, joule and gray) are named in honour of British scientists - more than from any other country. The current and previous Directors of the International Bureau of Weights and Measures (BIPM), which regulates the metric system, are both British.

(f). *“The metric system has been imposed by Brussels”*

Wrong! Britain started to go metric in 1965 - well before we joined the European Economic Community in 1973. Other EU states are quite content for the UK to be disadvantaged by trying to cope with two systems.

(g). *“British Commonwealth countries use imperial units”*

Wrong! With the partial exception of Canada (but see Appendix), they are all metric. Even Gibraltar (a Crown Dependency fiercely proud of its Britishness) is metric.

(h). *“Americans use the same imperial units as Britain”*

Wrong! Not all the measurement units used in the USA are the same as in the UK. The US gallon, pint and ton are smaller than their British versions. Americans do not use “stones” as a measure of weight. In any case the USA is also planning to change toward metric units: already road signs are permitted to appear in metres and kilometres, military equipment is designed in metric units, drinks have moved over to litre-based sizes and metric-only labelling of packages is likely soon to be permitted in that country. The American medical profession uses metric units for measurement and metric units are the standard for the semiconductor industry.

(i). *“Our language and literature will have to be changed”*

Wrong! Traditional expressions and literary quotations such as “pound of flesh” or to “fathom out” will not change. Other English-speaking countries which have gone metric, such as Australia, continue to use them.

Opposition to further progress

5.12. UKMA is aware that there is considerable hostility - not confined exclusively to the Eurosceptic Right - and much indifference to completion of the metrication programme. We try here to understand the possible reasons for this opposition.

5.13. Although a number of surveys have investigated public opinion on the metric changeover, these have largely been commissioned by organisations which are trying to obstruct further progress. The results of such biased surveys must therefore be treated with caution. However, it is probably true that there is widespread reluctance by many British people to adopt the metric system for everyday use. The depth of this resistance has not been researched, but the reasons for it are likely to include the following:

(a). People generally do not like change - especially when it means giving up the habits of a lifetime

(b). People do not like being told to change

(c). People particularly do not like being told to change if they think that the change has been imposed by foreigners

(d). People do not like to change unless they have been fully prepared for change through a proper information programme including an explanation of the reasons for and benefits of the change

(e). Many people are not familiar with and do not understand the metric system - either because they never learnt it at school (especially if they are over 45) or because they have had no opportunity to use it in Britain since leaving school

(f). People feel embarrassed at using metric units in everyday life since they fear being conspicuous and inviting ridicule

(g). Public ignorance has been exploited by populist politicians and some tabloid newspapers to stir up resistance - for example, by portraying rebellious market traders as "martyrs".

Since Magna Carta in 1215 it has always been held to be the responsibility of the state to establish which weights and measures shall be legal for trade and to ensure that the law is enforced.

5.14. UKMA believes that this perfectly natural resistance to unexplained change could be quickly and easily overcome by a well organised and Government-sponsored programme of public education - just as happened with the decimalisation of the currency in 1970/71 - and that any temporary political unpopularity would very soon evaporate. Just as in Australia, New Zealand, South Africa and many other countries, people would soon adjust and afterwards would wonder what the fuss was about (see Appendix A for examples of successful transition programmes).

Enforcement and civil liberties

5.15. The failure of successive governments to take responsibility for and to justify the metrication programme has enabled this opposition to take root and indeed to become organised. A mistaken belief has grown that somehow the routine enforcement of weights and measures law is a denial of civil liberties and an abuse of bureaucratic power. Even such an otherwise respected organisation as Liberty (the National Council for Civil Liberties) has attempted to cite John Stuart Mill as an opponent of compulsion.

5.16. UKMA considers these beliefs to be absurd. Since Magna Carta in 1215 (Stroud, 1980) it has always been held to be the responsibility of the state to establish which weights and measures shall be legal for trade and to ensure that the law is enforced (See Appendix B for quotations from Magna Carta and the Act of Union). It has not been the case since the Weights and Measures Act of 1824 that traders could choose for themselves which units of measurement they could use. To have permitted this would have made price comparison impossible, thereby undermining one of the basic requirements of a free market. [Contrary to Liberty's claim, John Stuart Mill accepted the principle of state regulation of trade as long as it was done in the interests of buyers (Mill, 1859, pp 150-151)].

5.17. The law has always - quite properly - been enforced against traders who failed to use

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The issue is not whether weights and measures law should be enforced: it is which units of weight and measurement should be authorised.

legal measures. To this day it is still illegal to serve draught beer or cider in metric measures (and this law is rigorously enforced). Thus, the issue is not whether weights and measures law should be enforced: it is which units of weight and measurement should be authorised.

5.18. UKMA therefore believes that Weights and Measures law - like all laws - should be enforced, even if, regrettably, this entails prosecuting unfortunate market traders who have naively allowed themselves to be used for a political stunt. The law exists to protect the weakest in society, and failure to enforce it can only lead to anarchy.



The Department for Transport believes that metric signage would be too "confusing" for British drivers. One wonders how visitors to the Palace of Westminster manage to find their way in.



Clearly, McDonalds have no such inhibitions

6. Principles of changeover

6.1. In this section we set out some basic principles which we feel should underlie the process of completing the metric changeover.

The role of “opinion-leaders”

6.2. A desirable condition for successful completion of the metric changeover is that it should be supported and assisted by the key opinion-leaders of society - the CBI, the BSI, the professions, consumer groups, the academic world and the more responsible media. Although these players were initially supportive of the decision to make the change - and in many cases have already carried through the change in their internal operations - in recent years they have not been prepared to argue publicly for the adoption of the metric system throughout society. While of course they are not primarily to blame for the current mess, their acquiescence has contributed to the situation.

6.3. A second desirable condition is that Opposition politicians should adopt a responsible attitude to the issue. It is no doubt tempting for politicians to try to exploit popular misunderstanding and resentment about a change which has never been properly explained or justified to them. However, it is clearly not in the national interest that irresponsible political opposition should continue to obstruct a necessary reform.

A desirable condition for successful completion of the metric changeover is that it should be supported and assisted by the key opinion-leaders of society - the CBI, the BSI, the professions, consumer groups, the academic world and the more responsible media.

Government planning and management of the changeover

6.4. The painfully slow progress made by the UK toward full adoption of the international metric system is attributable above all to one factor: the failure of successive governments to take the lead and to plan and manage the change. Instead, governments have pretended that the change could be made voluntarily and gradually, and that there was no need for the government to set the pace. Ministers have failed to explain that metric conversion is actually beneficial. Where new regulations have been introduced (such as the Price Marking Order 1999), they have attempted to shift the responsibility to the European Union. Understandably, therefore, both private and public sector organisations have refused to take on the role of explaining the change and educating the general public. Quite reasonably, they have argued that this is the Government’s job.

6.5. Furthermore, different government departments have tended to act independently from each other rather than acting in a co-ordinated (“joined-up”) way. Thus, the then Department of Education and Science introduced a metric school curriculum in 1974, whereas other Departments, notably Transport, have still made no significant progress 30 years later! There has been a lack of leadership from the top of the government.

6.6. UKMA believes that further progress toward completing the metric changeover can only be achieved if the Government as a whole, led by the Prime Minister, faces up to its responsibility actively to promote the change - by, for example:

- (a). Publicly declaring its support for completing the metric conversion programme
- (b). Explaining to the general public the benefits of completing the changeover

One of the lessons from the experience of countries which has successfully adopted the international metric system is that the transition is best achieved if people are encouraged to think and work in metric measures from the outset without attempting to convert from imperial.

(c). Declaring unequivocally that all imperial measures will be phased out for official use

(d). Empowering a cross-departmental authority to help manage the change

(e). Requiring all publicly-funded agencies and all private contractors on publicly-funded projects to work toward becoming exclusively metric

(f). Setting a timetable and target dates for completion in various sectors

(g). Introducing any necessary legislation and ensuring that it is enforced

(h). Undertaking a campaign of public education and familiarisation

6.7. UKMA is convinced that if this level of Government support were forthcoming, then within a very few years the UK could catch up with the rest of the world and could be enjoying the benefits of a single, simple and modern system of weights and measures.

Think metric (don't convert)!

6.8. One of the lessons from the experience of countries which have successfully adopted the international metric system is that the transition is best achieved if people are encouraged to think and work in metric measures from the outset without attempting to convert from imperial. Although the provision of conversion charts can help people initially to gain confidence in using metric, they can also prove to be a hindrance if they are retained indefinitely. This is because people have continued to visualise the familiar imperial measure and then have more or less painfully expressed this in the equivalent metric unit. It is rather like attempting to communicate in a different language by continually referring to a dictionary, and it is little wonder that some people have rejected this laborious process and have become resistant to metric units.

6.9. Experience has shown that it is far simpler and quicker just to set aside imperial units and to learn to visualise and use metric units by practical example without the intermediate stage of converting from imperial units.

Phase out “supplementary indications”

6.10. The UK Government's approach to metrication has been characterised by extensive use of “supplementary indications” - that is, giving the imperial equivalent to the primary metric measure. This approach was employed in the derogation (opt out) from the European Union Directive negotiated in 1989 which permitted pricing of loose goods (i.e. those weighed or measured at the point of sale) to be given in both metric and imperial units (albeit with metric as the primary unit). There have been a number of problems with this practice. It has led to increased costs of price-labelling, and there have been difficulties in enforcement (including some deliberate disregard of the law).

6.11. However, the biggest problem with supplementary indications has been that dual pricing has given no incentive to either traders or customers to adapt to change and to think in metric. Assurances were given to Parliament by nervous Ministers that customers

could continue to order goods in imperial measures, and the trader would simply translate the imperial quantity into the metric equivalent when pricing the goods. The Government accepted little or no responsibility for attempting to educate the general public. The result appears to have been that metric measures and prices have been widely ignored by large sections of the general public. Little progress has been made in helping people to adapt to metric shopping, and it remains to be seen how both traders and customers will cope when supplementary indications are phased out at the end of 2009.

UKMA is not generally in favour of supplementary indications and does not wish to see their use extended to other fields such as road signage. Rather, a 'clean break' approach is to be preferred.

6.12. Experience in other areas has been similar. The publication of weather reports and forecasts in both metric and imperial (e.g. temperatures in both Celsius and Fahrenheit) or a mixture of the two (e.g. visibility in metres but rainfall in inches) has done nothing to further the public understanding or use of metric. Even worse has been when the media sensationally report low temperatures in Celsius but high temperatures in Fahrenheit!

6.13. Similarly, the media have not helped the situation by routinely reporting foreign news stories either in imperial measures only (even when the original source is metric) or in metric measures with imperial equivalent. It is as though news editors (or individual journalists) have assumed that their audiences are incapable of understanding metric units and are not prepared to contribute to their education.

6.14. For all these reasons, therefore, UKMA is not generally in favour of supplementary indications and does not wish to see their use extended to other fields such as road signage. Rather, a 'clean break' approach is to be preferred, whereby traders, customers, readers, motorists etc are encouraged to adjust very rapidly to the new system and use it exclusively - just as they now have to do if they go on holiday or business abroad.

Avoid or minimise transitional periods

6.15. It follows from the last point that transitional periods - during which dual systems are in use - should be discouraged, except where a genuine case can be made on practical grounds, such as the time needed to re-equip factories, replace scales, train staff or change road signs. The experience of other countries has shown that, provided that there is adequate government support, persons within the normal intelligence range can adjust to a new system very rapidly.

6.16. As described above (paragraph 4.5), the UK's programme of adoption of the metric system has been exceptionally slow when compared with that of other countries. Most of this delay has been time wasted - attributable mainly to successive politicians' attempts to postpone potentially unpopular decisions until after they have left office.

6.17. UKMA therefore believes that transitional periods during which dual systems are in operation should not be permitted unless there are very exceptional grounds. This is in accordance with the "clean break" philosophy outlined above (paragraph 6.13).

Accept "user-friendly" metric units

6.18. One of the difficulties experienced by some British people in adjusting to metric units is that some of the units in use in the UK may not appear to be as user-friendly as they could be. For example, the building and engineering industries do not use the centimetre

It would also help public understanding of metric units if they were written in a consistent manner, as recommended by the BSI.





(cm), preferring to use only metres (m) and millimetres (mm). Similarly, the catering industry has standardised on litres (L) and millilitres (ml) rather than centilitres (cl). This policy has resulted in what may appear to be unnecessarily large numbers being used to describe everyday objects - such as a 600 mm wide refrigerator (rather than 60 cm), or a 500 ml bottle of mineral water (instead of 0.50 L or 50 cl). It has also sometimes resulted in arguably spurious accuracy, for example when a bath is advertised as being 1697 mm (rather than as a rounded 1.7 m).

6.19. The reason for this difficulty originates with the decision in 1969 (BSI, 1969) to recommend a purist subset of metric usage rather than the wider range of available metric units in use in most of the rest of the world. It is this which partly accounts for the (erroneous) view in some quarters that the metric system is scientific and not suited for everyday use.

6.20. While there is nothing inherently more difficult about millimetres and millilitres, UKMA accepts the continued use of the centimetre and centilitre in appropriate situations where they are already in widespread use. It also supports the use of certain strictly non-SI but highly compatible units, such as the hectare (ha) (10 000 m²), which have been internationally approved for use in certain restricted applications.

6.21. It would also help public understanding of metric units if they were written in a consistent manner, as recommended by the BSI (BS 5555, 1981).

Scandinova 9.4 CU.FT GROSS CAPACITY UPRIGHT FREEZER (WHITE)

|  Size | Width: 60 cm/23.6 ins Height: 186 cm/73.2 ins | <ul style="list-style-type: none"> Reversible door, for added versatility Defrost spout 20 kg/24 hrs freezing capacity 4 star freezer rating Adjustable thermostat for optimum efficiency Acoustic warning system | <ul style="list-style-type: none"> Ice cube tray Built in thermometer 281 kWh/year energy consumption | | | | | | |
|--|--|---|--|-------------|-----|---|---|--|---|
|  Storage Capacity | 9.4 cu.ft | | | | | | | | |
|  Energy Efficiency | A | | | | | | | | |
|  Ease of Use | <table border="1"> <tr> <th>Frost Free</th> <th>High Temp Warning</th> <th>Fast Freeze</th> </tr> <tr> <td>n/a</td> <td>✓</td> <td>✓</td> </tr> </table> | Frost Free | High Temp Warning | Fast Freeze | n/a | ✓ | ✓ | Dimensions (H x W x D) 1860mm x 600mm x 600mm (73.2ins x 23.6ins x 23.6ins) | Accessories you may need WPRO FRIDGE/FREEZER THERMOMETER 648612 |
| Frost Free | High Temp Warning | Fast Freeze | | | | | | | |
| n/a | ✓ | ✓ | | | | | | | |

676/107719 UFA 265W 060104 PA
 1860mm x 600mm x 600mm (73.2ins x 23.6ins x 23.6ins)
 ZDEE

Energy

Manufacturer: Scandinova
 Model: UFA 265 W

More efficient

A B C D E F G

Less efficient

Energy consumption kWh/year
 (Based on standard test results for 24 h)

281

Actual consumption will depend on how the appliance is used and where it is located

Fresh food volume I
 Frozen food volume I

228

Noise
 (dB(A) re 1 pW)

Further information is contained in product brochures.

Norm EN 153 May 1990
 Refrigerator Label Directive 94/2/EC

9.4 cu ft = 266 litres

[so where did the extra 38 litres come from?]

UK Regulations require retailers to display the Energy Label (bottom), which gives standard information in metric. However, some retailers then give inconsistent information in imperial!

7. Specific policy areas

Official use of measurement units by public bodies

7.1. Although the UK Government is ostensibly committed to metric conversion, it has not always set a good example in its official communications. Nor has it given sufficient encouragement to other public sector bodies to use metric units.

7.2. In its “Guidance Note on the use of Metric Units of Measurement by the Public Sector” (1995) the Department of Trade and Industry (DTI) has included the following statements:

“7. DTI’s revised advice to all public sector organisations is that **by no later than 1 October 1995** they should use metric units for the conduct of all future public business, with the exception of certain imperial units which may continue to be used as the primary units of measurement for the purposes described in Appendix 1.

“8. Public sector organisations are further advised that the continued use of imperial units as the primary system of measurement after 1 October 1995 - other than in the circumstances described in paragraph 7 above - could render liable to legal challenge expressions of quantity in future legislation, documentation, etc on the ground of inconsistency with the Units of Measurement Directive ... “

7.3. UKMA endorses this advice, which it believes to be an accurate statement of the legal position. Unfortunately, however, the advice appears to have been ignored or rejected by many branches of government and the public sector, as the following examples indicate:

(a) Schedule 11 of the Town and Country Planning (Scotland) Act 1997 (“Development not constituting new development”) refers to a tolerance of “1750 cubic feet” (<http://www.hmso.gov.uk/acts/acts1997/97008-bg.htm>)

(b) The Department of Health’s website encourages us to eat a “two inch piece of cucumber” as part of a healthy diet (<http://www.doh.gov.uk/fiveaday/portions.htm>)

(c) The Meteorological Office, an agency of the Ministry of Defence, while working internally in metric, continues to give weather reports and forecasts to the media and on its website in imperial as well as metric units (or sometimes in imperial units exclusively - e.g. wind speeds in miles per hour only. For example, in its report on a tropical cyclone, the Office’s website also refers to “rainfall which persisted for over two days and amounted to over 50 inches”. (<http://www.met-office.gov.uk/sec2/sec2cyclone/tcimages/nhem01/index.html>)

(d) On its website the Employment Tribunals Service (an Executive Agency of the DTI) invited tenders in 2003 for an office cleaning contract for 13,120 (sic) square feet. (<http://www.ets.gov.uk/list-assigned-tenders.asp>)

(e) Surrey County Council’s website report on road conditions on 31 January 2003 informed readers that “Up to three inches of compacted ice has covered parts of the A31 and yesterday the area was hit by 4ft. snow drifts.” (<http://www.surreycc.gov.uk/comm/Press.nsf/0/5854de05bc1467bf80256cbf004bb70a>)

Although the UK Government is ostensibly committed to metric conversion, it has not always set a good example in its official communications.

There should be no question of extending the period beyond which 'supplementary indications' (giving imperial equivalents of metric units) may continue to be used on price labels.

(f) Restormel Borough Council, Cornwall, like many local authorities, charges for allotment rentals by the "rod" (51/2 yards) (<http://www.restormel.gov.uk/cserv/recreation.html>)

7.4. Numerous other similar examples could be cited.

7.5. UKMA considers that, if the Government is seriously committed to completing the metric changeover then it must itself set a good example and require (not simply "advise") all its Civil Service Departments, Agencies and contractors and all bodies to whom it makes grants or loans (including local authorities, universities and charities) to work exclusively in metric units.

7.6. Furthermore, in order to aid public understanding and acceptance, public sector bodies and agencies should be required to use the correct written form of metric units, as recommended by the BSI (BS 5555, 1981).

Retailing

7.7. As in other areas, successive Governments' approach to metric conversion in retailing has been piecemeal rather than comprehensive, relying on voluntary action where possible, and they have lacked the will to make a decisive and effective change. Thus, for example, petrol has been sold in litres since the early 1980s, yet it is still illegal to dispense draught beer in litres. Compulsory metric labelling was introduced for pre-packaged goods between 1975 and 1995, but not until 2000 did price labelling and weighing or measuring of "loose goods" in metric units become a statutory requirement. Enforcement of the law has been patchy, with some local authorities appearing to turn a blind eye to open defiance by market traders. Meanwhile, some major retailers have sought a competitive advantage by exploiting loopholes in the law to continue to give prominence to imperial pricing and labelling, especially in their advertising.

7.8. Thus, although considerable progress has been made, much remains to be done.

7.9. UKMA believes that *inter alia* the following measures are needed in order to achieve completion of the metric conversion in retailing:

(a) The existing law on price marking and weighing/measuring loose goods at the point of sale should be enforced. (Following the final rejection by the European Court of Human Rights of the appeal by the so-called "metric martyrs", there is no longer any excuse for local authorities and traders to defer enforcement or compliance action.) Central government intervention may be needed where local authorities fail to act.

(b) There should be no question of extending the period beyond which 'supplementary indications' (giving imperial equivalents of metric units) may continue to be used on price labels. The existing derogation permitting supplementary indications was agreed by the EU in order to give the USA time to amend its regulations to permit metric-only labelling of EU exports to that country. However, British governments have used this provision in order to permit dual labelling of loose goods within the UK. In order to comply with the 2009 cut-off date for ending supplementary indications, the Department of Trade and Industry should begin consultation on a new Price Marking Order immediately.

(c) Metric units should be mandatory in descriptions of goods offered for sale - e.g. “white goods”, furniture, clothes.

(d) Dispensing of draught beer and cider should be permitted in convenient metric measures - either alongside or as an alternative to traditional pints. (This was in fact fore-shadowed in the 1972 White Paper (Department of Trade and Industry, 1972, paragraph 111), but never implemented. Whether pints should eventually be phased out completely is a further option for consideration, but is not an immediate priority)

(e) It is desirable in principle that packaging should be in “rational” metric sizes - that is, rounded to a convenient figure - not a direct translation of an imperial quantity (such as 454 g or 568 ml). Because of the cost of replacing or adapting packaging machinery, it may be necessary to allow a transitional period of, say, 5 years before non-rational sizes would be discontinued. Whether such rational sizes should be prescribed (as they now are for many goods) or whether this regime should be liberalised is currently under consideration by the European Commission. UKMA takes no view on this last point - except that we would favour the concept of “exclusion zones” around the established package quantity, so that manufacturers are prevented from downsizing by small amounts in order to disguise price increases.

(f) The requirement to display “unit prices” (i.e. prices per kg or per litre etc) for pre-packaged goods has much to commend it, as it enables consumers to compare value for money of packages of differing sizes and thus makes it more difficult for manufacturers and retailers to disguise price increases by changing the packaging. However, only goods covered by the Weights and Measures Act 1985 are caught by the regulations. This Act is now effectively 40 years old (being a consolidation of the 1963 Act), and there are broad exemptions for market traders and “small shops” (those with less than 280 m² of floorspace, which is not particularly small). In today’s changed conditions these loopholes need to be closed.

(g) At the appropriate stages in the process (e.g. just before supplementary indications are phased out) the Government should undertake an intensive programme of public education to help people adjust to the impending change.

(h) Similarly, retailers should retrain staff to work exclusively in metric units after the cut-off date for supplementary indications and to assist the general public to adjust.

At the appropriate stages in the process (e.g. just before supplementary indications are phased out) the Government should undertake an intensive programme of public education to help people adjust to the impending change.

Advertising

7.10. Despite the fact that the current Price Marking Order requires goods offered for sale to be priced in metric units at the point of sale, there is some confusion over whether and how far advertising is covered by the Order. As a result, Trading Standards Officers are reluctant to intervene, and some retailers have taken advantage of this situation to adopt an aggressive policy of advertising goods in whatever measures (imperial or metric) appear to show their goods to be better value for money. For example:

(a) Carpets may be advertised per sq yd rather than per m² since the former is smaller and appears to be cheaper (even though the unit price may be the same)

The lack of significant progress on converting road signage in the UK to metric units is perhaps the most obvious example of successive governments' failure to carry through the changeover which was begun in 1965.

(b) Vegetables may be advertised per lb even though prices at the point of sale must be per kg. Again this is done because 50p/lb may appear to be cheaper than £1.10/kg, although the unit price is the same.

(c) For the same reason, cheese may be advertised per 100 g since this quantity is less than $\frac{1}{4}$ lb

7.11. Where goods are advertised exclusively in imperial measures, it is impossible (without the use of a pocket calculator) to check at the point of sale whether the actual (metric) price charged corresponds with the (imperial) price advertised.

7.12. The effect (if not the intention) of these practices is to mislead the customer (while remaining strictly within the law) and thus gain a commercial advantage - especially over more scrupulous traders.

7.13. UKMA considers that the remedy for this unsatisfactory situation is to bring advertising explicitly within the scope of the Price Marking Order. It should be illegal to advertise goods for sale giving prices, weights, quantities or other measures exclusively in imperial units. As and when "supplementary indications" are phased out, metric units should be the only units permitted in advertisements as well as on price labels.

Transport (especially road signs)

7.14. The lack of significant progress on converting road signage in the UK to metric units is perhaps the most obvious example of successive governments' failure to carry through the changeover which was begun in 1965. To quote the 1972 White Paper, "It had previously been proposed that speed limits should be made metric in 1973 but on 9 December 1970 the Minister for Transport Industries announced in Parliament that this would not be done and that the Government had no alternative date in mind." (Hansard, 1970, quoted in Department of Trade and Industry, 1972, paragraph 107).

7.15. UKMA believes that the UK Government is also in default of its obligations under EU law as it has failed to implement properly the Units of Measurement Directive, which required the UK and Ireland to "fix a date" for adopting metric signage and in any case to use the approved international symbols. (In contrast to the UK, the Irish Government has complied with this requirement and has announced that all speed limits and most distance signage will be metric by the end of 2004).

7.16. When challenged on these points the Department of Transport has argued (variously) that

(a) There is no time limit for "fixing a date" (Rowlands, 2003)

(b) Drivers who have not received metric education at school would be confused by a change to metric units (Hansard, 2002)

(c) Dual signage (i.e. metric and imperial on the same or adjacent signs) would be confusing - and therefore dangerous in a safety-critical environment (Rowlands, 2003)

(d) The Commission has not objected to the revised Traffic Signs Regulations and General Directions 2002 (“the TSRGD”) or the failure to use the correct symbols. (Rowlands, 2003)

There is ample evidence from the experience of other countries which have made the change that both young and old drivers can adapt rapidly to metric signage.

7.17. UKMA believes all these arguments to be specious and disingenuous, and responds as follows:

(a) While EU Directive 80/181/EEC (as amended) does not specify what the date for adopting metric signage should be, it does require the Government to “fix a date”. The 14 year delay in actually fixing the date is unreasonable and clearly in breach of the Directive.

(b) There is ample evidence from the experience of other countries which have made the change that both young and old drivers can adapt rapidly to metric signage. (See Appendix A) Indeed millions of British drivers - young and old - do so regularly when they drive abroad. School teaching of metric units is largely irrelevant since pupils have little opportunity to practise using metres and kilometres outside the maths and science lesson or, except in certain work environments, when they leave school.

(c) UKMA agrees that safety is the paramount consideration in road signage. We therefore agree that the change to metric speed limits needs to be a rapid (preferably overnight) conversion, as was carried out in Australia and Canada and as is planned in Ireland. However, we can see no safety issue around the phasing of distance signage over a period, especially if it is clear whether the units are imperial or metric. This was in fact the view expressed in the 1972 White Paper (Department of Trade and Industry, 1972, paragraph 107). Moreover, the TSRGD does, exceptionally, already authorise metric units in conjunction with imperial units on vehicle height, width and length warning and prohibition signs. Arguably, such signs are safety-critical - yet they are permitted and not held to be “confusing”. The Department for Transport’s position is inconsistent and irrational.

(d) While it may be true that the Commission did not object to the revised TSRGD 2002, it is at least possible that this is because the Commission felt it to be politically expedient to turn a blind eye to the UK Government’s obvious failure. This does not excuse it.

7.18. This failure to even begin to plan for metric conversion of road signage may be contrasted with the national plan for adopting the Euro currency. In the one case (the Euro) there is a conversion plan but no commitment. In the other case (metric signage) there is a legal obligation to convert at some time in the future - but no conversion plan. This is particularly serious and indeed wasteful since, if such a plan existed, even today’s imperial signage could be installed in a way that minimised future conversion costs.

7.19. UKMA therefore calls upon the UK Government without further delay to announce the date when the UK’s road signage (and hence speed limits) will be converted to metric units. (This date should be as soon as reasonably possible taking into account the time required to pass the necessary legislation and physically replace or amend the imperial signage. Based on other countries’ experience it is believed that this date could be within three years of the announcement. Early 2007 would therefore be a reasonable and achievable target)

We are particularly opposed to the erection of new signs displaying both units on the same sign as we feel that such signs would become permanent and drivers would have no incentive to adjust to metric units.

7.20. As indicated above, UKMA considers that the conversion of distance signage could (as in Ireland) be spread over an extended time period, but we do not favour a long transitional period during which both imperial and metric signs are in place. We are particularly opposed to the erection of new signs displaying both units on the same sign as we feel that such signs would become permanent and drivers would have no incentive to adjust to metric units. Whether the changeover should be by totally new signs or by amending existing signs is a matter for detailed consideration.

7.21. The changeover arrangements should also include the use of the correct international symbols, including “km/h” to denote “kilometres per hour” (cf paragraph 7.6 above). In particular, the erection of further signs giving “m” as a symbol for “mile” should be prohibited with immediate effect.

7.22. The changeover programme will also need to include legislation to revise speed limits, revision of various Regulations, including the TSRGD and the Motor Vehicles (Construction and Use) Regulations to require legible “km/h” on speedometers, together with an intensive campaign of driver education shortly before and during the changeover.

Land and property

7.23. Land and property is an area where some progress has been made toward converting to metric units, but the process is far from complete.

7.24. The EU’s Units of Measurement Directive permits the UK to continue to use acres for land registration “until a date to be fixed by the (Member) State”. UKMA therefore welcomes the fact that for the purposes of land registration, acres have now in fact been replaced by hectares.

7.25. Within the commercial property business there is now increasing usage of metric units, and offices will sometimes be advertised in square metres (m²) and industrial estates in hectares (ha). However, the residential property market remains predominantly imperial with many estate agents giving dimensions exclusively in yards, feet and inches - often with no indication of floor area in either metric or imperial units.

7.26. UKMA believes that the only way to resolve this situation is to require property advertisements to give exclusively metric dimensions and areas - perhaps along the lines of the metric “homelabel” which we have described elsewhere (UKMA, 2003a). We see no benefit in a transitional period during which supplementary indications would be permitted since most purchasers only buy properties at widely spaced intervals, and it is unlikely that more than a small proportion of properties would be purchased within a transitional period.

Weather reports and forecasts

7.27. UKMA wishes to see an end to the confusing muddle of information which much of the media (including the BBC and broadsheet newspapers) use in their weather reports and forecasts. We consider that the use of inches of rainfall alongside metres of visibility and windspeeds in miles per hour inhibits readers and listeners from being able to relate the sizes or values of different phenomena. We particularly deplore the practice of giving cooler temperatures in degrees Celsius and hot temperatures in degrees Fahrenheit. This is sen-

sational reporting which does not help people to relate summer and winter temperatures or to judge how much warmer it is, say, in July than in January. The Celsius scale is intuitive, and it is well understood that 0° is the freezing point and 100° the boiling point of water. The continued use of the obsolete Fahrenheit scale for weather reports is also inconsistent with the now widespread use of Celsius for ovens, cooking recipes and basic science lessons at school. This has obvious safety implications - especially for children.

7.28. UKMA believes that the Government should take the lead and make it mandatory for publicly-funded bodies, such as the Meteorological Office and local authorities, to use exclusively metric units in weather reports and forecasts (including in their press releases). The appropriate units which should be used are as follows:

| | |
|--------------|----------------------------|
| Temperature: | degrees Celsius (°C) |
| Rainfall: | millimetres (mm) |
| Snowfall: | centimetres (cm) |
| Visibility: | metres (m) |
| Windspeed: | kilometres per hour (km/h) |
| Pressure: | millibars (mbar) |

7.29. While it would not be appropriate to make this a mandatory requirement of the independent media, UKMA recommends that, within a year, all weather reporting in the UK should be in exclusively metric measures. This transition period should enable those newspapers and broadcasters who currently report in imperial measures to change their practice, possibly in stages by giving dual measures and/or conversion factors in preparation for discontinuing the imperial data

Health and body

7.30. The National Health Service (NHS) is entirely metric in its internal operations. All health information is recorded in metric units - for example, body height in metres, weight in kilograms, temperatures in degrees Celsius, drug doses in milligrams (mg), blood pressure in millimetres of mercury (mmHg) and blood transfusions in litres. Yet when communicating with patients or the general public, doctors, nurses and hospital spokespersons often feel it necessary to translate this important and clinically accurate information into imperial measures.

7.31. It is of course important that health professionals should be able to communicate with their patients (it is more important that a young mother should understand whether her baby is the correct weight rather than that she should use kilograms). However, UKMA considers that the current emphasis on translating medical data into imperial equivalents is misplaced. Rather, the emphasis should be on enabling patients and the media to understand the unconverted data. This is indeed of vital importance in relation to dosage, which is invariably given in metric units.

7.32. Moreover, the key indicator of obesity (a major public health concern) is the Body Mass Index (BMI), which can only be calculated from the patient's weight in kilograms and height in metres.

7.33. UKMA therefore recommends that the NHS should carry out a short programme of

The continued use of the obsolete Fahrenheit scale for weather reports is also inconsistent with the now widespread use of Celsius for ovens, cooking recipes and basic science lessons at school. This has obvious safety implications - especially for children.

UKMA therefore recommends that the NHS should carry out a short programme of public education aimed at enabling patients to understand and then remember their body size and weight in metric measures.

public education aimed at enabling patients to understand and then remember their body size and weight in metric measures. This could include, for example, issuing each patient with a durable card containing their height in metres and their weight in kilograms. This would enable people to calculate their body mass index (thereby assisting in the campaign against obesity).

7.34. As referred to above (paragraph 2.6 (c)), the clothing industry is currently discussing the introduction of a new system of clothing sizes. It is pleasing that it is a British organisation (the British Standards Institute) which has taken the lead in establishing a database of body dimensions on behalf of other European institutes. The proposed system would thus be Europe-wide and would be based on customers' body measurements (waist, bust/chest, neck, inside leg etc in centimetres, accompanied by pictograms). UKMA sees this as an opportunity for the clothing industry, including clothing retailers, to participate in a programme of public education aimed at familiarising customers with their metric measurements.

Media

7.35. A major obstacle to completion of the metric changeover is the predominantly imperial culture which prevails in the media at all levels and including newspapers, publishers and broadcasters. Although there are many individual journalists, writers and broadcasters who personally use and prefer metric units, they are constrained by the policies of their editors or proprietors, which range from "laissez faire" in the BBC and some of the quality broadsheets to vigorously pro-imperial and anti-metric attitudes in most of the tabloids. An example of the absurd results of this confused approach could be seen in the Times report of 3 January 2004:

"Steve Irwin incurred the wrath of child charities yesterday after holding his baby son just a metre from the jaws of a thirteen foot crocodile"

7.36. When challenged, media spokespersons generally respond that they use the units which are best understood by their readers or listeners - which they believe to be imperial units. Since many of these readers and listeners have little exposure to stories in metric units, they have no opportunity to become familiar with them - and so the situation is perpetuated. It is a vicious circle, from which it will be difficult to break without a conscious effort.

7.37. The media, including both newspapers and broadcasters, defend their independence jealously and tend to resist outside regulation. Because of the power of the media to influence public opinion and hence political leaders (which they could use to undermine any attempt at regulation), UKMA does not advocate direct Government intervention to increase metric usage in the media. However, we believe that a clear Government statement that they wish to complete the metric conversion programme as soon as practicable would help to change the pro-imperial culture which pervades the media. Individual writers and journalists would feel that they have Government support for the use of metric units and would be prepared to challenge editors and subeditors who try to convert their material to imperial. While we would not expect the more virulently anti-metric tabloids to co-operate, we believe that more responsible newspapers and broadcasters would begin to follow the Government's lead, and that others would eventually follow suit.

Metric timeline

- 1215** *Magna Carta* requires "one measure" of wine, corn and cloth throughout the realm; and similarly for weights.
- 1707** *Treaty of Union* extends standard weights and measures to Scotland
- 1824** *Weights and Measures Act* phases out many traditional units and establishes the standard imperial system
- 1862** Commons Select Committee unanimously recommends adoption of metric units for public administration. However, 1864 *Weights and Measures Act* legalises metric units only for "contracts and dealings".
- 1884** UK signs *International Metre Convention*
- 1895** Commons Select Committee recommends immediate adoption of metric units for all purposes; that the metric system become compulsory after 5 years; and that the metric system be taught in elementary schools
- 1896** *Weights and Measures (Metric System) Act* legalises metric system for all purposes, but does not make it compulsory.
- 1904** House of Lords votes for compulsory change to metric system, but Bill fails in House of Commons.
- 1951** Board of Trade Committee recommends "organised change" to metric system. Report seen as premature and not implemented
- 1965** At the request of industry, President of Board of Trade announces that metric system will be adopted, with target for completion within 10 years. Commonwealth and other countries decide to follow Britain's example.
- 1968** Metrication Board established
- 1972** *White Paper on Metrication* – advocates gradual, not compulsory, change
- 1973** UK enters EEC and re-affirms commitment to adopt metric system
- 1974** Metric system taught in schools. Metric packaging begins.
- 1979** New Government abolishes Metrication Board.
- 1980** Most Commonwealth countries have completed metric conversion
- 1989** Government negotiates derogations with EEC to delay implementation of some aspects of the metric system
- 1995** All packaged goods required to be labelled in metric units.
- 2000** "Loose goods" required to be priced, weighed and measured in metric units ("supplementary indications" permitted for 10 years)
- 2009** "Supplementary indications" due to be phased out
- ????** Road signs and speed limits to be converted to metres and kilometres
- ????** Pints to be phased out for milk, cider and beer

8. Conclusion

8.1. We conclude by re-iterating the two fundamental prerequisites for getting Britain out of the dysfunctional measurements mess that we are in - namely:

- (a)** A broad consensus from key opinion-leaders that reform of our measurement system is necessary and should be brought to an early conclusion
- (b)** Government commitment **at the highest level** to finish the job which their predecessors started 39 years ago

8.2. Given the complete lack of political interest in sorting out the measurements mess, it is essential that those bodies who would benefit from a resolution press the Government for change. Such stakeholders include industry, standards bodies, consumer protection groups, the professions and the academic world.

8.3. It was successive British governments who, by their combination of disastrously poor judgement, timidity and political expediency, have got us into this mess. It will require a bold new initiative, led by the Prime Minister, to get us out of it.

8.4. The concern of political leaders that metric completion may be unpopular and lose them votes is understood. However, it is doubtful whether any such effect would be long-lasting or that it would register as a significant issue in the context of a General Election. As with decimalisation of the currency in 1971, we can expect a considerable amount of grumbling in the approach to the moment of changeover. A few months afterwards, when the change has settled down, people will wonder what all the fuss was about.

8.5. If the British Government, supported by major stakeholders, would only summon up the political courage to do the right thing for the nation, the United Kingdom could join the modern world and become a fully metric country within this decade.

8.6. We call on the Government and the stakeholders to accept their responsibility and give a lead to the nation.

If the British Government, supported by major stakeholders, would only summon up the political courage to do the right thing for the nation, the United Kingdom could join the modern world and become a fully metric country within this decade.



Spotted in Lymington, Hants, this light-hearted sign for a restaurant pokes fun at Britain's weights and measures muddle.

But while this British mess has its funny side, it is really beyond a joke.

9. Appendices

A. Lessons from experience of other countries

When the British government announced in 1965 that Britain was to go metric, with a target date of 1975, a number of countries, especially Commonwealth and former Commonwealth countries, decided to follow suit. They could not then have imagined that, whereas they were able to complete their programmes within 10 years or fewer, 39 years later Britain would still be only half way there!

The list of countries successfully converting since 1965 includes Australia, New Zealand, South Africa and all the other Commonwealth countries of Africa. Canada has attempted a slow conversion (like the UK) but while experiencing similar problems, has made greater progress in some areas, especially road signage. The Irish Republic is expected to substantially complete its programme in 2004.

Some of these examples are described below.

Australia

This account is based on Kevin Wilks (1992) and the (Australian) National Standards Commission (1995). The latter is in fact an extract from the final report of the Australian Metric Conversion Board, 1980-81.

The background to Australia's conversion was the successful outcome of the international General Conference on Weights and Measures (known as CGPM from its French initials). This established the International System of Units (SI), which began to be adopted throughout the world in the 1960s as the modern version of the metric system.

Australia had decided in 1966 to convert its currency to decimal, and in 1967 a Committee was established to consider the practicability of converting to the metric system. This reported in 1968 that the advantages of change were overwhelming and that there was a general consensus that change was inevitable. A significant consideration was that the UK had already decided (in 1965) to make the change and was expected to carry it through.

The announcement that Australia would convert was made by the Prime Minister himself in 1970, and later that year the Metric Conversion Act was passed. This Act was comprehensive in that it embraced the whole of the economy and society and cut across Departmental boundaries. It also included the setting up of a Metric Conversion Board with wide powers.

Although described as "voluntary", the conversion process was only voluntary in so far as the various sectors of the economy were widely consulted and were given considerable freedom over the timing and method of change. The objective of conversion was not negotiable. Thus, conversion began in 1971 at different rates in different sectors, with the construction industry being the first to complete in 1976.

Of particular interest were conversion of Road Traffic Regulations and the associated replacement of road signage. Kevin Wilks account (p. 31) is as follows:

Commonwealth countries, decided to follow suit. They could not then have imagined that, whereas they were able to complete their programmes within 10 years or fewer, 39 years later Britain would still be only half way there!

Despite suggestions by people opposed to metrication that ignorance of the meaning of metric speeds would lead to slaughter on the roads, such slaughter did not occur.

“One of the most important and publicly visible of the metric changes was the change in road speed and distance signs and the accompanying change in road traffic regulations. M-day for this change was 1 July 1974 and, by virtue of careful planning, practically every road sign in Australia was converted within one month. This involved installation of covered metric signs alongside the imperial sign prior to the change and then removal of the imperial sign and the cover from the metric during the month of conversion.

Except on bridge-clearance and flood-depth signs, dual marking was avoided. Despite suggestions by people opposed to metrication that ignorance of the meaning of metric speeds would lead to slaughter on the roads, such slaughter did not occur.

A Panel for Publicity on Road Travel, representing the various motoring organisations, regulatory authorities and the media, planned a campaign to publicise the change, believing that public education, not the confusion that would result from dual sign posts, would be the most effective way of ensuring public safety. The resulting publicity campaign cost \$200 000 and was paid for by the Australian Government Department of Transport.

In addition, the Board produced 2.5 million copies of a pamphlet, “Motoring Goes Metric”, which was distributed through post offices, police stations and motor registry offices.

For about a year before the change, motor car manufacturers fitted dual speedometers to their vehicles and, after 1974 all new cars were fitted with metric-only speedometers. Several kinds of speedometer conversion kits were available.

As a result of all these changes, conversion on the roads occurred without incident.

Coordinated with the road change, tour guides, road maps and street atlases were also produced in metric and, of course, traffic regulations in each State were amended to metric measurements.

The opportunity was also taken to change the design of road signs to conform to internationally recognised standards.

The change to metric on the roads quickly led to changes in the units used by motor car enthusiasts and engine power in kilowatts (kW) quickly replaced horsepower and newton metres (N .m) replaced foot pounds as the unit of torque. The kilometre, though mispronounced kilom ‘etre more often than not, soon become the unit of distance and the ‘k’, as in “doing 100 k”, became the jargon for kilometre.

After consideration of all aspects, the litre per hundred kilometres (L/100 km) was adopted as the preferred unit of fuel consumption. This was the system most frequently used in metric countries. The arithmetical process was neither harder nor easier than that of calculating miles per gallon or kilometres per litre and was more universally meaningful. As it is a compound unit, the public has found this a more difficult conversion to which to adjust than miles to kilometres or gallons to litres.

Claimed fuel consumption was stated in L/100 km by all Australian motor car manufacturers and its use as a unit was gradually established.”

By contrast, conversion in retailing does not appear to have been particularly well han-

dled. As Australia is a federal country, each State developed its own rules and methods, which led to inconsistency between States, especially over timing, package sizes, the display of unit pricing, and the use of dual measures. Nevertheless, a cut-off date for imperial measures was achieved throughout Australia by 1978.

A particular difficulty was experienced in the real estate business, where legislative support was lacking, and competitive pressures forced estate agents to revert to imperial advertising. Wilks concludes (p. 58): “In review, it seems almost axiomatic that any far-reaching national change, not only metrication, which is initiated by government can only be achieved by voluntary acceptance if it is made a democratic obligation on all by legislation.”

Costs were not considered to have major relevance to the decision to change, as it was believed that “the ultimate benefits would greatly exceed the costs of conversion. The actual conversion costs would be considerably reduced by careful planning.” (Wilks, p.19)

The Final Report (National Standards Commission) also commented that:

- Voluntary changeover causes “confusion and disadvantage” and requires legislative backing where necessary
- Voluntarily agreed plans should be “mandatory where necessary”
- Resistance to change (where it occurred) was “mostly due to fear of the unknown”
- Knowledge of the metric system comes from use - not from education or instruction
- The ability to “think metric” develops only slowly
- Savings outweighed the costs

Canada

This summary account is based on Reid (1996a) and Peterson (1998).

Canada’s metric conversion began with the publication in 1970 of a White Paper on Metric Conversion with all-party support, and in 1971 a Metric Commission Canada was established with a target of completion by 1980. Progress was initially smooth in some areas, and by 1975 product labelling of pre-packed goods in metric units had begun, weather reports and forecasts were in degrees Celsius and mm of rain, and teaching in schools was metric. Over the Labor Day weekend in 1977, speed limit signs were converted to km/h, and vehicle speedometers and odometers were required to be metric.

However, after 1978 setbacks began to occur. Following the indecisive election result of 1979, the new Government declared that conversion should be voluntary and failed to enforce the 1980 deadline for metrication of home furnishings. In 1983 two petrol service stations successfully challenged the law requiring the sale of petrol in litres. Although the judgement of the lower court was later reversed by the Ontario Court of Appeal, the Government had already decided to place a moratorium on the further enforcement of the Weights and Measures Act. This remains the position today, and as a result prices are normally displayed with imperial units more prominent than metric.

Some industries are metric whereas others remain imperial. Amongst the general population imperial usage is widespread, although the younger generation has not been formally taught imperial units.

Over the Labor Day weekend in 1977, speed limit signs were converted to km/h, and vehicle speedometers and odometers were required to be metric.

The population as a whole saw metrication as progress and put up with the inconveniences as part of the process that was to bring South Africa into line with the rest of the world.

Thus, Canada is in a similar measurement muddle to the UK - and for many of the same reasons: lack of political commitment, loss of nerve in the face of opposition, reliance on voluntary change, and lack of a comprehensive approach. A particular factor in Canada's case has been its geographical position close to the United States, which has only just begun to change. A redeeming feature of the Canadian experience is that metric conversion of roads and vehicles was achieved early in the process.

South Africa

This account of the South African changeover comprises extracts quoted directly from the UKMA website (2003):

Successful changeover in South Africa

[contributed by Martin Vlietstra, who was living in South Africa when the Republic changed from imperial to metric units]

"South Africa was a success story as regards metrication. The metrication process started in 1967 with the appointment of a Metrication Advisory Board to plan and co-ordinate the changeover to the metric system in South Africa.

At the time, the South African Government was intensifying its Apartheid legislation and was rapidly becoming a pariah in the world. To their credit, however, they were the first of the Commonwealth countries to have replaced an existing £.s.d. system with a decimal currency. This conversion had gone fairly smoothly and great pains were taken to ensure that the largely illiterate black population were not disadvantaged as a result of decimalisation.

From the point of view of the public, the bulk of the metrication process was carried out over a two year period between 1971 and 1973. Dual units were not used on packaged goods - initially, packaged goods remained the same size but with the Imperial quantity replaced by a metric quantity. For example, 2 lb tins of jam were replaced by 907 g tins. Road signs were replaced over a period of a few months with an entirely new style of road sign. The new style was close to the "European" style, but with the white fields replaced by a blue field. As with other measurements, speedometers with dual units were unknown - cars that were built up to about 1971 had mph speedometers and those from about 1972 had km/h speedometers.

For a number years recipes in newspapers and women's magazines would have recipes that needed 454 g of flour. A few years later this became 450 g and then finally 500 g. Similarly, I have a kitchen measuring jug that is in French and English rather than English and Afrikaans or English only - such devices were not manufactured in South Africa and nobody manufactured them using only English and metric units.

Certain officials refused to accept building plans in metric units for some time when the law required that metric units be used. Politically, the authority concerned (Carletonville) was run by the National Party, the same party as the Government. The English-language press (who were often vocal in their opposition to Apartheid) did not oppose metrication - nor on the whole did the population as a whole: they saw metrication as progress and put up with the inconveniences as part of the process that was to bring South Africa into line with

the rest of the world. Most of South Africa's large trading partners such as France, Germany and Japan were already using metric units and others such as the United Kingdom and Rhodesia (now Zimbabwe) were in the process of converting to metric units. At that time, as now, South Africa had comparatively little trade with the United States.

The Metrication Advisory Board was disbanded 1977 with its job complete. Apart from the use of feet and inches for people's heights, South Africa today is a metric country.

My own view is that the South African changeover, while being a little rough on the edges, recognised that people will only change over to metric usage once the imperial crutch has been withdrawn. In contrast, successive British Governments did not have the will to remove the crutch with the resultant mess in which we find ourselves today.

[Notes: South African decimalisation took place on 14 February 1961. South Africa withdrew from the Commonwealth on 31 May 1961 and was re-admitted in 1994.]”

The Irish Government has now taken decisive steps to bring the transition to a close by setting a date for amending speed limit signs to metric units and replacing speed limit signage.

New Zealand

This summary is based on Reid (1996b).

Metric conversion in New Zealand was relatively rapid. The initial impetus came from the UK's apparent decision to go metric by 1975. This was expected to have considerable implications for New Zealand because of its large trading relationship with the UK, and the Metric Advisory Committee of the NZ Standards Institute reported in 1967 that the adoption of the metric system was inevitable.

Early progress was made in some retail sectors including wool and milk, which were metric by the end of 1972, and the Celsius temperature scale was adopted in the same year. Another early achievement, also in 1972, was the conversion of road signs.

In 1976 Parliament passed the Weights and Measures Amendment Act, which established early deadlines for ceasing verification of non-metric weighing and measuring appliances, requiring the sale of remaining loose goods in metric quantities, and requiring all pricing and advertising to be in metric quantities only.

Ireland

This summary is based on Wade (1996), Newman (2003) and Ireland, Republic of (2003).

Like the UK and Canada, the Irish Republic has attempted a slow conversion over more than 30 years, and it has therefore suffered similar problems of metric units being used for official purposes while imperial units remain in widespread popular use. However, the Irish Government has now taken decisive steps to bring the transition to a close by setting a date for amending speed limit signs to metric units and replacing speed limit signage.

Ireland is less attached to imperial British units and more receptive to international (especially European) influences than is the UK. There is therefore less opposition to metric units on the grounds that they are perceived as “foreign”.

Ireland has made considerable progress with metricating road signage. Most distance signage on major roads is now in metres and kilometres

School syllabuses have been entirely metric since 1970, but school leavers (as in the UK) have had to adapt to imperial usage outside school. Since accession to the European Economic Community (EEC) in 1973, Ireland has been subject to EEC or EU Directives, including the same derogations as were negotiated for the UK. Thus, as in the UK, price labels give “supplementary indications” (imperial equivalents), and the pint has been retained so far for draught beer and cider.

However, Ireland has made considerable progress with metricating road signage. Most distance signage on major roads is now in metres and kilometres, although signs displaying miles and yards have not yet been replaced on minor roads. This is not reported to have led to serious confusion. Speed limits will be converted to metric, and it is planned to change all speed limit signs in autumn 2004. The cost of changing signage is estimated at €8 million, with a further €2 million for a publicity campaign (Ireland, 2003, paragraphs 11.5 - 11.7).

B. Quotations from Magna Carta and the Act of Union

Weights and Measures laws are of course as old as civilisation. One of the earliest recorded references can be found in Magna Carta, 1215:

“Let there be one measure of wine throughout our whole realm; and one measure of ale; and one measure of corn, to wit, ‘the London quarter’; and one width of cloth (whether dyed, or russet, or ‘halberget’), to wit, two ells within the selvedges; of weights also let it be as of measures.” (English translation from the Latin text based on W.S.McKechnie, 1914)

When the English and Scottish Parliaments were united in 1707, as Scottish measures differed from English, it was felt necessary to include the following words in Article XVII of the Treaty (or Act) of Union:

“That, from and after the Union, the same weights and measures shall be used throughout the United Kingdom as are now established in England, and standards of weights and measures shall be kept by those burghs in Scotland to whom the keeping the standards of weights and measures, now in use there, does of special right belong; all which standards shall be sent down to such respective burghs from the standards kept in the exchequer at Westminster, subject, nevertheless, to such regulations as the Parliament of Great Britain shall think fit.”

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The UK Metric Association is an independent, non-party political, single issue pressure group which advocates the full adoption of the international metric system (SI) in the United Kingdom as soon as is practicable. It is funded entirely by members' subscriptions and donations.

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