Submission to the

Senate Standing Committee on Environment, Communications and the Arts

on the

Energy Efficient Homes Package

By

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30th October 2009

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Thank you for the opportunity to contribute a submission to the Inquiry into Energy Efficient Homes Package, 2009. This submission:

- Identifies practical and efficient office methods to utilise program management with the Internet as a standard business tool to have excellent financial control of this and many other Government-based Programs.
- Shows how to quickly fix the consistent rorting of most Government Programmes including the Energy Efficient Homes Package and most other Programmes.
- Shows how to specify and produce an interactive Website with keyed entries by the general public, together with automated server side processes to do the vetting and issuing of work contracts to minimise Government Program fraud.
- Provides several innovative methods and practices that synergetically have the potential to radically minimise Australia's carbon footprint energy expenditure while keeping most home temperatures comfortable through most of all seasons.
- Shows why Clean Coal technology is fundamentally flawed, and that coal has other uses, making Uranium powered electricity the future for Australia.
- Shows why most Australian businesses have structurally unsound Quality Management Systems in place that systematically strive for mediocrity through just complying with ISO9001/2 and how this does not address Quality workmanship or safety.
- Shows why most Australian businesses are strangled in ISO9001/2 Red Tape and how this Red Tape can be dramatically reduced and eliminated through advancing into true Total Quality Management (TQM), to dramatically improve productivity, starting with the APS executives.

Please do not hesitate to contact me for further information.

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Table of Contents

Program Management with Internet

The APS has access to the best Internet tools in Australia but these tools have not been implemented so that the APS employees can work smart (not hard). This situation then begs the question on why the APS executive management is asking for external submissions to provide answers to immediately solve these obvious issues:

1 a. Administration of the program from a pricing, probity and efficiency perspective, including:

i. the basis on which the Government determined the size of the rebate for ceiling insulation;

ii. regulation of quoting and installation practices;

iii. protection against rorting and abuse of the rebate;

iv. the impact of the program in pushing up insulation prices;

v. the level of imported insulation to meet demand;

vi. ensuring value for money for taxpayers;

vii. waste, inefficiency and mismanagement within the program;

viii. ensuring the program achieves its stated aims as part of the government's stimulus package;

ix. the consultation and advice received from current manufacturers regarding their ability to meet the projected demand.

2. Consideration of measures to reduce or eliminate waste and mismanagement, and to ensure value for money for the remainder of the program, noting the planned $2.7 billion to be distributed under the program in total.

Standard Practices mean Low Variance

Installing fibreglass insulation bats into residence ceilings is a virtually standard process, and because of this situation, the variance in costing should be low, so this means that quotes will be highly predictable if a few conditions are included into the quote:

- Transport to the residential site is very marginal, and assuming that interstate transport may be required – every major regional centre should have a nominal wholesale price, because this where and how the local installers will be sourcing their stock as they resell to the residences.
- Area covered by fibreglass bats cannot be bigger than the maximum ground level footprint of the premises, and this footprint would be (proactively) agreed to by the local council – as they already have the footprint of all approved premises in the LGA. The Federal Government agencies should have been working closely with all the LGAs to have this data freely linked between them.
- There is a nominal standard thickness of fibreglass bats, and this should be the standard as manufacturing bats to keep the economy of scale up and the production costs really low.
- Installing (fibreglass) bats into roofs that have a low pitch angle (say less than 22 deg) can be considerably more expensive (per unit area) because there is not the room to manoeuvre to position the bats and alternatives have to be considered like removing tiles in the roof to install the bats and then re-installing the tiles, but:

- Roofs with low pitch angles (say less than 22 deg) usually have a layer of waterproof sarking (sheet of aluminium/tar/hessian/plastic) under the tiles to prevent water ingress into the ceiling, cause by capillary back-flow of rainwater under the tiles. This layer of sarking also acts as a heat insulator, and damaging this sarking layer will seriously decrease the effectiveness of this reflective insulation, and now leave the premises open to damage by storm and tempest.

Because the installation process is reasonably standard, then it is reasonable to expect that the quoting process can be standardised at an early point, and with simple controls, and consequently rorting of the system would be almost removed if the quotes were automatically vetted.

Unused Mature Website Technology

The APS has many Websites and therefore the APS should have a considerable amount of in-house expertise in the development and maintenance of its Websites – after all; interactive Website technologies is the IT business of now and the foreseeable future, so it is in the APS interests of efficiency to have in-house IT/Web Technology expertise on hand and not outsourced.

As all libraries in Australia have Internet facilities and virtually most premises have Internet, then it is reasonable to expect that the Internet can be used to the Government's advantage in managing the process of collating the quotes and issuing the tenders. The Australian Government already has a Government Tendering Website at https://www.tenders.gov.au/ As I understand it, this Website is engineered for major works, and as such this website should not (in my opinion) be loaded with premises insulation bids, but an associated Website could be used for Insulation bids and a wide range of other ancillary building/maintenance services.

If the appropriate department / agency in the APS were to create a PHP-based Website with an SQL backend that was specifically engineered to interface with an SQL based database that linked: Address, Roof Footprint, Bidder, Quote Value, Start Time (plus some other less obvious tracking and correlating data), then the premises owners could very easily and very quickly put the bid details into the Website.

When three bids have been entered, then the bid prices could be automatically checked by internal server-side software and the choice bidder would be contracted to do the installation. To even simplify this further, the contract would be automatically printed out in Public Domain Format (PDF) and this agreement would then be signed and countersigned when the work is done, and then the payment could be expedited to the contractor, once the agreement is mailed back to the agency.

An Interactive Website is by no means a new technology and the APS should have plenty of in-house expertise to specify and create a suitable interactive Website / host / database within three weeks from inception to resolve this rather straightforward process.

There are several advantages in using this Interactive Website technology and not exclusively these advantages include:

- Standard contract for the bidding contractors to sign and work to. This contract would be very simple and specific, spelling out the; people, location, roof area, payment, building standards, payment details, time stipulations and signoff procedure.
- From the contractors perspective they have clear instructions on what is to be installed at where and when and to which building standard, and how much they will be paid (and how they are to lodge their invoice), and when they will be paid.

- From the Government agency's perspective they would have a very cost effective method of correlating all the bids, together with complete control of which contractors get the work (which can be graded down if the work standards are not in compliance).
- The data gathered here can be used for much greater in-depth studies on greening Australia's housing footprint in the future.
- LGAs can easily provide all the addresses of all the premises along with their roof footprints, so rorting of the system in putting in oversize premises will be very quickly identified and those attempting to rort the system can be counselled and/or charged.
- Contractors that are unlicensed and/or not compliant can be quickly identified and these problems addressed.
- Contractors that charge to the high end or over the acceptable high limit of the contracting range will be quickly identified and appropriate action can be taken to strike them off the contracting list and/or reason why the high costs.
- This website technology could be easily transferred into several other standard processes so that rorting of several other products and services could be minimised saving the Government several $Bn per year in most other money handout schemes.

To me, it is stunningly obvious that the APS executive management is looking for a pencil and paper manual solution when they already have extensive Interactive Secure Website Internet infrastructure and the capability within their ranks to produce a relational database with SQL hooks into a PHP-based website where customers can put the essential details of their quotes from any Internet connected computer.

Computing technology would be exceedingly easily filter and manage the whole process for the few APS employees, and these employees could easily weed out the rorting, false claims, payments and other abnormalities like uncertified businesses, unqualified tradespeople, incompetent tradespeople and parasite industries.

The Folly of ISO9001/2 Accreditation

Safety comes from inside Quality workmanship – not through Government legislation, and certainly not via accreditation.

a. An examination of what advice was provided to the Government on safety matters, particularly in relation to fire and electrocution risks;

   i. to what degree the Government acted on this advice.

h. An examination of what advice was provided to the Government on occupational health and safety matters, particularly in relation to training for installers:

   i. to what degree the Government acted on this advice;

   ii. identification and examination of fires and electrical incidents resulting from the Government's Home Insulation Program.

Half-Hearted TQM

In the 1980/90s the Federal Governments of the day failed to follow through with the Total Quality Management (TQM) philosophy, which would have proactively addressed all aspects of safety, including the risks of fire and electrocution. Those Federal Governments were then coerced by competitive business drop TQM and take the "financial option" of ISO9001/2 Certification, and the brief history of this is covered in the Appendix which is the contents of an open email to me from Allan J Williams who was intricately involved with the introduction of TQM into Australia in the 1980s.

In the mid 1990's, competitive business pushed the ISO9001/2 Certification very hard because this process indemnified management and directors from litigation while pushing all the legal responsibility onto the workforce.

As a direct consequence, Australian businesses use contracts to certify work standards (to the minimum possible approval rating) as stipulated by ISO9001/2 and the workforce is individually 'Accredited' providing they attend a minimum legal-based course and sign-off to accept legal obligations regarding OH&S so that management are not implicated in poor processes and/or poor workmanship Quality.

The ISO9001/2 Certification does not make the work environment safe, the Certification merely places the onus on the worker that if there is an incident of any type then the worker has incidentally signed all the necessary paperwork in entering the building site so that the management and directors are absolved from any litigation. The contents of the course spells out in very clear English that the OH&S laws are very strict and that the checklists have to be signed off before the workplace is used and the signing of copious paperwork (Red Tape) under the dubiously termed "Quality Assurance Checklists" deflects any blame away from management and directors.

Executive management really have themselves to blame for low productivity and continuing poor workmanship. As long at these untalented executive management thugs continue down the ISO9001/2 path and remain focussed on maximising profits, they will continue to have poorly trained workforces (primarily because they poach from competitive businesses instead of growing and developing their own talent pools).

Governments of this same ilk minimise apprentices, make University courses expensive and push for online courses instead of hands-on classes with appropriate work experience as a necessary composite for development and advancement. The obvious consequence is that Australian workmanship standards fall even though the numbers of students rise, and businesses end up employing staff that are certified by accreditation and not by Quality workmanship standards.

Accreditation is not a Workmanship Qualification

There is a very subtle difference between being Accredited and being Qualified; where being Qualified comes through peer assessment of workmanship over an extended period of time like an apprenticeship, or a University degree (that actually involves related industry experience). When a person is determined to be Qualified they are awarded a Certificate to Certify the Quality of their workmanship

Being Accredited merely means that the person or business involved has ticked off a checklist of minimum contractual obligations, and this has absolutely no relation to the Quality workmanship that the person or business is capable (or incapable) of providing. Unfortunately, the ISO9001/2 processes have blurred the difference between being Accredited and being certified, as the ISO9001/2 process awards Certificates of Accreditation, and it has to be clearly understood that such accreditation certificates have no bearing on the persons Quality workmanship capability.

Getting ISO9001/2 Accredited to be on any building worksite through having a one-day legal consequences course does not address the Quality workmanship issue. It takes weeks if not months of careful tutoring and in-field training to recognise the real dangers of any workplace. It takes another level again to think Quality workmanship as a way of life, and at this level safety comes naturally, making Quality Assurance Checking totally unnecessary.

As an example of the futility of this ISO9001/2 legislation: *In January 1966 I began a 5-year training course to be a Qualified Telecommunications Technician, and I successfully passed and completed this course in December 1971. The first year was full-time training 8 am until 4.30 pm weekdays, and the following four years was 30% in-school training and 70% in-field training and instruction on the job. At the end of the course I was a Qualified Technician, having worked in more than 50 exchange sites over that period, and was totally aware of occupational health and safety through hands-on tuition. The number of incidents in those days was extremely low, and most incidents could be put down to skylarking, and/or rushing work to be done to a time schedule, not to a Quality standard.*

In 2006/7 I worked as a Project Supervisor to install and commission the major rebuild of Telstra's Cable Broadband Backhaul Network and Local Exchange infrastructure to handle 30 Mb/s download speeds in the metro areas through Hybrid Fibre Coax (HFC) Customer Access Network (CAN). This role involved my managing of several teams of technical staff in about 120 exchange sites in the Sydney metro area and the coordinating of this work with Telstra Operations, and several suppliers to deliver equipment on sites as required.

With no thanks the ISO9001/2 accreditation process; I now (2006) could not walk on site to the exchanges until I had been through a 'One Day' ***Occupational Health and Safety General Induction course for Construction in NSW****. Having done this course I was now ISO9001/2 'Accredited' by certificate to go on site. The 18 years that I had as a Qualified Technician, Qualified Senior Technician, Qualified Technical Officer etc.; and the 18 additional years that I had as a Qualified Engineer, Senior Engineer, Principal Engineer, Manager, Project Manager, Bid Manager, Consultant etc., obviously meant nothing – except for this one day*

course: and this was insulting to say the least, as this accredited certification is theoretical in a practical environment, and it does not address practical common sense or experience!

So here is the situation: I have more than 34 years hand-on experience in Telecomms exchanges and all their equipment; yet unqualified people can literally walk in off the street, and we both do the one day ISO9001/2 Accredited Occupational Health and Safety General Induction course for Construction in NSW, and we now both are 'certified' to enter a building site environment, while common sense and/or qualified experience is not considered.

Driving TQM over ISO9001/2

It is extremely unfortunate that Governments of the days capitulated to commercial business pressures over Total Quality Management (TQM), because the techniques learned by this management 'talent' extends way beyond ISO9001/2 Accreditation (which is the absolute minimum acceptable standard) for certainty for invoices to be issued, and payment enforced.

As long as the Government is willing to accept a high number of constituents (customers) with much less than acceptable Quality of workmanship being done on the installation of fibreglass bats (or any other work), then the ISO9001/2 accreditation process will faithfully deliver these poor delivery results, and the contracting managements will continue to systematically rort the systems and charge for excessive payments.

If the Government wishes to continually reduce the number of customer complaints, while concurrently raising the Quality of workmanship, while concurrently reducing the number of injuries, and concurrently raising the productivity; then the Government has to re-focus away from ISO9001/2 and focus on TQM. To focus on TQM this engagement must come from and through the top (executives, managers etc) down, to make continuous improvements to all processes.

Governments to date have not acted on implementing TQM and the very poor results on Australian productivity speak for themselves, as there has not been continuous improvement processes in Australia since about 1996 when ISO9001/2 started to take hold over TQM.

How to Remove the 'Red Tape'

Many businesses have complained for several years about Red Tape that is choking their profitability. This so-called Red Tape is the ISO9001/2 "Quality Assurance Checklists" signoff documentation that is endemic, and by moving past ISO9001/2 into TQM these signoff practices and Defect Check and Rectification processes would be totally unnecessary, removing the Red Tape problem.

Without Government leadership from the APS itself to embrace TQM, [4] competitive businesses will continue to oppose advancing beyond ISO9001/2 as executive management is assured that it will not be litigated against, and invoice payments are assured. With ISO9001/2, the workmanship will continue to be the Second Best scenario, customer complaints will continue to be assured, and Australian productivity (profitability) will continue to be stifled.

"It is very hard to saw like an Eagle when you are flapping with Turkeys!"

Synergetic Energy Efficient Products

If we really want to reduce the costs of home energy consumption, then we have to consider homes as they exist and look beyond the basics of fibreglass ceiling insulation as the panacea.

i. An examination of the costs and benefits of extending the scheme to include other energy efficiency products including wall and floor insulation, draft stoppers and window treatments.

From my engineering background, I am aware that still air is one of the best heat insulators and that is a prime reason why fibreglass insulation bats are so efficient. Wood is a good conductor in comparison to still air, and the vast majority of homes in Australia have wooden (or steel) frames and this structure must compromise the thermal resistance situation.

Like all TQM, the whole process needs to be identified and analysed and at this stage the installation of Fibreglass Insulation bats into ceiling cavities is a small part of the heat transfer process / path from the Sun to the home rooms. The following looks a little wider than the bats and quickly identifies several other areas that could make far bigger productivity improvements to the whole process.

Analysing the Solar – Home Heat Transfer Problem

What has to be understood is that most documentation about environmentally insulating homes to be energy efficient has been written in the northern hemisphere (USA, Canada, Europe etc) and there, every aspect is about heating the home where in Australia, almost every aspect is about keeping the home cool, so this renders most of their documentation as not helpful – except for some cold climates in Australia.

Looking from the top down (the Sun's view) of a home, the roof is the prime interface with the Sun, and the walls are the prime interfaces with the wind. If we used the 80:20 rule then we could say that 80% of the suns heat (direct radiation) is to the roof and the remaining 20% is secondary to the walls as indirect radiation.

This simple logic places the roof as the prime solar interface to the ceiling, and consequently 80% of the sun's heat will come in via the ceiling. Conversely, with convection flow (wind) this simple model also places the walls as the 80% heat transfer medium for convection and the roof as the 20% heat transfer medium for wind.

As most premises have a raked/gable roof and a flat ceiling, then these is a considerable cavity between the roof outline and the ceiling, and anybody that has worked in the roof cavity knows that this temperature is nominally 10 to 40 degrees hotter than in the rooms below the ceiling. Even though Gyprock (drywall plasterboard) has a high thermal resistance, heat will pass through and this ceiling material (over a period of a few hours) and the underside of the ceiling will become considerably hotter than the room, and the room will be substantially heated from the hot ceiling.

Using Fibreglass Ceiling Bats

Installing fibreglass wool bats into the ceiling cavity over the Gyprock (between the ceiling joists) is a 'quick fix' as it considerably increases the thermal resistance through the ceiling path by preventing air movement (convection heat transfer), and reducing radiation transfer as the fibreglass mat is generally a poor receptor and conductor of heat. Over several years, dust will settle on the fibreglass mats and their thermal resistance will decrease, marginally reducing their effectiveness.

The fact that the roof air cavity is a virtually closed air pocket, means that this air cannot escape, so as the roof gets hotter, then so does the air inside of the roof cavity. As the temperature of this air pocket moves towards the temperature of the roof, this situation seriously impinges on the effectiveness of fibreglass insulation to keep the ceiling cool in summer, because the heat will transfer through the wood ceiling joists to heat the ceiling.

Layers of Ceiling Bats

This low thermal resistance situation can be partially solved by putting yet another layer of fibreglass insulation bats over the existing fibreglass insulation bats to more than double the bulk ceiling thermal resistance, but this is clumsy and generally a poor solution, but good in the South Island of New Zealand, as it is relatively cold there compared to most of Australia.

One reason why layers of more insulation bats is rather clumsy is that although they will act as a good insulator, if there is any physical work to be done at some later time in the ceiling cavity then it will be a disaster, as the bats will have to be moved and replaced. As long as Australia stays with ISO9001/2, we can be rest assured that the multiple layers of bats will never be put back where they should be and the thermal insulation properties will never work to anything like their designed ratings – all because of poor Quality workmanship, which is promulgated and condoned through ISO9001/2.

Dissipating Heat with Whirly Fans

An elegant solution is to install whirly wind-powered roof vent fans near the crest of the roof, and as the temperature of the ceiling cavity rises, the hottest air will move by convection out of the cavity through these fans and cold air will move by convection up through the wall cavities – cooling the walls and considerably reducing the roof cavity temperature.

Whirly wind-powered roof vent fans are very inexpensive compared to Fibreglass Insulation, and they are very easy to install. My educated guess is that these fans will take off about 10 deg out of the ceiling cavity air on any hot day, and concurrently contribute to cooling the walls of the home through convection – providing there is vegetation near the walls ventilation holes near the ground to keep that air temperature cool, or these ventilation holes are in the upper wall area that is shaded by the eaves. These fans are a partial solution.

The Reflective Roof Surface Answer

A high proportion of urban Australia uses roof tiles, and a much smaller proportion of households use Orb Steel corrugated (galvanised) iron sheeting. Assume for this exercise the ratio is 80% Tiles and 20% Steel (and we are trying to keep the premises rooms cool).

Bright steel/zinc has a reflectivity of about 90%, meaning that about 10% of the radiated heat from the Sun will heat the steel and 90% will be reflected elsewhere. Inevitably, fashion strikes and stupidity rules so the galvanised iron sheet is painted some dark colour that is very unreflective so that what was once a great reflector is now replaced by a virtual ‘Black Body” and it absorbs about 90% and reflects about 10%.

This energy phenomenon really begs the question on why we in being energy conscious have not clicked on the very obvious fact that the galvanised Orb Steel (Zinc) that is used as roofing is now electroplated instead of being hot-dipped and why this sheeting has a colour coating. Hot dipped Zinc plating is much thicker and more uneven than electroplated Zinc but hot-dipping allows the sheets to remain unpainted for several decades and the reflective quality will keep the roof cool in hot climates – where (dark) painted roofs simply will not keep cool.

Most Terra Cotta tiles are somewhat shiny and a mid orange colour but, unfortunately most other tiles are usually both dull surfaced and dark coloured, so they act much more like a

'Black Body' than they do a 'Reflective Body", so they absorb about 90% and reflect about 10%, and the darker the fashion colour, the greater the solar absorption characteristic.

In a similar vein, the concrete tiles used for roofs are initially coated with a very thin (usually dark) paint surface that may well be heat-treated to fix. ***In my opinion, it would make so much more energy wise sense to move to a standard just-off-white silica glaze surface that was about 2 mm thick and offer a substantial rebate on roof tiles that were finished in this way.*** (Australia has plenty of the most pure silica sands in the world, so there is no shortage of quality silica for glazing as white as possible.) ***The tile manufacturing companies could easily change their processes to make tiles that have this much more reflective and impenetrable surface with a minimum of cost.***

The roofs in hotter geographic areas would then be highly reflective for several decades and the energy reflected would create a huge saving on the overall cooling efficiency, and the fibreglass insulation bats would 'work easier'; so the electricity bill for air conditioning would be substantially lower.

This innovation is a synergetic win-win situation for energy management because this reflective roof technique would pip the energy absorption problem before the Sun's radiance can be passed through the roof towards the ceilings in homes, and the fibreglass insulation bats will then be providing that extra layer of thermal resistance with the top side of the bats (and ceiling joists) a good 10 to 20 deg cooler, minimising the need to use electrical powered air conditioners, and with a Whirly fan or three installed, most of the extra energy would be deflected or dissipated and the fibreglass insulation bats would (almost) do the rest.

Saving on Energy Costs

In either case let's assume that the Sun's radiance is nominally 1000 W/m^2, and we have a standard 200 m^2 roof-print, so the power being passed from the Sun into the roof cavity will be in the order of 200 m^2* 1000 W/m^2 * 0.90 = 180 kW, and over an hour this energy is 180 kWh being passed towards the ceiling – with standard mid/dark fashion roof colours.

If this same roof was finished with shiny steel (or 'shiny off-white' tiles), then the power passed into the roof cavity would be in the order of 200 m^2* 1000 W/m^2 * 0.10 = 20 kW, and over an hour this energy is 20 kWh being passed towards the ceiling.

Now the difference here in energy absorption is remarkable (and anybody that has hung out white sheets or towels knows just how long they take to dry because they never get warm in the Sun). The difference for this fairly standard roof is in the order of 160 kWh, or in energy efficiency terms the reflective roof would prevent up to about 800% of the current peak electricity energy from being used to stabilise room temperatures. The simple maths for this is: 180 kWh / 20 kWh = 9; using 1 as the base, then (8+1)/1 = 9 therefore the saving is up to 8 times which is equivalent to an 800% maximum saving in electricity.

Say there are 400,000 houses (as above) in a warm climate city of 1 M people, then the difference in energy absorbed from the above example would be in the order of 160 kWh * 0.4 M = 64 GWh during these day-times. In other words, the required peak power to be generated would be decreased by a large portion of the nominal 64 GWh per million people.

The surrounding temperature might well rise, but not nearly as much as with the extra air conditioning, and remember that trees / plants are endothermic (they absorb energy to grow), so the gardens around will flourish while the electrical power demands are considerably reduced. Because most of Australia's electrical energy is produced through the dirty coal process, Australia has a comparatively high per-capita carbon dioxide (CO2) footprint.

Exposing the 'Clean Coal' Myth

Most of Australia's electrical power currently comes from burning coal, which in turn is putting a huge carbon footprint per capita on Australia. As CO2 is a prime by-product of coal-fired power generation, the notion of 'Clean Coal' is snake merchant's oil to keep burning coal to keep the profits flowing in the coal industry.

Chemically, burning coal is highly exothermic, so it naturally follows that to reduce CO2 back to carbon must be highly endothermic (and vegetation is highly endothermic – proving this point). This simple understanding proves that 'Clean Coal' technology is at the best highly inefficient or in more plain speak 'Clean Coal' is a marketing lie to keep the sales of burning coal for continued electrical power generation or any other reason.

Considering the large size of the coal industry in Australia, it would not surprise me in the slightest if the coal lobby has actively compromised almost all minsters involved with this industry so that all the ministers openly favour the funding of 'Clean Coal' technology.

This proposed compromising situation explains why the Federal Government would have put large Program funding into so called 'Clean Coal' technology without considering alternative uses for coal, or alternative electrical generation technologies such as Uranium – of which Australia has a good 40% of the total worlds supply, and in a prime position to control not only the supply, but also the safe repository of all used Uranium for the next few centuries, and be extremely wealthy because of this entrepreneur-manship!

Alternative base-load electrical power generation with far less a carbon footprint like thermal rocks or nuclear (which are coincidentally, highly associated) give coal a golden opportunity to mutate into plastics and oil technologies instead of power generation.

The Wall Shading Answer

Except if the residences are less than about 25deg south of the Equator; the Sun is not overhead for most of the day, and consequently, the roof eaves were engineered to shade the walls and keep the Suns direct radiation off the walls during summer months.

Unfortunately building developers in the last decade have corrupted the logical engineering strategy and in pursuit for maximised profits, building rules have been relaxed in areas greater than say 30 deg south of the Equator so that substantial eaves are not required. As a direct consequence these 'new' buildings are built with very small eaves and the walls are not shaded from the Sun – so they get hot, and these residences now more than ever require air conditioning to try to cool these homes.

This relaxed building rule needs to be reversed, and extended eaves need to be mandatory for double floor buildings so that the full height of residential walls (particularly Northern and Western walls) are shaded by the roof in warm climates over 30 deg south.

As an Example: *In 1974 we purchased a west-facing house in Emu Plains (about 55 km west of Sydney). This house was uncomfortably hot in summer and we arranged for fibreglass bats to be installed with limited success, as the roof pitch was about 17.5deg.*

In 1978 we installed a combined carport and front veranda awning structure. (This probably the first of its kind because there were numerous builders that consequently came, drew pictures and photographed the monolithic awning – then this awning structure became very popular). This awning went along the northern side about 5 m, across the front about 6 m, and was about 3.2 m wide all round, putting the large west-facing window and north-facing wall into almost full-time shade.

The immediate effect was that the summertime house temperature dropped by a good 10 deg and the need for using an air conditioner dropped from almost all the summertime to a few hours per day. This wide awning made a spectacular reduction to the electricity power bill and it paid for itself inside 12 months.

The eaves on that building were standard (450 mm), but not wide enough to shade the full height western-facing window, and it became obvious that the northern outer bricks heated up with the morning sun as the eaves were insufficient in width.

It should be obvious from this example that the size of the eaves plays a major part in keeping a house temperature stable and that the Building laws need to be changed so that in warmer climatic areas; full length walls are fully shaded during summer, so that houses can be comfortable without the need for air conditioners to keep them both cool in summer and warm in winter. The building laws here relate to longitude and terrain so they cannot be state based – they need to be nationally driven. Colonial verandas make energy-efficient sense.

The Wall Insulation Answer

A high proportion of homes inherently have wall insulation, as they are brick veneer (on the outside), or double brick wall construction. The problem is that bricks have a high thermal latency and they take in the order of 12 hours to get warm – and they are on the outside of the building. If the houses were constructed with bricks on the inside and internally rendered, then the wood exterior surface would provide the right thermal latency for the bricks and the bricks would heat up by sunset – keeping the house warm overnight. This probably explains why double brick constructions are that much cooler in summer and again that much warmer in winter.

The problem with (external) brick veneer can be significantly reduced by positioning fibreglass bats off the ceiling plates and noggings so that these bats prevent air circulation near the Gyprock wall cladding.

As an Example: *When we built our second home (1981) in Emu Plains (about 55 km west of Sydney), it had a large exposed west-facing outer-brick veneer wall. To mitigate the problems of a hot-walled bedroom we installed fibreglass bats in the western wall frame (as described above) before the builders installed the wall Gyprock. This additional insulation made a significant reduction to the wall heat in that room, and it was considerably cooler in the summer than the previous house's main bedroom that had a west-facing window and small awning to shade that window.*

Although nowhere nearly as expensive as double brick construction the brick veneer with fibreglass bats in the internal wall frame provides a very cost-effective high thermal resistance solution. It does not however provide the heat latency that double brick provides. ***All homes should install fibreglass insulation bats to be hung from the plates and noggings to prevent air convection flow from warming the Gyprock dry wall cladding.***

Solving Window Thermal Problems

Compared to walls, windows have a very low thermal resistance, but they are an essential to every home. It is essential that all windows have roof eaves extended far enough so that during summer months the shadow from the eaves shades the windows from 9 am through to 3 pm so that direct sunlight cannot pass through these windows.

The Federal Government needs to include eaves dimensions in all building guidelines – not as mandatory, but so that the buyers are made aware and this could be subtly included in several

TV programmes. ***The developers would quickly get the message when the buyers baulk on purchasing because the designs are not "energy efficient" due to poor shade engineering!***

Venetian blinds effectively slow the convection flow of air on the inside of the window, and a light hanging drape in combination with a Venetian blind effectively 'pockets' this air so that this air-pocket forms a thermal barrier to outside temperatures. People need to be made aware of these techniques and it should be part of home decorating – not a Government subsidy.

Mirror surfacing with a metallised plastic on windows is the window equivalent to fibreglass insulation bats and the metallisation provides a thermal reflectivity to radiation. This technique is often used in motor vehicles, and large office buildings to keep the radiation down.

Like fibreglass insulation bats, metallised glass surfacing and/or tinted glass should be included in the Government package for north and west facing windows to stimulate the economy while reducing the overall energy absorption from the Sun's energy.

Small and Medium Size Businesses

If executive management of Businesses of all sizes implemented TQM philosophies, then the costs would be minimised and the benefits would be maximised and the Government agencies would not need to be handing out. Even then, small businesses already can claim for maintenance and with a little bit of smart accounting environmental sustainability practices would already have been implemented and claimed.

j. An examination of the costs and benefits of changing or extending the scheme to make small and medium sized businesses eligible for installations.

There are basically three types of small business, those that operate:

a. Those that operate out of an industrial estate consisting of oversized garages with open roller doors and a very small office,

b. Those that operate out of a shopfront with a large glass window, a counter and an office/wholesale repacking area out the back

c. Those that operate out of a home

Home-Based Businesses

These businesses should already have insulation in their ceilings, and most likely these homes will also have air-conditioning. As these businesses are already claiming tax exemptions for these operating and set-up expenses there is no reason for these premises to claim yet again (double-dip).

Shopfront Businesses

These shopfront businesses are owned by the business, or rented from a property business. As these businesses are already claiming tax exemptions for these operating and set-up expenses there is no reason for these premises to claim yet again (double-dip).

Industrial Businesses

These industrial businesses are owned by the business, or rented from a property business. As these businesses are already claiming tax exemptions for these operating and set-up expenses there is no reason for these premises to claim yet again (double-dip).

To compound the issue, many of these businesses operate with their doors wide open so there really is no wind-flow management, and the workplace temperature becomes that what is the local in-shade temperature of that area.

Medium Size Businesses

These businesses employ nominally between say 15 and 200 employees, and usually own the premises they occupy, or occasionally are rented from a property business. As these businesses are already claiming tax exemptions for these operating and set-up expenses there is no reason for these premises to claim yet again (double-dip).

Many medium size business sites have offices attached to warehouses and more often than not, these offices are positioned upstairs, or are a two-level sub-building within the same warehouse complex building. The problem is that the offices are usually constructed without concern of energy sustainability and consequently the roof structures are commonly asbestos cement and there is considerable air leakage, and the air conditioning structure is usually far more brute force than elegant engineering.

The fundamental problem is that these medium sized businesses are so focussed on maximising their profits through short-term goals, that the question of sustainability is long lost. Proof is shown various Government bodies are foolhardy enough to offer handouts and no guesses on which medium sized businesses will be the fastest to float to the top of the pile ready to receive handouts.

This highly wasteful and uselessly expensive Government handout process (commonly used to 'buy votes') could be substantially reduced (if not totally eliminated) if the Government agencies in the first case implemented TQM philosophies into these businesses. ***The prime condition of the recipient competitive businesses would be that they too adopted TQM philosophies before they received handouts from funding arrangements!***

The TQM philosophies would make managements look very closely at all aspects of the productivity of their businesses including the sustainability of low carbon footprints. These businesses would in their natural TQM processes address the problems of excessive electrical power loss, poor workplace conditions and inefficient environment management (including poorly engineered air conditioning).

As these processes are better managed through TQM, these processes will easily surpass that in ISO9001/2 as their productivity dramatically increases. The profitability will naturally increase and consequently the taxes paid back to the Government consolidated revenue will more than cover the costs of implementing TQM and the costs of useless handouts to businesses that are in management wilderness.

Minimising the Transport Carbon Footprint

Even "Blind Freddy" knows that the oil supply is going to run out within the next 10 to 15 years, and the world is going to get a lot 'smaller' [1] and Australia has to start re-establishing its manufacturing sector. Over the past 30 years Australia has 'fire-sold' out its manufacturing expertise to international businesses and the associated tooling / knowledge is very expensive.

k. An examination of the extent to which imported insulation products met Australian standards and the method used to make that determination.

Australia has a (now competitive business) body called Standards Australia, which should be the reference body for specifying all standards in Australia – and in my opinion, Standards Australia should be removed from the commercial competitive arena and firmly positioned as a Government Business Enterprise (GBE). With this change Standards Australia can focus off making monetary profits and focus on providing realistic standards for all commodities – including building materials (which includes insulation materials).

If any non-Australian business wishes to competitively import building materials into Australia, then these materials must comply with the operationally functional standards provided by Standards Australia. If Standards Australia has done its work properly, then the applicable standard will exist and there will be very straightforward tests to measure to prove compliance to the standard, and this is a prime reason why Standards Australia should never have been 'privatised' as in this mode it simply cannot impartially set standards.

It therefore follows that it is up to the insulation manufacturing business (wherever it is geographically located) to ensure that the insulation materials that are manufactured meet and exceed the prevailing Standards Australia standard in every aspect. In this light it would be mandatory that the packaging of the insulation materials would carry the ISO9001/2 certification to show that the manufacturing and testing procedures have met their own minimum acceptable commercial standards. The insulation materials must also carry the specific Standards Australia certifying standard number to show that the insulation material complies with this specific standard.

Transporting the insulation materials from foreign countries will become expensive [1], and Australia's infrastructure engineers have loudly signalled that transport is going to get very expensive over the next decade. Air transport will become very expensive and that leaves sea shipping as the last alternative for competitive international trade carriage – apart from Broadband Internet based businesses.

Within Australia the Federal Government has to coordinate the construction of a fast common gauge railway infrastructure so that trains that can efficiently transport goods interstate to replace the very expensive, inefficient and outdated mode of road-based long distance transport, which as the world oil supply runs out – will be totally uneconomical.

An adjunct to these rocketing transport costs is that most information transport has quickly moved to the Internet, and Australia's National Broadband Network (NBN) and this will be a critical piece of infrastructure that must be put in place as soon as possible to carry data beyond the major capital cities.

Unfortunately, the NBN cannot be operated by Telstra in its current competitive business state because Telstra changed its financial mode of business following the Davidson Report [2] in

1982 to focus on operating its telecommunications network on commercially financially justifiable financial P&L conditions – no longer socially justifiable financial P&L conditions.

This fundamental business flaw is why, since 1982, Telstra have put almost all its infrastructure into the metro areas and almost nothing beyond the metro areas, the reason why the Davidson Report instigated the USO to make non-metro areas look comparatively competitive (and that failed), and why it is now necessary for the Federal Government needs to split Telstra into two bodies: one the National Broadband infrastructure incorporating all the Backhaul Network and all the customer access networks into one homogenous national network body for maximum efficiency / economy of scale; and repositioning Telstra/Bigpond as the privatised competitive retail reselling body with the golden opportunity for massive returns for its shareholders [3] once they realise that the bricks n' mortar telecomms infrastructure is not a high return on investment (ROI) investment.

In a very similar light, the Australian population will considerably decentralise over the next 20 years, as Internet becomes a prime low-cost transport medium and Australian manufacturing will again rise, so in the longer term almost all building materials will be manufactured within Australia. But in the short term, if any international manufacturer wishes to expert insulation materials into Australia, then the compliance of the Standards Australia specifications is mandatory.

What Greenfields Loan Program?

We have mature interactive Internet tools, but we in the APS are too fractionated and inept to use these Internet tools effectively! Reference [4] expands on this topic to try to make the APS efficient and effective.

3. Other related matters.

As far as I understand it, the same Federal Government agency that is managing the Fibreglass Insulation bats installation debacle is also managing the GreenFields Program; and here is the 'wot the!' situation that makes me want to metaphorically take a baseball bat and sort out this mess.

The Fibreglass Insulation Bats Program is such a debacle that I have been told as common knowledge that there are 'spotters' getting paid nominally $80 to cold-contact homeowners and pass on details to less than scrupulous contractors so that these contract installers can really capitalise on their time – no matter how poorly the work is done.

As the Federal Government agency is using Internet-based resources in the Greenfields Loan Program, then why is this same agency not using these same / similar Internet-based Web-associated SQL database to swiftly root out the problems in the Fibreglass Insulation Program?

It really beggars belief that any Government based agency can be so inept as to assume that any contractors will be honest – especially when several millions is thrown at them for doing nothing that they have to show any accountability about!

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Appendix

Communication from Allan J Williams

Understanding Quality is an extremely important subject, sadly lost within Australia!

Most manufactures understand quality and how it should be managed, as a normal industry discipline, specially knowing about the feedback from customer experiences. In Australia today useful feedback is near impossible due to the attitudes that have created commercial and market monopoly barriers, as established in recent times, (since about 1998) between the users of near all things and the producers of near all things.

The first official public introduction into Australia about TQM was by way of an Australian business group, established in about 1984 as AOQC, Australian Organisation For Quality Control. The Chairman at the time, John Sprouster within a company that marketed copy machines, manufacture in USA wrote the first book published in Australia about quality circles and how to implement them.

This group, AOQC (supported by Philips) was the first to bring into Australia the idea of quality improvement programs in other areas of business other than factories, programs initiated at every layer with an organisation, within and between "coupled" work groups, (in process coupled chains, between producers and users or to manage the throughput quality and efficiencies, between process inputs and outputs. Teams would spend about an hour per week to study information collected about defects within their work areas as fed back from coupled chains or from the public.

Based on scientifically studied behaviours as was professionally organised during the second world war, in British defence departments, in particular, (a Churchill / Cambridge University program) these study groups would train each other in behavioural disciplines. Post world war this behaviour was adopted within the Marshall plan, to organise fast recoveries of damaged environments within Japan and within Europe.

People in Japan like Ishikawa, within Japanese universities, and Ono, within Toyota, the production manager of their first car, developed these into programs that most of us recognise as Quality Circles. Unfortunately, companies within USA, (and now Australia) instead of introducing these as a free public, program as AOQC did in Australia, consultants sold these programs and even increased the complexities (to look professional and important, lots of paperwork) to become management programs such as re-engineering or Quality Management. Major consultancies like W D Scott become extremely rich marketing these programs into major enterprises, even like GM and Enron and Telstra!

In Europe, companies more or less paralleled the Japanese approach, as a program called Total Quality Management and Improvement, (TQMI), with a little hint that it was a management skill.

In 1985, I brought this program to Australia by way of a four day conference in Sydney, (sponsored by Philips International), where IBM, Kodak, Philips, Ford and Toyota each provided two, a morning and an afternoon speaker from their best quality managed units in their world, with group discussions with our 300 odd guests, about quality behaviour within companies. For the first time, as with AOQC, quality focussed on all company behaviours,

not just factories, even answering telephones or accounting systems and processes. (I recorded this conference on tapes).

Post this Philips TQMI conference, Graham Spong from IBM Australia and I (with Philips push and support from Europe) founded, in early 1986, the Australian TQMI Institute. We adopted the overseas ISO quality standards within our member companies, with the addition of the Quality Circles behaviour disciplines, about ten group training modules, how to define and measure the causes and costs of defects and how to solve problems and implement improvements, and how to calculate cost reductions. By these conformance standards measured against their specified criteria, they were able to measure continual improvements within their own teams, and reported these to managers. Less defects in processes and their systems meant increased profitability, which the teams were trained to understand, highly motivational while intellectually improved learning about their own systems and processes. By 1990's this Australian institute had about 400 Australian company members.

I pushed for the idea that this be a curriculum within Australian Universities. However, federal government had what they thought a better idea, to officially certify the use of the ISO 9000 standard in 1992, (now the 9001- 2) (and in Standards Australia about 1994, before Standards Australia was converted to a commercial business. This standard for companies to be public registered as ISO 9001 certified is no more than an emblem to prove they have a quality practitioner to certify minimum quality has been achieved. This paper certificate is to display to their customers that the company has a system and a quality practitioner who can identify and measure defects as a % of outputs, and will deliver "quality" according to agreed %.

The Government adopted our ISO training program (free of re imbursement fees!) but not the quality improvement modules. The government “qualified” professionals trained as Quality Practitioners for $3000 per person fee, who were then credited to install ISO 9001 certification systems into companies. This was then a company certified to Australian Quality Standards.

Then things started to go really sour.

First of all ISO 9001 certifies the minimum standard, as accepted or failed as measured by a quality practitioner, not by a work team. The concept behind TQMI is improvement; to continually improve the company's efficiency and while doing so, raise the minimum quality hurdles to reduce costs to the supply company. Japan has done so and as China is doing. But not in USA, where the ISO 9000 series is more a private charge on supplies and in Australia a private charge (to create jobs?) and also a tax on suppliers, no longer understood by the business fraternities as a process improvement skills within all layers of a company all, companies, even within government bureaucracies, that if a true quality system existed there, the members of the Australian parliaments would be listening to the needs of Australia.

Quality improvement is an intellectually developed talent. Quality is an attitude. With the new easy way out for most managers, few companies were interested in the Australian TQMI. It died; so did AOQC.
Does that help? Best regards, Allan. 17-Oct-2009

Acronyms

AOCQ	Australian Organisation for Quality Control
APS	Australian Public Service
CO2	Carbon Dioxide
GWh	A giga-watt for one hour
IP	Internet Protocol
ISO	International Standards Organisation
kWh	A kilo-watt for one hour
LGA	Local Government Area
MWh	A mega-watt for one hour
NBN	National Broadband Network
OH&S	Occupational Health and Safety
P&L	Profit and Loss Statement
PDF	Public Domain Format
ROI	Return On Investment
TQM	Total Quality Management
TQMI	Total Quality Management and Improvement
USA	United States of America
USO	Universal Services Obligation

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