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SUBMISSION

Cost benefit analysis of options for a national smart meter roll-out (Phase Two)

Regulatory Impact Statement

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Regulatory Impact Statement

1. Introduction

1.1 Smart metering Regulatory Impact Statement

Total Environment Centre (TEC) has made previous submissions on the smart meter rollout, and our submission of 21 April, 2008 (in response to the Phase 2 reports on the cost benefit analysis) should be seen as complementary to this response.

TEC has serious concerns about the limited framework within which the RIS and the CBA have been carried out. Both have defined the benefits of a smart meter roll-out so narrowly as to ignore the most significant greenhouse, efficiency and informational benefits that could result.

Noticeably absent is a comparison of smart meters plus in-home displays (IHDs) plus the requirement for networks to undertake direct load control (DLC) against other scenarios. This is unacceptable when one of the most critical challenges that Australia faces today is to reduce greenhouse emissions. It is even more unacceptable in the context of electricity consumption being the major cause of Australia's emissions, and when international experience has shown that smart meters can considerably reduced average (baseload) consumption, as distinct from reductions at peak times. It is an immense lost opportunity, therefore, that the only scenarios tested have been meters (without IHDs or DLC) compared to DLC.

We note the average energy use reductions achieved in a range of international contexts below[1]:

Carbon Trust, UK	5% - 12%
Sustainability First (21 studies), UK	5% - 14%
Hydro One, Canada	7% - 10%
EnergyAustralia	6% - 8%
Energy Futures Australia	4% - 10%
CBA (with IHDs and DLC)	**up to 7%**
RIS (without IHDs)	**3%**

[1] Energy Futures Australia for Total Environment Centre, *Advanced Metering for Energy Supply in Australia*, 2007,pp. 57-61

If similar results were realised in Australia it is possible that a 10% reduction in average energy use would result, delivering the following reductions:

- 19 million tonnes CO_2-e pa
- 3.5% of Australia's total greenhouse emissions
- Equal to taking 4.5 million cars off the road

If only the 7% average savings[2] identified in the CBA were realised with the roll-out of IHDs and DLC requirements, the following reductions would be delivered:

- 13.6 million tonnes CO_2-e pa
- 2.5% reduction in Australia's total emissions
- Equal to taking 3.2 million cars off the road

The enormity of these benefits further illustrates the short-sightedness of eliminating a thorough evaluation of smart meters plus IHDs plus DLC from the analysis to date.

The unrealistically low carbon pricing models used, which diverge significantly from established models[3], further reduce the scope of this work and the potential benefits, and fail to reflect realistic prices expected under the Emissions Trading Scheme that will commence in 2010.

Another issue of concern is that the investigation so far has been limited to residential consumers. Since commercial and industrial users consume more electricity as a proportion of the total, we urge the MCE to initiate a similar investigation regarding these users. To only apply an analysis of smart metering to residential customers represents another lost opportunity to maximise greenhouse benefits.

Finally, we urge the MCE to establish a 10% target for overall reduction of consumption, based of international best practice experience, with trials to be developed and carried out to ascertain the best route to achieve this.

Our main recommendations in this submission are:

- A 10% target for overall reduction of consumption, with trials to be developed and carried out to ascertain the best route to achieve this.
- Detailed investigation of benefits of smart meters plus IHDs plus DLC requirements and comparison with other options
- MCE commitment to ensure time of use tariffs are instituted widely

[2] The 7% was identified as a maximum and described as 'highly uncertain' in the CBA. TEC strongly rejects the assertion that these savings are uncertain. Rather than being a maximum, 7% represents, in our view, a conservative mid-point.
[3] For example, NETS Taskforce, *Possible Design for a National Greenhouse Emissions Trading Scheme*, August 2006.

- Review of smart meter potential nationally for medium and large users
- Revision of carbon price modelling and greenhouse benefits
- Inclusion of the facility for a home area network in the minimum functionality
- MCE commitment to ensure that distribution and retail businesses are obligated to provide the infrastructure to support direct load control (DLC) devices and to offer DLC-enabling devices to all relevant consumers, alongside appropriate price or cost reductions to these consumers
- MCE commitment to ensure that retailers and distributors pass on time-of-use prices to consumers through incentive or direct regulation
- Inclusion in minimum functionality of dual-element meters to facilitate measurement of gross embedded generation
- Extensive trials of a variety of tariff models and technologies
- Proper investigation of greenhouse gas emissions from peak loads versus base-load

1.2 Scope of this submission

In this submission we have addressed the stated aims for the rollout; responded to selected questions from the Regulatory Impact Statement (RIS); and taken the opportunity offered at the end of the RIS (list of general questions on p. 101) to discuss associated issues of concern; Section 1 could be regarded as a response to the general questions. Our response to the Phase 2 reports should be seen as a supplementary response to this RIS, particularly in regard to these general questions.

Please note that all quotes are from the RIS unless otherwise referenced.

The subsequent sections in this submission are:

1.3. Demand management and the NEM
1.4. Greenhouse benefits
1.5. Carbon price modelling
2. Users managing their demand
3. Introduction of time of day pricing
4. Home area network
5. Preferred scenario and model
6. Direct load control
7. In-home displays
8. Import/export metering
9. Pilots and trials
10. Public education programs

1.3 Demand management and the NEM

Smart meters can enhance demand management in all sectors of the electricity system, which has the potential to benefit all consumers. Demand management[4] (DM) in all its

[4] Demand management (DM) in this submission can be read to include 'demand response', 'demand side management', 'demand side response', 'energy efficiency' and 'non-network solutions'. In general, DM can include both the management of peak loads and energy efficiency as a way of meeting capacity requirements most cost effectively. It includes a diverse array of

forms is a viable alternative to current supply and demand forecasting mechanisms throughout the National Electricity Market (NEM). The Objective is set up to cater for "the long term interests of consumers"; without effective DM this is not being achieved.

A 2001 report for Energy SA[5] gives a still useful list of examples of demand side management opportunities:

- energy efficiency programs
- load shifting
- load curtailment
- tariff structures
- embedded generation, including fuel switching
- distribution network constraints, which provide opportunities for DM

The report goes on to suggest that, "Demand Side Management activities have the potential to provide a low cost alternative to generation and transmission investments, and are often the only effective short term tool for overcoming supply side and distribution system inadequacies."[6]

To achieve economic efficiency there must be equal emphasis on demand and supply as the basis of standard economic regulation. DM and energy efficiency must therefore be given high priority and be integrated in uniform national regulation.

The most important solutions for establishing a robust demand-side presence in the electricity market – and which must be given proper consideration in any review – include:

- provide transparency of pricing in relation to demand and constraints – end users are currently unaware of the true price of their electricity
- ensure networks investigate and implement DM before they consider network augmentation
- establish incentives throughout the NEM for the implementation of DM and the use of small, local generators
- establish a DM code of practice for networks
- develop the capacity for demand response providers to bid into the market
- establish a DM funding mechanism

These principles should be fundamental to considerations of how to roll out smart meters. It is unfortunate that the only two demand management strategies tested in this process were meters or DLC, as this does not give a broad sweep of potential measures. Some are being assessed through other avenues, but we would urge a proper, wide-ranging investigation of DM techniques and DM potential across the NEM.

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activities that meet energy needs, including cogeneration, standby generation, fuel switching, power factor correction, interruptible customer contracts, and other load shifting mechanisms.
[5] Energy SA, *Demand Side Management – Benefits to Industry & the Community*, 2001, p 5
[6] Ibid., p 5

The emphasis on small users in the smart meter analysis also neglects medium and large users. Smart meters are being installed in some areas for these users, but this is inconsistent across the NEM and the kinds of tariffs vary widely. These users generally all have interval meters if their consumption is above a particular threshold, but these are not necessarily smart meters. TEC recommends a similar review process be established for these consumers since the same goals apply to them.

1.4 Greenhouse benefits

Greenhouse benefits are likely to result from a distributor-led rollout of smart meters that meet the minimum functionality, largely due to increased efficiency resulting in reduction in electricity demand. Without IHDs, DLC and the guarantee of best practice tariffs, however, the degree of these reductions remains uncertain, and considerably lower than they could be with these elements. If the facility for a home area network is included in the minimum functionality then this will at least increase the potential for further reductions.

Greenhouse benefits are among the stated objectives to be considered (points 5 and 7, p. 29); but are strangely absent from the definition of the problem (Question 1), as if the failure of the NEM objective and Rules to acknowledge its centrality in the climate change landscape has not been a blindness of immense proportions. The problems listed are:

- Inefficient electricity pricing
- Load profiling and retailer costs
- Cross-subsidies between consumers
- Time-related costs
- Transitional costs and additional benefits
- Split benefits problem.

What is lacking in the statement of the problems is direct engagement with the issue of greenhouse emissions. This is a major and chronic failure of the NEM and the contribution that smart meters could make to the reduction of greenhouse emissions and carbon costs is being greatly limited as a result.

The benefit from smart meters relies on the inclusion of specific features, since otherwise there are only modest emissions reductions to be gained. If managed properly, smart metering may form an effective part of a suite of programs and policies to address the reduction of greenhouse gas emissions. It is clear from the reports and experience elsewhere that maximum greenhouse benefits rely on:

- IHDs which provide
    - Superior and ongoing consumer education
    - Superior information provision to consumers about prices, carbon costs, emissions and consumption rates
- The facility for remote cycling or shutting down of home appliances, such as air conditioning and pool pumps; this area too has had little investigation here, with most of the focus being on air conditioning units and most of the testing so far being done in South Australia.
- A range of time of use tariffs offered by retailers
- Regulatory requirements or strong incentives for networks to utilise DLC facilities

- Facility for import-export metering that measures gross generation; which will integrate with the emerging feed-in tariffs - this has not been seriously grappled with in this CBA.
- Ongoing promotion of the programs

1.4 Carbon Price Modelling

The carbon costs modelled in the CRA report[7] have been vastly underestimated and, as a result, the benefits of the ability of smart meters to reduce average consumption have been inappropriately minimised.

The CRA report posits the start of an emissions trading scheme at 2012[8], two years later than the 2010 date the Federal Government has committed to, and two years later than the previous state-based National Emissions Trading Taskforce (NETT) scheme was planned to commence. The 'expectation' of the 2012 start date is unjustifiably conservative. Not withstanding the long explanatory footnote in the CRA report on this problem, this carelessness cannot be rationalised as a mere timing problem: commitment to an emissions trading scheme was made on 3 December 2007[9] and the CRA report was not released until 15 February 2008. This oversight has significantly impacted on the carbon prices estimated.

Carbon prices modelled are overly conservative, not only because of the incorrect start date of the emissions trading scheme. The CRA report uses the most conservative NETT modelling without explanation, arbitrarily ignoring the medium and high NETT prices.[10] For example, the NETT Scenario 2 price reaches $35 per tonne by 2020; the CRA price doesn't reach $35 per tonne until 2028. These differences would have a substantial impact on the benefits of savings in average energy consumption achieved by smart meters with IHDs and DLC. It must be noted that the NETT prices are already undervalued, with none designed to achieve the Federal Governments' target of 60% below 1990 levels by 2020, which current science is also showing to be conservative. The **current** EU price of $35 per tonne is more reflective of near-future carbon costs and further illustrates that the greenhouse modelling for this exercise is deeply flawed.

2. Users managing their demand

One of the aims stated in the RIS for the rollout is, "to allow users to better manage their demand for peak power …" (p. 11) and it is noted that, "The initial driver for investigating smart meters was to reduce demand." (p. 29) A smart meter alone will not assist a residential user to manage their demand, based on the definition of a smart meter being, "an interval meter with secure two-way communications and remote reading capabilities

[7] CRA, Cost Benefit Analysis of *Smart Metering and Direct Load Control: Economic Impacts on wholesale electricity market and greenhouse gas emission outcomes*, 15 Feb 2008.
[8] Ibid., p. 26.
[9] 'Rudd's First Act: yes to climate pact' in The Age, 4 December 2008, at http://www.theage.com.au/news/national/rudd-yes-to-climate-pact/2007/12/03/1196530575996.html
[10] For example, NETT, *Possible Design for a National Greenhouse Emissions Trading Scheme*, August 2006, p. xxi.

…" (p. 8). Indeed, a smart meter without an IHD is like a computer without a monitor or software.

The primary requirement is that consumers receive information on what their usage is, irrespective of whether they are aware of prices (see section 3 on time of day pricing). Some features which facilitate information flow are:

- Time of use pricing (see section 3 below)
- Home area network (see section 4 below) at this stage of technological development (it is conceivable that some other form of communication may develop long-term)
- In-home displays (see section 7 below); again, this is the best vehicle technically available at this stage for most consumers
- Detailed bills, with full information on patterns of usage, prices, carbon costs and greenhouse gas emissions.

To achieve greenhouse benefits it is critical to reduce overall consumption, not just reduction of the peaks. Networks are built to accommodate peak consumption and TEC has argued in many forums about ways to improve on this approach, in particular via a variety of types of DM.

A focus on peak periods neglects the fact that greenhouse emissions primarily emanate from baseload (coal-fired) generation, and there must be mechanisms to reduce these emissions. In fact, it has been argued that some generation in peak periods will have lower emissions if it is gas generation (it should be noted, however, that this does not apply nation-wide; for instance, in Victoria peak supply is more likely to come from hydro-generation).

The findings of this CBA are not a good indicator of how deeply the conservation effect may bite over time. There are currently over 700,000 consumers who are concerned enough about environmental impacts to voluntarily pay higher prices for GreenPower accredited electricity. As awareness of climate change and carbon costs increase, the critical importance of smart meters in being able to facilitate more efficient electricity use will therefore grow. For smart meter functionalities to be so severely limited at this stage represents an appalling lack of foresight from consultants and decision makers.

3. Introduction of time of day pricing

The "introduction of time of day pricing" is another of the stated aims for the national rollout. However, there are no proposals to date about how to ensure time-of-day pricing is actually introduced. This is borne out by the CBA's estimate of a staggering 57% of consumers may choose to remain on flat tariffs. It is not clear, therefore, whether time-of-day pricing is an actual goal or whether it is just a vague in-principle notion.

The CBA indicates that a "distributor-led" rollout provides the greatest benefit. Yet there is no onus, or recommendations for such, on the distributors to establish and pass on time of day pricing to retailers. They may well choose to do so because of the efficiency gains, but there is no apparent intention to ensure that this occurs, either through incentives or regulations. There is also no guarantee that the retailers will choose to offer

time of day pricing to customers. Even under a retailer-led rollout this dilemma still applies.

We emphasise that time of use (TOU) tariffs do not only encourage load shifting as a reaction to peak pricing, as so often is presented in discussions. Since they are also a vehicle of informing customers about the fluctuations in electricity price, they may also encourage average load reductions. In tandem with an IHD, customers can become better informed not only about prices but also about carbon costs and greenhouse emissions, which has the potential to greatly increase reductions in consumption overall.

TEC is also concerned about the substance of the discussions about TOU pricing that may be on offer in Australia in the reports on this process, and in the RIS. For instance, various models for TOU tariffs are used in other countries (some of which are canvassed in the RIS) but so far there has been very limited testing here of variants, with most trials relying on critical peak pricing to deliver changes in consumption patterns. This may be an effective mechanism, but there seems to be an over-reliance on it to effect change. There has been an associated assumption that retailers will offer simplistic scales of tariffs. There are twin difficulties here: there have been relatively few trials here, and the trials have involved small samples; and there has been no rigorous testing of different models of pricing plans so it is unknown how Australians would react to other types.

To enhance consumer understanding of potential benefits, there must be:

- Incentive regulation or direct regulations to ensure retailers pass on TOU prices (whether it is a distributor-led or retailer-led scenario).
- Comprehensive consumer education of what TOU pricing means, in terms of potential benefits to the consumer of reducing their environmental impact as well as reducing their costs
- More thorough investigation and trials of varied tariff plans

An existing form of TOU pricing is off-peak rates for appliances such as electric hot water units, and this has been raised as an obstacle for the rollout in jurisdictions where such pricing is common. The obvious solution to maximise greenhouse benefits is to phase out off-peak pricing. This would encourage consumers to switch to more efficient hot-water heating options such as solar, instantaneous gas or heat-pump. But again, the limited framework within which the smart meter exercise has been carried out – minimising the capacity of smart meters to reduce greenhouse emissions – has meant that such an approach has been ignored. Instead of encouraging such a transformation, the smart meter process has instead chosen, rather un-creatively, to see off-peak tariffs simply as a barrier, rather than as an opportunity to in which smart meters could effectively transform inefficient consumption.

In order to meet objective 7, regarding energy efficiency and greenhouse benefit, it is essential that ways of ensuring that TOU tariffs and IHDs are promoted across Australia. If the MCE is genuine about the objectives of consumer information and greenhouse benefits, they have to come to grips with developing a mechanism to ensure that relevant and appropriate TOU tariffs are offered to consumers.

4. Home area network

TEC supports the consultants' recommendation for the inclusion of an interface with a HAN for each meter (Question 2). However, without IHDs and DLCs, the HAN is virtually useless. A HAN does not in itself allow communication between the meter and attached appliances or an IHD; it is, however, a prerequisite for that communication to occur. Including an interface for a HAN in the minimum functionality at least gives the capacity for such communication in the future. However, the costs of retrofitting these functions for customers who wish to install an IHD or participate in DLC could be prohibitive and it makes business sense to install them at the same time, particularly as it appears to be a relatively minor extra cost. In addition, inclusion at this stage will give more certainty for consumers to be able to buy appliances that have standardised features. Future government policies in response to climate change imperatives are likely to favour and/or promote these functions and it would be a mistake to miss the opportunity to include this facility from the start.

NERA notes that this feature has a positive net benefit even at the low end of the estimates, in the case of a low demand response plus DLC capability. With a high demand response plus inclusion of an IHD the benefit was solidly positive. We agree with all of the supporting actions NERA recommended (cited on p. 33 of the RIS), concerning maximising energy efficiency and DLC uptake in order to optimise the benefit of the HAN.

5. Preferred scenario and model

TEC supports a distributor-led system, as this would probably be the most secure and certain scenario for consumers. The distribution businesses are geographic monopolies whereas there may be many retailers in one region, so there would a reduced possibility for conflict about who is responsible when problems arise. We also accept the CBA finding that this gives the greatest benefit. The main disadvantage specific to a distributor-led roll-out is the lack of guarantee that TOU prices would be passed on to consumers; a retailer-led scenario may give more certainty of this occurring (Questions 7 & 8).

Notwithstanding our comments about the unacceptably limited scope of the CBA, amongst the options considered the DLC-only scenario is the one with the greatest focus on greenhouse benefits, but the findings from the CBA indicate that these benefits are likely to be greater with a smart meter in play as well. The main difficulty here is uncertainty surrounding the degree to which distributors and/or retailers will become involved in DLC schemes without some regulatory lead or incentive (and see section 6).

In terms of alternative scenarios, a rollout of interval meters would be the most obvious alternative. These still give the capacity for TOU tariffs and are being used for this purpose in places like Italy and Sweden. Italian retailers offer a range of tariffs related to time of day and day of the week, while in Sweden it is possible to choose tariffs that are directly related to the pool price. The example of France, as discussed in the RIS, is an interesting one where they use a code system (via lights) to signal peak, standard or low prices to consumers. Nonetheless, a smart meter has the added benefits of near real-time interaction with the consumer and the facility for DLC, which leads to our preference for smart meters (as long as the additional features for communication and management are incorporated in the rollout).

It would make sense to retain NEMMCO (or the next incarnation) as the responsible body for centralised communication and overall data management within the distributor-led scenario (Question 9 onwards). Although an overhaul of their systems will be required to deal with the extra mass of data, giving NEMMCO the responsibility ensures greater security for the information collected. If it is left to the private sector, there is the risk that changes in ownership or insecure systems could result in loss or misuse of data.

6. Direct load control

DLC is a critical tool to enable load reductions at both peak and average (base-load) times. The CBA clearly shows that reductions in consumption are substantially increased with smart meters and DLC working together (Question 5). Where there is no smart meter, the overall benefit from DLC only is lower, because there are no price signal or conservation impacts. Again, the limited scope of this review has resulted in the dismissal of such findings as smart meters combined with DLC was not compared to other options.

As summed up in the RIS, "Where smart meters do incorporate a HAN which enables DLC ... then NERA estimated that the smart meters would result in *greater* reductions in peak demand than DLC, as a result of the combined impact of DLC and CPP [critical peak pricing] under the smart meter scenarios." (p. 55)

The lack of regulations to ensure that DLC occurs is borne out by the CBA assumption that only 7% - 15% of consumers will take-up this option. The RIS, as if learning nothing from the limitations of this approach, assumes that DLC will be optional and does not assess required DLC with smart meters.

If distributors and/or retailers don't actively engage with widespread DLC schemes one of the major advantages of smart meters will be lost. The DLC-only scenario provided that, "Distribution businesses would be obligated to provide the infrastructure to support DLC devices and to offer DLC enabling devices to customers on certain existing air conditioners, pool pumps or other large energy using devices." (p. 47) It is a bizarre omission that this requirement was not included in a smart meter roll-out scenario.

The distributor-led scenario should include the same onus regarding DLC devices, existing and future, and both distribution and retail businesses should be obligated to support and/or offer appropriate compensatory tariffs to participating consumers.

7. In-home displays

In-home displays are essential to convey information to consumers and to maximise greenhouse benefits. Without IHDs the meters are for the benefit of electricity business efficiency, not for direct consumer benefit, and will only result in small greenhouse emissions reductions. An IHD has been the only genuine vehicle proposed for consumers to receive information on their usage and impacts, and the higher-range greenhouse benefits modelled in the CBA all depend on the existence of IHDs. Without these, for consumer information and greenhouse benefits a smart meter is no better than an interval meter. It is suggested that retailers may offer them to customers, or consumers may be able to buy them, but there is absolutely no guarantee and limited incentive for these possibilities to eventuate.

IHDs are fundamental to the process objectives of, "enabling customers to better manage energy use and greenhouse gas emissions" and, "promoting energy efficiency and greenhouse benefits", both of which contribute to, "promoting the long-term interests of consumers". Without them, the objectives are not met. TEC accepts that IHDs will add to the costs of such a rollout, and although there is purported uncertainty around how much greenhouse benefit IHDs would deliver, maximising any benefits depends on their inclusion.

We reiterate our response to the Phase 2 CBA:

> "At this stage, if the consultants' recommendations are followed, there will be no consequent rollout of IHDs within the general smart meter rollout. If this is the case then other routes for installation must be pursued if COAG and the MCE wish to meet the goal of users being able to manage their demand. Time of use tariffs will not succeed in this respect on their own, and in any case there is no indication that these tariffs will be mandated nationally; it is even unclear whether they will be mandated at a jurisdictional level. Therefore there is no certainty that retailers will pass them through to consumers."

Maximising greenhouse emissions benefits, promoting energy efficiency and enabling customers to better manage their energy use and greenhouse gas emissions depends on the inclusion of IHDs. A supplementary analysis of the inclusion of IHDs in minimum functionality should be undertaken.

8. Import/export metering

TEC supports the inclusion of the facility for metering net import or export in the minimum functionality, particularly since a number of jurisdictions are implementing feed-in tariffs for on-site generation and co-generation. Metering, however, should be able to measure the *gross* amount generated at the site and not just *net* exported (ie: minus import).

We are concerned that there has been no proper consideration of the potential for the meters to measure gross production. The MCE has responded to our communications on this matter arguing that the rollout does not prevent installation of gross measurement meters where required. However, this approach is extremely short-sighted in the context of the emergence of feed-in tariffs measuring gross generation around the world and in Australia. It is becoming obvious that net generation payments for small-scale, local generation will not lead to the dramatic increase in domestic solar power needed to impact Australia's emissions from the stationary energy sector.

Under the current smart meter proposal, by the time gross generation tariffs are mandated, domestic solar power producers will have to install a replacement dual-element meter. This is highly inefficient and comprises yet another barrier to distributed generation, adding to the many that the MCE is already attempting to reduce.

The facility for gross export metering should be included in the minimum functionality of smart meters on the basis of a more comprehensive examination of its role in the context

of complementary climate change policies and general efforts to promote renewable energy in Australia.

9. Pilots and trials

We have referred above to trials required for TOU tariffs and IHDs (Question 20). There is a clear requirement for more trials across Australia to pick up local variations. We also urge the establishment of a 10% target for overall reduction of consumption, with trials to be developed and carried out to ascertain the best route to achieve this. Further trials are also needed to test the conclusions to date, in particular regarding variations between jurisdictions plus the government policies required to maximise the benefits while ensuring protection of consumers. The proposed technical working groups would be appropriate to design pilots and trials, but these would require public consultation before initiation.

10. Public education programs

If the smart meter rollout is simply a distributor-led rollout, with a HAN only, then public education about DLC and DM needs to be undertaken extensively (Question 24). It is noted in the RIS that, "The consultants suggested that consumer education programs, about the introduction of smart metering and associated innovative tariff products, are necessary to ensure that demand response is maximised." (p. 96) We certainly support that assessment, but emphasise that such programs should **not** be viewed as replacements for the other consumer information mechanisms we have recommended, but only as **adjuncts** to them. Such programs are necessary whatever form the rollout takes but are not sufficient as a long-term strategy for consumer information about techniques for demand management in lieu of IHDs and required DLC.

On the other hand, if the whole process actually institutes features for consumer information and greenhouse benefits, then all levels of government could participate in public education about ways consumers can minimise greenhouse impacts plus strategies to reduce their electricity bills. Guidelines for promotion programs by distributors and retailers must also be developed, for instance concerning how carbon costs, greenhouse emissions and greenhouse reductions are reported on customers' bills. As NERA points out (as cited on p. 96), this will be a minimal cost in relation to the whole rollout so the bill could be footed by whoever undertakes the promotion (government and business alike).