RENEWABLE FUTURE

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Dr John Tamblyn of AEMC
PO Box A2449
Sydney South NSW 1235
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Dear Dr Tamblyn

I am writing to you about the Victorian Jurisdictional Derogation (Advanced Metering Infrastructure Roll Out). I am involved in the installation of PV systems and energy consulting work including domestic interval meter data analysis and tariff development.

Big Picture

The current five year roll-out will cost households $1billion and will not change the thermal characteristics of any house directly and hence peak power will continue to grow as more air-conditioners are sold. The financial signal of CPD (Critical Peak Day) pricing is limited to a few hundred dollars per household per year at best. In the light of current financial difficulties it would be better if this investment was directed squarely at the air-conditioning growth area, low income households. (Advanced Meter roll-out should be maintained at natural replacement levels.)

The attached paper outlines one possible approach which would yield significant greenhouse and peak power benefits. This program could be focused on healthcare card holders with wall insulation and aluminum backed roller blinds being brought into the first fit-out. Additional funding could be provided from an external conservation tariff. That is the net capital cost (Capx minus VEET credits) could be raised from a Low Income Carbon Proof Fund sourced from taxes and/or a small energy tariff. Perhaps the best option is to allow distributors to invest in household insulation measures and count this as part of their asset base. Why should conservation measures be excluded from long term energy investment structures?

In addition, a revenue neutral, installation charge for air-conditioners and rebate for external evaporative coolers could be used to shift the residential cooling market. This action would greatly reduce peak power demand from current levels, over time.

In the light of current financial uncertainty perhaps it is time to revisit this issue and fund real capital works that protect the most vulnerable in our community from future increases in energy costs and protect the community from the dangers of Peak Power. For too long the issues of greenhouse and peak power have been treated like a hot potato to be passed to the next group with no positive action.

Small Change

Whilst the above approach would greatly benefit the community it does not benefit any particular financial group or union base as just has no powerful support. Therefore it would be difficult to implement in today's political environment. However, a small exemption would be very helpful for the emerging solar electric industry.

Your website notes said: *There are some disadvantages associated with a distributor led rollout, but they could be minimised by the implementation of mechanisms to allow for the transition from service provided under a monopoly environment to contestable environment.*

Businesses who sell PV (Photo-Voltaic) systems will bear a significant disadvantage in that the meter change over cost will rise from $250 to $400 and the quality of service will be degraded as there is no competition. (If the State Government was a business the proposed action would be illegal under the trades practice act.)

Could you please consider providing an exemption for this market? That is allow households to choose their meter installer if they are activating the meter change request directly or through an agent. It should be noted this is already occurring and no new processes need to be established.

This minor change would enable market competition, provide a better service, enhance solar electric installations, reduce net peak power (through more solar installations), reduce greenhouse emission and allow small interval meter supplies to survive until AEMC decides to make the meter market contestable whilst not hindering the proposed accelerated roll-out.

It should be noted the Federal Government requires PV installers to setup smart meters for schools. That is internet access to past consumption and generation of electricity is required for educational purposes. This service is being provided through 'The Energy Lab' system by Metropolis. To my knowledge none of the Distribution companies have a similar service. Therefore the State Government's requested action will shut down part of the Federal Government's sustainable schools program unless the exemption is given.

Thank-you for considering of these matters.

Regards, Mark Fleming
Dr M Fleming

Making Sustainability Accessible
Web: www.RenewableFuture.com.au

Address: 52 Tallis Drive, Mornington, 3931
Email: MFleming@RenewableFuture.com.au
Mobile: 0409 146 495
ABN: 65 431 168 867

Greenhouse and Low Income Households

Prepared by Dr M Fleming
Date 9/8/2008

Table of Contents

Document Control Sheet 2
1. Background 3
2. Summary 3
3. Household Empowerment 3
4. Reducing Government Cost 3
4.2. Renewable Energy Credits (REC) 4
4.3. Victorian Energy Efficiency Targets (VEET) 4
4.4. Electricity Distributor Benefits 4
4.5. Retail Margin 4
5. Proving Householder Value 5
6. Getting Started 5
6.2. Value Statement to Household 5
6.3. Mail Out 5
6.4. Creating Social Momentum 5
7. Estimate of Impact & VEET Credit Generation 6
8. Coordinated Action 8
8.2. Federal Government 8
8.3. State Government 8
8.4. Local Government or Mornington Peninsula & Western Port Biosphere (MPWP) Biosphere 9
8.5. Electricity Distributor 9
8.6. Energy Retailer 9
8.7. Aggregator 9
8.8. Sub-Contractors 9
8.9. Households 9
9. Conclusion 9
Appendix: Increase Photovoltaic Capacity to 1.8kWp 10

Document Control Sheet

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Contact for Enquires

Name	Company	Phone	Mobile
Dr Mark Fleming	RenewableFuture Trust mfleming@renewablefuture.com.au	03 5975 3997	0409 146 495

Releases

Release No.	Date	Amend by	Nature of Amendment
0.1	1/8/2008	M Fleming	First draft release
0.2	7/8/2008	M Fleming	Notes on tables
0.3	9/8/2008	M Fleming	Minor edits and footnotes

1. Background

1.1.1. The greenhouse challenge is extreme. The natural global absorption of CO_2 was around 4GT/ann (GT: Giga Tonne=10^9) and is expected to fall to around 3GT/year which is 0.5T/year/person as there are 6billion people. Australia's Greenhouse footprint is over 5T/year/person (5.63T). This means we need a cut of 90% to be equitable.

1.1.2. Once a Carbon Trading Scheme is introduced by the Rudd Government, clearly the price of CO_2 will rise significantly above the startup price of $20 or $40/Tonne for Carbon Dioxide. When this occurs low income households will be adversely affected as the compensation package will not be enough.

1.1.3. It would be better to reduce the demand for energy of low income households in the next few years to avoid this problem.

1.1.4. This paper outlines a proposal for a targeted programme to reduce the energy usage of low-income households on the Mornington Peninsula.

2. Summary

2.1.1. Offering Healthcare Cardholder households a 40-80% CO2 reduction by:

- Free Solar Hot Water.
- Free Energy Audit & Fit Out (Lighting, Shower Rose).
- If they pay a fixed fortnightly sum from their Centrelink payments equal to their current gas and electricity bill for 2 years. Future tariff increases reduced by 50% in the fixed payment period.
- Second stage of works focusing on insulation and draft reduction in return for another 2years of fixed payments.
- Funded from existing rebates, REC and VEET credits, Distributor value, retail margin and Government support. That is spreading the cost burden.

2.1.2. Our goal is for 80% of Mornington Peninsula Low Income households to reduce their Carbon footprint by at least 50% within 5years.

3. Household Empowerment

3.1.1. Many low income households are renting, in public housing or lack the funds and resources to reduce their Carbon footprint. Landlords are reluctant to invest in solar hot water, energy conservation measures and the PV rebate is not available to these people.

3.1.2. These barriers need to be removed and low income households encouraged to reduce their Carbon footprint thereby empowering the community.

4. Reducing Government Cost

4.1.1. We need to maximize other sources of revenue to reduce tax payer costs. As noted above the use of existing rebates, REC, VEET and retail margins can all act as funding sources.

4.2. Renewable Energy Credits (REC)

4.2.1. The Solar Hot Water and PV installations attract Renewable Energy Credits (REC), and as such reduce the installation cost by around $1600 and $900 for standard installations, respectively.

4.3. Victorian Energy Efficiency Targets (VEET)

4.3.1. Victorian energy retailers will have to find 2.7million CO_2 tonnes/ann of VEET (Victorian Energy Efficiency Target) credits through residential energy efficiency programs starting on 1/1/2009, less than 5months away. Assuming there are 2.2 million houses in Victoria, the target is 1.23T/ann/household or close to 1MWh/ann. There is no soft start to this program, and will be implemented on top of the proposed Carbon Cap and Trade proposals.

4.3.2. This VEET target is significant and may prove difficult to achieve. If the VEET program focused on low-income households, the benefits would be:

- Capital from VEET would be used on low-income households,
- Low-income households would avoid large increases in energy costs,
- Reduced billing problems for energy retailers and
- Governments would solve the low-income Greenhouse dilemma.

4.4. Electricity Distributor Benefits

4.4.1. The installation of aluminum-backed roller blinds and insulation reduces the heat gain in summer, and so reduces the air-conditioning load of critical peak demand for the electricity distribution network. If sufficient households take this action peak demand would be reduced, thus avoiding investment in electricity distribution networks and power generation.

4.4.2. Distributors need to be allowed to increase their asset base by investing in demand reduction and greenhouse saving, rather than by increasing capacity. This is currently not possible, and needs to be trialled with an interval meter roll-out program to measure the impact.

4.4.3. It should be noted that the falling capital cost of air-conditioners has the potential to create new markets for air-conditioning in low-income households. Provision of blinds and insulation will reduce this uptake and usage. The following equation provides an estimated community value for air-conditioning avoidance:

*Peak Power = 60% Duty Cycle *2.5kW = 1.5kW*
Community Cost = 1.5kW($1000/kW Generation +$300/kW) = $1950*

4.5. Retail Margin

4.5.1. If a household's energy demand is reduced by 40% but they are paying the same bill, an additional retail margin is generated. This margin can be reinvested in household energy reduction actions. For example wall insulation and even double glazing will be expensive and require

significant investment. The concept is to use the 'Low Hanging Fruit' to pay for the more difficult actions through retail margin.

4.5.2. In an ideal world this would be achieved through a conservation tariff split between the household and the community, but this is currently not achievable.

5. Proving Householder Value

5.1.1. For this program to work households need to take ownership. This will only occur if they see sufficient value. The value comes from avoiding pain of increased costs and seeing results.

5.1.2. The installation of a Solar Hot Water Unit and Energy Efficient Lighting provide the tangible results in the house and a fixed bill with 50% reduction in future tariff increases provide the reduction in pain.

5.1.3. The involvement of government would also bring brand power, security and removal attitudinal barriers. People are overloaded with information, and find it difficult to discern correct actions. In addition, potential landlord resistance would be greatly reduced with government support.

6. Getting Started

6.1.1. Clearly empowering households to reduce their Carbon Footprint is a radical concept, and so a local trial will be needed to prove that it is achievable. Since Solar Hot Water is a key element in the householder value, and the State Government has increased the regional Solar Hot Water rebate by $1,000, a regional area is a logical location for a trial.

6.1.2. The Mornington Peninsula has both a large low-income population and a Local Government committed to sustainability and hence is a logical area to trial the process.

6.2. Value Statement to Household

Reduce your Carbon Footprint by 40-60%
Free: Solar Hot Water for healthcare card holders ($800 for others)
Free: Energy Audit and Fitout with lighting and shower rose
50% Saving on future energy tariff increases for 2years
Commitment: If you pay electric and gas bills, at their current level, for 2 years through Centrelink
Extra charges may apply for gas connection and multi-story dwellings
Later stages may include free wall insulation, draft reduction and roller blinds
This offer is subject to availability of Solar Hot Water Rebate and various greenhouse credits.
Sponsored by ~~~~

6.3. Mail Out

6.3.1. The above value statement could be mailed out to all the Peninsula households and placed in local papers and the Council Paper, with an invitation to sign up to participate.

6.4. Creating Social Momentum

6.4.1. At the heart of this proposal is a social contract between households, government and a range of businesses. The contract is: *We fit your*

house out and work on future challenges if you pay the same bill for 2 years, plus 50% of future tariff increases.

6.4.2. To create this contract and the required social momentum, a kick-off event could be held. This could be free afternoon tea at the Mornington Golf Club or similar venue to explain the program. The drawcard being free reduction of your Carbon footprint and avoidance of increased energy costs as outline above in section 6.2.

6.4.3. A short talk would be given and questions taken. Some form of on-the-spot sign up incentive could be used, with a 7-day cooling off period.

6.4.4. This event could be photographed and published in the local paper and national papers and other media thus creating more social momentum. The theme could be: *'Mornington Shire creating a sustainable future, not just talking about it'*. This public launch should allow entry into many of the local community groups: a roadshow could go as invited to clubs, churches, schools etc.

7. Estimate of Impact & VEET Credit Generation

7.1.1. The tables below outline the anticipated impacts for a typical household. The Carbon price is assumed to be $20/Tonnes. These tables are rather involved and may be ignored.

	Greenhouse Rate kg CO2e/GJ	Market Value $/T
Electricity	364	$20 /T
Natural Gas	57.3	

Table 1 Assumed emissions for Natural Gas and Electricity

Showers	3	per day		
Duration	5	minutes		
Change in Flow Rate	15	lt/min	(25 to 10lt/min)	
Temperature Rise	30	degC	(15 to 45degC)	
Specific Heat	4.2	kJ/lt/degC		
Duration	3	years	Daily	
Total Energy Saving	31	GJ	28.35 MJ/d	
Water Saving	246	klt	225 lt/d	
GHG Saving			Percentage	Value
Electricity	11.30	t-CO2e	30%	$225.99
Natural Gas	1.78	t-CO2e	70%	$35.58
			Average	$92.70

Table 2 Average Low Flow Show impact

7.1.2. The total energy saving for the 3-year period, assuming an average of three 5-minutes showers per day with a saving of 15lt/minute.

*Total Saving(GJ) = 365*3*Daily Saving/1000 = 31GJ*
Daily Saving(MJ/d) = 15minutes(25-10)lt/min*4.2kJ/lt/deg*30degC/10^3*
*GHG Saving (Elec) =31*364/1000 = 11.3T*
*GHG Saving (Gas) =31*57.3/1000 = 1.78T*
Assume 30% of houses have electric hot water
*GHG Value = (0.3*11.3T+0.7*1.78T)*$20/T = $92.70*

Lighting	LED	CFL		
Fitting Life	50,000	6,000	hrs	
Usage	4	4	hrs/d	
Expected life	34.2	4.1	years	
Power Saving	42	60	Watts	LED 50 to 8Watts
Total Energy Saved	2100	360	kWh	CFL 75 to 15Watts
GHG Saving	2.73	0.47	t CO2e	
VEET Value	$54.60	$9.36		
Electricity Cost	18	18	c/kWh	
Duration	1	1	year	
Value	$11.04	$15.77	/ann	

Table 3 Lighting Assumptions (LED lights, shown above used in downlights)

7.1.3. Assume CFL (Compact Fluorescent Lights) are used for standard light fittings and LED for downlights. The GHG (Green House Gas) savings are:

CFL Saving = 6000hrs/1,000,000(75-15)Watts*0.364T/GJ*3.6 =0.47T*
LED Saving = 50,000hrs/1,000,000(50-8)Watts*0.364T/GJ*3.6 =2.73T*

*Electricity Saving = 18c/kWh/100*4hours*365days*Power Saving*

House Insulation	Draft	Blinds	Wall Insulation	
Average House Size	170	170	170	m2
Average Heating	50	50	50	GJ/ann
Heating Type	Gas			
Percentage Saving	20%	25%	40%	
Duration	25	25	25	years
Energy Saving	250	312.5	500	GJ
GHG Saving	14.3	17.9	28.7	t CO2e
VEET Value	$286.50	$358.13	$573.00	

Table 4 House Insulation Assumptions

7.1.4. The insulation calculation assumes the average existing house uses 50GJ/ann of gas heating with the savings being 20% draft reduction, 25% for aluminum-backed blinds and 40% for wall insulation. The greenhouse gas saving is:

*GHG Saving(T) = 25years*50GJ*57.3T/GJ*Percent Saving*

7.1.5. The table below shows that a saving of 40%-80% in greenhouse gas emissions is achievable, depending on the level of investment in household savings (assuming the current average is 12T/ann/dwelling).

Typical House Electricity	Units	Occurance %	Energy Saving kWh/d	MWh/ann	GHG Saving t-CO2/ann	VEET t-CO2e	Reduction %
Downlights	15	100%	2.52	0.920	1.20	40.95	
Standard Lights	15	100%	3.6	1.314	1.71	7.02	
Solar Hot Water		30%	11.8	4.309	1.68	25.21	
Gas			MJ/d	GJ/ann			
Solar Hot Water	1	70%	42.5	15.513	0.62		
Total (Stage 1)					**5.21**	**73.18**	**43%**
Extras							
Draft Reduction					0.57	14.33	
Roller Blinds					0.72	17.91	
Wall Insullation					1.15	28.65	
Solar PV		100%	4.4	1.606	2.09		
Total (Stage 1 & 2)					**9.73**	**134.06**	**81%**

Table 5 Average Household Impact

8. Coordinated Action

8.1.1. The concept is to align and coordinate many stakeholders in our community to achieve our desired goal of making sustainability both feasible and accessible, particularly for low-income households.

8.1.2. The proposed goal is to have 80% of Mornington Peninsula Healthcare Card holder households achieving an average of at least 50% energy-use reduction, in 5years.

8.1.3. This will require additional government funding for just 20% of these households. That is the first 20% would seed/fund the remaining 80% through reinvestment of returns. (It should be noted the bulk of the investment would be provided by the standard rebates and greenhouse credits.)

8.1.4. This section outlines the actions needed by each key stakeholder group. It should be noted that these requirements are still under development and have been provided at this stage to generate discussion.

8.2. Federal Government

8.2.1. Allow splitting of CentreLink payments. Currently CentreLink payment is to a single account.

8.2.2. Provide funding of $500 per household for the first 20% of healthcare card households on the Peninsula and $50,000 seed funding. Provide funding of $250 for low-income households that install a solar electric unit (PV).

8.3. State Government

8.3.1. Allow electricity distributors to invest in approved energy-reduction projects in return for an increased asset base and hence an increase in regulated DUoS (Distributor Use of Service) tariff.

8.3.2. Allow an aggregator to collect a fixed payment from CentreLink for energy supply to households with sufficient CentreLink payments.

8.3.3. Provide media support and endorsement.

8.3.4. Provide funding of $500 per household for the first 20% of healthcare card households on the Peninsula and $50,000 seed funding. Continue the 'Regional Solar Hot Water Program' for Healthcare cardholders, who join our action, after the 5000 units Statewide have been installed.

8.3.5. Provide funding of $250 for low income households that install a solar electric unit (PV).

8.4. Local Government or Mornington Peninsula & Western Port Biosphere (MPWP) Biosphere

8.4.1. Provide local support and endorsement to reduce household uncertainty.

8.5. Electricity Distributor

8.5.1. Provide capital to aggregator to purchase energy-reduction technology that also reduces peak power demand most notably aluminum-backed roller blinds, insulation and some evaporative coolers.

8.6. Energy Retailer

8.6.1. Provide aggregator contract to aggregator and purchase VEET credits from aggregator.

8.6.2. Arrange for interval meters to be installed so performance can be monitored more closely. (this function could be provided by the electricity distributor also.)

8.7. Aggregator

8.7.1. Coordinate local program. Manage households, sub-contractors, events, media and funding. Develop Customer Relations Module (CRM) software. Obtain any certificates if required.

8.8. Sub-Contractors

8.8.1. Provide labour for household installations and auditing.

8.9. Households

8.9.1. Sign a Retail Contract with the Energy Retailer and an Aggregator Contract with the aggregator.

8.9.2. Have an energy audit and fitout (solar hot water, lighting and shower-rose).

8.9.3. Pay a fixed fortnightly bill for two years with tariff increases limited to 50% of standard increase. Extend the fixed payment period for additional investment notably insulation, blinds, draft reduction and photovoltaic units.

9. Conclusion

9.1.1. If we empower low-income households (and others) to reduce their carbon footprint by 40% or more, we will protect low-income households from rising cost of energy and reduce greenhouse emissions. This can be achieved through a social contract where households pay their current energy bills plus 50% of tariff increases for the next 2 years in return for a free solar hot water system and a fitout of their homes.

9.1.2. Its time we offered a solution not a handout!

Appendix: Increase Photovoltaic Capacity to 1.8kWp

9.1.3. Our goal is to protect low-income households from high energy costs. For those who own their home an option could be to install a larger PV array[1] as is done in a number of European countries like Germany and Spain.

9.1.4. To achieve this goal, additional capital would need to be made available upfront. This could be part of the distributor's peak demand-reduction strategy. Favourable treatment through VEET credits would also be helpful. For example a 1.8kW unit could get a credit of:

Credit = Peak Power(Alinta+VEET) –REC for 1kWp unit*
Credit = 1.8kW($1600+$2100) -$900 = $5,760*
*Alinta distributor = $2000/kWp*0.8Duty Cycle= $1600/kWp*
*VEET=$40/T for 25Years Assume 2.1T/kWp = $40*25*2.1 = $2100/kWp*
kWp means peak power output of PV unit under standard test conditions

9.1.5. As a point of interest this approach could be used as a step-down method for the photovoltaic rebate when the funding runs out[2]. That is the $8/Wp could be replaced with a $3/Wp for the first 1.8kW rebate and a good feed-in tariff. The Peninsula could be used to trial this particularly for rental people who have been excluded including Public Housing.

Credit(1kW) = $1600+$2100 +$3000 = $6700

[1] A large PV array reduces the household net energy demand and hence exposure to future tariff increases. With energy conservation measures they may even become net exporters of electricity and hence obtain a feed-in tariff and even have a negative carbon footprint. Why not encourage our low-income households to be carbon neutral and so not exposed to the price rises.

[2] The Federal Government needs to manage the media perception of this event. The current danger is people will see them are hypocritical. That is speaking green but acting brown. The approach suggested above has many layers to it. These are:

1) The previous government increased the rebate to $8 as a knee-jerk reaction and was not a well thought out policy.
2) It excludes rental people, public housing and businesses. The exclusion of rental properties is regressive in nature and exclusion of businesses means large scale installations are not encourage.
3) The 1kW cut-off was too low. A 1kW unit produces around 4.2-4.5kWh/day and household demand is around 12-15kWh/day.
4) The level of rebate is excessive compared to other abatements and needs to be reduced.
5) Where possible it is better to use tariffs, rather than taxes, to fund greenhouse measures as this increases the scarcity of energy.
6) Photovoltaic output peaks on critical peak demand days and needs to be recognized through the distributor tariff structure.
7) For the next 30years each time many people go to vote they will think I have a solar hot water unit and PV array because the Rudd Government took the lead. Rather than I have an increased energy bill because of the cost of carbon and we still haven't solved the greenhouse issue.

The proposal brings the rebate back to normal levels, provides access to low-income households. It helps solve the State Government's public housing dilemma with regard to greenhouse. It encourages larger installations which are more cost effective particular on the roofs of businesses.