INTEGRATED SYSTEM PLAN CONSULTATION FEEDBACK: PERSONAL POWER PACKS AND INTERNET-OF-THINGS SMART POWER MANAGEMENT

Dear Audrey and AEMO staff,

Well done on the release of the ISP and request for consultation.

I have a strong interest in Energy (that) Matters, and in June 2007 commissioned the first grid-interactive Solar PV generator in Mallacoota, Victoria. Since then, the system has generated 21.51 MWHs and is currently generating 1,317 Watts, of which about 1,200 Watts is being exported to the grid, and for which I will be paid 67 cents per KWH.

My retail supplier is Powershop and I access my electricity import and export history through their website in 30-minute blocks. As the financial reward for energy exports is high, I manage my energy usage patterns, for example time control of electric-powered cooking and air-conditioning. I also have a solar heated hot water system, for which I turn off the booster for most of the year to avoid electrical booster heating as solar does the entire job for about 8 months.

I have skills and experience in Information and Communication Technology, and can, for example, switch on my living room light via a Wemo switch from anywhere in the world though an app on my mobile phone.

Personal Power Packs

Let's bring these systems together and transform (!) the way electricity is controlled. Your ISP describes many effective options; here is another for you to consider - Personal Power Packs (PPPs). (I'm ex-military, and like AEMO, love TLAs!)

PPPs would work like this. I purchase a Personal Power Pack which could have a capacity of (say) 10 KwH. I plug it into any power point in the house and connect it to my WiFi system like any other smart device. I register the device using a mobile phone app like I do with the Wemo devices. (There might also be a requirement from a smart meter to allow export of electricity as I do with my Solar PV system.) The app gives me access to the usage of the PPP and how much I have earned.

When surplus energy is available, for example when sun is shining, and/or the wind is blowing, my PPP would receive via the Internet a WiFi signal that it is to draw power from the grid and fully charge. My PPP account would be debited with a cost per kilowatt of, (for the sake of argument) 10 cents per KWH, so a 10 KWH charge will cost me a dollar. Now, it is 15:00

hours, the day is hot and humid, and the power demand for air conditioning is high. My PPP gets a WiFi signal to generate power and export it to the grid via its power point. Alternatively, I consume the PPP electricity locally as I do with my Solar PV generation. For this, I get paid (say) 50 cents a KwH. Each full 10 KwH cycle therefore makes me a profit of $4.

A PPP would have a GPS chip, so it (or the Mobile app) knows where it is. AEMO can control PPPs on the basis of their locality and therefore control energy flows across the grid. A smart set of sensors and computer algorithm would automate the process.

The PPP stores this power-flow information and sends it off to (say) my energy retailer for accounting. In my case, I would instruct Powershop to offset my PPP earnings with my electricity costs. I have been doing this for several years. Powershop has been excellent to deal with and I recently enrolled in their energy management scheme. I helped them develop the accounting software for the Victorian Guaranteed Service Level Rebates:

https://www.esc.vic.gov.au/document/energy/30383-victorian-electricity-distributors-guaranteed-service-level-payment-scheme-final-decision/

One of the benefits of the PPP system is that it would open participation of renters in the energy market. Many people would like to participate in 'green energy', but cannot, because they don't own the property in which they live. If they bought a PPP, they could take the device with them when they move. Storing surplus wind and PV energy, and supplying it when needed is very environmentally friendly, especially in Victoria where each KWH of coal-fired energy releases 1.56 Kg of CO2:

https://en.wikipedia.org/wiki/Hazelwood_Power_Station

Would a PPP pay for itself? This depends on the cost of the PPP, the charge cost and the generation payment and the power cycles a PPP could deliver. If a 10 KwH PPP could be purchased for (say) $500, the charge cost was 10 cents a KwH, the generation payment 50 cent a KwH and the lifespan 500 cycles, then the arithmetic is:

(50c Generation -10c Charge) / 100 Dollars * 10 KwH * 500 Cycles - $500 Purchase Price = Gross Profit $1,500.

Getting the retail cost of a PPP to (say) $500 will require economies of scale or perhaps some Dederal and/or State / Territory incentives, but with a person with the entrepreneurial skill and technology base of (say) Elon Musk, it is do-able. We might even ask him to set up the factory in the now defunct Holden Factory in Elizabeth, South Australia, with the support of Premier Weatherill.

Recycling would reduce the cost of PPPs and provide additional employment opportunities. My desktop computer is connected to the grid via a UPS. The battery lasts about 3-5 years. When it is losing capacity, I replace the battery for a fraction of the cost of a new UPS - the electronics are rugged and last for years. One of the issues with Lithium-Ion batteries is the cost of the cobalt required for the electrodes. Recycling PPP batteries would recover this increasingly expensive metal. The PPP factory would have capacity to recycle the components of the PPP battery, greatly reducing life-cycle costs. A replacement PPP battery could cost as little as $200, and should be a 'self-install' design.

Energy Smart Internet-of-Things

While we are considering smart 'Internet-of-Things' energy-management devices, we should consider 'smartening' hot water generation. A GPS-informed WiFi activated switch could store electrical energy as hot water when surplus power is available. Again, a concessional price for smart water heating would be the incentive for a person to install the system in their home or business. Currently, winter hot water heating is my highest electrical energy use.

To conclude, I applaud AEMO for its development of the ISP and the consultative approach it is taking.

This is where I found the reference to the AEMO ISP - it may give you a laugh (or a cry of despair):

https://johnmenadue.com/alan-pears-turnbull-has-politicked-himself-into-irrelevance-on-energy-and-climate-in-2018/

Kind regards,

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