AMERICAN POWER CONVERSION (APC) RESPONSE

TO

DIGITAL ECONOMY FUTURE DIRECTIONS CONSULTATION PAPER

1. Summary

APC is a major, global ICT company which has a part to play in supporting the growth of the digital economy through its activities, particularly those relating to data centre infrastructure. Accordingly, APC wishes to highlight the following issues which it believes are relevant to the Future Directions paper:

- Environmental considerations going forward are vital for all stakeholders, but particularly industry and government (the 'leading by example' policy). Issues such as energy efficiency for data centres and product stewardship must be addressed, and will likely require Government regulation and enforcement to be effective (Section 3 (a) below);
- Procurement policies, particularly on the part of Government, are a great weakness in the theory of supporting the move to a cost-effective, performance-orientated and environmentally sustainable digital economy, particularly in the area of data centres. Government policies are not leading to 'value for money', but rather 'lowest cost' outcomes that will undermine efforts to create a world's best digital economy infrastructure. This model must change (Section 3 (b) below);
- The emerging potential offered by innovative 'containerised' data centres (data centres 'in a box') can support the deployment of IT intensive activities in areas not suitable for 'bricks and mortar' data centre solutions. In this way, a range of IT services (business, scientific, medical, education, etc) can be supported, particularly in regional and remote Australia, thus further facilitating the growth of the digital economy (Section 3 (c) below).

2. APC Background

American Power Conversion (APC) provides protection against some of the leading causes of downtime, data loss and hardware damage: power problems and temperature.

The company is a global leader in network-critical physical infrastructure (NCPI) solutions. APC solutions, which are designed for both home and corporate environments, improve the manageability, availability and performance of sensitive electronic, network, communications and industrial equipment of all sizes. The company

focuses its efforts on four primary application areas: Home/Small Office; Business Networks; Data Centres and Facilities; and Access Provider Networks.

APC solutions include uninterruptible power supplies (UPS), precision cooling units, racks, physical security and design and management software, including APC's InfraStruXure® architecture the industry's most comprehensive integrated power, cooling, and management solution.

The company is an acknowledged leader in data centre design and provision of innovative technologies and energy efficient solutions, all of which play a supporting role in the enablement of the digital economy.

Further information is available at: www.apc.com

3. Issues

In this response, APC intends to focus its comments on three issues relating to data centres, a key component of the digital economy's infrastructure. They are:

- Environmental Considerations
- Procurement Practices
- 'Containerisation' of Data Centres

a) Environmental Considerations

As the consultation paper correctly identifies, there is a significant (and increasing) environmental impact associated with the growth of the digital economy. Much of this is attributable to data centres and their associated power, cooling and IT infrastructure.

The consultation paper states that Government regulation is being considered to ensure energy efficient equipment is utilised, and that discussions will commence on this issue in 2009. APC supports this initiative, and believes that for too long both customers and vendors have ignored the need to address energy efficiency considerations given the significant cost and environmental benefits that will follow. However, this raises a very real issue in relation to procurement practices (see point (b) below), particularly in Government, which at present can undermine such intentions to deliver savings in cost as well as greenhouse gases.

APC also believes that product stewardship considerations are a critical component of ensuring that the developing digital economy operates in a manner consistent with community standards/requirements and addresses the range of 'externality' issues associated with hazardous substances, e-waste, etc. Again, APC would support regulatory moves in this area that were focused on international standards.

Already, APC has introduced its APC Product Stewardship initiative to reduce the environmental impacts associated with its products throughout their entire life-cycle from product development, manufacturing, use, service, and product end-of-life. APC's Product Stewardship activities are incorporated into the company's business and engineering systems and processes.

The goals of the APC Product Stewardship program are to:

- Design products with fewer hazardous materials and increased use of recycled materials;
- Make products more durable, reusable, and recyclable;
- Make products more energy efficient; and,
- Provide customers with product end-of-life options that facilitate recycling.

b) Procurement Practices

It is the opinion of APC that current Government procurement practices for capital items, actively work against the drive for better value, energy efficiency and world's best practice. This is particularly evident in the construction and fit-out of data centres and serves to undermine the delivery of a first-class digital economy infrastructure.

The hardware that drives the digital economy uses significant amounts of electricity and therefore generates vast amounts of heat output by the servers, switches and storage housed in data centres across the country. These data centres require large Uninterruptible Power Supplies (UPS) to ensure continuous supply of electricity to the IT load. Even larger diesel generators are required to provide a further backup for the UPS systems, and complex cooling systems are required to keep the IT load within the required operating temperature range.

It is a fact that in each of these categories of vital pieces of equipment, there is a range of equipment grades, from the lowest priced, redundant/obsolete and inefficient models up to the latest designs featuring worlds best practice technology. It is likely that the newer more efficient designs will have a higher initial purchase price, but this will be balanced by lower operational costs over their service life.

In many cases the price differential is minor, and can be demonstrably offset by the savings made through more efficient operation within the first year of operation. For example, in the case of Computer Room Air-Conditioning (CRAC) equipment, the latest In-Row cooling technologies use only a third of the power of older legacy designs that are placed around the perimeter of a computer room. A large data centre using three times the power on its cooling, would also require chillers that are three times as large, and generators that are suitably oversized. Additional land is required (as well as the

concrete and steel in constructing the buildings) to house this additional equipment – all because an obsolete technology in one category may have been 2-3% cheaper than the latest highly efficient designs. Real-life examples abound, in numerous product categories, and these mistakes continue to be made today with impacts of hundreds of millions of wasted dollars over the lives of these facilities and significant adverse environmental consequences.

Unfortunately, the way that Government data centre facilities are currently built and maintained is through procurement of the lowest cost item in each category, through the tender process. The tender process appears almost guaranteed to result in the worst-case outcome in terms of environmental footprint, total cost of ownership (TCO) as well as overall performance.

The current process involves utilising Consulting Engineers, paid on a percentage of total dollar value of a project, where there is little incentive to encourage the adoption of new technologies that will reduce the value of the project (minimising their fees).

Paying consultants on the efficiencies they can build into a project, thereby encouraging the adoption of worlds best practice technology is a more likely way of achieving the desired outcomes, including 'value for money' which is (or is required to be according to the Commonwealth Procurement Guidelines) one of the cornerstones of Government purchasing. Similarly, considering products on their purchase price AND likely operational costs makes much more sense than looking purely at purchase price.

c) Containerised Data Centres

There is an emerging trend to re-examine the potential offered by 'containerised' data centres to support critical infrastructure needs, either as temporary or long-term solutions to customers' data centre requirements.

From a digital economy perspective, there can be significant benefits in the concept of a standardised, scalable data centre modules, constructed within environment-proof refrigerated ('reefer') shipping containers that can be deployed quickly and in a straightforward manner.

They can allow a wide range of users to implement data centre supported IT activities that are cost-effective, timely and environmentally friendly. This approach can support short-term or long term requirements, and also lends itself to facilitating IT intensive activities in regional and remote locations in Australia where cost, construction, skills or other issues mitigate against a 'bricks and mortar' solution. In this way, digital economy activities including business, scientific research, medicine, education, government service delivery, disaster recovery can all be facilitated, often in situations where this would otherwise be difficult, if not impossible, to achieve.

Whilst the concept of 'containerising' IT equipment is not new, with several vendors fitting server racks into standard containers, this niche has not yet succeeded in finding favour. As such early generation systems have been non-expandable, highly customised and have failed to deliver a mainstream application, they have not been adopted by the market.

However, a new approach to this issue overcomes the key issue of scalability by enabling containers to be joined lengthways, creating a room of unlimited dimension that can be deployed easily and cheaply, removed just as easily, and provide the very highest levels of power efficiency. By enabling a larger facility and removing the artificial space limitations imposed by early containers, it is now possible to deploy the vendor-neutral data centre architecture that is commonly deployed in 'bricks & mortar' facilities, rather than the specialised accommodation found in space-constrained early containers.

In addition, rather than being built from the uninsulated container type typically used for general cargo, the new solution is specifically designed to withstand the most extreme of climates, with significant insulation installed. Thermal leakage tests attest to the ability to maintain a safe working environment regardless of external temperatures.

It is APC's view that with these problems satisfactorarily addressed, the digital economy will be well served by the lower overall costs and greater flexibility of the new containerised data centre. APC has designed and built such an innovative system in Australia, known as the APC Datapod, and is in the process of launching it.