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I am making this submission as	General public
Submission type	Personal
Organisation making the submission (if applicable)	
Your position in the organisation (if applicable)	
Consent to make submission public	Public
Your story	I experienced bushfires, firsthand, in 1994 and have looked back over the past 26 years to see apathy and inaction by government o address the issues of failing aerial power and communication cables.
1.1 Causes and contributing factors	Aerial power cables both cause and contribute the to the spread of bushfires.
1.2 Preparation and planning	Elimination of aerial cables, both power and communication will eliminate fire danger and contribute to efficiencies in the management of fires and redevelopment.
1.3 Response to bushfires	Refer above.

1.4 Any other matters

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PUTTING CABLES UNDERGROUND

BRIEFING PAPER

Executive Summary

This paper was initially prepared for and presented to the NSW State Government in August 2015. At that time I was an Executive member of a now disbanded lobby group “Cable Downunder”. The purpose of the paper, at that time, was to present to Government both the efficiencies and cost savings to be achieved by undergrounding aerial power and communication cables. To date nothing has eventuated but the issue has again come to the fore following the recent bushfire and subsequent storms and floods.

Background

- In 1976 Neville Wran’s Labor Government came to power and amalgamated the various County Councils which, up until then, were responsible for building and maintaining their own power distribution systems. Wran also gained access to massive funds held by the County Councils which had been put aside to fund undergrounding programmes. Wran’s Government subsequently diverted these funds to other projects, e.g. Darling Harbour.
- In November 2001 Bob Carr announced that all overhead power cables in New South Wales (NSW) would be undergrounded and streets would be rid of power poles. Twelve months later Carr distanced himself from this announcement when the results of a flawed enquiry undertaken by IPART were released.
- In April 2009 Nathan Rees announced an \$18b programme to update the State’s aging, aerial power distribution system.

Current Distribution System

- NSW is currently serviced by an antiquated and duplicated power distribution system which has “grown like topsy”. Since 1976 the centralised authorities have adopted a “bandaid” approach and in broad terms maintained the many distribution systems built and maintained by the previous County Councils.

Benefits of Undergrounding

- **Reliability** – Once undergrounded an increase in reliability in the order of at least 4.2 to 1 can be expected.
- **Maintenance** – the cost to maintain an optimised underground system is in the region of two to one in favour of underground.
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- ***Motor vehicle collisions with poles*** – Such accidents are said to contribute at least 10% to the State's annual road toll with massive ongoing costs due to resultant injuries.
- ***The Rural Fire Service*** – In NSW an average of 322 bushfires per annum are started by falling and arcing power cables. Once a fire starts the unreliable aerial system of power and communication cables is further destroyed causing problems for the fire fighters and community. This came to the fore recently resulting in an inability to pump water, communicate and long lead times for rectification of services. This was exasperated by the arrival of severe storms and flooding.
- ***Greenhouse emissions and transmission losses*** - The previous power distribution companies all acknowledge that aerial cables contribute to both greenhouse gas emission and transmission losses.
- ***Traffic*** – Urban and rural roads are constantly being closed due to falling power cables and poles.
- ***Vegetation management*** – the community, as a whole, is outraged by the butchering of street trees. The cost of such is estimated to be in the millions of dollars per annum.
- ***New optimised network*** – in undertaking an undergrounding programme the planners will be given the opportunity to develop an optimised distribution system which will eliminate duplication and allow for the elimination of a number of electrical phases which exist in the current inefficient distribution system.

Funding/Financing

- Various undergrounding programmes currently being undertaken throughout the world and within Australia are being funded and financed using a number of models which involve both public and private funds.
- , Cables Downunder developed its own model which, at the time, showed that a programme 100% privately funded would cost ratepayers \$0.63 per week and motorists \$30 per annum on their registration.

Community Acceptance

- Both anecdotal and formal research undertaken showed that the community was, and still is, in favour of undergrounding all aerial cables and is willing to directly pay for it.

National Telecommunication Act

- The National Telecommunications Act states that all aerial communication cables must be taken down and if need be undergrounded within six months of the undergrounding of power cables.

Recommendations

It is recommended that the NSW State Government:

1. Immediately halt all non urgent work on the electricity distribution system infrastructure involving cables under 33kv.
2. Undertake a review of expenditure on said infrastructure with a view to the progressive development of an underground system using existing infrastructure expenditure allocations and other suitable funding and financing options. This review to be completed within six months. The focus of the review should be to initially underground cables within bushfire prone areas.

PUTTING CABLES UNDERGROUND

BRIEFING PAPER

1. Introduction

This paper is prepared by Greg Bleazard, a former executive member of the now disbanded lobby group Cables Downunder, and is intended for Members of NSW State Parliament. It sets out the perilous nature of local aerial power and communication distribution systems and puts forward recommendations to strategically protect these systems from the environment making them more reliable and cost efficient.

At present undergrounding programmes are being undertaken in Perth, Darwin and Adelaide. Similar programmes are being pursued in California, Florida, Maryland and Virginia in the United States. New Zealand's major cities are actively undertaking the burial of aerial cables. It is estimated that 85% of power in the United Kingdom is reticulated underground while in Europe in excess of 70% of all power is reticulated via underground networks with work underway to bury more. In the vast majority of countries in Scandinavia and the Baltic States power distribution systems are completely underground. Even a number of third world countries in Africa that were primarily colonised by the French have underground power distribution systems.

2. Background

2.1 Merger of County Councils

In May 1976 Neville Wran's Labor Government came to power and immediately targeted the capital reserve assets of local County Councils (CCs) across New South Wales (NSW). These CCs had been, up until then, responsible for building and maintaining their own independent electricity distribution systems. Wran commenced the amalgamation of these CCs under the umbrella of Sydney County Council (now Energy Australia/Ausgrid) and eventual corporatisation of remaining CCs. In amalgamating and corporatising CCs Wran gained access to large contingency funds (said to be in the vicinity of \$850m) earmarked by the local CCs for infrastructure improvement, specifically retro undergrounding. Undergrounding had already commenced in a number of areas. Wran also established an ongoing dividend process which progressively "milked" funds from the utilities (refer comments below). It is said that these funds were taken into the State's consolidated revenue and spent to honour election promises such as the building of Darling Harbour. Should that aforementioned retro undergrounding have continued Sydney's electricity distribution system should now be completely underground.

2.2 1994 Como Bushfires

In January 1994 my wife and I experienced, firsthand, the Como bushfires where many homes and one life were lost. On that Saturday afternoon while we were ringed by flames and smoke we felt helpless as we had no power or communication with the outside world, bar an old battery driven transistor radio and the ABC. With the initial advance of the fire our power poles literally blew up with the heat and brought down our aerial power and telephone lines thus isolating the community (refer photo 1). Many similar examples of devastation and human frustration have occurred across this nation in the intervening period. Again this has come to the fore in 2019/20 with nothing being done to address the problem over the past 25 years.

2.3 Bob Carr Announces Undergrounding

On 21 November 2001 Bob Carr, then Premier of NSW, held a press conference and stated that he wanted to see all overhead cables in NSW undergrounded and all hardwood power poles removed. Carr justified his reasoning highlighting the benefits set out below and emphasising the need to eradicate motor vehicle accidents with power poles. He told his then Minister for Energy, Kim Yeadon, to work out how it was to be done and to report back in six months. The matter was reported extensively on that night's electronic news broadcasts and in the print media on subsequent days.

Approximately 12 months after Carr's announcement pressure increased on Yeadon to release his findings. Yeadon had turned to IPART to undertake his review. Hearsay tells us that Treasury, specifically the then Treasurer, Michael Egan, became involved and instead of informing Carr on *how it was to be done* it told him *why it shouldn't be done*. Subsequent studies of the report by industry experts revealed an extremely flawed report which focused on cost and not benefit. Unfortunately findings of this flawed report continue to be used in writings on the subject.

2.4 Nathan Rees Announces Infrastructure Spend

In April 2009 then Premier, Nathan Rees, announced five year expenditure of \$18b to repair and upgrade the State's existing electricity grid. In the subsequent budget of 2009 control of this expenditure was placed in the hands of the Treasurer, Eric Roozendale.

2.5 Barry O'Farrell's Announcement

In April 2011 new Premier, Barry O'Farrell, acknowledged that over the last 16 years the Labor Government reaped more than \$15b in dividends from the State's electricity providers. He went further to say:

- future dividends would be frozen over the Budget four year forward estimates period;
- electricity companies would need to justify dividend payments against their effect on rising prices; and
- he was determined to stop price gouging and what he calls "gold plating" of electricity infrastructure – work he believes the companies are undertaking on poles and wires that is unnecessary.

3. Current Distribution Systems

In 2012 Sydney, and the Sutherland Shire (Shire) in particular, are crisscrossed by a number of Very High Voltage 132/110/66/33kv subtransmission systems distributing power from a bulk supply point which, in the Shire's case is at Picnic Point, to numerous zone substations. At the zone substation power is then distributed along local streets using High Voltage 22/11/6.6kv cables to distribution substations which in turn redirect the power back onto street cables to households/businesses by way of low voltage 415/240v cables. The majority of these cables, particularly in the older established areas of Sydney and the eastern Shire, are aerial.

Along with aerial power cables the Shire is crisscrossed by, in many cases, aerial telephone copper cables (refer photo 4) and duplicated broadband cables. This description is typical of many regions within the State, particularly in rural areas. While the need for landline communications has diminished the now mainly mobile system also suffers due to ill preparedness in building communication towers.

4. Benefits of Undergrounding

Many of the benefits which will be achieved through the undergrounding of cables and the elimination of immovable poles are anecdotal as, in many cases quantifiable evidence is not kept, and where it is kept is difficult to access. The following are, however, widely accepted benefits of an undergrounding programme:

4.1 Reliability

The reliability of underground systems is inherently greater than for overhead. **A survey of Australian distribution utilities has found that an increase in reliability in the order of 4.2 to 1 in favour of undergrounding is to be expected.** It must be recognised however, that for problem areas, usually where there are a large number of mature trees and shrubs, reliability will be significantly greater still. Should there be any dispute on this point one need only look to Energy Australia's/Ausgrid's (EA) policy of undergrounding its Main Feeder Network to increase reliability of supply. EA has recently spent in excess of \$40m in the northern beaches area of Sydney, in an expansion of this policy.

Extracts from the Annual Reports of EA and Integral Energy (IE) highlighting the non-reliability of aerial cables reveal:

- *"...customer service responded to 3,145 emergencies and handled more than 10,000 calls as a result of the southern and inner Sydney hailstorm."*
- *"A major storm over the 1996 Father's Day weekend tested our ability to respond to the threats of nature. Strong winds persisted for almost 20 hours with the maximum gust 124 km/h. "*
- *"We recorded 117 high voltage circuit breaker and 426 low voltage distributor fuse operations. Mains staff attended more than 4,160 separate reports of wires down, wires arcing or trees resting on wires."*

4.2 Maintenance Costs

The Federal Government's **"Putting Cables Underground"** report of 1998 states that the **cost of maintenance of underground cables versus overhead is in the region of two to one in favour of underground.** However, on advice from the supply industry, this figure is at the lower end of the range and greater economies are obtainable. It should be recognised that due to their design and environment, underground cables deteriorate very little in comparison to their above ground counterparts. Likewise they suffer little at the mercies of the weather and are virtually immune from motor vehicle accidents and trees being blown across them.

Cost savings identified in the Federal Government's report put the difference between maintenance costs for underground and overhead at \$786 (1998 dollars) per kilometer per line per year, in favour of underground cables.

4.3 Motor Vehicle Collisions with Utility Poles

Figures on collisions with power poles in NSW reveal that such collisions contribute 10% of the State's road death and injury toll. On average, one person is killed per week, while 10 suffer serious injuries at a conservative cost to the community approaching a quarter of a billion dollars per annum (1998 dollars). This figure does not take into account the cost of long time care of resulting quadriplegics or paraplegics nor the physical pain and suffering of both victims and friends and family. This could largely be avoided if the findings of a State Government report commissioned in 1989 had been acted upon.

A study conducted in Sydney (Energy Authority, 1989) looked at the casualty crash reduction resulting from a variety of countermeasures. Of those considered, the use of slip base light poles in conjunction with increased lateral offset of the poles (moving the poles further from the edge of the road) and undergrounding of services, was found to be the best. The casualty crash reduction rates that were calculated for the use of slip base poles in conjunction with increased lateral offset (with the lateral offset of the poles included in brackets) were 72 per cent (1 m), 78 per cent (1.5 m), 84 per cent (2 m), 87 per cent (2.5 m) and 93 per cent (3 m).

Undergrounding of cables will save lives and the subsequent use of slip base light poles will save lives!

4.4 The Rural Fire Service

In NSW an average of 322 bushfires per annum are started by falling and arcing overhead power lines. This is akin to a double edged sword as the fire is not only started by these power cables but in the resultant fire further power poles and cables are destroyed along with overhead communications cables, making the task of fighting the fire, together with the presence of live cables, more difficult and dangerous.

A typical recent case can be seen in the "Black Saturday" fires in Victoria where the resultant Royal Commission recommended among other things that:

- ***The State amend the Regulations under Victoria's Electricity Safety Act 1998 and otherwise take such steps as may be required to give effect to the following:***
 - ***the progressive replacement of all SWER (single-wire earth return) power lines in Victoria with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk. The replacement program should be completed in the areas of highest bushfire risk within 10 years and should continue in areas of lower bushfire risk as the lines reach the end of their engineering lives.***
 - ***the progressive replacement of all 22-kilovolt distribution feeders with aerial bundled cable, underground cabling or other technology that delivers greatly reduced bushfire risk as the feeders reach the end of their engineering lives. Priority should be given to distribution feeders in the areas of highest bushfire risk.***

4.5 Greenhouse emissions and transmission losses

Both Energy Australia and Integral Energy state in their annual reports the need to reduce Greenhouse gasses and reduce costs of distribution in an increasingly competitive environment.

- ***Energy Australia.***
 - ***"It is time to put a stake in the ground, to open the debate on Greenhouse gasses and ensure that the cost of energy production reflects the cost to the environment."***
 - ***"Our pure energy program, which reduces Greenhouse emissions is being actively promoted to customers"***

- **Integral Energy**

- *“Revenue pressure will increase under the latest IPART (Independent Pricing and Regulatory Tribunal) recommendations to cut the cost of electricity distribution over the next five years by burying the wires and cables that are used to distribute power to our homes and industry. Distribution maintenance costs are halved and a saving in the production of Greenhouse gasses estimated by some to be as high as ten percent, is achievable.”*

4.6 Traffic

Reports of **“wires down disrupting traffic”** have become almost a daily occurrence on Sydney’s breakfast and drive time radio programs. These reports are of traffic incidents and so do not tell the full story of dislocation to industry, commerce and private life, or the potential life threatening situations they create. One such incident is estimated by the NRMA to have cost the community \$1.5m

4.7 Vegetation Management.

The ongoing pruning of street trees is now causing friction between residents and electricity distributors (refer photo 3). The two main electricity distributors in the Sydney region spent a total of \$54.4m during the period 1999–2003. This is a direct saving when the power cables are buried.

4.7 New Optimised Network.

Of late we have seen a massive increase in expenditure on electricity infrastructure (refer 2.4 above). To use the commonly used vernacular - *poles and wires*. Unfortunately this expenditure is, in the main, being spent on replacing like with like. As the existing distribution system across Sydney and the State is a result of the amalgamation of those systems developed by the former County Councils this amalgamation has resulted in a massive amount of duplication. To date little has been done to reduce this duplication.

The Federal Government’s **“Putting Cables Underground”** report, mentioned above acknowledges that:

“the conversion of whole localities from overhead to underground supply provides the network designer with the opportunity to design a modern network (optimised network) that will have a life of at least 50 years. Underground networks which are replacing existing overhead networks can be designed with confidence since many of the design parameters can be known with considerable certainty. As a result of these known quantities the designer of a converted network is in a position to design a better network than were the original designers of the overhead network being replaced, or the designers of modern URD networks in new subdivisions. This permits a new creative design which is cost effective, reliable and takes into account a realistic assessment of risk which is not necessarily constrained by the design philosophy used in the network being replaced”.

5. Funding/Financing

The Federal Government's "**Putting Cables Underground**" report, mentioned above, highlights the difference between these two terms:

- funding considers who should be responsible for paying; and
- financing considers how the organisation or individual responsible for paying raises the necessary money to make the payment.

The report went further to shortlist funding options as:

1. property owners;
2. National, State or Territory utilities (that is electricity distributors and telecommunications carriers) levy;
3. Commonwealth, State or Territory tax payer funded consolidated revenue; or
4. property owners, with an additional component of contribution by the relevant Commonwealth, State or Territory government.

Since the release of the report it has become clear that further funding options could focus on private/public partnerships.

Examples of financing options can be seen in the Western Australian municipalities of Applecross and Melville where projects were self financed. In these instances the State and Western Power funded a third of the cost and the residual was borne by residents under a variety of financing options.

Cables Downunder has developed its own model whereby a levy of \$0.63 per week is collected by way of a rate increase (those with existing underground cables do not pay) and a \$30 per annum levy on car registration (those benefiting from safer roads pay). Lower income earners are not included in either payment.

Bearing in mind the previous Government's allocation of \$18b to repair and upgrade the State's electricity grid adequate funds should exist to, at least, partly fund such a programme. In time savings achieved will go a lot of the way to fund completion of the project.

6. Community Acceptance

Anecdotal evidence tells us that the community, as a whole, is in favour of the commencement of an undergrounding programme. Discussions reveal that individuals are aware of benefits such as reliability, decreased road death and injury, eradication of vegetation management and, most common, improvement in the streetscape.

Examples of formal research are:

- **McNair Ingenuity (MIR) (December 2001)** – “ *An ‘electricity’ poll conducted by MIR found that most people in Sydney would be prepared to pay \$80 extra in rates per annum for the next 30 years in order to fund moving electricity cabling underground. Those most in favour of burying Sydney’s cabling were the young and the affluent. In fact, three quarters of people with a household income of at least \$80,000 were in favour of paying the additional rates in order to move power cables underground.*”
- **Household’s willingness to pay for undergrounding electricity and telecommunications wires: McNair BJ, Bennett J and Hensher DA (Crawford School of Economics and Government, Australian National University), 2010** – This study was undertaken in Canberra and concluded that there is a correlation between the estimated value of benefits to households and the amount those households are willing to pay to have aerial cables buried. It concluded that conservatively this value would be at least \$6,838 per property on average. Most importantly the study showed that of the respondents 25% were willing to pay in excess of \$16,000 for undergrounding in their suburb. The study also stated that these figures should be higher in State capitals as in Canberra cables are generally strung along backyards having less of an impact on the streetscape. As an aside Cables Downunder research shows that the cost will be nowhere near those figures, particularly as economies will be achieved through the size of the project.

Both of the above studies show that people are prepared to pay as long as they can see a direct/tangible benefit to their well being. Anecdotal evidence indicates that at present these same people are opposed to any form of increased payments for electricity as they can see no tangible benefit resulting.

7. National Broadband Network (NBN)

Under present National Broadband Network Corporation (NBNco) protocols (assuming an agreement is finalised with Telstra) the NBN will be rolled out using the existing Telstra copper cable underground ducting. Where existing copper telephone wires are strung aerially it is planned to string an aerial NBN cable. Cables Downunder has discussed this matter with Anthony Albanese, Federal Minister for Infrastructure, who unashamedly stated that pursuit of an aerial strategy was purely to hasten roll out and lower costs.

Unfortunately a major proportion of the Sutherland Shire has aerial copper cable and thus will be burdened with an aerial NBN cable. Such a strategy will once again expose residents to the negatives of a strategic aerial cable especially in greatest time of need such as storm and bushfire. It is envisaged by NBNco that at least 25% of the national NBN network will be strung aerially.

As an aside it should be noted that should aerial power cables be buried the National Telecommunications Act, 1997, states that all aerial communication cables must be either undergrounded or dismantled within six months of the undergrounding of local power cables.

8. Summary

I refer you to point 2.2 *Como Bushfires*. It is now 18 years since the fires and we are still burdened with the same antiquated, unreliable and downright dangerous aerial power and communications distribution system (refer photos 1 and 2). That which affects my wife and I,

also affects many hundreds of thousands of residents across the Sutherland Shire, Sydney and the State. We now await the next fire and while we know that our power and communication distribution systems will immediately fail us we can only hope that the consequences will be less catastrophic than those of the last fires.

As set out above the commencement of a programme to progressively underground the power distribution system will:

- **provide the community with a much more reliable, cost efficient and optimised system;**
- **make our roads safer and reduce the economic impact of road accidents on the community;**
- **greatly decrease the number of bushfires and lessen the danger encountered by firemen and volunteers in fighting fires;**
- **lessen the release of greenhouse gasses and transmission losses;**
- **lessen the disruption to traffic and the community at large through downed “wires and poles”; and**
- **improve the streetscape through the dismantling of an antiquated system of ‘poles and wires’ which will allow the planned planting of street trees and eliminate the need to continually “butcher” and kill existing trees.**

With the election of a new State Government which came to power promising *real change* there now appears to be an opportunity for the Government to deliver in the form of a modern, optimised, safe, reliable, and cost efficient power distribution system using existing funds allocations combined with alternative funding sources and financing options. The adoption of such a policy will also result in the communications authorities, both public and private, having to follow suit. For many years we have needed the political will to release bureaucracy from the long accepted paradigm that water is delivered underground and power by an aerial system involving “poles and wires”.

9. Recommendations

It is recommended that the NSW State Government:

1. Immediately halt all non urgent work on the electricity distribution system infrastructure involving cables under 33kv.
2. Undertake a review of expenditure on said infrastructure with a view to the progressive development of an underground optimised system using existing infrastructure expenditure allocations and other suitable funding and financing options. This review to be completed within six months.
3. Inform the Federal Government and NBNco of its intentions with a view to them reviewing their rollout strategies for the NBN in NSW.



Photo 1: [REDACTED] during the 1994
fires



Photo 2: [REDACTED] 2011



Photo 3: The results of 'vegetation
management'



Photo 4: The fragility of aerial copper
telephone cables