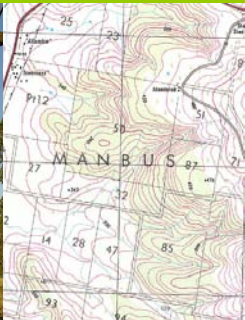


# Kyoto Energy Park



**Preliminary Assessment Report for the Project Application  
under Part 3A of the  
Environment Planning and Assessment Act 1979**

**for the**

**Kyoto Energy Park at  
Mountain Station and Middlebrook Station, via Scone**

**pamada**

Original Submission : 5 December 2006

Amendment C : 13 February 2007



## **Kyoto Energy Park**

**Creating a source of green, clean and 100% renewable energy**

**keeping Scone green and clean  
a local initiative**

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# Kyoto Energy Park

This is the Preliminary Assessment Report for the Project Application for an Energy Park that shall comprise electricity creating eco-generating devices (such as wind turbines, solar photo-voltaic cells, solar-thermal plant, closed loop small hydro and others), an associated Visitor and Education Centre, Manager's Residence and ancilliary works at a site near Scone in NSW.

It is hoped with this proposal to create energy sufficient to power all the residences and many businesses in the greater Hunter Valley, and much of the Newcastle area, providing ALL residents the opportunity of using green and renewable energy.

With just one wind turbine, the Energy Park will create annually a similar amount of power that is used annually in Scone.

This is an opportunity to send green, renewable energy back down the line towards Muswellbrook.....

Now that's a thought.....

# 1 INTRODUCTION

## 1.1 Its Time

The proposed Kyoto Energy Park is not a new, opportunistic attempt to jump onto the bandwagon of community feeling about a strong and real commitment to a sustainable world. ***The Kyoto Energy Park on this site has been in planning for many years.***

In fact, the first work commenced over 10 years ago. Solid research started in mid 1998 and has now provided significant confidence this is REAL and a pressing and an important project deserving the support of the Scone community, NSW and Australia as a whole.

The first phase in the formal approval process started in 2005 with a request for the Upper Hunter Shire Council to amend the Scone Local Environment Plan to define eco-generating works in the LEP. The amendment to the LEP has gone through every stage of approval including gazettal by the Minister for Planning.

## 1.2 What's the real motivation?.....

A key motivating factor for this application is a desire to make and create a better world to live in, and do this in a manner that can be sustainable environmentally, economically and socially:

### **Environmentally**

By producing electricity from renewable efficient technology

### **Economically**

By being practical with solutions, staging and timing. Ensuring also that solutions are attractive as investments with acceptable returns.

### **Socially**

By ensuring that the local community can directly benefit by the enterprise and continue and maintain its strong link to the land without major change.

The intent is to establish a flexible framework for an energy park. The nature of the approval sought is designed to give the proponent flexibility over time and flexibility with regard to obtaining all the other necessary approvals such as grid connection, power sale and use of emerging technologies.

It is vital this application is approved so to embed the opportunity in the Hunter of a region capable of producing clean energy for all the community. It is supplementary and supportive of the Hunter Valley's strong and vibrant energy generation industry.

## 1.3 Key Points

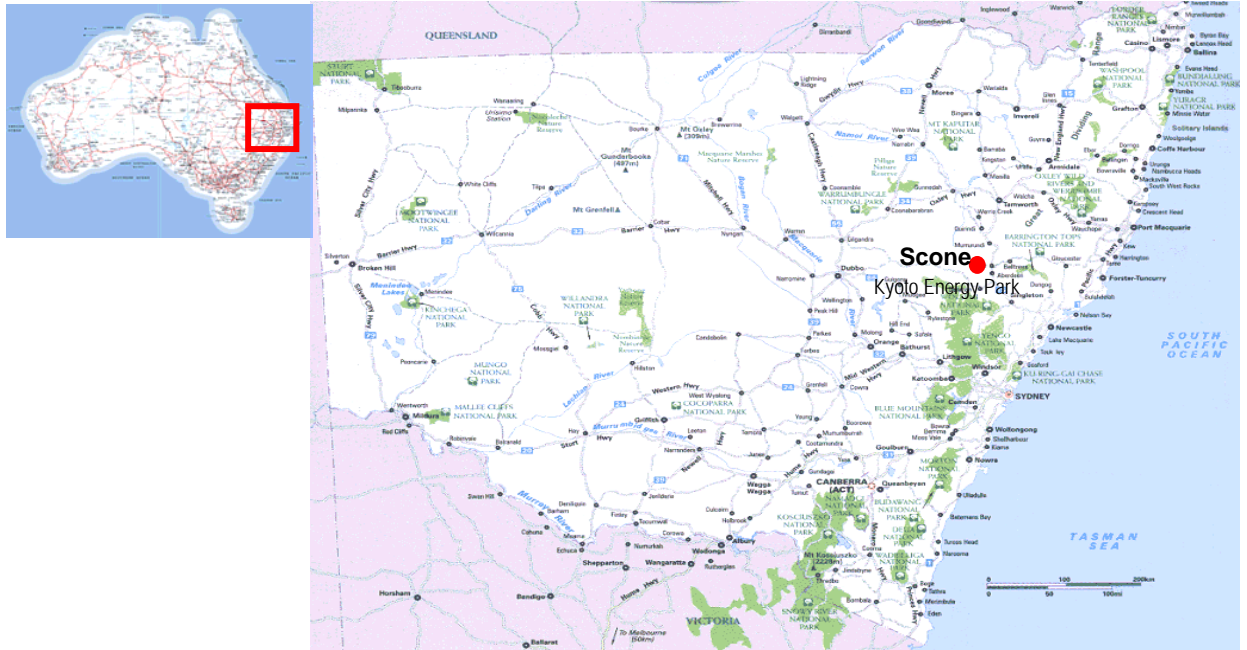
This proposal describes an Energy Park (an eco-generating power station that generates electricity from renewable sources such as the wind, water and the sun) near Scone in NSW's Upper Hunter Valley. This document is the Preliminary Assessment Report for the Project Application relating to the project. The project is known as the Kyoto Energy Park, is a venture of the Kyoto Energy Park Company, an Australian company with deep local ties to the Scone area.

The proposed location for the energy park is along a ridge running north south, approximately 12km west of Scone and on the plateau beyond. It is on land owned by a single landholder and completely within the Upper Hunter Shire. In general terms, the Scone Local Environment Plan 1986 applies to the land.

Long considered as a great opportunity, the range west of Scone was identified as a potential great source of energy, generated from wind. In 1998, the NSW Government commenced plans to install a Wind Monitoring Mast on the land.

The land is currently used primarily for agricultural activities.

Once the project application is approved, the project will have consent for eco-generating devices which may contain wind turbine generators, solar-thermal plant, photo-voltaic array, small closed loop hydro-electric generator and associated works. The application covers work that will be required to upgrade existing power lines in the Scone area, ancillary works such as a Visitor and Education Centre and Manager's residence, and during the process will include the closing of some minor paper roads and tidying up of some minor leasehold/freehold matters.



#### 1.4 Location of the Kyoto Energy Park

The site for the proposed Kyoto Energy Park is approximately 12km west of Scone, in the Upper Hunter Shire Council area.

The “site” is made up of two landholdings; Middlebrook Station and Mountain Station. Only a small fraction of the two landholdings will be used for the Kyoto Energy Park proposal. All existing agricultural, tourism, residential and private aviation uses will continue unaffected. A larger copy of this map and further illustrative maps are attached in Appendix E.

#### 1.5 Statutory Framework and Process

This is a Preliminary Assessment Report of the Project Application under Part 3A of the Environment Planning & Assessment Act 1979.

Part 3A is a new part of the Act specifically designed to streamline large, complex and important infrastructure projects. As part of the process, before being in a position to lodge this application, concurrence was sought from the Director General of the NSW Department of Planning to confirm whether the proposal meets the criteria for a proposal to be considered under Part 3A. Two opinions were sought and two letters of concurrence received. Copies of the requests are attached in Appendix B. The Director General concurred and a copy of his correspondence is included in Appendix A..

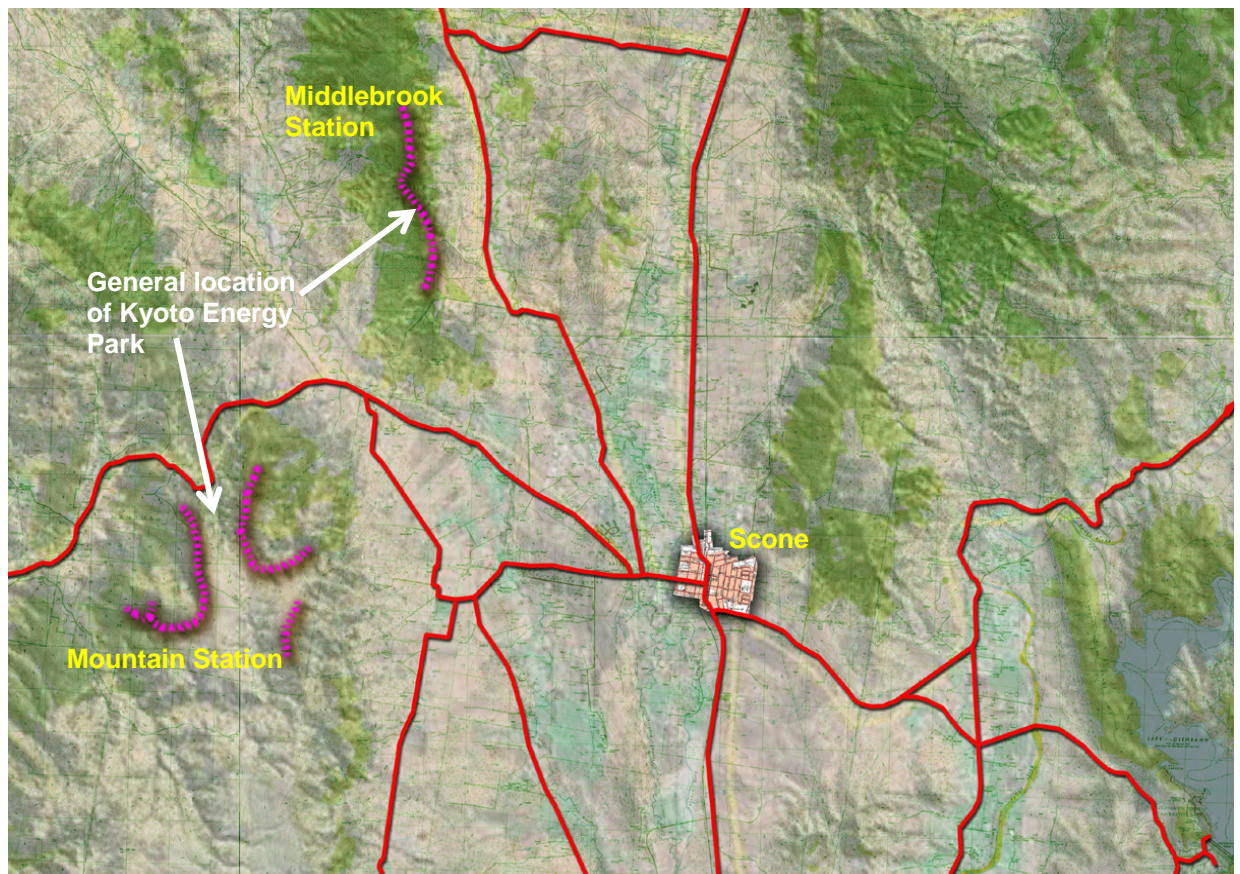


The process for review of the Kyoto Energy Park under Part 3A is rigorous and lengthy.

Initially it was thought that the project will require further Project Applications for the other eco-generating devices that are proposed on the land to progress. Due to a technical planning peculiarity, it was not possible to lodge for all the eco-generating devices as part of the initial application, only the Wind farm components and ancillary works relating thereto. After legal advice and concurrence from the Director General Planning, it became possible to amend the initial application rather require a separate additional application. Amendment C of this document allows for the eco-generating works to be added to the initial application.

In Appendix C, proposed factors for Environment Assessment and ongoing reporting are shown. The matters for which this Project Approval are sought are specifically identified in Section 6.

The preliminary process of engagement with the community began albeit quietly in early 2005 with briefings with the Upper Hunter Shire Council Executive. The Proponent has subsequently opened an office / shopfront in Scone's main street (Kelly Street) mid November 2006 to provide the community with unprecedented access to information. Further community participation commitments are described in this document.



## 1.6 Structure of this Project Application

This Planning Assessment Report identifies specific matters seeking Project Approval in Section 6. Accordingly, the matters contained in this document relate to the information relevant to this stage of application only. There will be subsequent Construction Certificates and other approvals for other aspects and details for the Kyoto Energy Park.

This document sets out a brief case for a green, clean renewable future and why it is important for all citizens of Scone and NSW to want Energy made from renewable and clean sources.

Whilst technical at times, is written as a public document.

The location, siting and information regarding the project are included.

The impacts of the project are identified and will be evaluated as part of the relevant Environmental Assessment process.

The stages and detail of Environmental Assessment proposed are outlined in Appendix C.

## 1.7 Project Name

Thought has gone into identifying an appropriate name for the proposed Energy Park. The proposed name of Kyoto Energy Park is however, only seen as possibly a temporary name and may in time be changed.

### 1.7.1 “Kyoto”

Even though Australia has not signed the International Kyoto Protocol (the International agreement that seeks to reduce Greenhouse Gas emissions and increase global reliance on renewable forms of energy) “Kyoto” has awoken many people to the issue of creating a cleaner, greener and sustainable future.

Using “Kyoto” it was felt would be a strong reminder to the community at large that creating green, clean energy is a global issue, not just local. It fits with the strong message this should send.

### 1.7.2 “Energy Park”

It is important to note that the proposal is for an Energy Park which will create energy from a number of renewable clean resources, using eco-generation devices such as hydro-electric, solar and solar-thermal, and wind devices.

It is hoped all technologies described in this application will be constructed in the short term, but importantly, the application seeks approval for a range of eco-generating devices that as new technologies and clean forms of energy generation are developed, that these too may be located within the infrastructure that is created by the project.

### 1.7.3 Future Name

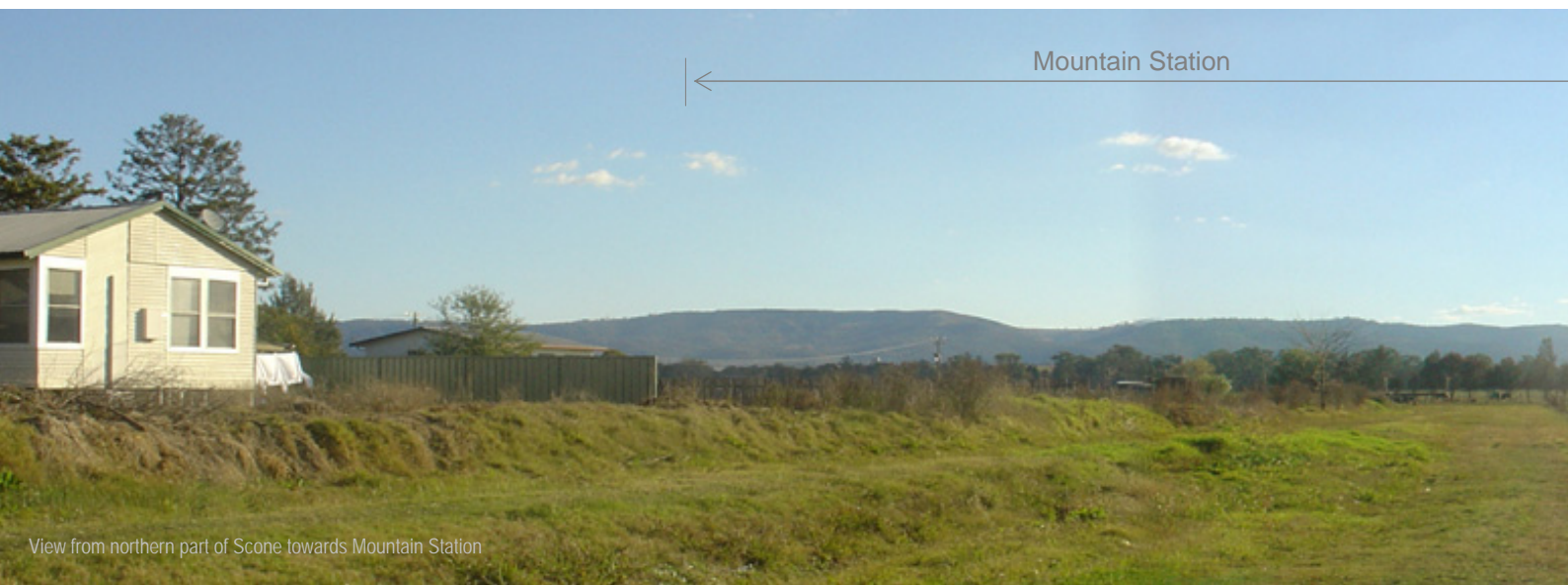
Should the Kyoto Energy Park proposal obtain all the necessary approvals, as part of the community participation process, a new name might be adopted that might reflect:

- Western and/or indigenous cultural history on the land;
- Other naming or historic relevance;
- Local ownership;
- Local tourism opportunities for Scone and surrounds; or
- Other matter duly raised out of community participation,

in a manner similar to the successful consultation process undertaken by the Upper Hunter Shire Council in determining the new logo and image for the Shire as the “Horse Capital”.



The Kyoto Protocol to the United Nations Framework Convention on Climate Change



Mountain Station



## 1.8 The Proponent, a local initiative

This Project Application is made by **pamada** Pty Limited (the “Proponent”), a property advisory company based in Sydney and Scone, on behalf of Kyoto Energy Park Company Pty Ltd, the energy park developer. The principle activities of the Proponent are as an advisor in the property industry, with a key focus on community development and projects which seek to achieve a renewable and sustainable world.

Pamada has been authorised by the landowners and the developer to make the application. (A copy of the landowner authorisation is attached in Appendix D).

The financial partners behind the Kyoto Energy Park Company and the proposal are local to Scone or Sydney based. Over time, it is the intention to broaden the investor base to offer all Scone citizens an opportunity for ownership in the company, including other investors from further a-field and thus enhance the public ‘ownership’ of the Kyoto Energy Park as an asset of the community, not only creating green power for the Upper Hunter Shire, but also generating income and employment in the Shire that can remain for the long time.

This is a local initiative, borne out of a desire to keep Scone green and clean and send a strong message that the community values its green healthy landscape coupled with a strong desire not to have coal mining in its area. It supports Scone’s reputation as a healthy location, with high landscape values and being the horse capital of Australia.

The idea of an Energy Park at Scone was simultaneously arrived at by the then NSW Sustainable Energy Development Authority (now part of the NSW Department of Energy Utilities and Sustainability) and the Henderson Family interests, the landowner.

The financial entity undertaking the proposed energy park is the Kyoto Energy Park Company. All enquiries should be addressed through Sydney, although our local address is also possible:

| <b>Kyoto Energy Park Company Pty Ltd<br/>c/o Pamada Pty Limited</b> | <b>Kyoto Energy Park Company Pty Ltd<br/>c/o Pamada Pty Limited</b> |
|---|---|
| Level 16<br>14-24 College Street<br>Sydney NSW 2010 Australia       | Suite 3<br>166 Kelly Street<br>Scone NSW 2760 Australia             |
| PO Box 1446<br>Darlinghurst NSW 2010                                | PO Box 35<br>Scone NSW 2337   |
| Tel 02-9969 3608<br>Fax 02-9383 8321                                | Tel 02-6545 9555<br>Fax 02-9383 8321                                |
| Attention: Mark Sydney, Director                                    | Attention: Jacquie Ryan, Project Manager                            |
| Email: <a href="mailto:kyoto@pamada.com">kyoto@pamada.com</a>       | Email: <a href="mailto:kyoto@pamada.com">kyoto@pamada.com</a>       |





## The farmer's view....

The Kyoto Energy Park is an initiative that follows the tradition of the innovative spirit of the Aussie farmer.

Perhaps for decades he cursed the wind and the sun for the tough agricultural life. Full of cold winds and the harsh wrinkle making sun, a tough endeavour to say the least.

Long ago has traditional farming become for him a marginal pursuit, at best a sponsorship of a lifestyle kept alive because of tradition – but not much more. At last, he can now farm, not just the impoverished soils, but also the air and sun that dries them out and yet maintain his strong bond and tradition with the land.

....and all the while, there in Scone, he looks southwards towards the topographical killing fields of the coal mines, fearing their northward creep.

Finally technology and an awareness that it is time to tame the natural beast and make good the energy stored in that wind and sun and bring about change.

He recalls his forebears, of the nineteenth and twentieth centuries that used the Southern Cross Windmill to move water for the stock, and now can see the reality for the twenty-first century farmer who can use the modern windmill and modern mirror to feed the community around his home with clean renewable energy ....



## 2 THE CASE FOR A GREENER CLEANER FUTURE

### 2.1 FINALLY.....a very brief word

Not trying to be alarmist, the newspapers, 'The Inconvenient Truth', the Stern Report, all express the urgency with which we need to address climate change.

Without doubt, mining, and in particular coal mining is very important to Australia's economy and the economy of many regions, including the Hunter Valley. Many in our community benefit greatly from the lucky and rich resource Australia has. The innovation and skill with which we, as a nation have harvested the natural mineral resources is a testament and incredible compliment to the competency of our nation. The task, whilst clever and without pun intended, the resourcefulness in which we plunder our soils however, in the broader picture brings us more long term pain than perhaps is justified by the short term (perceived) gain.

And finally the world is understanding this, and it isn't only a few hippies....

Our newspapers are full of stories, the leaders of the largest economies are all finally recognising it, and recently serious scientific muscle has come out to say that unless we drastically address our creation of CO<sub>2</sub>, we may get to the point of no return, if we haven't already got there.



They say we have to spend billions today to save trillions later. Possibly true, but no amount of money will compensate people for dying because of reduced air quality, rising oceans, worse droughts, more severe storms and less water.

The time is now, to undertake all means to build the framework for a green future.



Wind Turbines at Hampton near Lithgow

## 2.2 Proven Technologies

Enormous global investment and research into energy generating devices from renewable sources over the past twenty years has seen a vast uptake in feasible, efficient and practical solutions to the ever growing demand for energy. Much of global progress has been on the back of financial support from governments. This is changing with government support reducing generally. Costs for renewable energy have been reducing as well as costs in traditional forms of energy generation (coal and hydro) becoming more expensive or seen as environmentally unacceptable. Communities around the world are realizing the true cost and impact of their reliance on coal and hydro-electric energy is harming our global environment, possibly to levels which degrade our environment that we'll never be able to recover from.

Renewables are emerging as a realistic alternative, albeit it is appropriate to comment and a reflection of the reality, that if the world continues with its insatiable desire for more and more energy, the future demand for energy will have to be met with the support of the coal and possibly nuclear industries. The main reason to continue to develop energy from renewable sources is that if new technologies emerge over time, making current solutions less efficient or practical, the impact of removal of these, or the impact of having had the renewable solutions working for us in the meantime is nought. The impact of coal and nuclear is unfortunately with us for hundreds if not hundreds of thousands of years thereafter.

The proposed eco-generating devices proposed for the Kyoto Energy Park are in all cases proven and use long-tested technology, highly sophisticated and have successfully proven decades of use

around the world. The technology the subject of this first Project Application for the Kyoto Energy Park is a Wind Park. As soon as possible a further application shall be lodged for a Solar Thermal Plant, a Photo-Voltaic Solar Array, and a small closed-loop hydro-solar electricity plant.

At this time, wind generating turbines are the most effective and efficient solution to producing large scale quantities of renewable energy and have a major fundamental benefit over other purported 'green' solutions such as Nuclear and Hydro. If, say as stated above, in thirty years, there is a better answer to producing renewable greenhouse friendly energy from another device and wind is no longer seen as effective, necessary or needed, the removal of the wind turbines leaves no impact on the environment after it's use, nor having had any negative impact on the environment during its use. The same cannot be said for nuclear, coal or hydro systems which change the environment and ecology forever.

The design of the Energy Park will take into consideration all of the proposed energy generation methods. The following is a general description of the proposed technologies.

### 2.2.1 Wind Turbine Generators

Over the last 20 years, with much research, development and implementation around the world, energy created from wind turbines has become an extremely effective and efficient form of generation in the right places. A modern turbine pays back its energy in terms of the development, creation, transport and construction within five months of being installed.

A modern turbine can produce a similar amount of energy annually that may be needed by a town such as Scone in the same period. Accordingly, a number of turbines working together at the proposed site, could generate enough energy in a year that is similar to the energy needs of the greater Hunter Valley.

Modern turbines are typically installed with a capacity of 1.5MW to 3MW each, with some off-shore installations using 5MW turbines.

Typical modern turbines vary in height between 50m and 105m (to the height of the Nacelle.) The Nacelle is the generator housing atop the long tower that the blades are connected to.

All typical modern turbines have three blades, with the blades varying between 40m and 45m in length. (There are some circumstances where shorter blades are used.)

Often a small transformer or switchboard is located adjacent to the base of the tower. It is possible for agricultural uses to co-exist right up to the tower base and is most common in most circumstances.



Often publicized photos of the wind farms of California of the nineteen seventies, represent only a moment in time and would under normal circumstances not be repeated again today with modern wind turbine layouts and design.

As an example, modern layouts typically space the turbines with a minimum of 250m to 350m apart between turbines and blade rotations have reduced significantly in the number of rotations per minute to an average of approximately 14rpms.

### 2.2.2 Solar Thermal Plant

The Solar-Thermal plant proposed for the Kyoto Energy Park would use existing proven technology which has been successfully operated for over 30 years at various locations in the United States, Israel and Spain.



Solar-thermal technology has numerous forms, and will be similar to technology recently announced as being supported by the Australian Government through its support of a large solar-thermal plant in northern Victoria.

Essentially, Solar thermal electric power plant generates heat by using lenses and reflectors to concentrate the sun's energy. Because the heat can be stored, these plants are unique because they can generate power when it is needed, day or night, rain or shine. The sun's heat can be collected in a variety of different ways:

- **Solar Parabolic Troughs** (above left) consist of curved mirrors which form troughs that focus the sun's energy on a pipe. A fluid, typically oil, is circulated through the pipes which is used to drive a conventional generator to create electricity.
- **Solar Parabolic Dish** systems (above right) consist of a parabolic-shaped concentrator (similar in shape to a satellite dish) that reflects solar radiation onto a receiver mounted at the focal point at the center. The collected heat is utilized directly by a heat engine mounted on the receiver which generates electricity.
- **Solar Central Receivers** (see below) or "Power Towers" consist of a tower surrounded by a large array of heliostats.





### 2.2.3 Photo-Voltaic Solar Array

Energy generation from photo-voltaic solar cells has been long identified as the future best way for renewable energy to be generated.

There are three main issues with Photo-Voltaic Solar Array systems:

#### **Energy Efficiency**

Currently the most efficient photo-voltaic solar cells manufactured in the world have a foreseeable life span of approximately 25 years and being the same duration that the solar cells require to create the equivalent amount of energy that has been needed to create them. Unfortunately, an fundamentally inefficient process.

#### **Cost Effectiveness**

Currently photo-voltaics are not commercially cost efficient for the quantum power created.

#### **Scale**

Very large areas of land are required to achieve comparably small outputs of energy.

Nevertheless technology and circumstances change and solar photo-voltaics are improving. Photo-Voltaics are a very effective energy generator for small quantities of power and why they have been effective in remote locations. Very significant global investment is going into solar-voltaic design and engineering to improve effectiveness and efficiency.

Accordingly the short term likely uses of photo-voltaics will be for ancilliary uses such as pumping systems around the land.



### 2.2.4 Hydro - Solar Plant

A closed loop hydro plant is believed feasible. Over time, water can be collected from rainfall that can be used in the closed loop system. The concept is to take advantage of the hydro system as a storage bank of energy.

Using small solar devices, or possibly surplus electricity generated from other devices on the site, water can be pumped up at slow efficient rates to holding tanks at higher levels on the site.

Given certain circumstances, such as at night, low wind, or very high electricity pricing, the water can be released using gravity to drive turbines and create new electricity.

It is very useful way of being able to even-out the electricity output from the site although the quantum of electricity from a small closed loop hydro-system will be small.

There are numerous commercially available off-the-shelf kits which could be feasibly installed with extremely minimal impact on the land.

### 2.2.5 Energy Storage Systems

Ancilliary to the Wind Park, some energy storage capacity is proposed. There are numerous new technologies emerging, and some tested and proven that can provide efficient and cost effective temporary energy storage solutions to supplement the energy generation installation and provide a greater annual output for the overall Energy Park.

For a highly optimized energy park from numerous forms of energy, an efficient energy storage system will be very useful.

Examples of the effectiveness of energy storage:

- Releasing stored energy into the grid when power rates are at their highest, rather than when they are produced.
- Using stored power to keep the solar-thermal boilers hot at night will improve the solar-thermal efficiency enormously.
- Releasing energy when
  - Night (no solar)
  - Calm (no wind)
  - Capturing energy is not practical to release to the grid.

### 2.2.6 Water Use

Appropriately there is much focus in Australia on water use.

Water on the site, can be collected in a number of ways, without effecting the natural water balance of the land.

Water can be captured, for example off the mirrors in the solar-thermal plant, the roofs of the visitor centre and manager residence, for use in the closed hydro loop, or feeding of stock.

Water can be recycled too, with numerous tested systems that treat grey or black water for safe reuse on the land.



### 3 REGIONAL PERSPECTIVE and BENEFITS

The Hunter Valley is famous for its wines, horses, green hills, valleys and picturesque landscapes. The Hunter is home however, to coal mining and power industries, two industries with vast impacts over land, the visual amenity of a whole region as well as health, natural habitats, natural landform amongst many. The Coal Industry is a very important part of NSW and Australia's community and economy, with the Hunter playing a vital role. Coal is undeniably a driving force in the economy of the region and many community groups deserve to recognize the coal industries' support.

The majority of mining and energy production occurs in the Muswellbrook Shire immediately south of the Upper Hunter Shire.

There are proposals and feasibility studios underway investigating coal mining in the Upper Hunter Shire.

The above ground mining sites and power station sites in the Muswellbrook area use over 5000 hectares (15000 acres) of high quality farming land.

The same coal fired power plants produce tonnes of CO<sub>2</sub> ozone depleting gases, speeding up the impact of global warming. And that coal, (the majority) which is excavated and exported to other countries rather than used in the local power stations, nevertheless contributes to global warming overseas.



Over the past ten years the rapid pace of development of the coal industry has seen more mines, and larger mines, mines that were previously closed, reopened, mines that were underground now proposing to be open-cut. The landscape is changing around the region so quickly, that the largest dominant landscape feature around Muswellbrook today is the large coal slagheap to the west. The coal industry attempt to conceal the changes to the land with densely landscaped berms built up against roadways but the experience of driving through the Hunter is no longer one of a rolling valley with the backdrop of mountains, but one of impact after impact of the mines along one's journey.





Recognising a need to create a cleaner, more renewable future, a large scale Solar array is proposed near Singleton which is proposed to generate approximately 3MWh of energy. This is in comparison to 2600 MWh currently being produced by the 3 power stations in the Muswellbrook Shire.

And recognising a need to address renewable energy, the Upper Hunter Shire has actively promoted the investigation and implementation of alternative renewable energy generation. As soon as Council discovered its Local Environment Plan did not allow eco-generating works, it sought to change the LEP and make it possible for projects such as the Kyoto Energy Park to happen.

Despite the changing topography of the Hunter as a result of the mines, many other changes have occurred in the region. The wineries, coastal development and the improved road system, successful horse breeding and training in the Scone area, all have brought a new awareness to the region about the sensitivity of the land and the air we breathe and generated a ground swell of support for a future less reliant on the coal industry to power our homes and the world.

Accordingly, the opportunity has emerged and fundamental behind the Kyoto Energy Park is the hope that all residents in the area, whether they subscribe specifically or not, with the development of the Kyoto Energy Park, will use green, renewable energy 24-7 in their lives.

Local interest in participating in the financial entity is high and once all regulatory approvals have been met, it is hoped the local community will be provided with an opportunity to 'own' a piece of their own green power supplier in preference to a broader offer to the public. With the 'ownership' of the Energy Park, education programmes and a refreshed even greener regional identity can further develop and that will reinforce the message that Scone is clean and green and acts in accord with its values.

The Kyoto Energy Park is a great opportunity for the region to shout its support of renewable energy, rather than simply accept the landscape degradation of the mining activities.

