# The Electricity Crisis

How fanciful forecasts are stifling the Australian Economy

# Introduction

- The electricity industry is in crisis as massive over investment in the grid has caused unsustainable price rises.
- This presentation will delineate 8 key themes that have shaped the current crisis in the industry.

1. Price – an international and domestic perspective

2. The industries fanciful forecasts that have lead to massive overbuilding of infrastructure for a demand that simply does not exist.

3. Gold Plating of the network.

4. A local example of flawed project justification. On a local level the problem of self serving forecasting is magnified.

5. The industries fatally flawed regulatory framework.

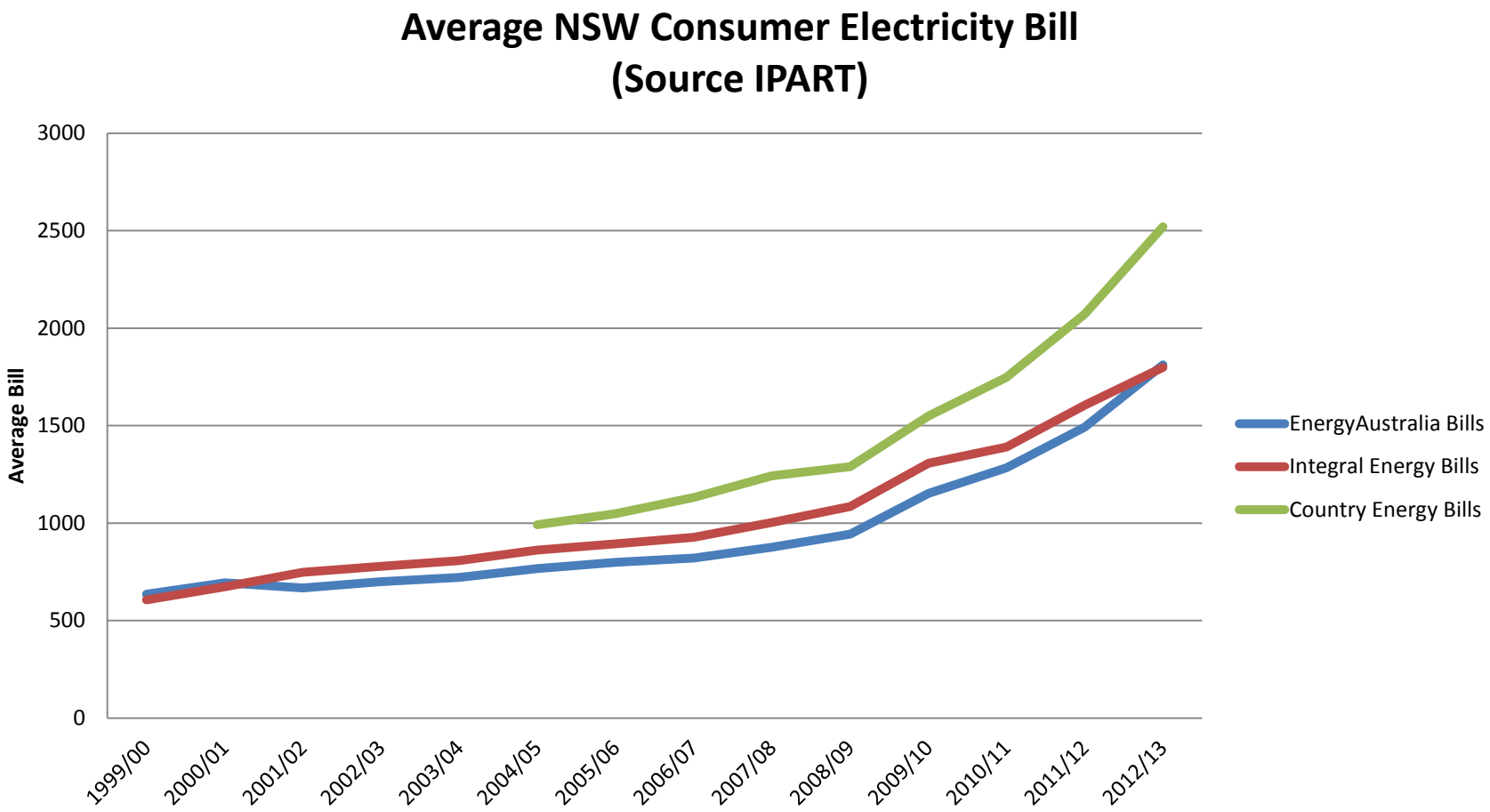
6. Demand Management – a wasted opportunity.

7. The Myth of Peak Demand.

8. The Negative Feedback loop of falling demand.

Finally we will suggest some solutions to ameliorate the crisis.

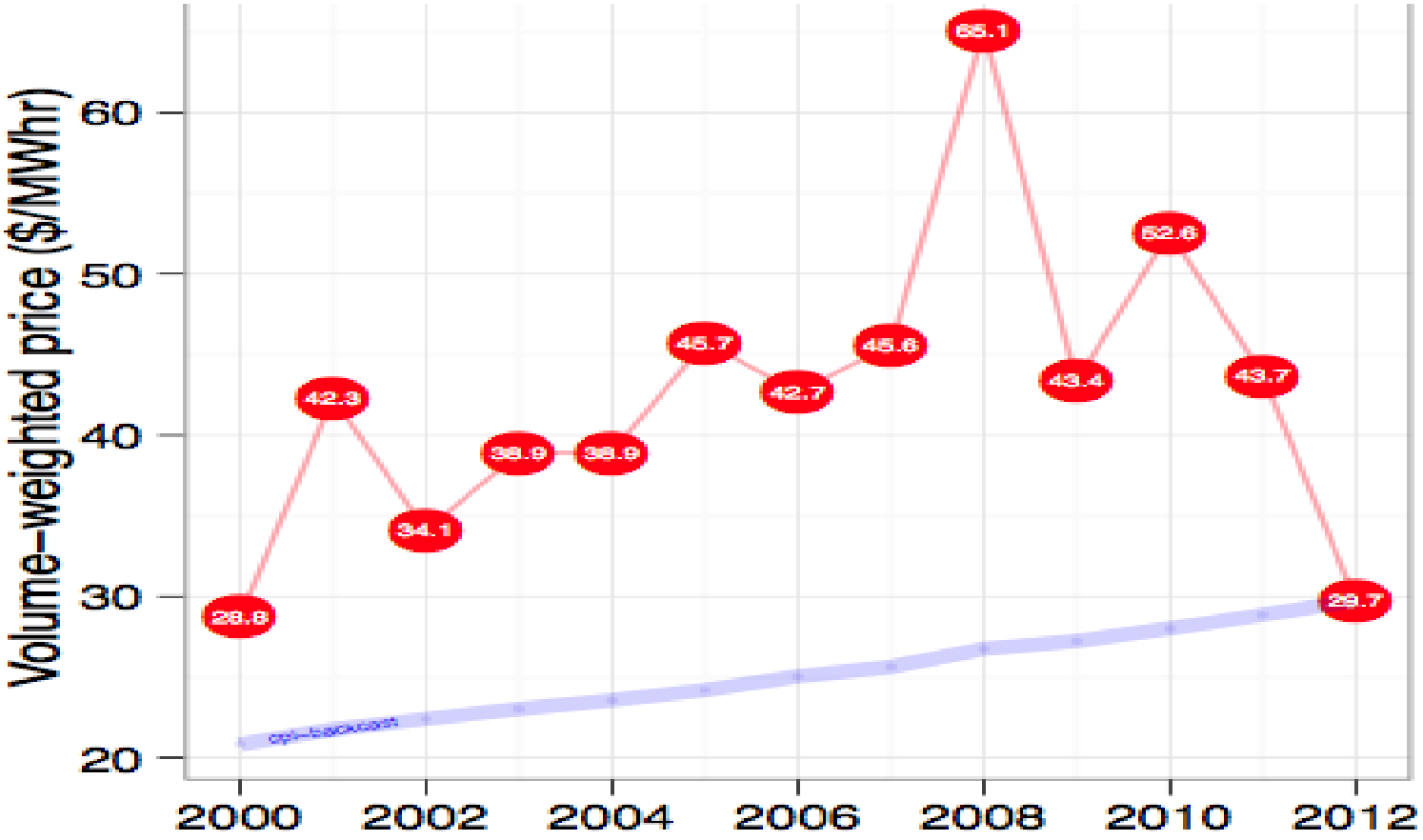
# Electricity Bills Skyrocket



# Some perspective on the Price rises

- A large price rise in a basic commodity is around twice the cpi,  around 5-6% pa.
- Prices in NSW for small customers have risen by an average of **15% pa for the last 5 years**.
- Current forecasts are for double digit price rises into the future.  **This is unsustainable**.
- Since 2005 an average **regional** NSW retail customer's bill has risen by **154% to $2520.**

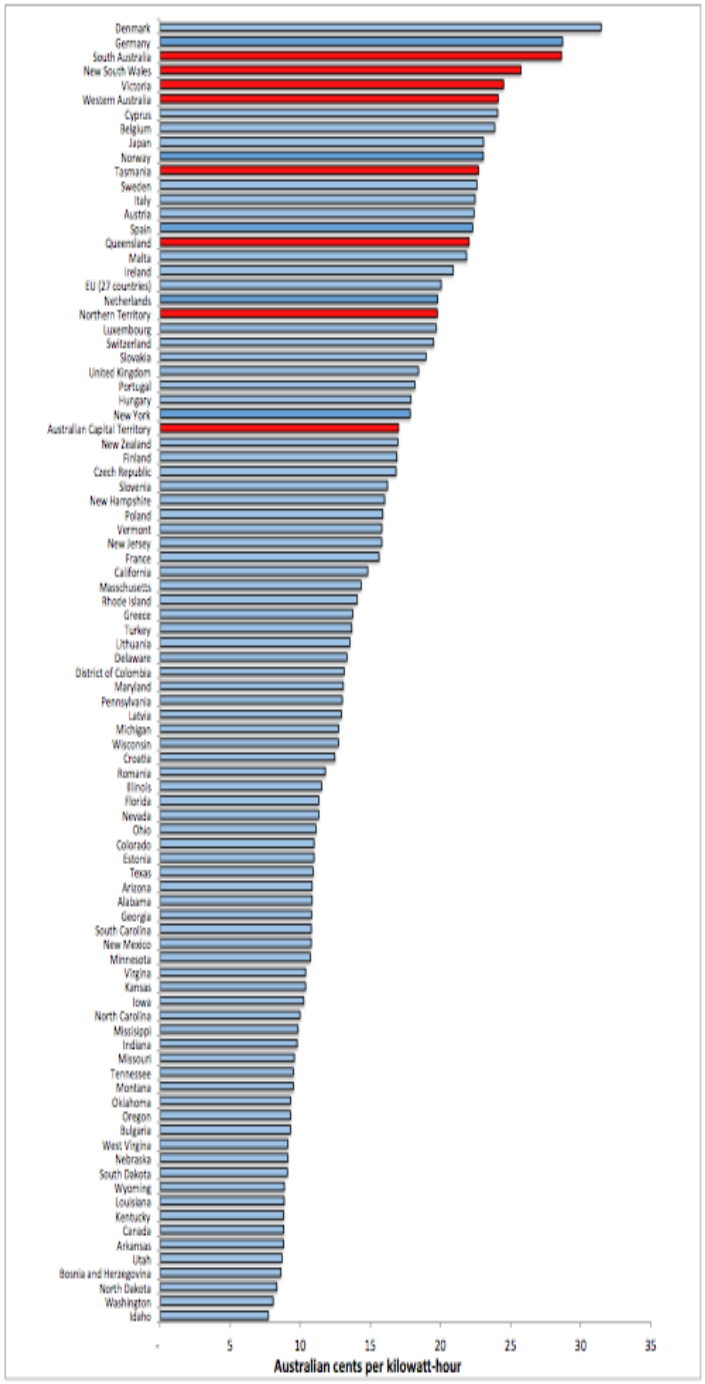
# Wholesale Electricity Prices



# The Generators are Struggling

- Wholesale prices are at the same level as they were in 2000.
- Generators are struggling with low prices and revenues.
- This trend is likely to be exacerbated by the uptake of solar.  Professor Mike Sandiford has argued that solar uptake will shorten peak periods of demand and further crimp generator revenues.

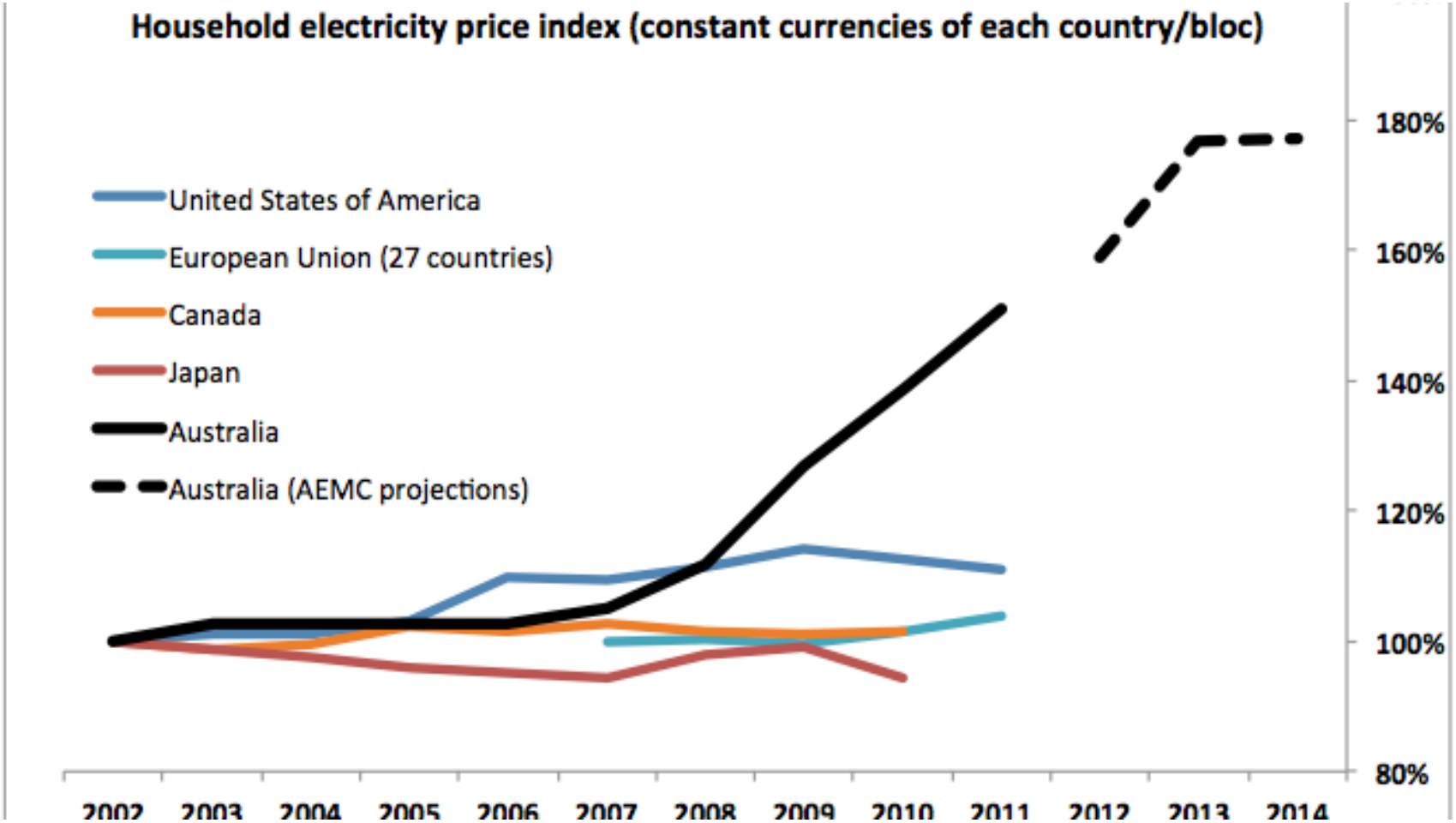
Figure 3. 2011 household electricity prices by country, state and province[iv]



# Prices Internationally uncompetitive

- In 2011/12 average household electricity prices in Australia (just under 25 cents/kWh) were 12% higher than average prices in Japan, 33% higher than the EU, 122% higher than the U.S. and 194% higher than Canada.
- Out of 91 countries, states and provinces surveyed by the Energy Users Association of Australia in 2011, NSW was the 4$^{th}$ most expensive market in the world.
- With the average price rise of 18% in 2012 **NSW probably leads the world as the most expensive electricity market.**

# Prices Internationally Uncompetitive and getting more so



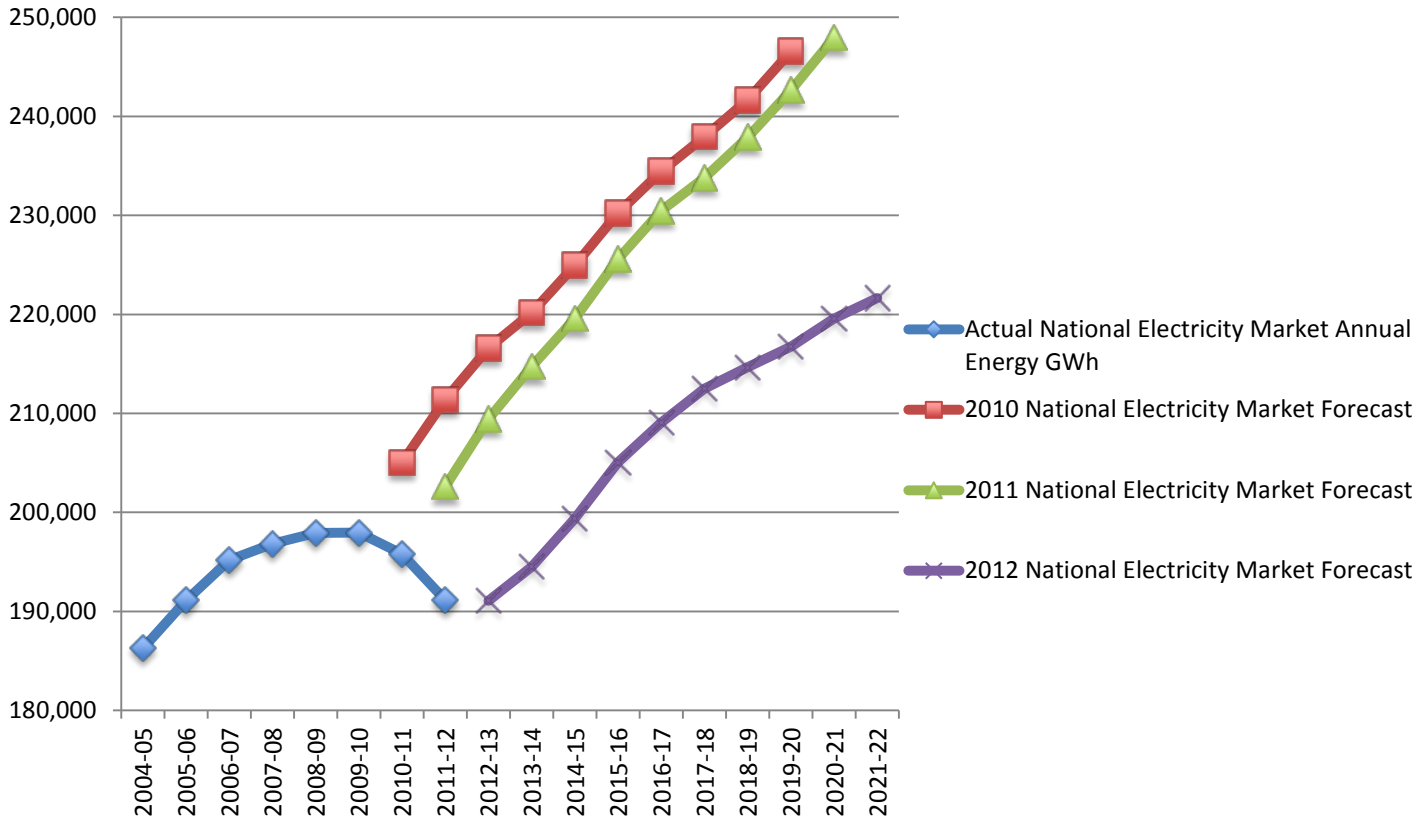
# 2. Fanciful Forecasts

- The Electricity industry has failed to recognize a change of trend in total demand, peak summer and peak winter demand.
- This change in demand has been driven principally by one factor.
- Price
- Forecasts have been consistently too high.
- The industry persists in forecasting against a clearly established trend.  Demand is falling due to massive price increases.
- There is only one inescapable conclusion the industry is either grossly incompetent or professionally negligent.
- Poor demand projections is leading to massive overbuilding and the wastage of billions of dollars in the National Electricity Market.

# Basic Economics

- Forecasts are determined by 3 things, Supply, Demand and Price.
- Price is the key determinant.
- The one variable that is inarguable in economics is price. It is often said that economists know the price of everything and the value of nothing.
- Price shapes consumer behavior. If you want to influence consumer behavior just change the price.
- The electricity industry has been changing the price at a rapid and accelerating rate since 2007.

# Fanciful forecasts for the National Electricity Market Annual Energy



# National forecasts are hopelessly inaccurate

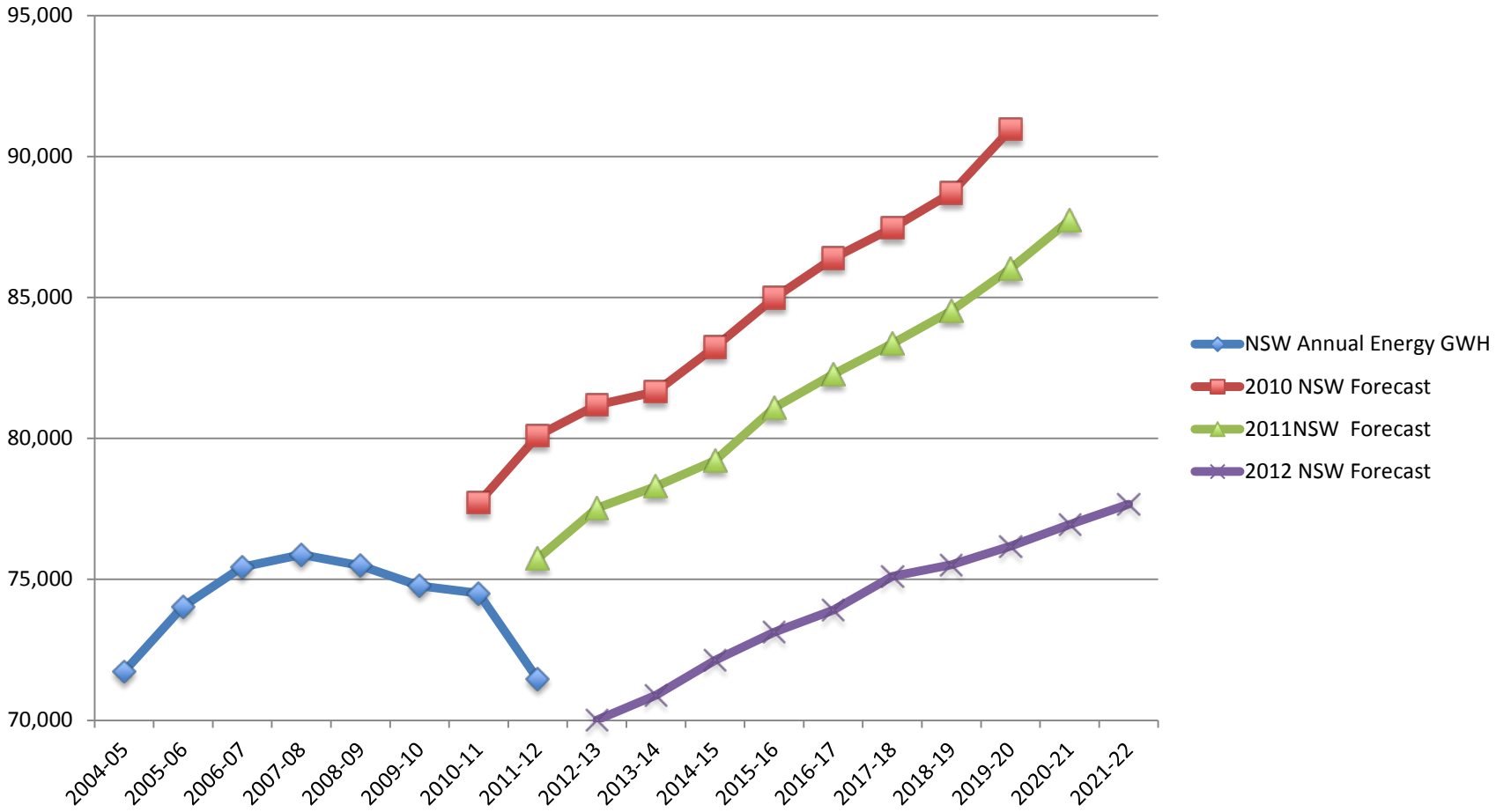
- Forecasts are continually being downgraded
- The industry is forecasting against an established trend driven by price.
- The industries credibility in forecasting is in tatters as it can’t even come close to getting it right just 12 months out let alone on a 10 year view.

# The Electricity Industry has not taken account of Price and the Vicious Circle

"Energy price forecasts have also under-forecast rises in electricity retail prices across the NEM, leading to a compounding effect, with economic forecasts being too high, leading to electricity forecasts being much higher than actual demand."

(Source Australian Energy Market Operator National Electricity Forecasting, Information Paper December 2011, Page 23)

# Fanciful Forecasts for NSW (NSW Annual Energy)



# Transgrid Chastised by the AEMO

- The Australian Energy Market Operator (AEMO), frustrated with Transgrid's failure to accurately forecast has for the first time in its history produced their own forecasts for NSW.
- The AEMO is funded 40% by the electricity industry.
- The AEMO have failed to take account of price and the consequential accelerating downtrend in demand. **They are still forecasting a radical reversal of the trend. They are still projecting significant growth.**

# The AEMO's model doesn't cater for the dramatic price rises

- The AEMO model does not fully take account of the dramatic and sustained rises in the price of electricity. The inputs to the model assume a fixed component to all consumers consumption regardless of price.
- We contest that this has not been the case since 2008.

# Assumptions for Gross State Product growth also questionable

- The AMEO assumptions for growth are also questionable.
- We consider that the high prices combined with government incentive programs to enhance energy efficiency of the business sector have permanently changed consumer behaviour.
- Once consumers and businesses change behaviour they do not change back.

# Transgrid's and the AEMO Forecasts in NSW not even close to reality.

- **Transgrid and the AEMO got the trend wrong one year out.**
- Average growth in annual energy for the 10-year outlook period is now forecast to be 1.2%, down from the 1.6% forecast in the 2011 ESOO.
- This is a **MASSIVE 25%** reduction in the long term growth rate in annual energy for NSW in just one forecasting period.
- In just two years **Transgrid's and the AEMO forecasts for 2020 have been revised down by 16%.**

# Maximum demand forecasts for NSW are also fatally flawed

- Average growth in summer maximum demand for the 10-year outlook period is now forecast to be 1.2%, down from the 1.9% forecast in the 2011 ESOO.
- **The 2020-21 forecast for peak summer demand has been dropped by 18% in just 12 months.**
- **In the February 2012 Options Selection Report The Stroud to Lansdowne Project was promulgated on a 19% rise in peak summer demand by 2021. The Downgrade in peak summer demand has totally negated the need for this project.**

# 3. Gold Plating

- All relevant government agencies and enquiries (IPART, AEMC, AER,AEMO, The Tamberlin Enquiry, the Garnaut report) have agreed that the cause of the large price rises has been the Transmission and Distribution costs caused by gold plating the network.
- The Transmission and Distribution companies are paid based on the capital invested in their business.
- This is a wholly regulated artificial return.
- The state owned transmission and distribution companies are borrowing with the benefit of, in effect, a government guarantee.
- There is an incentive for these companies to over capitalize the network. This is termed **Gold Plating.**

# Gold Plating worse in NSW

- NSW distribution network charges are forecast to make up 60% of the price NSW consumers pay for electricity by 30 June 2013.
- This is 19% above the national average.

# 3. Transgrid's Tomago to Armidale Project

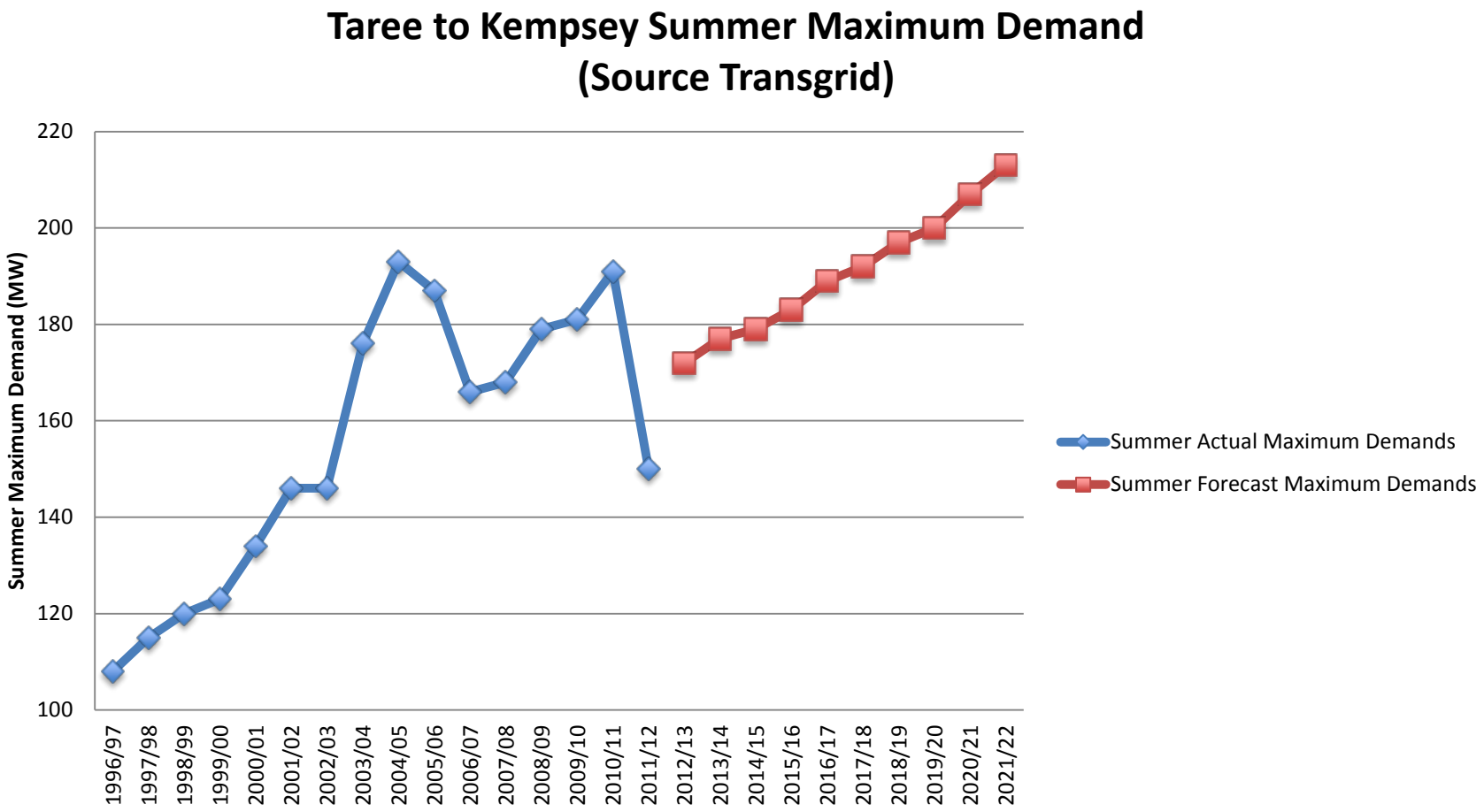
(The single largest example of waste and unnecessary infrastructure in NSW)

- 330 000v High Voltage Transmission Line
- The Stroud to Lansdowne section is a $126m Project
- A 125% increase in capacity
- Justified by Transgrid as being for growth in the lower Mid North Coast and the Mid North Coast and reliability.
- Part of a much larger project from Tomago to Armidale with an estimated project cost of $750m.

# Transgrid's Project Justification

- In the Options Selection Report Transgrid stated that the project was justified by:
- "Capacity to cater for future population growth and industrial growth in the area" (lower mid North Coast)
- They also mentioned improved reliability and latest technology. If the project is for reliability it must form a loop to Armidale or Coffs Harbour.
- **This project is a spend of over $750m for an incremental growth in population of 30,000.**

# Summer Demand Falling



# The Stroud to Lansdowne Project Gold Plating at its Peak

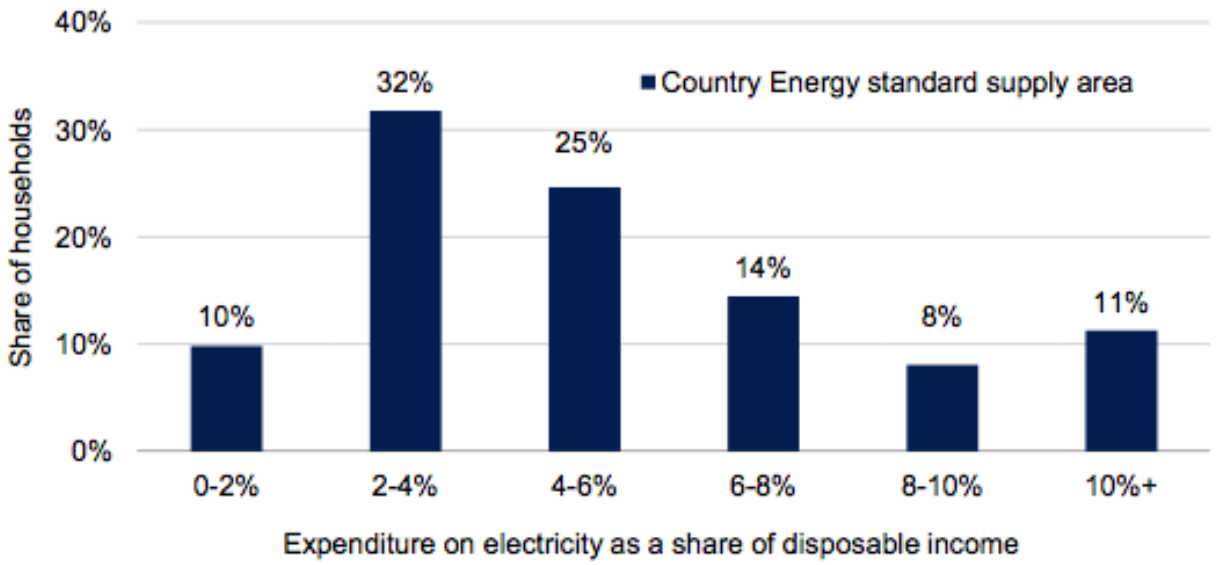
- Energy Poverty is greater on the mid north coast due to higher than average bills and lower incomes.
- The mid north coast is a lower income area. The effects of price are being felt more keenly and demand is falling dramatically.
- Forecasts are even higher than those for NSW in the face of reality.

# Energy Poverty

- Energy poverty is defined as when energy costs are greater than 10% of disposable income.
- At this level consumers are faced with a dreadful dilemma to **Eat or to Heat**.
- The Lower Mid North Coast fits the bill as an energy poverty area.  This situation will only get worse as electricity prices are forecast to continue to rise at a rapid rate.
- There is a clear need for reform.  Electricity is unaffordable.

# Expenditure on Electricity as a share of disposable income

**Figure 6.4 Distribution of annual spending on electricity as a share of disposable household income — Country Energy's supply area, 2012/13**




**Note:** Distribution based on Sydney distribution adjusted to reflect median income and median electricity bills in each postcode in Country Energy's standard supply area. Customer bills are net of the Low Income Household Rebate and medical rebates.

**Data source:** ABS Census 2006, Table B02; Country Energy data; ABS Catalogue No. 6302.0: Average weekly earnings, Australia, November 2011; IPART analysis.

# Energy Poverty is real and it is Here

- Greater than 11% of Country Energy's customers are currently in Energy Poverty.(Defined as spending greater than 10% of disposable income on Energy)
- The graph above excludes expenditure on Gas

# The Situation is worse on the Mid North Coast

- Median Weekly Household incomes show the situation is worse on the Mid North Coast.
- Excluding Sydney regional NSW has a median weekly household income of $961.
- Our towns all have median weekly household incomes below this level. Ranging from Port Macquarie with $855 to Kempsey at $581.
- Given lower local incomes, predicted Electricity Price rises and including gas expenditure it is not hard to see **approximately one third** of the mid north coast is in Energy Poverty now or in the very near future.

# Demand Lower – Transgrid's Project Proceeds

- The Stroud to Lansdowne project was promulgated on peak summer demand rising by 19% over a 10 year period.
- There has been a clear and unequivocal change in the trend in peak summer demand.
- Peak summer demand on the Mid North Coast fell by 21% in 2011/12. This is a bigger fall than registered in NSW of 18%.
- Peak summer demand has been falling faster on the Mid North Coast than in NSW over the last 5 years. The state decline is 5.8% whilst the Mid North Coast is 9.6%.

# Inconsistent Forecasts

- Peak summer demand is forecast to rise by 1.2% pa in NSW over the next 10 years whilst Transgrid has forecast demand to rise by 3.6%pa on the Mid North Coast.
- **The growth rate that is forecast for the Mid North Coast is 300% higher than that for NSW. Despite the history showing demand is falling faster on the Mid North Coast.**
- The figures to justify the Stroud to Lansdowne line have no credibility.

# No need for this project in my lifetime

- Taking the 35% growth in peak summer demand as the trigger point for this project we come up with a figure of 244 mw.
- If we use the NSW growth rate of 1.2% pa in peak summer demand as forecast by the AEMO (a forecast we reject as exaggerated) Transgrid don't need to build this project until **2052**.
- If more realistic numbers were used this project will be superceded by new energy saving and generation technologies long before it is ever needed.
- People from Tomago right through to the Manning Valley are having their land expropriated for a project that is not needed or wanted. **This is Legalized Theft.**

# The Project Justification

- In February 2012 Transgrid published the Stroud to Lansdowne Transmission line project options selection report in which they, along with Essential Energy, quoted a figure for summer maximum demand growth of **19%** over the next ten years on the mid north coast.
- In May 2012 the last update for the Tomago to Stroud line was published. In it they quote a figure of **35%** growth on the mid north coast in peak demand over the next 10 years.
- This compares to **25%** on the Transgrid web site for Stroud to Lansdowne line.
- And **42%** if you look at the numbers contained in the July 2012 Annual Planning Report.
- Consistency or credibility is not Transgrids core business. They build Transmission lines.

# 5. The Industries Regulatory Framework is fatally flawed

- “But the regulatory framework—the national energy Rules that set out how the Australian Energy Regulator (AER) must regulate electricity and gas networks— **has led to some price increases that are difficult to justify**. The framework was introduced in 2006, when capacity issues were emerging after many years in which Australia had lived off the legacy of historical overinvestment in energy infrastructure. New Rules were drafted to stimulate network investment by locking down the regulatory decision making process. While this approach has successfully increased network investment, it restricts the regulator from making holistic assessments of how much of that investment is efficient or necessary. **This restriction has led to consumers paying more than necessary for a safe and reliable energy supply.”**

# 6. Demand Management- A Wasted Opportunity

- Demand Management is known as best practice in utilities of all sorts (Water, power etc).
- A
  Deloitte analysis has estimated that the ec onomic value of the peak demand reductio ns potentially achieved by the five core ini tiatives that
  they studied ranges between $1.5 and $4.6 billion, over the period 2012-13 to 2021-22.

# Deloittes potential Benefits of Demand Management

| Initiative | Low case benefits ($m) | High case benefits ($m) |
|---|---|---|
| Time of use pricing | 58 | 193 |
| Critical peak pricing and incentives | 385 | 1,272 |
| Direct load control of air conditioners | 200 | 1,338 |
| Direct load control of pool pumps | 188 | 231 |
| Electric vehicles | 60 | 537 |
| Energy Savings Measures | 361 | 486 |
| Enhanced uptake of Solar PV | 300 | 528 |
| **Total gross benefits** | **1,551** | **4,585** |

Total estimated value of gross benefits 2012-13 to 2021-22 (NPV, $m)

# Demand Management of Air Conditioners

- Direct load control has been used by electricity distributors to control residential electric storage hot water systems across Australia for over 30 years. It is not surprising, therefore, that direct load control of air conditioning and pool pumps, two of the major drivers of peak demand in Australia over the past decade, is now being trialled by distributors.
- This involves having a chip in the compressor of the air conditioner that switches off remotely, for short periods, at times of peak demand.
- There is little reduction in performance of the air conditioner as the fan still works and cold air still comes out.

# Trials show large reductions in Demand

- Since 2006, ETSA Utilities has conducted se veral direct load control trials targeting resi dential and commercial customers air conditioning. Results of these trials indicated that potential reductions in peak load range from 19% to 35%.

# Demand Management TOO RISKY

- Despite the large potential gains from demand management such measures are not being widely adopted as the regulatory environment is not conducive.
- In a recent presentation by Transgrid, on Demand Management, in a Slide on Funding of Non Network Options they stated that it was a **Risky business for Transmission and Network Service Providers.**
- The final concluding remark for the Transgrid presentation was “Regulatory framework needs improvement to give commercial incentives to TNSPs (Transmission and Network Service Providers) for proactively implementing DM (Demand Management) and energy efficiency projects other than for capex deferral.”

# 7. The Myth of Peak Demand

- Much has been said and written about the peak summer demand being the problem as the system cannot cope with the spikes in demand. Time and time again it has been used to justify projects.
- This assertion has proven to be false as the industry now has the same 10 year growth rate in NSW for both peak and overall energy demand.
- **The 10 year growth rate for peak summer demand is now 1.2%pa the same as energy demand.**

# Peak Demand

- Much has been said about peak demand driving the infrastructure build.
- In the so-called family-formation bracket, where the main income earner is 30 to 50 and has kids, one in four households were at risk of not being able to pay their power bills. “If you want to find the root cause of all of this, you are talking about rising peak demand and the subsequent investment in new infrastructure to sustain it,” Professor Simshauser said.

# The AEMO National forecasts for peak Demand

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# State by state forecasts for peak demand

| AEMO Forecast 10 year growth rates in demand | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | **Difference between Summer Maximum** | |
| | **Annual Energy** | | **Summer Maximum** | | **and Annual Energy** | |
| | **2011** | **2012** | **2011** | **2012** | **2011** | **2012** |
| NSW | 1.6 | 1.2 | 1.9 | 1.2 | 0.3 | 0 |
| Queensland | 4.1 | 2.9 | 4.2 | 2.5 | 0.1 | -0.4 |
| South Australia | 1.5 | 0.9 | 1.7 | 1 | 0.2 | 0.1 |
| Tasmania | 0.9 | 0.9 | 1.4 | 1.1 | 0.5 | 0.2 |
| Victoria | 1.6 | 1.4 | 2.1 | 1.6 | 0.5 | 0.2 |
| National Electricity Market | 2.3 | 1.7 | | N/A | | |

It would appear that peak summer demand is **NO LONGER A PROBLEM**

# Government Policy is Working

- The drop in electricity demand shows that Government sponsored energy efficiency schemes are working.
- Insulation schemes have worked.
- The solar bonus schemes are mitigating peak summer demand. Indeed Professor Mike Sandiford stated that: "It will only take several more doublings in capacity, or about 18 months if recent history is any guide, to reduce midday demand to current midnight levels. That would render the midday to early afternoon period akin to the current overnight 'off-peak'.

# Lack of Transmission

- Unfortunately, good government policy outcomes have not lead to lower prices of electricity because the industry has continued to over invest in useless infrastructure.

# 8. The Negative feedback loop of falling demand

- As demand falls the fixed charge of the Transmission and distribution companies is spread across a smaller base of kw/h.
- This will lead to spiralling prices which in turn will lead to lower demand which in turn will lead to spiralling prices  etc etc .
- The over-capitalisation in this industry needs to be addressed urgently to avoid this situation.

# $1 Billion of Waste

- The Australian Energy Market Operator has argued that NSW state owned power grid companies are rushing ahead with **$1 billion** of unnecessary expenditure over the next two years. This was based on a study of Ausgrid alone.
- There are 4 Transmission and distribution companies in NSW alone. (Transgrid, Ausgrid, Endeavour and Essential Energy.)
- We contend that an additional $500m of Transgrid's Transmission line projects could be stopped today with no effect on reliability.

# The Great Electricity Swindle

- Prices for electricity in Australia are internationally uncompetitive
- The prices have risen to such an extent that many in our society are now in Energy Starvation or Poverty.
- The Regulatory environment is fatally flawed leading to gold plating of the network.
- The industry cannot forecast. Billions of dollars of investment are occurring based on fanciful self serving figures.
- Peak summer demand, the driver of an investment super cycle, is no longer a problem
- The industry is in danger of a negative feedback loop as falls in demand lead to higher prices in a ever increasing spiral.
- Demand is falling both for annual energy and peak summer and winter demands as the radical price rises of the last 6 years take hold. The consumers of electricity simply cannot afford the product.
- There is Urgent need for reform. Billions of dollars of overinvestment can be stopped with NO effect on reliability. The lights will not go out.
- This is the greatest market failure of our day affecting every individual and business in Australia.

# A Call for Action

- We are calling for an immediate moratorium on all spending on electricity infrastructure nationwide.
- We call for demand management initiatives to be implemented prior to building new infrastructure.
- All projects should be re-submitted to the AER under the new rules.
- The AER's decision should be final and binding…no appeals.
- A review of all projects undertaken since 2006 should be undertaken to see if they are useful assets.
- All expenditure that has been made that is not highly productive should be written off.
- Without large writeoffs the industry will go into a death spiral with higher prices leading to lower demand leading to higher prices etc. etc.
- This industry has the capacity to permanently impair the entire Australian economy and have serious social implications.
- Inaction is not an option.