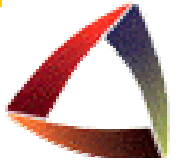




**University of New South Wales**  
**23 May 2002**



**ACRE**

# **Regulation to improve the Sustainability of the Electricity Industry**

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# Sustainability & the electricity industry



- Environmental sustainability:
  - Impacts on ecosystems of local to global scope
- Social sustainability (local to global scope):
  - Employment, equity, autonomy, etc.
- Technical sustainability (innovation):
  - Improve sustainability of energy conversion chain
- Economic sustainability:
  - Need economic surplus to invest in the above



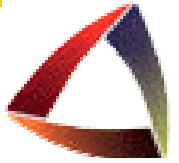
## Mandatory Renewable Energy Target (MRET) - Renewable Energy (Electricity) Act 2000



- Certificate properties:
  - Traceable to a specific MWh from an accredited facility (nominal MWh for solar water heaters):
    - *Hence potentially a unique price*
  - Transferable & valid until surrendered
- Liable entities (only in grids > 100 MW):
  - Retailers or direct wholesale buyers:
    - Self-generators are exempt
    - Must surrender certificates equal to annual obligation:
      - $\pm 10\%$  leeway in accumulated obligation (bankable)

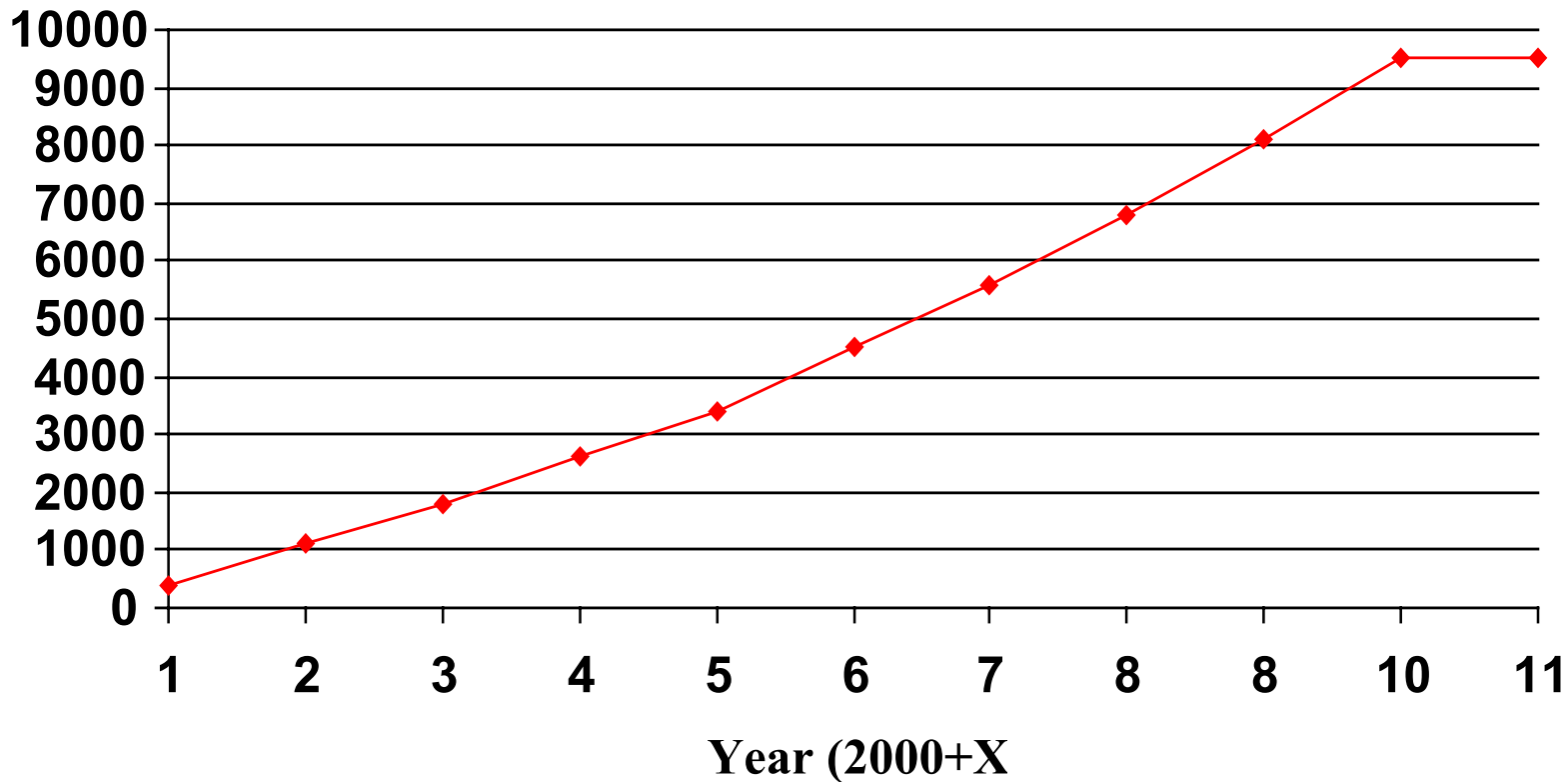


# MRET annual targets for electricity from “new” renewable energy



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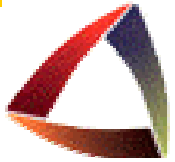
◆ GWH



9500  
GWH  
to 2020



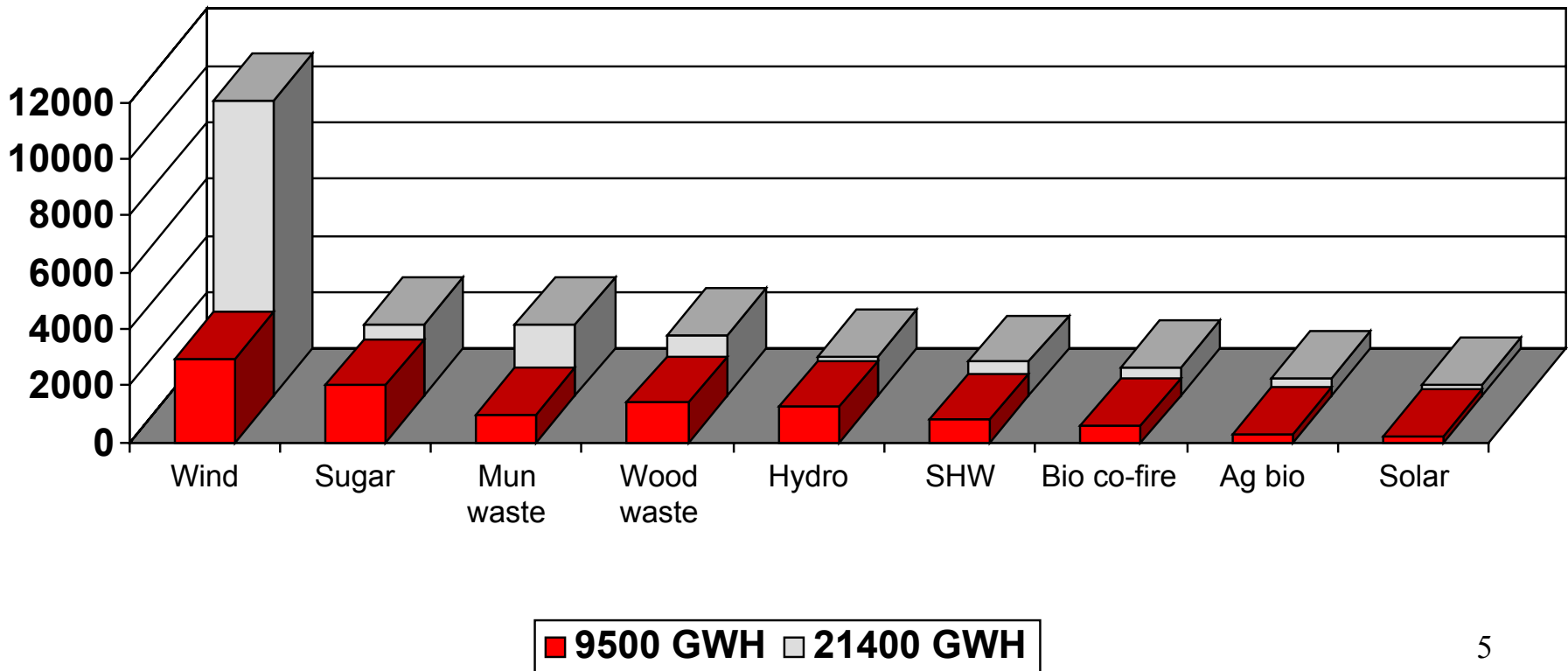
# AEA prediction of renewable energy to meet MRET 9500 GWh pa target



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(Australian Ecogeneration Association, 2001)  
(GWh per year)

*However considerable uncertainty in outcome*

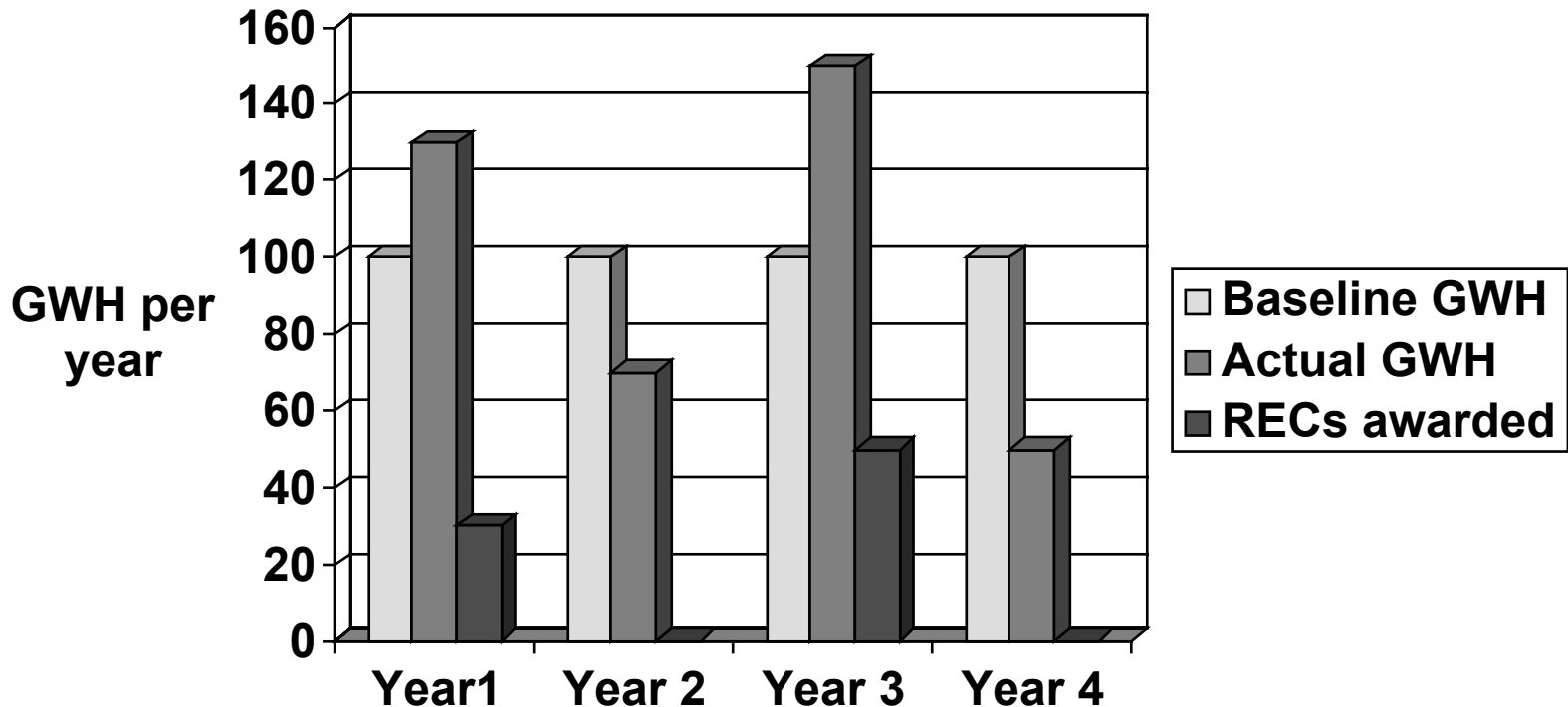




# MRET baseline: default is 1994-96 Average output or LTA



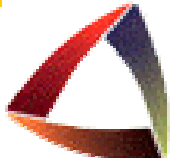
RECs awarded above baseline but not “clawed back” below it



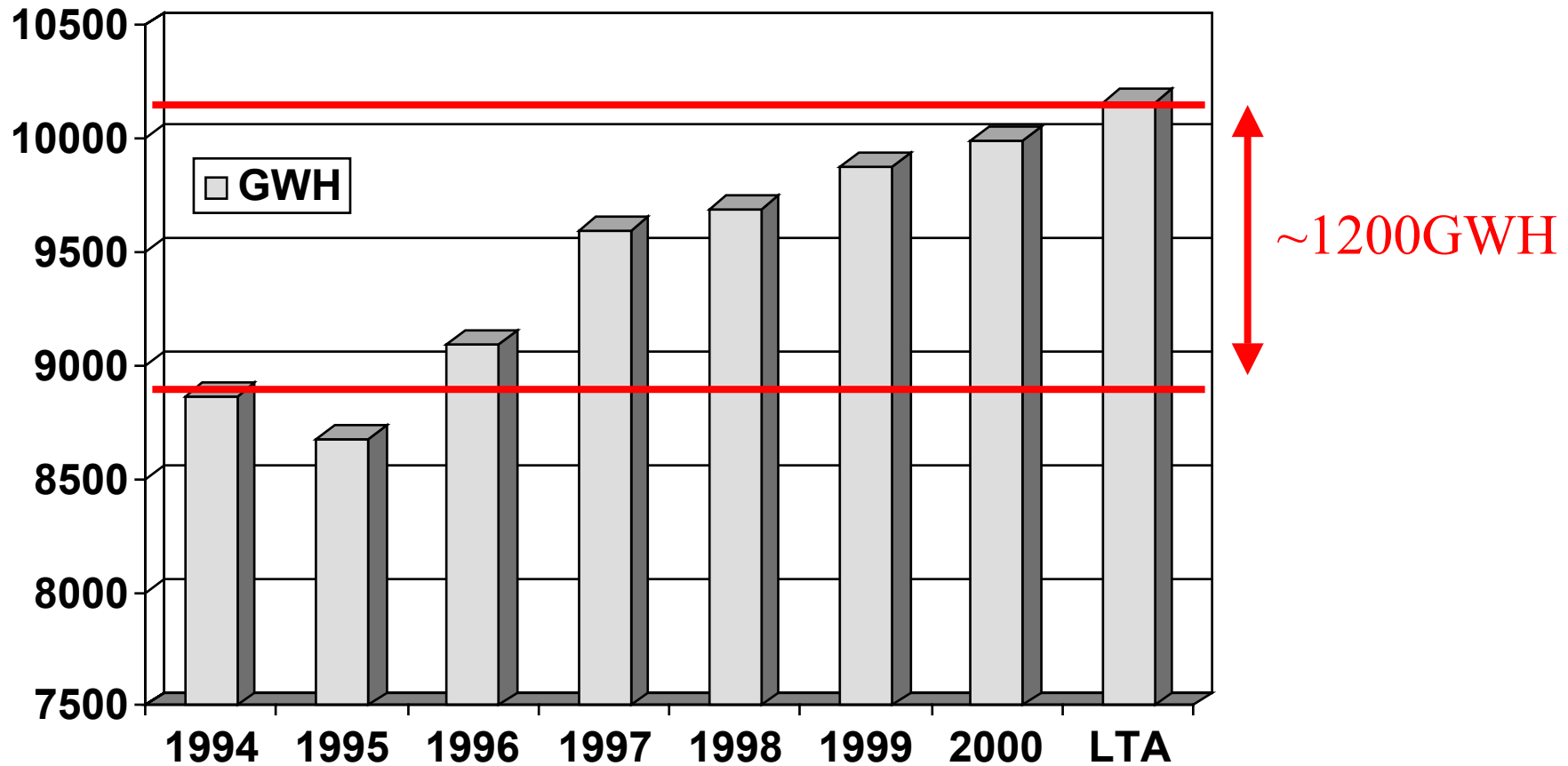
Rewards those generators with non-zero baseline & high annual variability  
(here 80,000 RECs over 4 years although ave. output = baseline)



## Possible “free ride” baseline effect: Tasmanian hydro with long term storage and load growth



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Note: Estimates only, actual baseline is confidential  
Data: ESAA Annual Reports



# Key issues with MRET implementation



- Baseline for pre-existing generators:
  - Inappropriate incentives
- Conflicting perspectives on biomass:
  - Ecosystem or energy resource
- Local versus global impacts, eg:
  - Wind farm visual impact vs global warming
- Uncertainty about policy direction, eg:
  - Target beyond 2020
  - RECs awarded to pre-existing large hydro





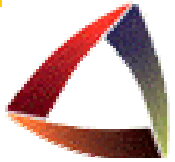
# Existing NSW electricity sustainability policies



- Market transformation activities by SEDA:
  - Important policy support for sustainable energy
- Distributor network planning required to consider distributed resource alternatives:
  - A good start but only partially effective
- Introduction of green power accreditation:
  - A good start but not a long term answer
- Greenhouse reduction targets for retailers:
  - Failed to achieve policy intent

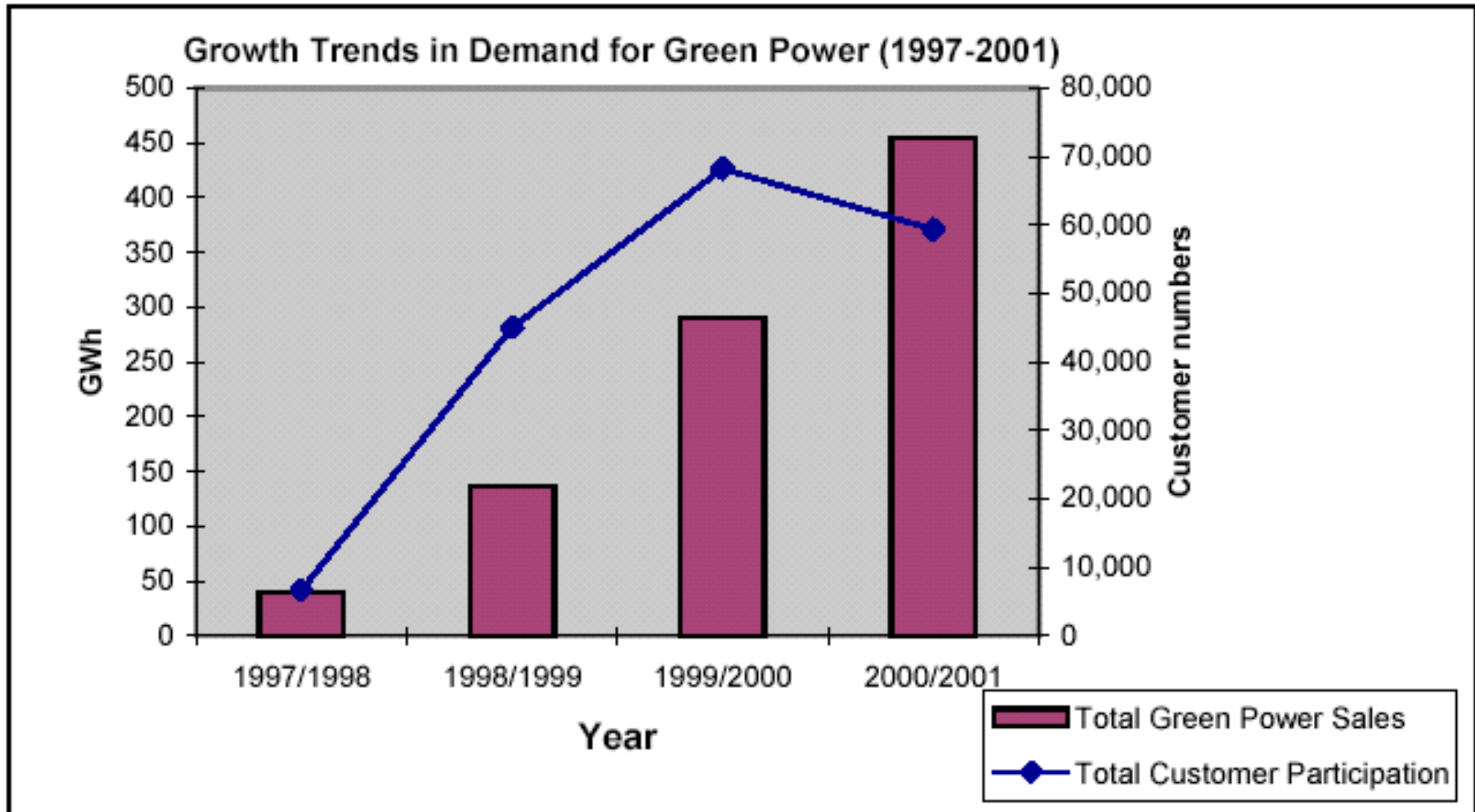


# Australian green power sales & customers (SEDA, 2001)



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(Increasing participation by non-residential consumers)





# Retailer emission reduction target - allowed strategies



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- Assigned generation declaration (AGD):
  - Contract with a “low emission” generator to buy rights to the “emission reduction” per MWH:
    - (“NSW pool” emission coefficient) minus (generator emission coefficient) per MWH
- Energy sales foregone:
  - Electricity “saved” by encouraging an end-user to improve end-use efficiency or switch fuel
- Carbon sequestration:
  - Offset fossil fuel use by biosphere carbon



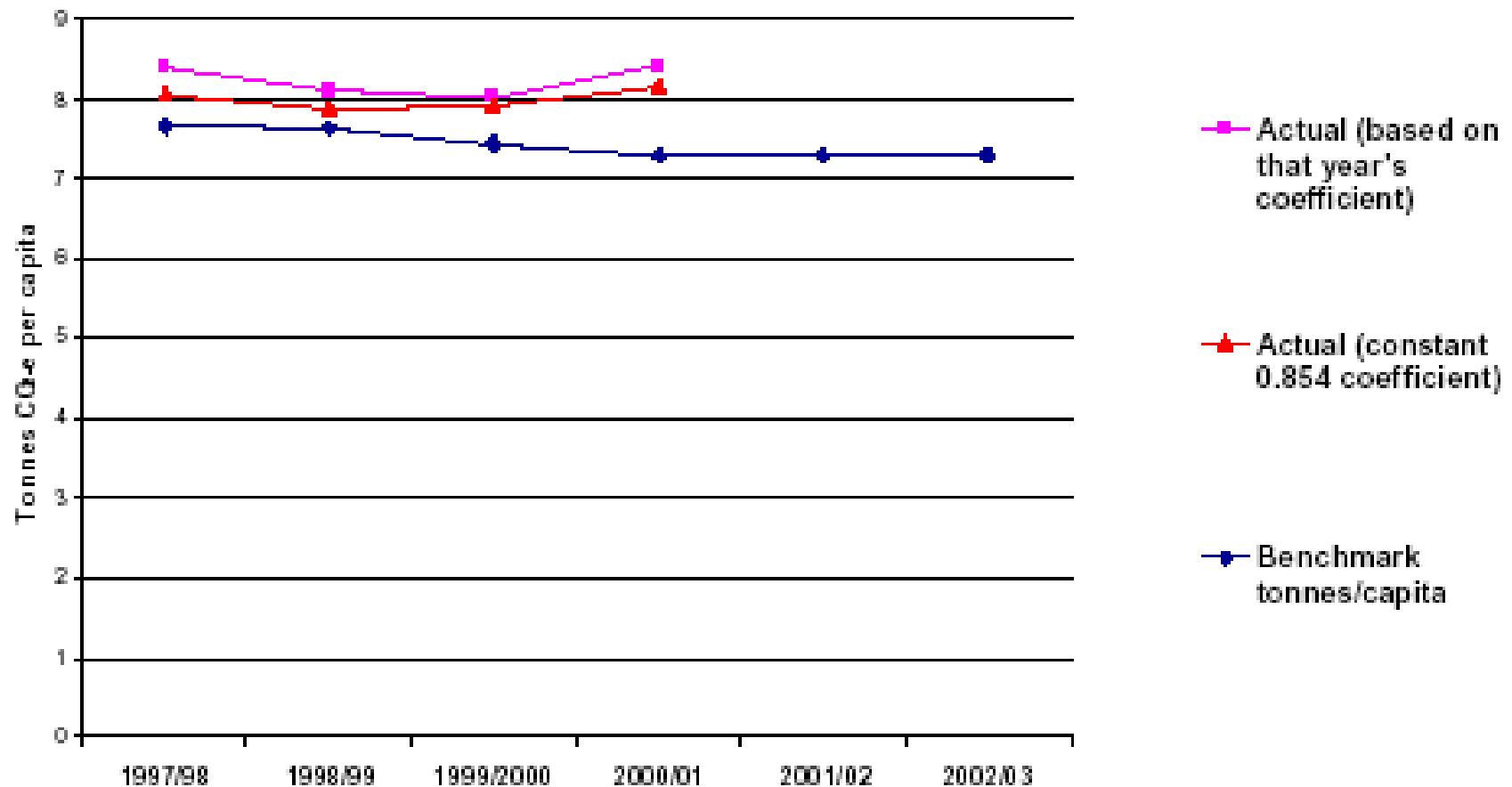
# NSW Electricity Industry GH emissions

(IPART Licence Compliance Report, 2001)



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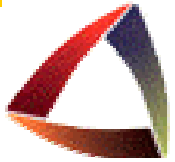
Figure 1 NSW electricity emissions per capita: benchmarks and actual





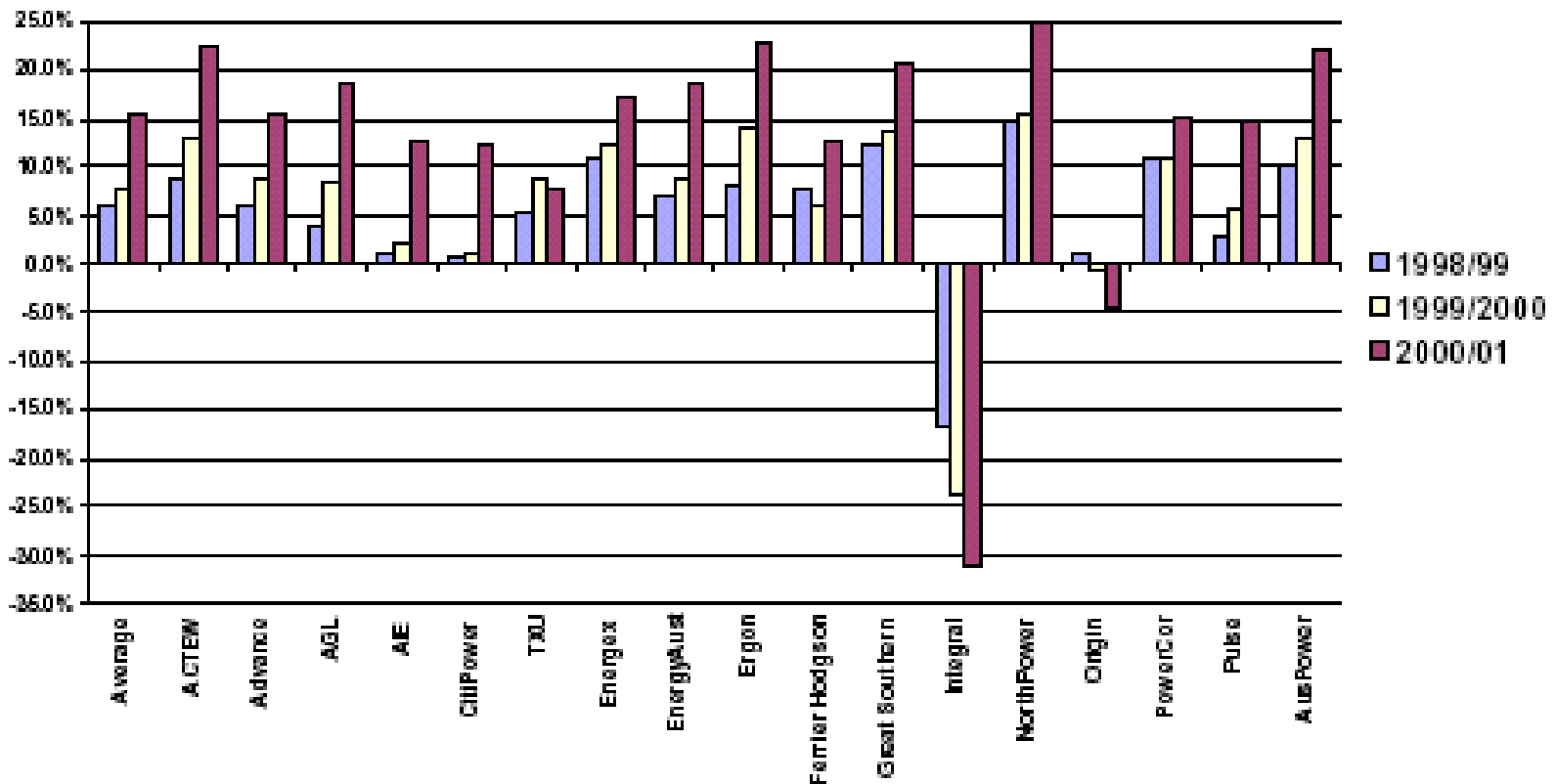
# Compliance by retailer

(IPART Licence Compliance Report, 2001)



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Figure 3 Performance against emissions benchmark, last 3 years  
(current coefficient)





# Issues with existing GH licence condition on retailers



- Most retailers failed to comply with emission reduction targets:
  - Partly due to the complexity of the scheme
- Problems with “free-riding”:
  - A renewable energy generator can sell federal RECs & NSW AGDs for the same energy
  - Gas-fired generators installed for other reasons
  - “Energy sales forgone” difficult to audit



# Changes proposed in NSW Govt Position Paper Dec 01



- Introduce penalties for non-compliance
- Allow trading of AGDs (renamed as AGCs)
- Remove de-rating for out-of-state AGCs
- Remove ambiguity over “direct sales”
- Allow pre-1997 zero-emission AGCs above baseline (similar to MRET)
- Re-set targets to deliver a substantial GH gas reduction



# Analysis of proposed AGC arrangements

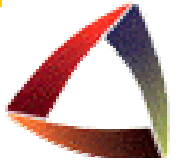


- Based on latest publicly available documents:
  - November 2001
- MEU to release a further paper shortly:
  - May change our predictions





# Assumptions in the analysis

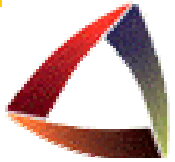


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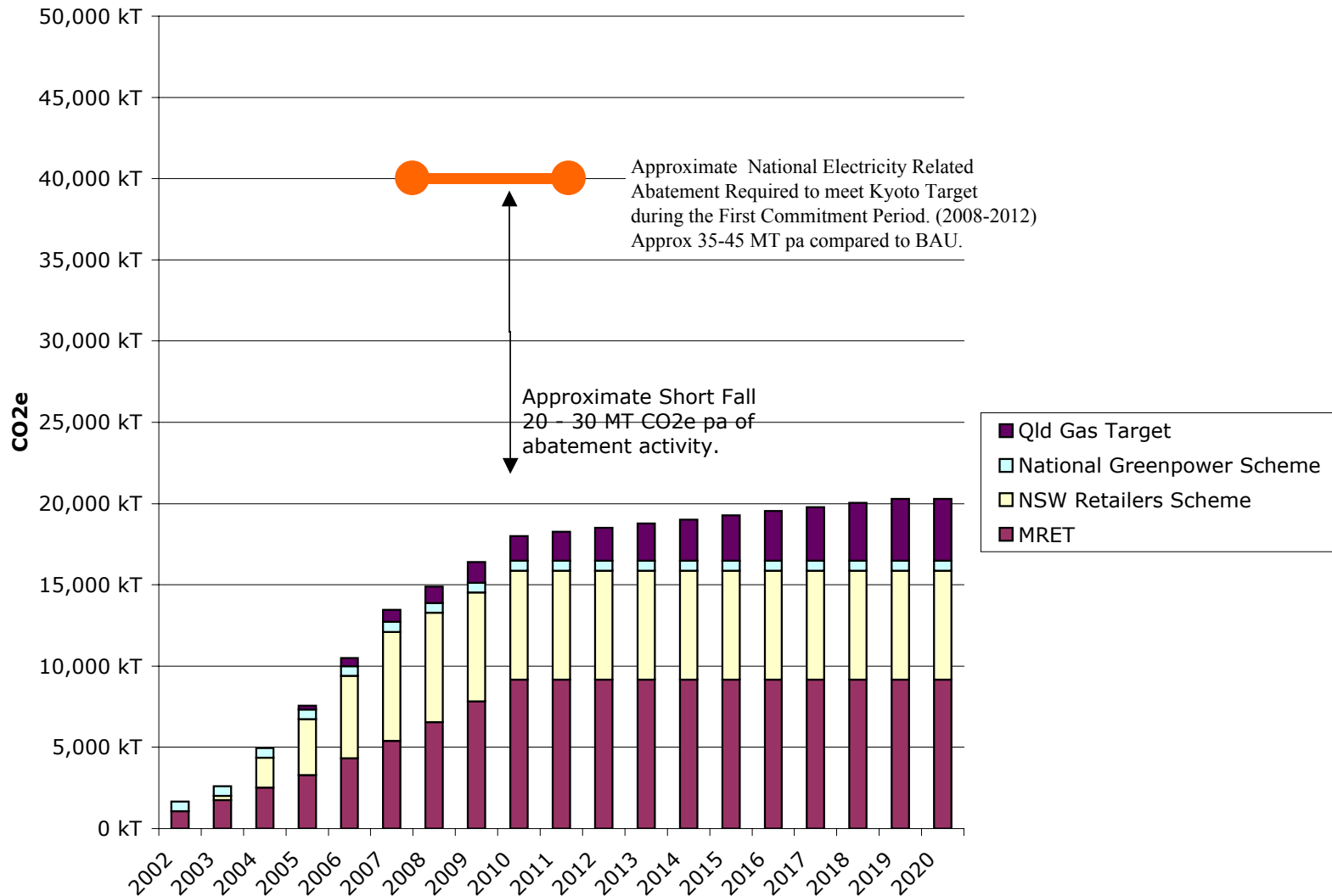
- MRET
  - Legislated MWh targets
  - Assume an emission intensity
    - Some variation will occur, however unlikely to be +/- 10%
- NSW Scheme
  - Known per-capita targets
  - Population data from ABS
  - Electricity use projections from Transgrid



# Predicted CO<sub>2</sub>e abatement with current state & federal policies

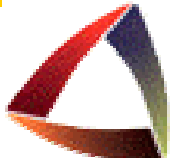


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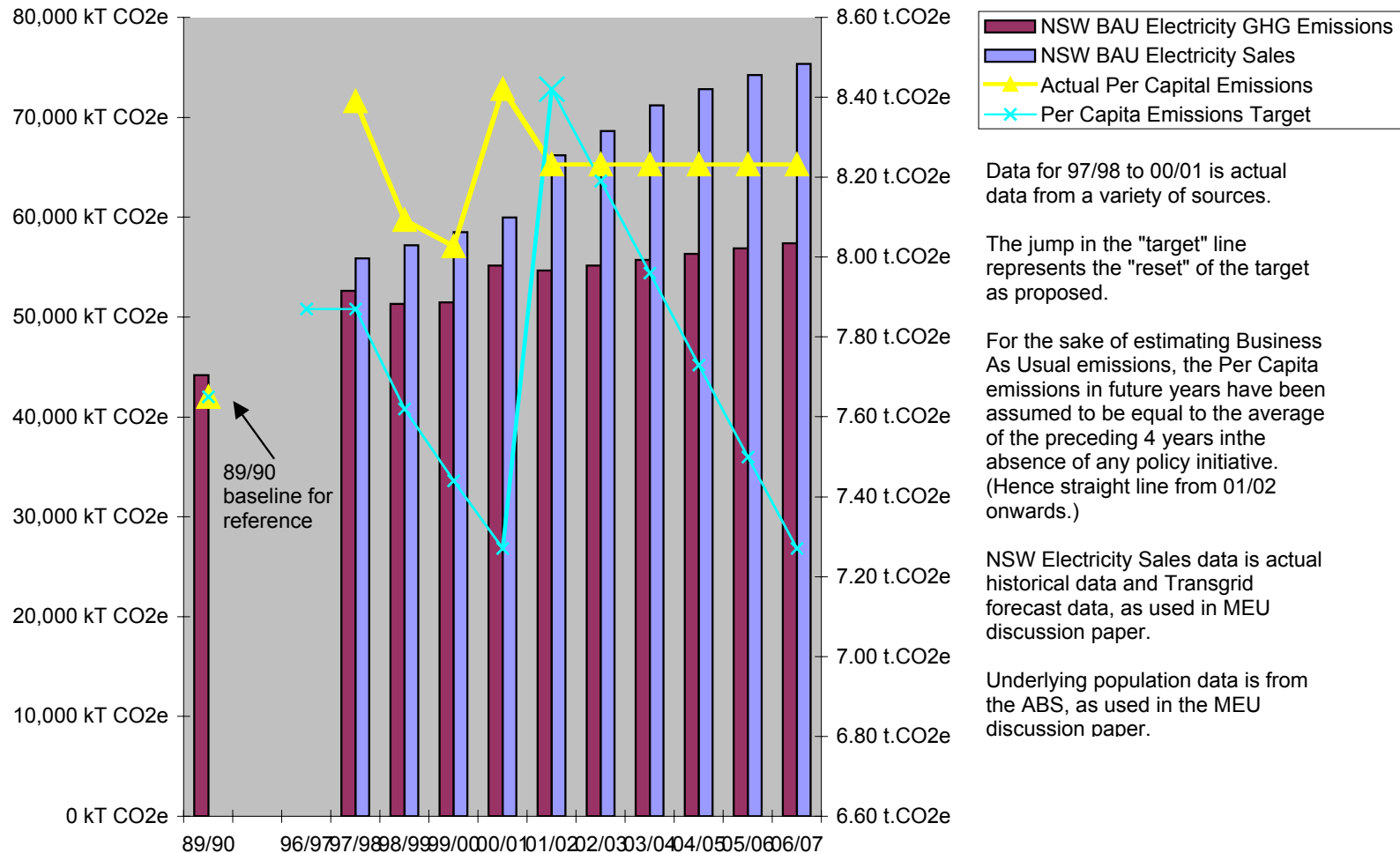


# How are our predictions derived?



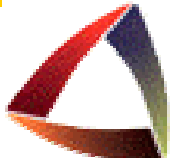
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**NSW BAU Emissions and BAU Electricity Sales  
with Per Capita Emissions and per Capita Target**





# Predicted “abatement”

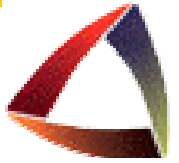


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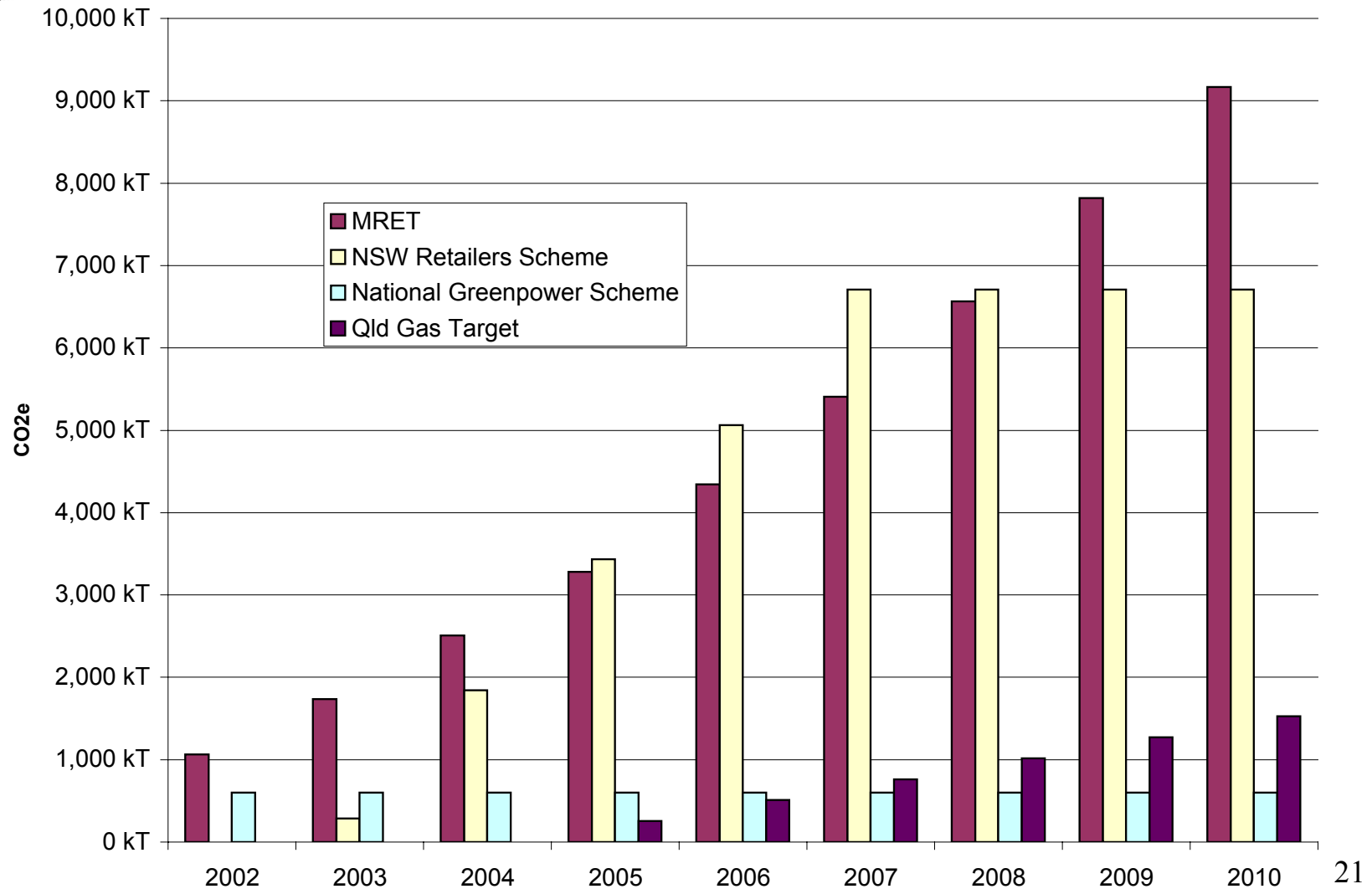
- NSW scheme
  - Nil in 2002
  - 6,700 kT CO<sub>2</sub>e compared to BAU in 2007
- MRET
  - 1,000 kT CO<sub>2</sub>e compared to BAU in 2002
  - 5,300 kT CO<sub>2</sub>e compared to BAU in 2007

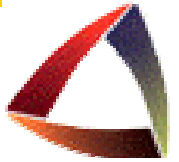


# Predicted abatement by scheme



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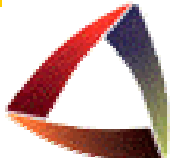
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## Are these “additive” abatements?

- What does “akin to double counting” mean?
- Refer to our list of reference sources:
  - AGC’s can be created by any generator connected to NEM but surrendered only with respect to energy sold in NSW
  - Generators can create RECs & AGCs from the same energy:
    - Such AGCs would measure the same emission reduction as the RECs



# Market impacts

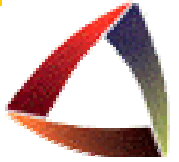


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- Road death statistics .....
- Significant abatement projects take at least a year to develop and implement
- If compliance is for end of 2003, retailers need to start taking action now



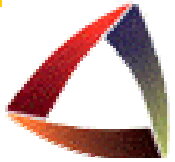
# Market valuation of AGCs



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- Treasury estimated emission reduction cost of \$10 - \$15 T CO<sub>2</sub>e
  - Proposed penalty set at \$15T CO<sub>2</sub>e
- Proposed UNSW trading experiment:
  - Reverse Dutch Auction





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# Current Forward Contracts

- RECS for delivery 30 June 2003
  - \$25 - \$30
- AGC's for delivery 30th June 2003
  - Last trade \$5
  - Range \$2.50 - \$6
- Those who believes the scheme will have significant impact should go “long” now