Introducing UNSW Centre for Energy & Environmental Markets

- New centre founded jointly by Faculty of Engineering and Faculty of Commerce & Economics.
  - An experimental economics capability, but also broader policy interests – particularly electricity and energy related environmental markets.

- About Karel

  - Senior Research Fellow, UNSW, since 1st January 2004
  - Manager Environmental & Electricity Markets, Australian Financial Markets Association since 2001
    - Founded in 1986, and is the peak industry body representing the OTC markets
      - Dealer accreditation and trading
      - Standardised documentation
        - Eg: REC Shortforms, ISDA for electricity
  - Now 30% of membership are electricity companies
  - Many of AFMA's members now involved in various environmental markets
- Weather Derivatives Working Group
- Environmental Products Working Group
  - Weekly Enviro-products Revaluation Curve for over 18 months

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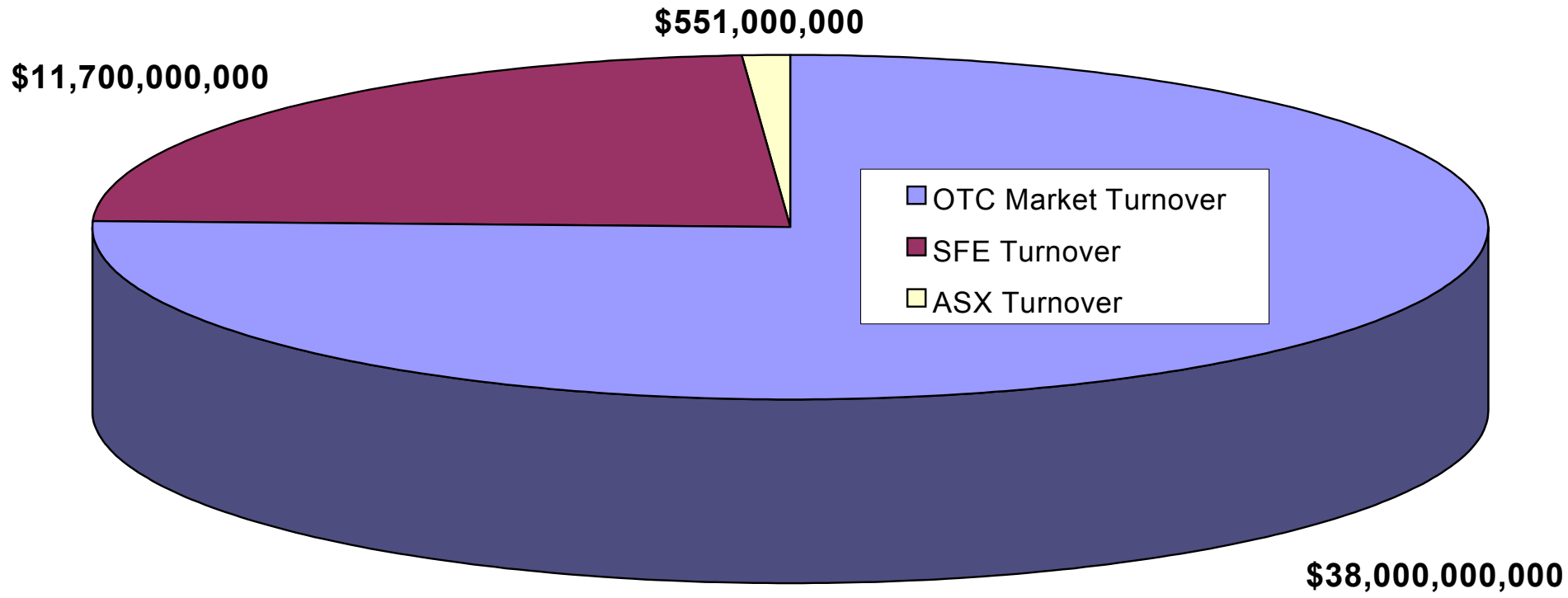
Turnover by market - 2001/02



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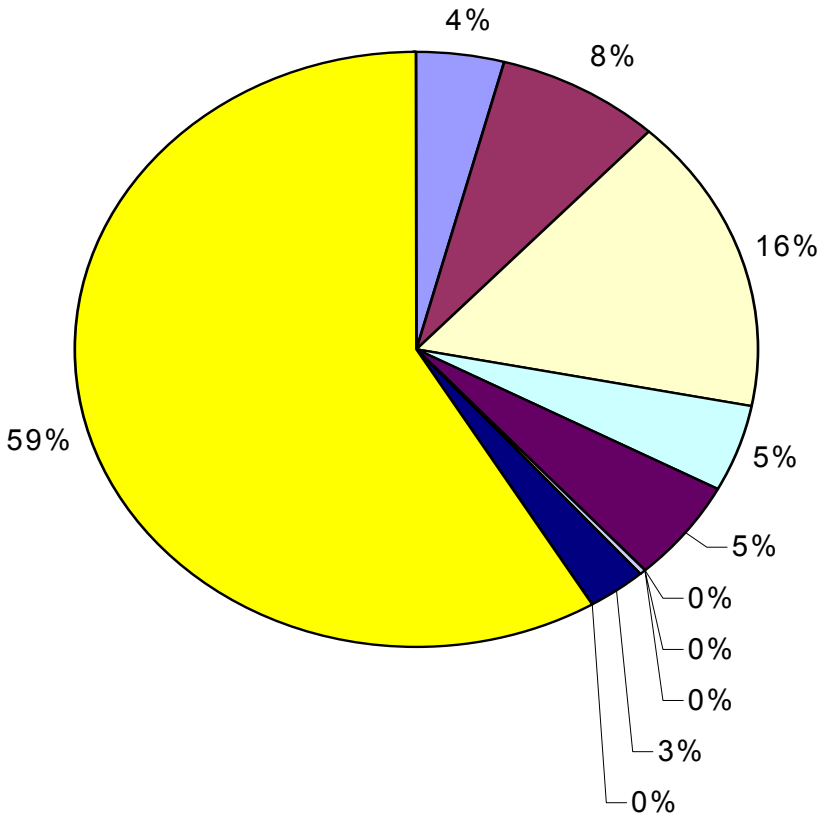
OTC Turnover by Instrument
AUD 2000-01



- Debt Securities
- Negotiable and Tranferable Instruments
- Repos
- Swaps (non-elec)
- FRAs
- Interest Rate Options
- OTC Equity Derivatives
- Credit Derivatives
- Currency Options
- Electricity Forwards
- Forex (all kinds)

Some risks that get ignored

- Credit Risk
  - Market theory generally assumes all profitable trades occur. (Less transaction costs).
  - Some participants are just too risky to deal with.
    - Difficult if the point is to get new entrants.
- Settlement Risk
  - Use of third party clearing houses – eg: Austraclear
  - Doing some experimental work on this at the moment
- Regulatory Risk
  - Volume in the MRET market dried up during the government review of the scheme.
  - REGULATORY RISK IS THE BIG PROBLEM WITH ENVIRONMENTAL MARKETS
  - "Designer" markets
- Who will do the monitoring and surveillance in these markets? The EPA? The RBA? ASIC? ACCC? (Who knows if the MRET market is or isn't working?)

SIRCA

Getting experimental

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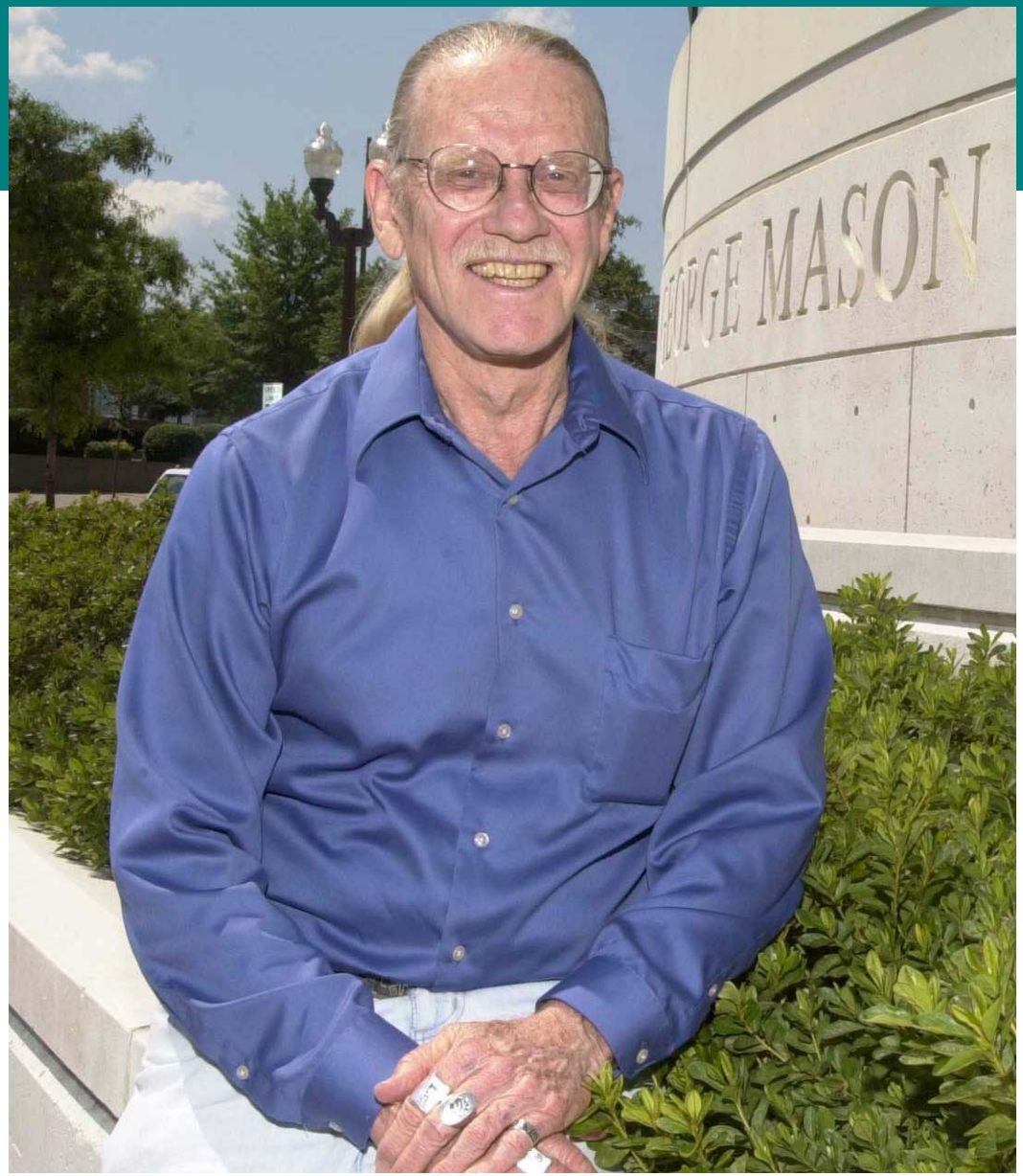

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MRET and Electricity Experiments

- Series of experiments for 2003/04 jointly funded by:
  - School of Electrical Engineering UNSW
  - Faculty of Commerce & Economics UNSW
  - ICES Labs, GMU

- Experiments aim to test the market structure
- All experiments involve some level of abstraction from reality
- Examine the ability of the MRET market to meet the policy objective of obtaining a quantity of renewable energy at least cost.

  - Ultimately to run cases with investment decision making, regulatory risk, credit risk, etc.
  - Extend to include a forward market

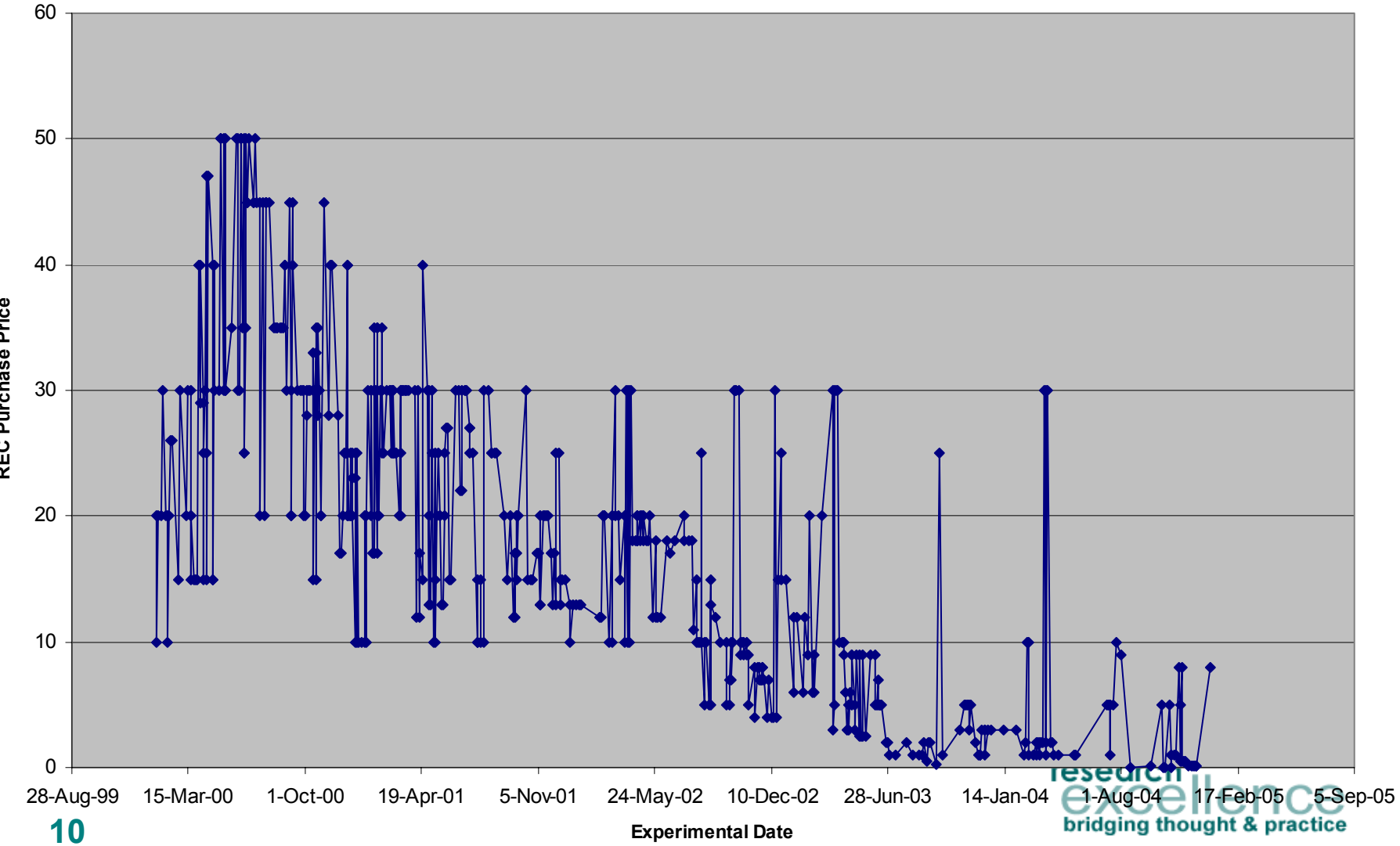
MRET Market Structure

- Similar to UK ROC and the Texas REC schemes.
- Electricity retailers are held liable to secure RECs
- Renewable generators can produce RECs
- Banking
- Bilateral OTC trading, with some brokers
- RECs can be created from electricity at any time
  - Only become visible after creation
  - Information problem exists

Experimental Question Number 1:

- Does this market design come to equilibrium?
- Does a forward market assist?

Typical results of experiment so far



Some preliminary thoughts

- Even with very simple base cases (known and fixed electricity sales and generator outputs) the market is not coming to equilibrium. (In case shown, equilibrium would be $27.50)
- Generators produce, try to keep the generation hidden (so they all keep producing), and suddenly a big rush of REC's comes into the market – too late !!
- By then the generation cost is incurred, and they dump at any price.
- Possibly the forward market will help, if it introduces extra information that generators can use to determine when to stop.

- While it is possible that the real MRET market is efficiently tracking on the equilibrium, there is as yet no experimental evidence that would make one relaxed and comfortable that it is the case.

Policy Implications

- Regulatory and to a lesser extent market risk are significant problems in environmental markets that are supposed to attract investment.
- Market designs should be experimentally tested.
- The Government Depart who sets up a market instrument should have a mandate to actually observer the market performance.
  - Likely impacts on market performance should formally be part of the government decision making criteria.
- The market performance is the output of all the parts – primary issuance, secondary trading and forward contract markets. **Simply concentrating on the design of the instrument and a registry is not enough.**