Solar roofs, networks and tariffs
Some thoughts
Some questions we will ponder today

Part A

1. Have households that installed rooftop PV when subsidies were at their peak had a windfall gain?
2. How much have households invested in rooftop PV?
3. How much subsidy did households that have invested in rooftop PV receive, and where did that subsidy come from?

Part B

4. Are Australia’s network services businesses serving the public interest? If not, why not?
5. Should households in Australia have higher fixed charges in their electricity bills?

Part C

6. Should households with PV have higher fixed charges in their electricity tariffs?
7. Should households with PV be paying more to network service providers?
Introduction

PV in Australia
• 12% of Australia’s houses – 1.2 million homes
• Rapid expansion – 8,000 (2007) to 1.1 million (2013)

Scope
• Evaluation of costs of benefits of solar PV in Australia
• 900,000 installations during period 2010 to 2012

System Size
• System size increased – 1.1kW (2009) to 3kW (2012)

Three factors
• Rising electricity prices
• Capital and production subsidies
• Declining PV system costs
Rising Electricity Prices

Australian household electricity price index
Adjusted for changes in CPI

(ABS, 2013)

New South Wales household electricity bill
2007-08 and 2012-13

(Productivity Commission, 2013)
RECs created through solar PVs

Renewable energy certificates

- 120+ million solar RECs created during 2010 to 2012
- Multiplier declines from 5 to 1 (for up to 1.5 kW systems)

(billions of dollars per year)
Production Subsidies

Production subsidies

- A bumpy ride…
- Jurisdictional Feed In Tariffs (FiTs) – Net and/or Gross (NSW and ACT)
- Mandatory ‘retailer payments’ account for small step rises
Putting it all together

**Internal Rate of Return (IRR)**
- 9.8% (the discount factor at which the NPV is zero)

**Location Dependent**
- Varies by Jurisdiction – SA 11.5%...Tas 5.5%

![Graph showing costs and savings over time](image)
All cost and no benefit for energy users?

Findings

- Effective subsidy - $108/MWh – over PV lifetime – paid by users
- PV production at time of peak demand – reduction in wholesale market price
- Reduction in overall and peak demand
- $162 / MWh compares with nation-wide electricity price $320 / MWh
- $250m p.a. less to monopoly network service providers
Regulated network charges in Australia now much higher than GB or U.S.

It never used to be this way: regulated revenue per connection doubled in constant currency between 2005 and 2013

Source: US (EPRI), GB (Ofgem), Australia (gazetted network tariffs, average household consumption data, OECD PPP)

Source: Regulatory decisions
And there is a government / private split

Regulated revenue per connection

$ (2013)

$2,000
$1,800
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
$

Ergon Energy
Essential Energy
Ausgrid
Endeavour
Aurora Energy
Energex
SA Power Networks
SP Ausnet
Powercor
Citipower
Jemena
United Energy

Government owned
Privately owned

Source: regulatory decisions
Many factors, but higher regulated assets of government-owned networks is the main explanation …

Source: regulatory decisions

Regulated assets per connection

- Privately owned
- Government owned

Much higher capex + upward asset revaluation

Assets per connection in GB and private Australian distributors are comparable
… and larger asset base has translated into remarkable financial gains for the government owners.

Pecuniary benefit = Pre-tax attributable profits + income tax (which state government collects) + “guarantee” fees on the debt provided by state governments.

Source: Statutory accounts
Shareholders in private distributors in Australia have also done well.
Operating conditions don’t explain govt./private cost differences …

• No evidence of systematic or enduring quality of supply problems

• Peak and average demand contracting since 2009, and unremarkable growth before that.

• Asset age data of government-owned distributors does not support “catch-up” hypothesis.

• Rationale for introduction of RPI-X 15 years ago - low capital and labour productivity - does not support claims of historic “under-spending”
So, why these outcomes?

Factors common to government and private NSPs

- Quasi-judicial merits review arrangements combined with opportunity to cherry pick has undermined regulator
- Generous cost of capital compared to US and GB
- Consumers’ willingness to pay largely ignored.

Factors specific to government NSPs

- Incentives
- *De jure* but not *de facto* regulatory independence
Incentives: RPI-X applied to government distributors has over-compensated capital expenditure

- For govt. distributors allowed rate of return >> cost of capital, so more money to be made (and more easily) by inflating expectations and then expanding the RAB rather than under-spending regulated expenditure allowances.

- State regulators approved large intra-period capex and opex increases when govt. distributors said they would spend above controls.

- Recent evidence that state govt. credit-rating worries are now providing “capital market” discipline to govt. distributors. But deep cuts needed to restore reasonable prices not on the radar, and little political or regulatory appetite to deal with stranded assets.
Independent regulation in word, much less deed

- Australian Energy Regulator (AER) created (2005) through federal-state bargain, along with Australian Energy Markets Commission (AEMC), a powerful advisor / rule maker answerable to the jurisdictions (states and territories).

- Seeming dilution of state government political control suggests greater regulatory independence. But:
  - AER implements regulation designed by AEMC (globally, a unique bifurcation).
  - Some key factors (e.g. network planning standards, inability to adjust WACC to account for income tax receipt by govt. distributors) determined by state governments.

AER is convenient whipping boy for state energy ministers but AER gave the govt. distributors most of what they asked for (which their govt. owners strongly supported).
Summary: **Ownership is 9/10ths of the law**

- RPI-X applied to govt. distributors has encouraged the discovery of wants, rather than efficiency.

- Those suggesting that it was wishful thinking to ignore ownership when applying RPI-X seem to be right.

- Cost and price outcomes by private distributors more encouraging but shareholders seem to have had more than their fair share of the spoils.

- Fresh thinking and willingness to consider major reforms needed.