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Value of Net-FiT PV Policies for Different Electricity Industry Participants Considering Demand Side Response

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Presentation outline

- PV in Australia
- Financial impacts of Net-FiTs
- Data and demand side response modelling
- Value of Net-FiTs for key stakeholders
- Policy implications

PV in Australia

- 2.3GW of PV, 95% of systems at the household level
- Key stakeholders:
  1. Households with PV systems
  2. Retailers: purchase electricity from the wholesale market and retail it to end consumers
  3. Distribution network service providers (DSNP): responsible for the distribution network and charge regulated network tariffs to retailers
- Falling PV costs + strong PV policy support => explosive & overwhelming PV deployment:
  - Sudden cancelation of FiTs
  - Significant financial transfers
  - Costs and benefits distributed across stakeholders
- Currently: net metering arrangements (low Net-FiTs)

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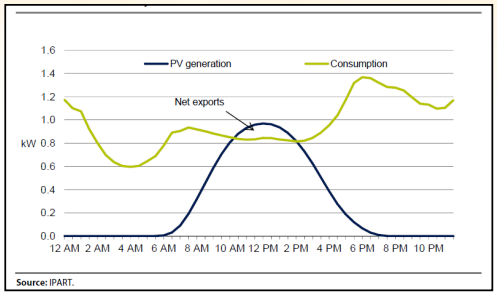
Financial impact of Net-FiTs

- Impact of 1kWh of PV electricity on operational revenue and costs (one year)
- Households: save electricity bill + get the FiT payments for exports
- Retailers: lose sales (margin) + get assigned the wholesale value of PV export
- DNSPs: less revenues (without saving costs) + potential impact on network expenditure (change peak demand)

- 2 Net-FiTs designs:
  1. "Net-High-FiT": 60 ¢/kWh (40€¢) paid by all end-users
  2. "Net-wt": Low FiT (current) at the wholesale price of electricity (around 8 ¢/kWh (6€¢)) paid by the retailer
- FiTs that differ too much from the retail electricity tariff => potential demand side response (DSR):
  - High FiT: households prefer to export
  - Low FiT: households prefer to self-consume



Source: IPART.

Financial Impact on	*Under Net-high-FiT*	*Under Net-wt*
PV customers	$R_t \times SC_t + FiT \times Exp_t$	$R_t \times SC_t + w_t \times Exp_t$
Retailers	$(-R_t+N_t+g+w_d) \times SC_t + w_t \times Exp_t$	$(-R_t+N_t+g+w_d) \times SC_t$
DNSPs	$DUOS_t \times SC_t$	

Financial Impact on DNSPs = $DUOS_t \times SC_t + S \times (\Delta peak_{pv} + \Delta peak_{disp})$

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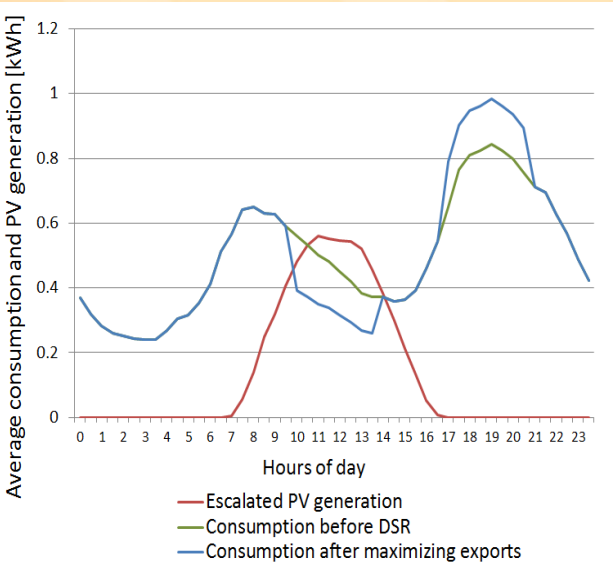
PV data and demand side response (DSR) modelling

- Half-hourly PV generation and household consumption: 60 houses in Sydney in 2010
- Average size 2.6kW, average consumption 7,100 kWh/year, 50% Exports
- Half-hourly wholesale prices and Flat and TOU retail and network tariffs in NSW
- DSR modelling: shift 10%, 30% and 50% of daily load to maximize household returns



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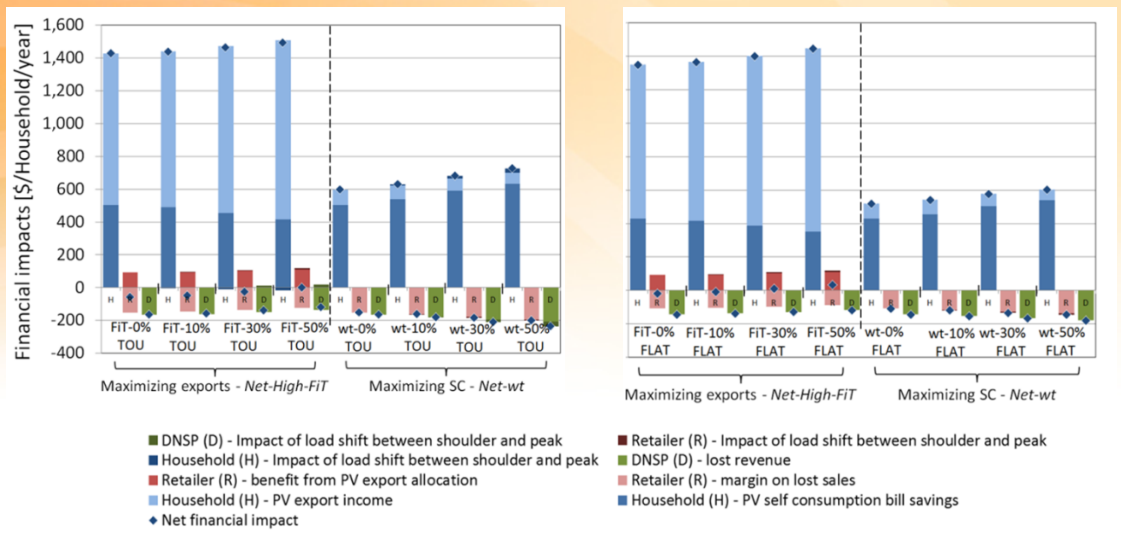
Value of Net-FiTs for households with PV, retailers and DNSPs



- Retailers and DNSPs: significant revenue losses
- DSR modestly improve household revenue, but greater impact on retailer and DNSP
- TOU worsens the adverse impacts on retailer and DNSP revenues

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Policy Implications

- DNSPs will be likely granted permission to increase network tariffs to recover this revenue loss
- Unsustainable dynamic: PV more attractive => less households paying the network costs
- Significant financial transfers from customers without PV (low-income) to households with PV
- Retailers losses could deter competition for PV customers
- Rethink PV policy support

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Thank you,

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Questions??

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