Centre for Energy and Environmental Markets

UNSW THE UNIVERSITY OF NEW SOUTH WALES SYDNEY • AUSTRALIA



A Review of Energy Efficiency Obligation Schemes In Australia

Joint work with Martin Jones and Paul Twomey

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Presented by

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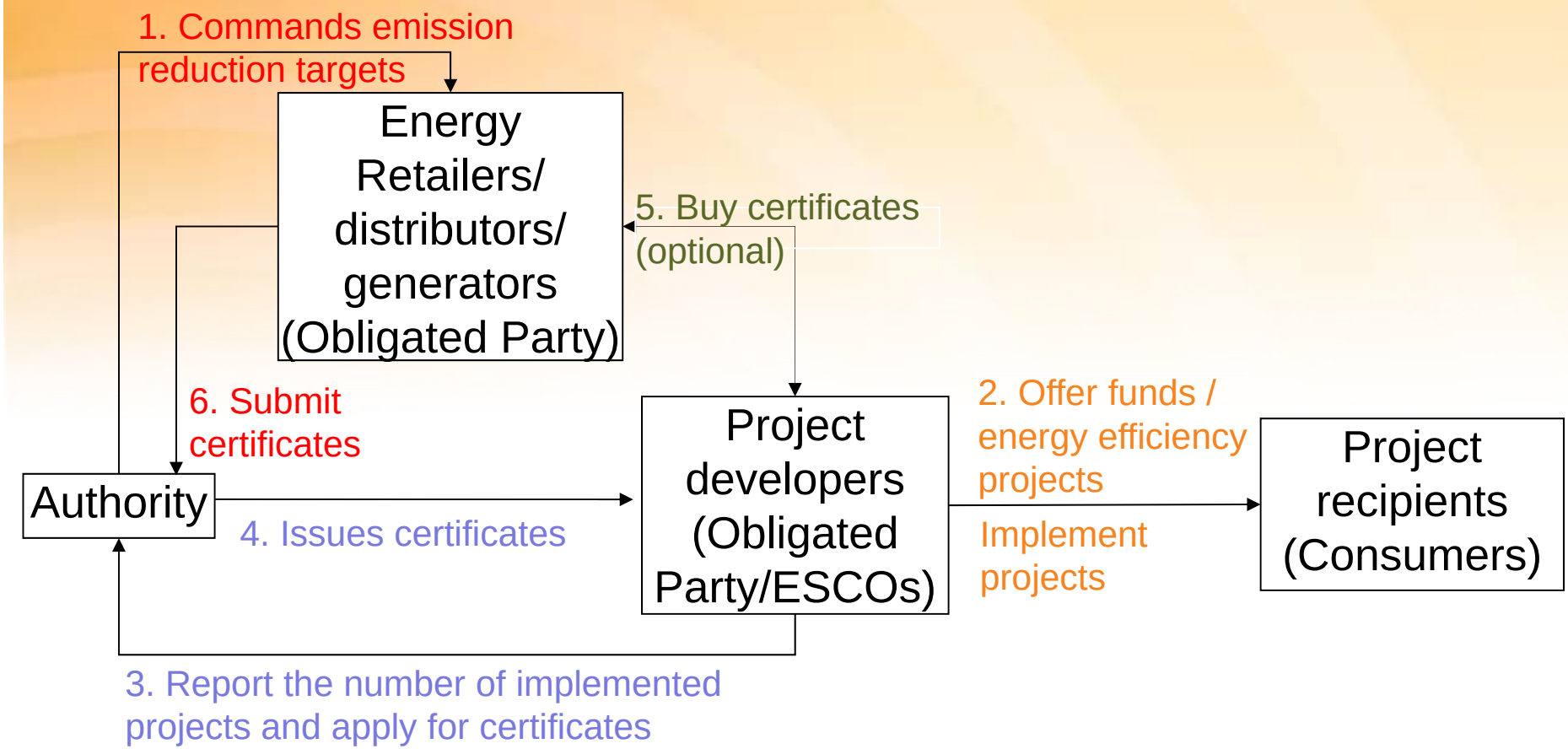
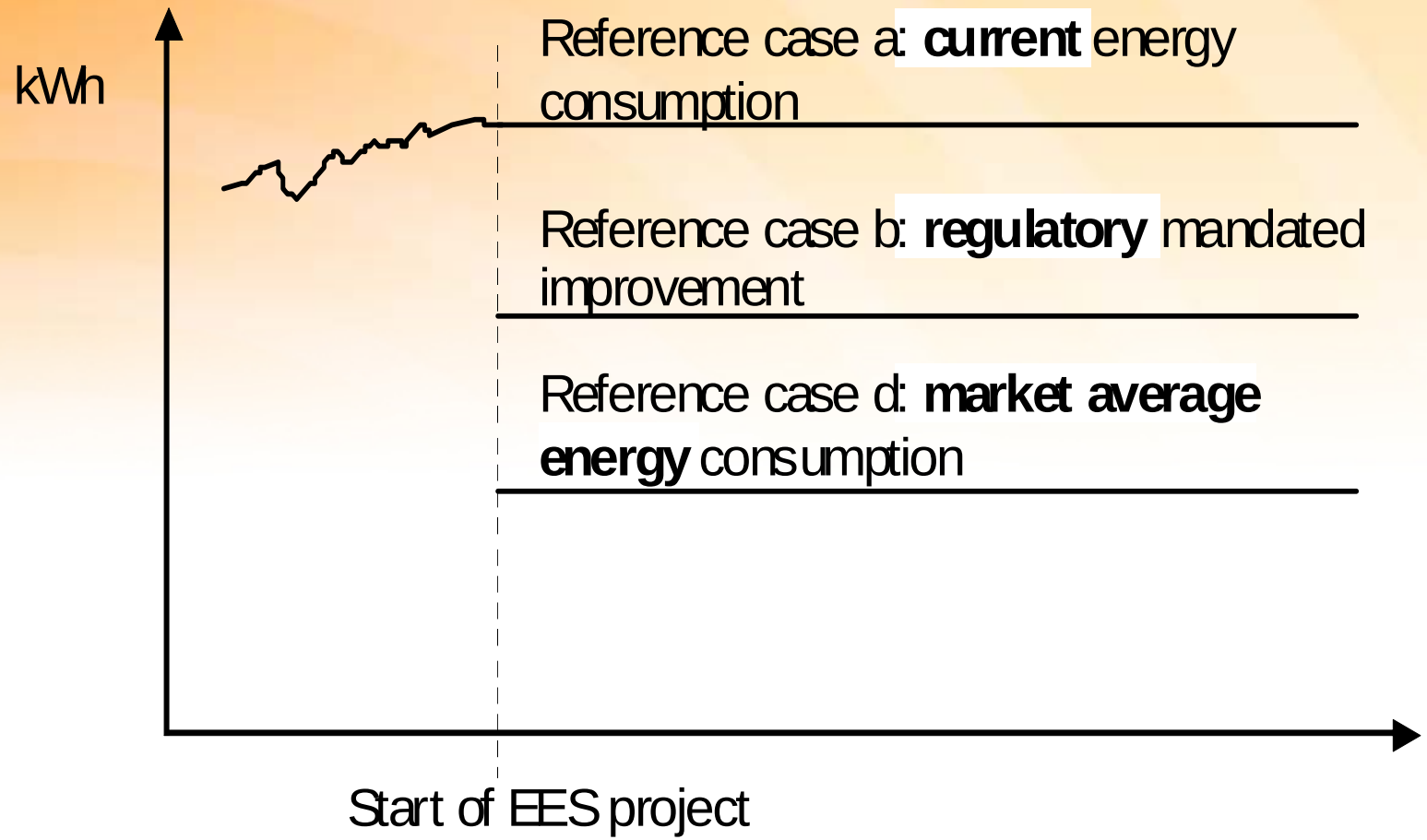
Motivation

- Need to close the energy gap, which is due to various market failures and barriers for an efficient use of energy
- Several countries have used market approach and introduced energy efficiency schemes (EES) in recent years to increase energy efficiency
- Australia has 3 (soon 4) State based energy efficiency schemes (covering approx. 65% of Australia's population and 13.7% of final energy) and the Australian government is assessing the introduction of a federal scheme or harmonisation of existing schemes
- None of the schemes has been independently evaluated

General design and functioning EES



The baseline: Energy consumption without the project



Financially EE projects are likely to be attractive, financial additionality difficult to use

The Australian context

- Productivity Commission, 2006
  - A national energy efficiency target, based on an annual requirement to acquire a target level of energy efficiency related savings, should not be implemented.
- Federal Govt, 2006
  - The Government agrees that the case for a national energy efficiency target has not been made. A national energy efficiency target is not under consideration.
- Govt. Task Group on Energy Efficiency, 2010
  - Recommended establishing a National Energy Efficiency Savings Scheme to replace present and proposed State-based Schemes
- **Clean Energy future Plan,** Energy Savings Initiative, **2011**

Comparing Australian EES Design (1)

	NSW ESS	Victorian VEET	South Australian REES
Start	July 2009 (since 2003 part of NSW GGAS)	January 2009	January 2009
Obligated Parties	NSW electricity retailers	Electricity and gas retailers with more than 5,000 customers	SA electricity and gas retailers with more than 5,000 customers
Number of Obligated parties (2012)	33 (mainly retail suppliers; some generators directly suppling customers; some market customers)	7 (4 gas & electricity; 3 electricity only).	14

Comparing EES Targets

Year	ESS		VEET/ESI	REES	
	Percent	$ktCO_2$-e	$ktCO_2$-e	$ktCO_2$-e	Audits
2009	0.4%	*205*	2,700	155	3,000
2010	1.2%	*621*	2,700	235	5,000
2011	2.0%	*1,047*	2,700	255	5,000
2012	2.8%	*1,482*	5,400	255	5,667
2013	2.6%			335	5,667
2014	4.0%			410	5,667

Comparing Australian EES Design (2)

	NSW ESS	Victorian VEET	South Australian REES
Eligible Parties for savings accreditation	Accredited Certificate Providers	Accredited persons: e.g. Consumers of electricity or gas	Electricity and gas retailers can engage third parties
Trading	Allowed	Allowed	No trading but flexibility if approved from Commission
Eligible projects	Residential, commercial and industrial	Residential and from 2012 also Small Medium Enterprises	Residential

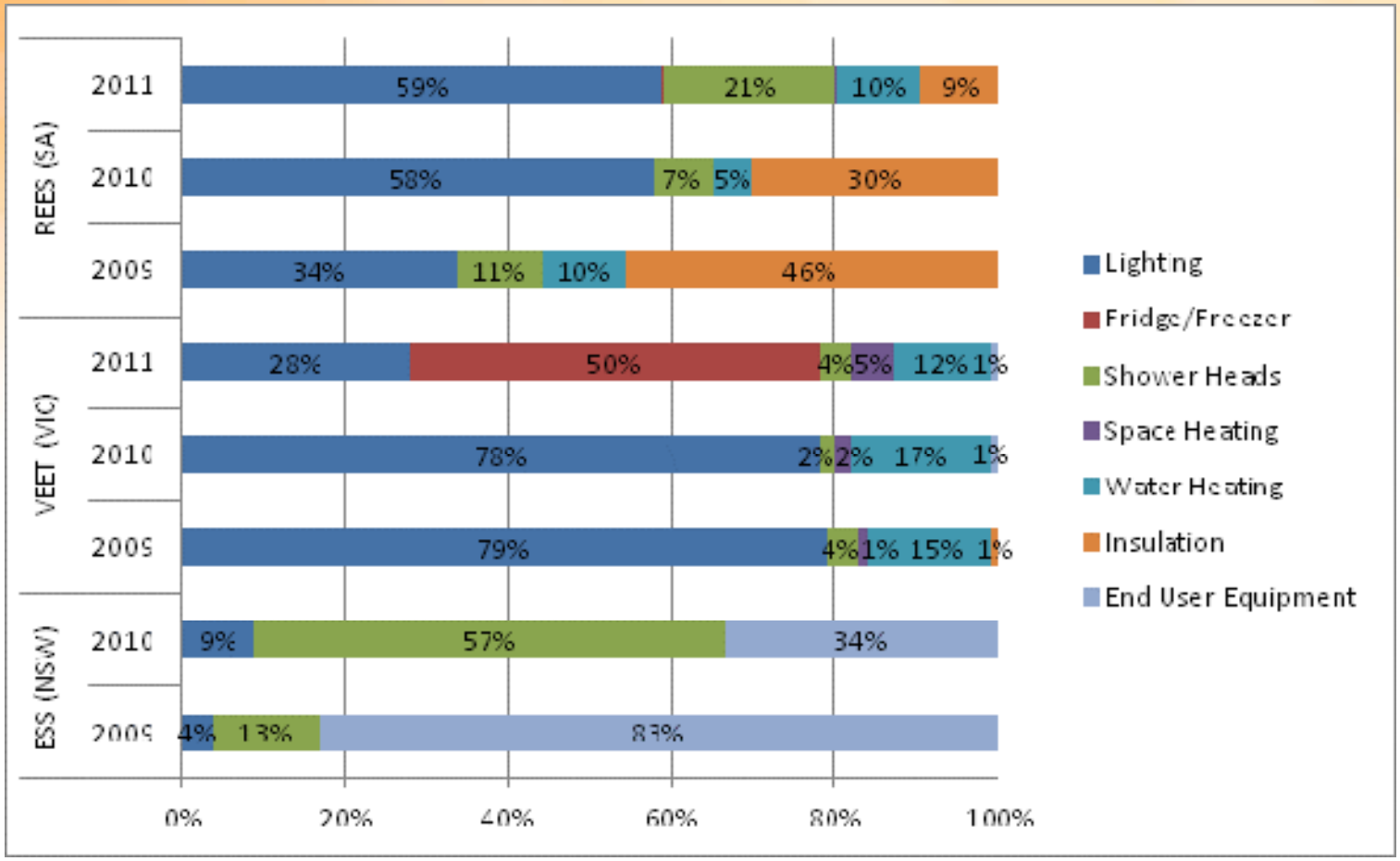
Comparing Australian EES Design(3)

	NSW ESS	Victorian VEET	South Australian REES
Penalty	After tax $32.90 (2010) or $24.50 MWh * 0.94 MWh/CO2e (conversion factor), 50% borrowing in 1st year, 20% thereafter	2009: $40 t CO2-e plus GST	Make good base penalty $10,000 + $70 t CO2-e + $500 per missing audit Borrowing 10%
Certificate Size	tCO2-eq. conversion factor: 1.06 kg CO2-e/kWh	tCO2-eq., VEEcs expire after 6 years	tCO2-eq. conversion factor 2009: electricity 0.98 tCO2-e/MWh and gas 0.0707 t CO2-e /GJ

Comparing Deemed Emissions Savings

	ESS	VEET	REES
Formula	Default Savings Factor (0.45 MWh) x Installation Discount Factor (1) x Certificate Conversion Factor (1.06)	Product abatement factor (0.41) x Regional abatement factor (0.98 metropolitan or 1.04 regional)	none
Savings	0.477 tCO_2-e	0.4019 tCO_2-e (metropolitan) 0.4264 tCO_2-e (regional)	0.43 tCO_2-e (directional lamp) 0.18 tCO_2-e (non-directional)

Evaluation: Energy Efficiency Activities (Proportional) by Scheme and Year



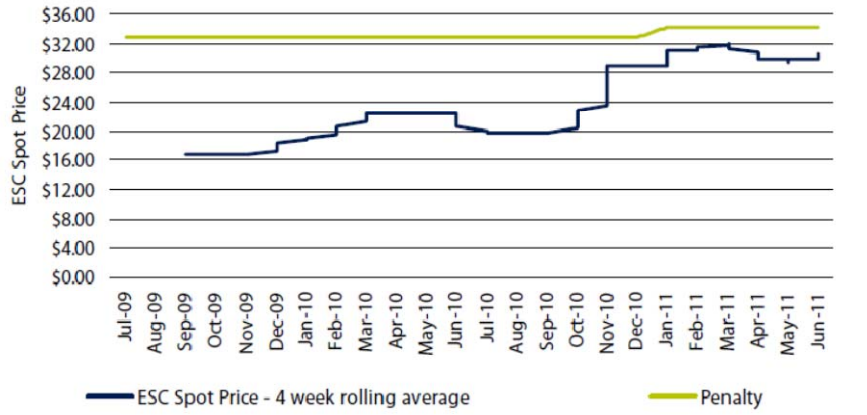
Evaluation: Compliance

	ESS ESCs			VEET VEECs			REES Activities			REES Audits		
	2009	2010	2011	2009	2010	2011	2009	2010	2011	2009	2010	2011
Surplus (shortfall) from previous year	0	(139,843)	(29,012)	0			0	54,989.6	61,308	0	679	2,201
Created /carried out	278,176	804,318	?	3,667,472	2,529,153		208,335	248,083	200,594	3,674.50	6,527	3,326
Target for t	289,118	858,004	?	2,700,000	2,700,000	2,700,000	155,000	235,000	255,000	3,000	5,000	5,000
Surrendered /submitted	148,928	651,655	?	2,547,700 + 3,809			Assumed same as creation			Assumed same as creation		
Surplus (shortfall) carried forward	(139,843)	(29,012)	?				53,335 (own calc)	68,072.6 (own calc)	6,902 (own calc)	674.5 (own calc)	2,206 (own calc)	527 (own calc)
Penalties, units	1,997	317,180	?				0	0	2,875	0	0	25
Penalties, dollars (kAU$)	45	7,304	?						221			22.5

Policy uncertainty particularly in NSW may have lead to moderate supply

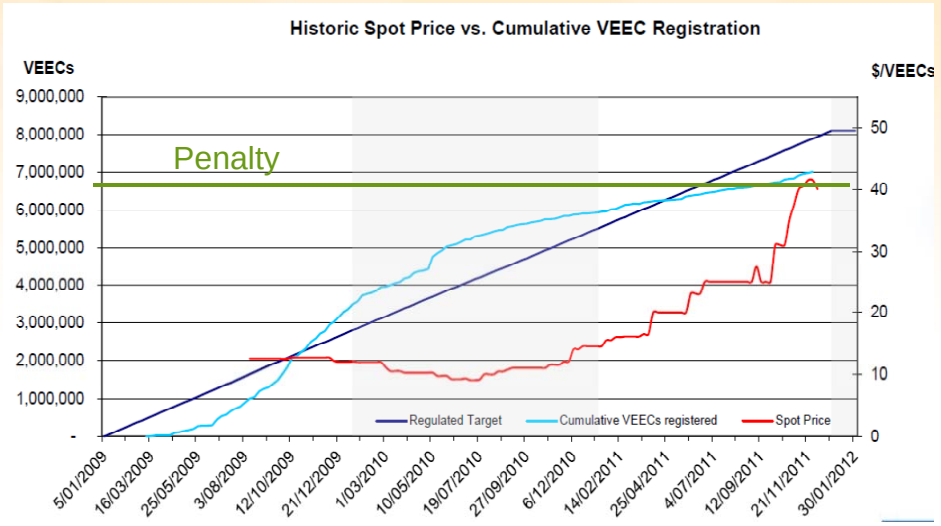
Price development

Figure 7.1 Trends in the ESC spot price over the period July 2009 to July 2011



Note: This figure shows a 4 week rolling average of the last market spot price. This data accounts only for certificates traded through NGES and may not reflect the price paid by certificate buyers at the times shown. The Scheme Administrator recommends that persons seek independent advice before buying or selling certificates, and cautions against making decisions based solely on this chart.

Data source: The Green Room, published by NGES (see www.nges.com.au).



Price is getting closer to penalty level indicating scarcity of created certificates

Market participants are criticising the lack of transparency and low liquidity of market

Evaluation options

- Counting the number of Energy Savings Certificates created
  - Method only works if rigorous additionality assessment occurs when certificates are issued
- Establishing the reference case
  - Estimate the energy consumption without the Energy Efficiency Scheme (assumptions of trend) and comparing it with the actual energy consumption
  - Matching household data of households with and households without measures (Peer-group)
  - Challenges: Data availability

Lessons learnt

- Mixed success with White Certificate Systems in Australia so far
- Major challenges:
  - Setting the reference case to avoid non-additional projects
  - Inappropriate rules (eligibility lists and deemed savings) can create easy winners who can dominate scheme and reduce its effectiveness (eg. ‘giving away CFLs’ have been very significant despite considerable concerns regarding actual energy savings associated with such programs)
  - Avoiding double dipping and verification problems (e.g. with lighting projects)
  - Policy uncertainty
  - Including industry and commercial sectors seems to drive away the activities in residential area. Reasons may be lower transaction costs but higher overlap with any ETS.

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