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Environmental Policy Evaluation

An Interdisciplinary Framework

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This work contains no material that has been accepted for the award of another degree or diploma in any university, and to the best of my knowledge and belief, this thesis contains no material previously published or written by another person except where due reference is made in the text of the thesis.

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Contents

Tables and Figures

Acronyms and Abbreviations

ABS	Australian Bureau of Statistics
ACCI	Australian Chamber of Commerce and Industry
ACF	Advocacy Coalition Framework
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ARENA	Australian Renewable Energy Agency
ATSE	Australian Academy of Technological Sciences and Engineering
BCA	Business Council of Australia
BREE	Bureau of Resources and Energy Economics
CBA	Cost Benefit Analysis
CCA	Climate Change Authority
CEFC	Clean Energy Finance Corporation
CER	Clean Energy Regulator
CGE	Computational General Equilibrium (Modelling)
CO_2	Carbon Dioxide
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DSGE	Dynamic Stochastic General Equilibrium
EITE	Emissions-Intensive Trade-Exposed (Industry)
ERF	Emissions Reduction Fund
ETS	Emissions Trading Scheme
GHG	Greenhouse Gas (Emissions)
GWh	Gigawatt Hours
IAD	Institutional Analysis and Development (Framework)
IPA	Institute of Public Affairs Australia
IEA	International Energy Agency
IPART	Independent Pricing and Regulatory Tribunal
IGE	Intergenerational Equity
LRET	Large-Scale Renewable Energy Target
MCDA	Multi Criteria Decision Analysis
MP	Member of Parliament
MRET	Mandatory Renewable Energy Target
PC	Productivity Commission
PV	Photo Voltaic
NEM	National Electricity Market
NPV	Net Present Value
RE	Renewable Energy
RET	Renewable Energy Target
SME	Small and Medium-sized Enterprises
SRES	Small-Scale Renewable Energy Scheme

Introduction

How can environmental policy evaluation be improved?

2015 has been a tumultuous year for environmental policy in Australia. Major policy issues have been present in news reports for many aspects of the environment, from the Murray Darling Basin Plan, the Great Barrier Reef Plan, to the controversial approval of the Shenhua and Adani coalmines. The announcement of Australia's greenhouse gas (GHG) emissions target also brought further public debate to the environmental policy realm in preparation for the 2015 United Nations Climate Conference in Paris. This was also the case in Australia's renewable energy (RE) sector, which has been embroiled in fierce discussion at all levels of debate. This is the backdrop to which this thesis was written – amidst a tide of environmental issues, each unique in its players, problems, and its dynamics. Common to all, was the inescapable complexity and interdisciplinary nature of each issue. This thesis aims to improve environmental policy evaluation by engaging with this commonality.

Why Environmental Policy Evaluation?

This topic emerged from the notion that economic theories that have been challenged and disproven can still be resurrected to dominate the discourse of policy debate and decision-making - a phenomenon described as 'Zombie Economics' (Quiggin, 2010). Discussion of Australia's Renewable Energy Target (RET) and the subsequent 2015 RET amendments resonated with this concept, with examples of antiquated economic principles that have been reintegrated to justify the interests of agents in the policy arena. These 'defunct' ideas were then disseminated through the media, government agencies and the 2014 RET 'Expert Panel' Review (hereafter referred to as the Warburton Review). The limited critical engagement with the application of these ideas therefore became the catalyst for a topic that was as persistent as the 'defunct' ideas themselves.

Examining the dominant influence of economics in environmental issues exposed the significant challenge of this research question: how to evaluate policy in a way that rejected the 'objectivity' of evaluation and was founded on the notion that all agents have inextricable interests. The driving force of this research therefore became finding a mechanism to engage with policy evaluation that was systematic, able to explicitly engage with inevitable normativity, and acknowledge environmental policy as an open and complex process (Mickwitz, 2003, 416).

This thesis explores a possible way forward through interdisciplinary policy theory, where the development of policy frameworks provides a systematic evaluative mechanism for analysis and knowledge building. Despite a long tradition of theoretical analysis, policy theory has been underutilised in current policy practice, particularly in evaluation (Chelimsky, 2012). This gap between the academic work conducted in this field and the implementation by policymakers is demonstrated by the inadequacy of the 2014 Warburton Review in engaging with broader notions of evaluation. Moreover, the current approaches have overlooked the significance of systematic knowledge building, with limited use of the common frameworks explored in policy theory.

A preliminary application of the framework that analyses the 2015 amendments to Australia's RET was chosen to demonstrate these ideas. This application was particularly chosen to encourage knowledge building in an under-developed, but developing area. The current Federal Government's apathetic attitude to RE in Australia only adds to the importance of knowledge building in this field, and emphasises the need for research to continue through other channels.

Theory

This thesis starts from an interdisciplinary foundation. Environmental issues require an engagement with multiple disciplines, and this is a key strength of a policy framework. A framework is defined here as an independent and interdisciplinary tool that is able to engage with multiple theories and models, and is contingent on the phenomena being examined. This research engages particularly with four areas of literature: ecological and institutional economics in the critique and application of the

framework, and policy and evaluation theory in selecting and improving the framework. It also contributes to the strong unifying tradition of ecological and institutional approaches when examining environmental issues (Vatn, 2005; Adger and Paavola, 2005, 353).

Ecological Economics

Ecological economics begins from the foundation that the economy is situated within the global ecosystem (Eriksson and Andersson, 2010, 58). This approach engages with systems, identifying feedback loops and complex interdependencies that understand the world through evolutions of processes. This examines systems of both "biological and cultural change" (Costanza, Daly & Bartholomew, 1991, 7; Daly, 1973 in Vatn, 2005, 242). Individuals are characterised as more than economic agents, as they can respond to ethical considerations beyond self-interest and engage in both individual and collective decision making processes (Hamilton, 1997, 39). The ecological approach emerged as an alternative to the conceptualisation of environmental issues using market principles, the singularity of exchange-valuation, and the monetisation of environmental phenomena (Hamilton, 1997, 43)[1]. This shift is achieved through "synthesising various types of economics, and moving back to an explicit inclusion of ethical issues in the mode of classical political economy" (Spash, 1999, 413).

Institutional Economics

Institutional economics takes the conceptual foundation of an "open-ended evolutionary approach" that considers path-dependent institutional development (Hodgson, 2008, 157). This systems view of social phenomena is compatible with systems of ecological processes (Vatn, 2005, 249). Further, policy is conceptualised as an institutional phenomenon that is complex and contextually specific. Institutional analysis can "reveal structural causes of policy success or failure", yet this makes systematic evaluation complex and often absent of definitive conclusions (Crabbe and

[1] Some literature uses the term only to refer to linking ecology and mainstream economics (Spash, 1999, 413). Like environmental economics, this may utilise mainstream notions such as monetary valuation, aiming to ensure the 'true values' of environmental services are reflected in prices paid by those who use them' (Hamilton, 1997, 40; see for example: Longo, et al., 2008). The ecological economics discipline is therefore is not without internal tensions. It is diverse and complex, with a range of perspectives and approaches (Spash, 1999, 422).

Leroy, 2008, 17, 21). Institutional approaches reject 'value-free' notions of social science, and question the legitimacy of current forms of institutional social organisation and power relations (Elliott, 2008, 153). This perspective therefore rejects individual preferences and values as given and stable, acknowledging instead the social foundation of preference formation (Vatn, 2005, 162).

Methodology

A pluralist methodology is utilised to engage with a range of theories and models that are relevant for environmental policy analysis. This occurs through the examination of different 'schools' or systems of knowledge that inform methodology, each of which is a representation of reality (King, 2002, 85-86). According to Dow, "each school can support its approach to knowledge with reason, while recognising the legitimacy of alternative approaches. ... World-view and theory of knowledge cannot be eradicated; yet recognition of differences at this level allows for more reasoned debate over appraisal criteria and analysis of different methodologies" (Dow, 1996, 45-46).

Pluralism will, by definition, require certain methodological choices to be made by the researcher. Often, the outcomes of research are contingent on how this element of selectivity is engaged with. A comparative and selective plurality will therefore discern appropriate theory and models based on the issue-specific context. Further, the pluralist acceptance of incommensurability in engaging with inherently interdisciplinary phenomena paves the way for a richer explanatory capacity that engages with complexities of real world phenomena. Contextually specific selection places emphasis on the justification of this selectivity. Thus, the choice of a particular method or theory must be considered in tandem with the justification of this choice. Considering both these elements provides a holistic understanding of the underlying ideology or interests that frame these choices.

This thesis accepts the assertion that in the social sciences, theoretical analysis is inseparable from normative considerations. This undermines the positivist claim that economics is, "in principle, independent of any particular ethical position or normative judgements" (Friedman, 1953, 1-4; 40-42). Alternatively, pluralism

encourages explicit analysis of the "value judgements and political ideologies [that] pervade economic thought" (Stilwell, 2006, 47). Acknowledging the impact of selective assumptions highlights the inescapability of normative claims and the inherently political nature of social science research. Pluralist approaches are therefore "capable of incorporating both the rigour of empirical science and the classical traditions of normative theory" (Fischer, 1995, ix-x).

Key Concepts

The following section explores the key concepts of the research question. In policy theory, different definitions may cause theorists to 'talk past' each other. To minimise this, specific definitions or approaches will be assumed.

Environmental Policy

Environmental policy is defined as "courses of action which are intended to affect society – in terms of values and beliefs, action and organization – in such a way as to improve, or to prevent the deterioration of, the quality of the natural environment" (Lundqvist 1996, in Mickwitz, 2006, 11). This purpose-based definition is incompatible with notions of policy integration, as a categorical separation of environmental policies is established through the definition (Mickwitz, 2006, 11). Further, consideration must be given to the impact of unintended consequences of any policy or regulation (Mickwitz, 2006, 12). Given the research intention to evaluate specific policies, this definition remains suitable, provided that the policy context, unintended consequences and adjacent policies are examined.

RE Policy as Environmental Policy

As a facet of environmental policy, RE[2] policy research is central to debates on energy security, the future of energy production and is a major topic of discussion in long-term solutions to climate change. RE research therefore has a range of relevant implications for policy makers, businesses and citizens. However, the primarily focus here will be on the environmental policy implications of RE policy. While RE can be

[2] RE sources are defined as those that are constantly reproduced and naturally replenished in a reasonable period of time (Eriksson and Andersson, 2010, 16).

analysed entirely from within an energy policy perspective, the alignment of the RET's stated aims with the definition of environmental policy utilised here enables the presumption of the RET as an environmental policy for this research (REE Act, 2000).

Post-Positivist Evaluation

The pluralist tradition of post-positivst evaluation is an area that parallels the theoretical and methodological approach of this thesis. The impossibility of objectivity in post-positivist evaluation provides a foundation that justifies an interdisciplinary and pluralistic approach to knowledge building (Hanberger, 2001, 47). It draws upon mixed-method evaluation to bridge the gap between evaluation theory and practice. This thesis utilises this approach in the capacity of 'evaluation for knowledge', which is conducted to "generate understanding and explanation", and aims to "obtain a deeper understanding in some specific area or policy field" (Chelimsky, 1997, 102). This takes inspiration from Weberian 'Entzauberung' or 'disenchantment', implying that evaluation aims to "de-mystify the prevailing myths" of policy. Evaluation can therefore provide "information in the public interest. … [It] is valuable if it produces strong information on subjects that are important for the public to know, even when use seems unlikely: for example, when there's political unwillingness" (Chelimsky, 2010, 4).

Environmental Policy Evaluation

Environmental policy evaluation is defined as the "careful assessment of the merit, worth and value of administration, output and outcome of environmental policies, which is intended to play a role in [current and] future, practical action situations" (Vedung, 1997, 3, [own addition]). This definition was amended to recognise the dynamics of the present through *ex nunc* policy evaluation. An *ex nunc*, or 'real time evaluation' approach examines policy with a temporal consciousness that recognises the path dependency of policy development (Hanberger, 2001, 46). This moves beyond the dichotomy of *ex post* or *ex ante* policy evaluation (Mickwitz, 2006, 14; Mickwitz, 2003, 416; Crabbe and Leroy, 2008, 6). This definition further highlights the dynamic implementation and evaluation relation by linking 'administration' and 'outcome', and the impact of unintended consequences by distinguishing 'output'

from ‘outcomes’ (Mickwitz, 2006, 15). This indicates policy evaluation is an ongoing, iterative process, which aims to amend policy toward better longer-term outcomes.

Thesis Structure

This research question is addressed by proposing a framework that draws from policy theory. Chapter 1 will critique economic approaches to current environmental policy evaluation. Ecological critiques of economic efficiency, environmental value and inter-temporal discounting in environmental policy are examined to demonstrate their implicit normative implications. This chapter also explores the translation of these assumptions to modelling techniques, demonstrating how an unfounded claim to objectivity itself has politically charged repercussions. The final section then examines how a solely economic approach may perpetuate this implicit agenda when the evaluative judgements align with the interests or ideology of agents in the policy process.

Chapter two therefore utilises interdisciplinary innovations in policy theory. A set of criteria is assumed to determine an appropriate framework from the policy theory tradition. This builds on an existing framework by proposing modifications that broaden the applicability of the framework. In order to enhance the evaluative capacity of the framework, this chapter will also explore post-positivist evaluation approaches that foundationally reject objectivity in evaluation, facilitating instead a pluralistic and interdisciplinary form of knowledge building. This broader systematic approach can explicitly and holistically engage with both the interests of agents, and the inherent normativity of evaluation.

In chapter three, a case study on the 2015 amendments to Australia’s RET is used as a preliminary application to test the proposed framework. While this research question remains within the realm of environmental policy, the concepts employed here are equally applicable to other areas of policy evaluation.

Chapter 1

Environmental Policy: Economic Approaches and Ecological Critiques

> "Climate change is the great *moral* challenge of our generation. [It] is not just an environmental challenge. Climate change is an *economic* challenge; a *social* challenge…"
>
> - Kevin Rudd
> Former Prime Minister 2007-2010; 2013
> National Climate Change Summit Speech
> March, 2007

1. Introduction

This quote highlights the multifaceted and inescapably moral nature of environmental issues such as climate change policy. Despite the significant rhetoric that acknowledges the interdisciplinary nature of environmental issues, the dominance of economic traditions in environmental policy evaluation remains. This chapter will present key criticisms of common economic assumptions used in environmental policy analysis and therefore, policy evaluation. These critiques from ecological economics aim to dispel the prevalent myths in the evaluation process. Two key examples in environmental issues will be discussed: the use of economic valuation techniques and the ethical implications of inter-temporal discounting. The translation of these assumptions to modelling techniques will also be discussed, with a case study on two economic models used in the 2014 Warburton Review of the RET. These issues reveal the implicit normative imposition of economics in policy evaluation, and the implication of this will be discussed with reference to the alternative approach to environmental policy evaluation proposed in the following chapters.

1.1 The 'Scientific Objectivity' of Economics

The study of economics as defined as the act of "studying how society manages its scarce resources", and defines efficiency as "the property of society getting the most it can from its scarce resources (Mankiw et al. 2012, 3-4). Such definitions of economics implicitly perpetuate the 'neutrality' of economics, drawing on an earlier definition by Robbins, who asserts, "economics is neutral as between ends … Economics cannot pronounce on the validity of ultimate judgments of value" (Robbins, 1932, 131). This is reinforced in defining the methodology of economics. Friedman famously stated that:

> "Positive economics is, or can be, an "objective" science, in precisely the same sense as any of the physical sciences. … Economics as a positive science is a body of tentatively accepted generalizations about economic phenomena that can be used to predict the consequences of changes in circumstances" (Friedman, 1953, 4; 42).

The highly mathematical methodology of mainstream economics stems from a tradition focused on emulating the methodology of 'hard' sciences[3] (Benton and Craib, 2001, 23-24). This combines the epistemological trends of empirical and rational thought, and manifests as a positivist approach with a foundation of deductivist axiomatic theory developed through academic abstraction (Dow, 1996, 11-13). This has translated into the general acceptance of mathematical models as simplifications for the economy (Dow, 1996, 72).

These claims have led to the common presumption of the 'scientific objectivity' of economics, and reinforce economic efficiency criteria as a neutral arbiter in policy evaluation. This builds on the implicit "objective truth rule" that implies efficiency is both an accepted norm of 'good', and that this conclusion is determined through a neutral scientific methodology (Bromley, 1990, 87). However, economic efficiency as defined by either Pareto improvements or increases in net national income, is neither

[3] While both the precise methodology of individual economists and the boundary definitions of 'mainstream' varies greatly, mainstream economics can be "adequately characterised in terms of its enduring reliance, indeed, unceasing insistence, upon methods of *mathematical modeling*" (Lawson, 2013, 4 [italics from text]).

objective nor scientific. Economic efficiency implies normative implications that have become obscured through the development of the concept over time (Bromley, 1990, 89).

The use of Pareto optimality or the 'broader' Kaldor-Hicks condition[4] therefore has significant repercussions in policy evaluation. These limited axioms derive from welfare economics traditions, where the prioritisation of 'allocative efficiency' is at the expense of considering the distributional consequences. This at odds with the nature of public policy decision-making, which involves making distributional choices for current and future generations. "It matters a great deal *whose* welfare is improved and *whose* is impaired", yet, this is unacknowledged by such minimalist axioms (Paavola and Bromley, 2002, 7 [emphasis from text]). These axioms are translated to simplistic decision rules and are quantified in monetary terms through cost-benefit analysis (CBA) or economic modelling to yield outcomes in environmental policy evaluation (Guglyuvatyy, 2010, 356).

The prevalence of these techniques in policy evaluation therefore becomes a mechanism by which to legitimate these normative claims under the guise of scientifically objective evaluation. Examining the unfounded claim of economics as a neutral arbiter of policy reveals the two key issues. First, the implicit politically charged consequence of assuming the 'scientific objectivity' of economics in evaluation, and second, the way this may align with the ideology or interests of agents who may benefit from the imposition of certain economic methods. Moving beyond this, and enacting "the abandonment of the usual efficiency norm liberates the economist to focus on evaluation analysis on those aspects of policy choices that matter most to those in a position to decide" (Bromley, 1990, 104).

[4] The Kaldor-Hicks requirement attempts to broaden the possible set of allocations by including non-Pareto improving allocations, so long as those individuals made worse off are adequately compensated to the equivalence of a Pareto improving position (Varian 2003, 15-16).

1.2 Environmental Value

By definition, conceptions of value are inescapable for any notion of evaluation. This is a rejection of the positivist "fact-value dichotomy", which implies "empirical research is to proceed independently of normative context or implications" (Bernstein, 1976; Proctor, 1991 in Fischer, 1998, 130). In environmental policy evaluation, how value is conceptualised is a critical component of the determination of outcomes in evaluation.

There is widespread use of economic assumptions in determining value in environmental policy. Yet, the normative implications of these assumptions used in economic modelling are often left implicit, or are acknowledged only peripherally (Denniss, 2012, 4). These hidden assumptions may form the basis for the results of 'independent' economic modelling, and become pivotal evidence in swaying policy decision-making, outcomes, and policy evaluation. The normative implications of mainstream valuation methods will therefore be examined.

1.2.1 Traditional Approaches to Valuation

Monetary valuation of the environment is the most common conceptualisation of value used in mainstream economic methods. It acknowledges environmental degradation as a market failure, and recharacterises nature as an input to the production process (Keohane and Olmstead, 2007, 65). This attempts to rectify market failure by 'internalising the externality'; mapping a role for business and implying firms are responsible for the impact of their production processes on the environment (Gleeson-White, 2014, 62; Hamilton, 1997, 40). In its practical application, environmental market valuation is complementary to current market operations and methods, using traditional valuation techniques to obtain the dollar valuations on environmental resources and ecological systems[5] (Costanza et al., 2014, 152).

[5] For example, the "estimate for the total global ecosystem services in 2011 is $125 trillion/year (assuming updated unit values and changes to biome areas) and $145 trillion/year (assuming only unit values changed), both in 2007 $US" (Costanza et al., 2014, 152).

However, internalising an externality through a price mechanism implies firms will be able to pay that price, so if a particular model was too risk averse in assessing uncertainty, prices could be so prohibitive firms could not operate within these parameters (O'Neill, 2007, 42). The use of a price therefore becomes redundant if the contributing polluter cannot pay it. Models may therefore begin from the premise that there exists a price that can be paid to nullify environmental damage (O'Neill, 2007, 45). This may encourage an undervaluation of resources and could lead to the destruction of irreplaceable ecological systems.

Yet, innovations that are founded on these traditional economic valuation techniques are increasingly adopted globally. Recent developments have proposed integrating these concepts globally through a radical overhaul of the current International Accounting Standards, implementing a 'six capitals' system (Gleeson-White, 2014, 174-178). This broadens the definition of capital to include a broader classification system that includes the environmental capital in integrated reporting. These monetising concepts are also applicable nationally in the calculation of aggregate domestic output, where resource consumption is considered as a variable in the production of output. In traditional macroeconomic indicators, this may be represented as a shift towards accounting for net domestic product, instead of gross domestic product (Daly, 1996, 99-100).

For example, the Australian Bureau of Statistics (ABS) began annually releasing the 'Australian Environmental-Economic Accounts' in 2014, a statistical summary which "brings all ABS environmental accounts together in one place to deliver a broad and cohesive picture of the environmental stocks and flows of relevance to the Australian economy and society" (ABS, 2014, 2). Valuing the environment as capital in this way implies that the value of the environment derives primarily from its economic value, often expressed in monetary terms.

Further, this approach and the resultant innovations are criticised for the implicit promotion of marketisation of the natural environment (Gleeson-White, 2014, 81). Engaging firms in 'green accounting' may distort the moral arguments for environmental preservation. Market principles encourage a price, and this may become a signal of the cost at which environmental preservation can be 'bought off'

(Sandel, 2012, 10). This is an example of the "corrosive tendency of markets" which not only allocates goods with certain implicit moral judgment, but also "express and promote certain attitudes toward the goods being exchanged" (Sandel, 2012, 8-10). Like markets, this approach to the environment can distort values and alter incentives. The moral arguments made about the commonplace implicit or explicit monetary valuation of traditionally unpriced components of the environment highlight the inescapable moral implications of these economic techniques.

1.2.2 Cost-Benefit Analysis

CBA is one of the key tools recommended by the Australian Government for environmental policy evaluation (Commonwealth of Australia, 2006; Commonwealth of Australia, 2014; NSW Treasury, 2007). The use of economic valuation techniques in CBA is criticised for over-simplifying the worth of a system to prices. It is argued that standard valuation outcomes of CBA are inaccurate and implausible, that the use of discounting trivialises future harms, that questions of fairness and morality are excluded, and that CBA is neither objective nor transparent (Ackerman and Heinzerling, 2002, 1563). Traditional valuation techniques like CBA give the impression of scientific calculations for environmental value, yet the assumptions used as inputs to this process are criticised as unavoidably arbitrary in assigning a specific dollar valuation (O'Neill, 2007, 23-24). Uncertainty of future and current outcomes, costs, impacts and responses create many informational asymmetries in the CBA process, which are estimated based on calculated probabilities. Inherent uncertainty is a significant problem for environmental modelling, and highlights the infinite possibilities of a justifiable predictive model. In this context therefore, a particular model will always carry an element of arbitrariness.

Broader analytical approaches to value highlight the constitutive incommensurability of markets and the environment, suggesting CBA is unable to account for distributional consequences or explain the reasoning for individual preferences (O'Neill, 2007, 24; 26-29). CBA reveals an "efficient use of means to ends, but does not tell us what our environmental goals should be" (Ackerman and Heinzerling, 2002, 1583). It cannot explain why we value the environment, or the reasons for doing so, as preferences are taken as given (O'Neill, 2007, 28).

1.2.3 Non-market Valuation Techniques

Non-market valuation techniques are also used in CBA and include techniques such as revealed preference, stated preference and benefit transfer (Baker and Ruting, 2014, 6-7). These non-market techniques are an alternative way environmental preservation could be implemented, indicating the varying degrees of policy implications that stem from how a particular environmental price is used. This approach builds on counterarguments that suggest assigning a dollar value does not causally imply marketisation or privatisation (Costanza, 2014, xi-xx). For example, environmental (and some ecological) economists point to the existence of the statistical life[6], arguing this does not imply humans should be traded in markets as commodities, and that environmental valuation should be treated similarly (Gleeson-White, 2014, 92-93). It is argued that the price of the environment already exists in global accounting and business practices - the problem is that this purchase price is currently zero (Everard, 2014 in Gleeson-White, 2014, 95).

Whilst such techniques are advocated as methods to improve environmental valuation, the criticisms raised earlier apply equally to these techniques. Their increasing input into CBA does not alter the normative implications of using monetary valuation. Therefore, what both these valuation perspectives have in common is the idea that the environment can, and should be priced. Both market or non-market techniques imply the naturalisation and inevitability of the penetration of markets and economic methods in the environmental sphere, and therefore, environmental policy evaluation.

1.2.3 Nature as Priceless and Pluralism of Ecological Value

Viewing nature as 'priceless' counters mainstream valuation techniques, environmental marketisation, and the monetary quantification of the worth of environmental systems. The theoretic proliferations of this perspective range from the rejection of monetary valuation of environmental systems, the rejection of traditional valuation techniques, to the intrinsic value of the environment above servicing the

[6] According to the Office of Best Practice Regulation, Department of the Prime Minister and Cabinet, the "estimate of the value of statistical life is $4.2m and the value of statistical life year is $182,000 in 2014 dollars" (Commonwealth of Australia, 2014, 1).

needs of humanity and the capitalist economy. Some proponents of this perspective explicitly reject monetary based CBA, presenting a potentially damning critique that proposes alternative regulatory and valuation techniques to advance the case for environmental protection (Ackerman and Heinzerling, 2002, 1562). It also suggests a type of implicit valuation that focuses on policy mechanisms, acknowledging that a singular dollar value is not needed to implement regulatory controls.

Pluralist approaches highlight valuation as a process within evaluation, rejecting the need for a transcendent or perfect notion of value. "Our evaluative experiences, and the judgments based on them, are deeply pluralistic" (Anderson, 1995, 1). Incorporating a plurality of values and voices can acknowledge competing perspectives through public reasoning and deliberation (Demals and Hyard, 2014, 36). This can overcome the "reason and distributional blindness" of mainstream approaches, and highlights the environmental valuation as contextually dependent on the issue, agents and entities involved (O'Neill, 2007, 41-43). Mainstream economic assumptions therefore normatively imply the value of the environment through specific valuation techniques. These techniques obscure the normative claims of assuming the environment can be priced or marketised, and that ecological value is derived only from its relation to economic phenomena.

1.3 Ethics, Environment and Intergenerational Equity

Mainstream economic valuation methods highlight one way economic assumptions impose specific moral conclusions about the worth of the environment. Similarly, inter-temporal assumptions used in economic models of environmental policy issues also have moral implications. Classical political economists discussed issues of economic significance in the context of broader moral concepts[7]. Over time, however, this moral context has been gradually detached and obscured from the influence of economics in environmental policy issues, reinforcing the 'scientific objectivity' of

[7] An example is the 'Adam Smith Problem'. An exclusive reading of either the Wealth of Nations or the Theory of Moral Sentiments may lead to contrasting conclusions, which can be considered irreconcilable (Sen, 2009, xi). However, these can be interpreted cohesively, as they were originally written and concurrently revised. Together, they present a holistic and explicit moral view of the Smith's 19th century society, where economic issues were not conceivable as independent of social phenomena. The meaning of 'economy' did not imply a separate entity until the 1930's (Mitchell, 2005, 131).

economics. The re-inclusion of the moral implications of economic theory and methods therefore represents a return to earlier traditions of classical political economic traditions.

1.3.1 Intergenerational (In)Equity?

Intergenerational equity (IGE) features frequently in environmental ethics, yet these discussions are largely separate to the assumptions of economic approaches. In economics, these principles manifest in the application of discount factors to applied economic modelling and forecasting, which are key tools for evaluation. The presumption of discount factors in modelling therefore has major ethical implications for the outcomes that result in environmental policy evaluation. Mainstream economics has often avoided engaging with these normative issues, instead focussing on formal mathematical analysis to derive an appropriate social discount rate.

The historical development of political economy highlights the derivation of mainstream economics from the utilitarianism of Jeremy Bentham, developing over time toward supposedly value-free and amoral preference theory (Spash, 2009, 12). In economic techniques such as CBA, moral choices are often taken as given from economic welfarist traditions. These are commonly assumed through the principles of utility maximisation, and the translation of simplistic utilitarian axioms into aggregated social welfare absolutes. Converting this to a monetary figure translates ordinal preferences into an implicit value theory that uses money as "a cardinal measure for interpersonal comparisons of well-being" (Spash, 2009, 15). This is the process by which philosophical discussions on the implications of economic axioms and assumptions are divorced from economic methods to reinforce their objectivity (Bromley, 1990, 97).

1.3.2 IGE and Discount Rates

An example of the mainstream economic approach to discount rates is a report commissioned by the US Environmental Protection Agency (EPA), which consults a panel of notable economists including Arrow, Nordhaus, and Weitzman (Arrow, et al., 2012). The reported findings of this panel highlight the differences in approaches to

discount rates. Consensus among the panel recognised select methods as appropriate for intergenerational discounting:

> "Under certain assumptions—and ignoring uncertainty—this approach leads to the Ramsey discounting formula, in which the discount rate applied to net benefits at time t, ρ_t, equals the sum of the utility rate of discount (δ) and the rate of growth in consumption between t and the present (g_t), weighted by (minus) the elasticity of marginal utility of consumption (η): $\rho_t = \delta + \eta \cdot g_t$" (Arrow et al, 2012, 2).

However, a divergence among the panel occurred in determining the Ramsey equation parameters. This issue also drew major debate in criticisms of the well-publicised 2007 Stern Review (Caney, 2014, 323; Weitzman, 2007, 703). Stern and others have argued for a utility rate of discount to be zero, ie. $\delta = 0$, a derivation that explicitly assumes the principal of IGE, with the equal weighting of current and future generations consumption. However, others recommend that these parameters should be calculated based on empirical analysis of market interactions and trade offs (Arrow et al., 2012, 4).

The social discount rate used in CBA or impact analyses is often justified using the utilitarian assumptions of Pareto optimality or the Kaldor-Hicks criterion, which determine the net impact on welfare over time. In the context of energy policy, Sen acknowledges the inescapable ethical character of a chosen discount rate when making social assumptions in CBA. However, through an examination of social welfare functionals, he further argues that the Pareto optimality condition is "inadequate to sustain ethical analysis involving equity, liberty, or even utilitarianism" (Sen, 1982, 350).

1.3.3 Non-Utilitarian Ethical Approaches

Using CBA or common orthodox assumptions implies that in decision making, that individuals follow a utilitarian philosophy, implying they "believe the net utility from the consequences of an action determines whether that action is right or wrong" (Spash, 1997, 404). Common economic valuation techniques used in CBA therefore

do not provide any scope for capturing preferences held by an individual with principles-based, rights-based or deontological approach to society or the environment. The incompatibility of these values with common valuation techniques means only the views of those with utilitarian values regarding the environment are recorded, or those with these alternative philosophical perspectives are forced to conform to a utilitarian preference system in data capture (Spash, 1997, 405).

Rejecting these ethical positions implies perspectives that highlight the inherent value of the environment are incompatible and disregarded, and the imposition of falsely 'neutral' economic analysis therefore reinforces a purist utilitarian standpoint. This impossibility is described as a representation of lexicographic preferences:

> "The utility functions are undefinable for an individual since the axiom of continuity is violated, and indifference curves collapse to single points denying the principle of gross substitution. Lexicographic preferences are conveniently regarded as unrealistic and unlikely to occur in economics" (Malinvaud, 1972, p. 20 in Spash, 1997, 406).

The rejection of the compensation principle in deontological perspectives implies that no amount of money could ever compensate for the inherent value of a certain action or good. It is therefore an outright rejection of the narrow mainstream definition of rationality. Yet, such perspectives may be common among conservationists or environmentalists, implying that current economic methods are incapable of accounting for alternative ethical positions. This highlights the tension in maintaining an isolated economic approach to environmental issues. The need to engage with ethical considerations demonstrates the instability of monistically applying orthodox economics in environmental issues that are, by nature, interdisciplinary (Mickwitz, 2003, 416; Beder, 2011, 140). In advocating for moral pluralism, Brennan notes, "there is no single theoretical lens which provides a privileged set of concepts, principles and structure in terms of which a situation can be viewed. … One and the same case can properly be viewed in many different ways" (Brennan, 1992, 29).

Obscuring the weak ethical underpinnings of discount rates therefore has significant normative implications. By operating under the false notion of scientific objectivity,

the use of social discount rates is therefore advancing a specific set of normative principles that have little concern for equity issues. Implicitly implementing these principles in environmental policy evaluation under the guise of neutrality therefore has political ramifications. IGE is therefore an example within environmental policy evaluation that ethical considerations must be explicitly engaged with. The implication of parameter choice for discount rates, and the limited strength of ethical considerations in welfare economic theorems highlight the need to explicitly acknowledge and integrate ethical considerations into economic thinking, in a return to classical political economy.

1.4 Economic Modelling and the Environment: A Case Study

Economists and modellers are often seen as independent arbiters in environmental policy evaluation. Common policy practice involves the inclusion of an economic perspective to bring a necessary 'rational' or 'efficient' approach. As demonstrated earlier, this notion is ill conceived on two accounts. First, the discipline of economics has a fundamental set of moral assumptions underlying its key theories and models. Second, the key tools used by economists to model environmental policy such as CBA are contingent on the assumptions used, implying the generated outcomes of such a model can be modified to suit the interests or ideological agenda of agents in the policy process. This can be demonstrated in the use of fallible economic modelling. Techniques to evaluate environmental policy are misused, and are misleading when implemented as a sole mechanism for evaluation. The subjective and malleable nature of these models will be explored in the 2014 modelling of the Australia's RET for the Warburton Review.

1.4.1 Economic Modelling and Environmental Policy

A model is "a simplified representation of a more complex mechanism", that for economists, has become a key tool to create "a mathematical representation of the linkages between selected elements of the economy" (Denniss, 2012, 1-2). Any model, by definition, has a set of assumptions that underpin the models outcomes or forecasts. Choices on which model to use, modifications to model structure and key assumptions are informed decisions made by technically trained modellers. Yet, the

selectivity of certain assumptions can promote a desired outcome. This prompts a potential 'circular argument' problem in economic modelling. Such a problem occurs if the assumptions are distorted and set up in a certain way that predicts the intended outcome, in effect creating a "process of recycling assumptions" (Denniss, 2012, 3).

This then translates to a non-economic audience through press releases and media, where essential contextual assumptions can be obscured in a way that supports a desired outcome, potentially the outcome desired by the entity funding the study (Denniss, 2012, 5). This is amplified in economic modelling of environmental issues, in which strong assumptions are required to overcome significant levels of inherent uncertainty in prediction and forecasting. Climate change is one such example where "political opponents of policies to mitigate climate change have promoted spurious uncertainty to provide a justification for their position" (Quiggin, 2008, 203). Modelling can therefore be commissioned to justify or obscure the interests of agents in the policy process.

Limitations are also placed on the ability of economic modelling as a methodology to inform policy decision-making and evaluation. According to a 2001 report by the Australian Government's Productivity Commission (PC), the inability for economic modelling to account for non-price based policy mechanisms means that "as well as setting sound price-based policies, governments can and should act to research, coordinate, inform and motivate the technical, institutional and cultural changes that also have a significant role in controlling GHG emissions" (Pezzey and Lambie, 2001, 83). This implies that the problem with economic modelling is not simply one of inadequate or poorly applied models (though that's a problem too). Rather, this speaks to the limitation of the single-minded application of mathematical models in evaluating or explaining phenomena.

1.4.2 Modelling the RET: Complications for RE Policy Evaluation

One such example is the modelling on electricity prices conducted for the 2014 Warburton Review. Most models submitted for review were variations of mainstream methodology, with (sometimes) empirically based parameters. Often, these parameters are derived from unrealistic neoclassical theoretical conclusions and form the bulk of the models assumptions (Scrieciu, 2007, 679). The following section will

compare the findings of two of the most prominent and widely cited models; the economic modelling commissioned by the government sponsored review, conducted by ACIL Allen Consulting ('the ACIL model'), and the response modelling report by Deloitte Access Economics, as commissioned primarily by the Australian Chamber of Commerce and Industry (ACCI), the Business Council of Australia (BCA) and the Minerals Council of Australia ('the Deloitte model').

The RET sets a fixed figure equivalent of 20% renewable generated electricity by 2020 (on 2010 electricity demand forecasts), and current planned targets are implemented until 2030. The key difference in the two models is highlighted by the long-term outcomes, where results are increasingly subjective and specifically subject to the assumptions on uncertainty and future conditions by the modeller. Relating the major finding of both reports:

> "Deloitte modelling shows that continuation of the RET would see annual household electricity costs *rise in the range of $47 to $*65 per annum by 2030. This compares with an increase of around $54 per year through to 2020 as forecast by ACIL Allen, commissioned by the Australian Government, followed by *a decrease in electricity prices* by an average $56 per year to 2030" (BCA, 2014, 1 [own emphasis]).

These results are relatively concurrent over the period to 2020, however the divergence beyond 2020 highlights contradicting findings (Deloitte, 2014, 2). The predictions of the Deloitte model and associated assumptions are also in contrast to the modelling conducted by Bloomberg New Energy Finance (BNEF) and by ROAM Consulting on behalf of the Clean Energy Council, which both largely align with the ACIL models (Cox and Hannam, 2014; ROAM, 2014, 1-3; BNEF, 2014 in Warburton Review, 2014, 18).

According to the Deloitte report, "the differences in the two analyses appear to arise from differences in the capital costs, fuel and contracting". It was further stated that compliance costs for the RET would increase. In the modelling, "retail electricity prices increase by more than the reduction in wholesale prices. Overall, this results in a net increase in electricity prices" (Deloitte, 2014, 2). In contrast, the government

ACIL modelling predicted RET compliance costs would decline till 2030, and wholesale energy prices were predicted to be lower than if the RET was repealed (ACIL Allen, 2014, 3).

1.4.3 CGE Modelling: Garbage in, Garbage Out?

Computational general equilibrium (CGE) models are one of the most common economic modelling tools for evaluating environmental issues, as they are suitable for long-run policy analysis. In light of the Lucas Critique[8], CGE relies on simulation modelling of the entire economy, making it better suited to analysing environmental issues like climate change or renewable energy, as these require long term effects of policy measures on prices and the whole economy (Denniss, 2012, 9). Both ACIL and Deloitte used in-house CGE modelling to determine the impact of various scenario changes to the RET on electricity prices for consumers, modelling the 'business as usual' and the repeal case.

The PC report discussed earlier highlights some problematic assumptions in inferior CGE models. For example, many CGE models (such as the two discussed above) do not endogenise technological progress and this can be of significant concern in medium to long-range analysis of industry-based behaviour such as the renewables sector (Pezzey and Lambie, 2001, 82; Hamilton and Quiggin, 1997, 16). Further, the reliance on microeconomic foundations for assumptions not easily determined from empirical evidence has potentially limiting effects on modelling applicability (Dow, 1996, 70-71). Assumptions such as the representative household are used, such that in the Deloitte model, **"**each region in the model has a so-called representative household that receives and spends all income" (Deloitte, 2014, 36). The use of representative entities may have implications for the ability of a model to predict distributional consequences (Pezzey and Lambie, 2001, 83). Neither model analysed here presented information regarding the dispersed burden faced by different sectors of the community in electricity prices. Given the widespread use of such models in

[8] The Lucas Critique challenges time-series forecasting due to the limitations of adjustment to shocks outside the aggregated historical data. This critique shifted modelling to more stochastic (rather than deterministic) models where simulations, rather than historical data, are relied upon (Snowdon and Vane, 2005, 26).

environmental policy evaluation, there is a significant imperative to explicitly examine the economic assumptions that underpin their legitimacy.

1.5 An Alternative Interdisciplinary Approach

An ecological perspective on mainstream economic notions of environmental value and the implicit ethics of social discount rates reveals the normative implications of economic assumptions. These underlying normative judgments are then reinforced through their common evaluative tools such as economic modelling or CBA. These are imbued with false notions of scientific objectivity. Obscuring these assumptions, and their use in economic methods of evaluation downplays the subjective nature of selection in economic modelling:

> "Since analysis almost always requires judgement about what data to use, what models and analytic methods to employ, what assumptions to begin with, how to characterise uncertainties, and other choices, analysts cannot escape the need to make ethical choices based on how they understand their role and what expectations guide them" (Weimer and Vining, 1999, 47-53, in Bryner, 2006, 434).

The use of these 'independent' models on evaluation outcomes is demonstrated in the modelling submissions for the Warburton Review. Economic techniques examined in this chapter can be used to perpetuate the interests or ideology of agents in the policy process, by using selective assumptions that presuppose the outcomes of modelling. This may also have been reinforced through the normative repercussions of economics on notions of equity or value, which may align in evaluation to further the interests of agents.

Economists may assert a counter argument that ethical, institutional, political or social complexities should be left to the corresponding discipline, reinforcing the notion that "positive" economics ought to avoid engaging with explicitly normative issues or non-economic phenomena. However, as demonstrated here, the conclusions drawn from the linear focus and methodology of economics are limited when monistically

applied to interdisciplinary issues. A purely economic approach to policy evaluation does not mitigate the potential susceptibility of agents utilising an approach to further their own interests or ideology.

The Warburton Review and the Federal Government's response is an example of the insufficiency of a piecemeal amalgam of discipline-specific approaches. Given the epistemological impossibility of objective evaluation raised in post-positivist evaluation approaches, relying solely on economic modelling and its underlying assumptions is insufficient in accounting for the interests that arise in policy-making. This example is characteristic of a broader trend within policy evaluation practice that is perhaps symptomatic of a disconnection between evaluation theory and practice (Chelimsky, 2012, 91).

Evaluating environmental policy issues is therefore improved by an approach that begins from an interdisciplinary foundation (Beder, 2011, 149). Any discipline will prioritise certain concepts, just as economics prioritises economic efficiency:

> "[N]one of the disciplines combine all concerns. An efficient and effective policy might still be defective if, for instance, it dangerously compromises equity. In a similar vein, hypothetical equity of a policy would not rationalise its lack of efficiency and environmental effectiveness. For that reason, all of the corresponding factors need to be considered simultaneously" (Guglyuvatyy, 2010, 357).

This considers political and economic notions within a holistic understanding of society, as "each discipline, and practice, enters inevitably into the field of the other … economic processes and interests 'shape political issues and measures' [and] government policy, in turn, 'increasingly shapes the course of economic affairs' " (Clarke, 1957; Hamilton, 1957 in Elliott, 2008, 153). Explicitly engaging with the limitations and normative implications outlined here does not make the economist obsolete in policy evaluation. Rather, this reconceptualises their role "as centrally concerned to assist the decision making in selecting choices that are consistent with the latters objectives" (Bromley, 1990, 15-16).

This thesis will now explore a holistic systems-approach that counters elements of traditional economic reductionism by understanding policy problems not as isolated issues, but as specific to their political economic context in a broader system of social and ecological mechanisms and structures. Beginning from this perspective can therefore account for the inherently political and subjective nature of policy evaluation, and endogenise the inevitability of active agents with interests in the policy process. The following chapter examines this approach in policy theory analysis.

Chapter 2

A Framework for Environmental Policy Evaluation

> "Collective choice situations are most properly modeled as situations in which individuals and groups of individuals have interests in particular outcomes … We can either undertake to design an evaluation paradigm that recognizes and contributes to this reality, or we can persist in hiding behind a bogus and quite irrelevant façade that makes us feel good – and look bad".
>
> - Bromley, 1990, 105-106.

2. Introduction

As discussed previously, the limitations of current economic approaches to environmental policy has potentially problematic implications for environmental policy evaluation. This chapter seeks to propose an alternative approach to current economic evaluation mechanisms. It will do this by beginning from a foundation of a systematic and interdisciplinary analysis and will draw from sub-disciplines of policy theory.

The first half of this chapter explores policy framework theory, examining mechanisms for improving environmental policy evaluation through frameworks for systematic knowledge building. A number of policy frameworks are considered for this evaluative task, with a comparative focus on the two most promising: the Advocacy Coalition Framework (ACF) and the Institutional Analysis and Development (IAD) framework. The conclusion of this comparative exploration will justify the selection of the IAD framework for environmental policy evaluation. Concepts from evaluation theory are then explored, a tradition that has developed independently from the policy framework literature. Key developments from the post-positivist evaluation literature will then be incorporated to examine and broaden the evaluative capacity of the IAD framework in order to enhance the framework for the task of environmental policy evaluation. Chapter 3 will then carry out a preliminary application of the IAD in a case study on the 2015 amendments to Australia's RET.

2.1 Policy Framework Theory

The use of frameworks is widespread as a systematic mechanism for analysis in policy literature. However, few theorists explicitly engage with a framework as distinct from theories or models, or its specific purpose or role (Schlager, 2007, 294). Policy framework theorists are characterised here as those who explicitly engage with and develop policy frameworks for the purpose of systematic knowledge building in policy analysis. This section explores the epistemological foundation, definition, and major justifications for a framework. The implications of this definition and the necessity of a framework for environmental policy evaluation will also be discussed.

2.1.1 Epistemology and Policy Frameworks

In contrast to positivist economics, notions of a framework for knowledge building links to the epistemology of Laudan's 'research traditions', where scientific progress is characterised as a process of problem solving (Hung, 2013, 402; Weible et al., 2011, 351). Notions of research traditions developed in contrast to the approaches of Kuhn's scientific paradigms and Lakatos' research programs (Laudan, 1978, 70). Characterising science as "problem solving" emphasises the need for a comparative approach to theories and models that aims to explain a particular phenomena. Differing theoretical perspectives are commensurable, and a comparison of theories is necessary to solve a particular scientific problem in the pursuit of scientific progress (Laudan, 1978, 72-82). In this context, frameworks "serve as a platform for groups of scholars to work together toward common understandings and explanations of phenomena" (Weible and Nohrstedt, 2012, 126). A framework therefore provides the foundation to comparatively explore theories and models, thereby contributing to a body of knowledge that can withstand critical scrutiny.

2.1.2 Defining 'framework'

Most commonly, a framework is used to provide an overarching structure to conceptual or analytical work. However, reframing social scientific inquiry as research traditions for knowledge building imbues the use of a framework with more significant justifications. Constructing clear boundaries between framework, theory

and model therefore reinforces knowledge building through a comparative approach, as defined by Ostrom:

> "Framework: identifies, categorizes, and organizes those factors deemed most relevant to understanding some phenomenon.
>
> Theory: posits general causal relationships among some subsets of these variables or categories of factors, designating some types of factors as especially important and others as less critical for explanatory purposes.
>
> Model: specifies the specific functional relationships among particular variables or indicators that are hypothesized to operate in some well-defined set of conditions" (McGinnis, 2011, 170).

Such a delineation is often unclear in policy studies, lessening the possibility for "a certain self-consciousness and explicitness from the policy scholar" that comes with such a conscious classification of how policy is examined (Shlager, 2007, 294). The use of a framework therefore presents an opportunity to clarify and utilise the boundaries and scope of a particular work and comparatively examine a phenomena using competing theories and models. It exists to help generate the questions that need to be addressed in consideration of a particular issue or set of issues (Ostrom and Polski, 1999, 3). This evades the possibility of unqualified generalisation of theory or overextension of the explanatory capacity of a model (Shlager, 2007, 294).

2.1.3 Frameworks and Improving Environmental Policy Evaluation

A framework in this context facilitates the accumulation of knowledge, by introducing systematic analysis and rigour to reasoning in an openly comparative way. This also encourages less confusion in the interpretation of theories and discourages the practice 'talking past' opposing perspectives in debates (Schlager and Weible, 2013, 390). This knowledge accumulation is a necessity for progress in policy development, implementation and desired outcomes. Further, frameworks can work to unite disparate disciplines, a particular necessity for the examination of environmental policy issues (Mickwitz, 2003, 416). A framework can therefore offer a standardised

comparison of policies, with a common structure and 'meta-theoretical language' (Ostrom, 2007, 25). This comparative usage encourages a critical examination of the transparency and implications of assumptions in a theory or model, which is an element that was highlighted earlier as lacking in environmental policy evaluation. The contribution of a framework is therefore multifactorial, and goes beyond using frameworks for structural purposes only.

2.2 A Framework for Environmental Policy Evaluation

This section presents a set of criteria that will be used to judge the choice of framework most suited to this evaluative project. This comparative analysis will be applied selectively, with the spectrum of policy frameworks narrowed to the most suitable, namely the ACF and IAD framework. These will be discussed to determine their suitability for environmental policy evaluation.

2.2.1 Selection Criteria for an Environmental Policy Evaluation Framework

Choosing a suitable framework requires selectivity in determining the approaches that best align with the definition of framework taken by this thesis. The following questions therefore narrow the scope of analysis:

1. *How does this framework and its application define 'framework'?*

2. *Does the use of a framework encourage standardisation and contribute to knowledge building?*

3. *How has this framework been applied previously?*

The framework-theory-model delineation is often ignored, and analytical frameworks commonly blend into highly specific theories, models or empirical evidence (Shlager and Weible, 2013, 391). Many frameworks are also designed for specific use in non-environmental areas, such as development or social security policy (Cairney and Heikkila, 2014, 372). A number of conceptual frameworks have also been omitted from consideration due to their one-off usage. These frameworks are often vague, and

the framework is often solely for structural reasons. This neglects standardisation and comparison in evaluation, and limits the facilitation of knowledge building.

The frameworks which best fulfil the above criteria are the ACF and IAD framework, the justification of which is threefold. First, these well-developed frameworks conform to the previously established definition of framework, having been applied many cases with the intention of contributing to the standardisation of policy analysis and cumulative knowledge building (Shlager, 2007, 294; Cairney and Heikkila, 2014, 373-4). Second, the IAD and ACF are also the most commonly used in the analysis of environmental policy issues (Niles and Lubell, 2012, 41-42). Third, the historical development and application of both frameworks has been interdisciplinary (Polski and Ostrom, 1999, 3; Jenkins-Smith and Sabatier, 1994; Weible, et al., 2011, 349).

Despite this, cases exist where ACF and IAD usage has been adapted and applied in a prescriptive fashion that mirrors the role previously advocated for theory. This may also encourage very specific forms of modelling. A difficulty of the key definitions described above will be maintaining the boundaries between framework, theory and model, and to avoid potential prescriptive tendencies. Without an awareness of this, the usefulness of the comparative nature of a framework is diluted.

The following questions will therefore be used examine the ACF and IAD framework and determine their suitability for environmental policy evaluation:

4. *What are the main units of analysis?*

5. *How does this framework understand policy?*

6. *In what capacity does this framework engage with evaluation?*

7. *Does this fulfil the needs of examining environmental policy evaluation?*

Policy theorists writing on the comparison of these frameworks have asked similar questions which fall into the categories of these broader questions (Cairney and Heikkila, 2014; Weible, 2014; Schlager, 2007). Question 4 considers the unique units

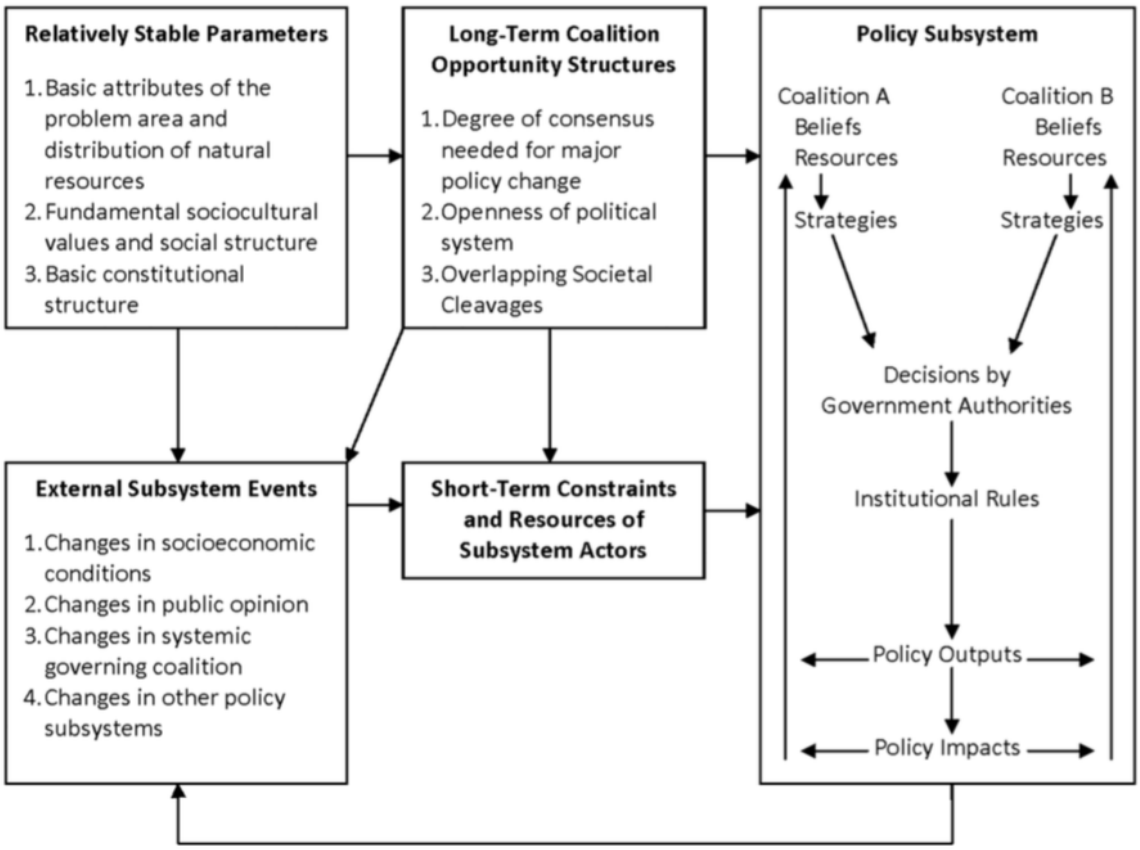
of analyses of each, covering the key concepts, actors and relationships. Question 5 sees the understanding of the policy process in each framework as how issues are framed, including treatment of context, decision-making, ideas and beliefs, institutions and any assumptions. Question 6 assesses the potential evaluative capacity, and the flexibility of the framework to be amended for this aim. Question 7 examines the applicable scope, scale, how changes over time are characterised, and which theories and models are compatible (Bruyninckx, 2009, 31). Together, these considerations give an indication as to whether the requirements of environmental policy evaluation are fulfilled. Each of these prescribed elements therefore contributes to the overall 'fit' of the framework, its suitability for engaging with environmental issues, and its evaluative capacity.

2.2.2 The ACF and the IAD Framework: A Summary

This section will briefly outline the two frameworks for comparison. The ACF uses 'policy sub-systems', and was designed to specifically consider the nature of coalitions, policy learning and policy change (Cairney and Heikkila, 2014, 371). Drawing on more constructivist notions, it examines questions such as: "How do people mobilise, maintain and act in advocacy coalitions? What is the role of scientists and scientific information in policy making? What factors influence both minor and major policy change?" (Weible et al., 2011, 349).

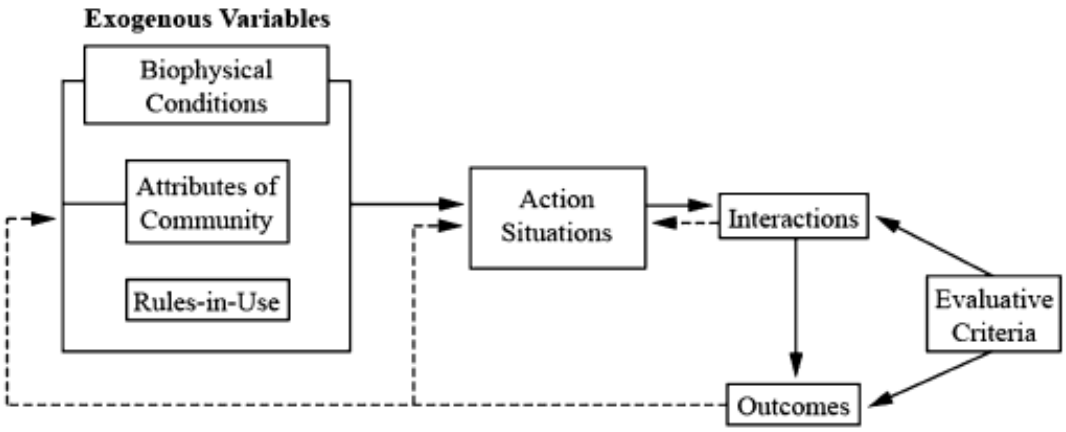
Alternatively, the IAD framework has a strong institutional foundation, and examines 'action situations', a less prescriptive consideration with the possibility of a diversity of theories and models (Cairney and Heikkila, 2014, 371). The IAD framework examines institutions and organisations, and helps to simplify complex policy issues by providing possible questions to consider for systematic analysis. It asks questions such as: "Are they formal rules that are also used in practice, and are there informal rules that are at variance with the formal ones? Who are the people in these action situations? What are the attributes of the goods or services they are trying to produce or consume or distribute, or the resource they are trying to use or share?" (Blomquist and deLeon, 2011, 2-4). The figures 2.1 and 2.2 summarise the two frameworks in a diagrammatic sense.

Figure 2.1: The Advocacy Coalition Framework



Source: Weible, et al., 2011, 352

Figure 2.2: The Institutional Analysis and Development Framework



Source: Ostrom, 2005, 15

2.2.3 Comparing the ACF and IAD Framework

This section extracts the key differences between the ACF and IAD framework in relation to the criteria in section 2.2.1. The ACF has more specific assumptions that are explicitly discussed with reference to the policy subject, where the IAD framework has a broader scope, considering "questions related to how institutions (as rules) are crafted and how they affect human behavior" (Cairney and Heikkila, 2014, 368). The ACF focuses on beliefs and their implication in political behaviour in contrast to the focus on institutions and rules in the IAD framework. In dealing with change over time, the ACF response to internal external shocks, through links to other subsystems. The IAD framework instead emphasises exogenous factors, with less focus on ideas or networks considered in ACF subsystems (Schlager, 2007, 309-310).

Explicit evaluative applications are not common in either the ACF or IAD framework. The IAD framework has explicit 'evaluative criteria' built into the framework as a significant component in the policy process (as in Figure 2.2). Since its conception, a number of evaluative criteria have been raised by Ostrom or affiliated IAD authors, and this remains a key component of many applications of this framework. The ACF has typically been applied more descriptively, and is rarely concerned with evaluation in an explicit sense. On balance, the ACF is therefore less suited to facilitating a 'careful assessment', as warranted by the definition of environmental policy evaluation discussed earlier.

The preceding discussion has attempted to draw out the differences between the two approaches to determine suitability for this project. On this basis, the IAD framework was deemed a more suitable 'fit' for the following reasons. First, the broader scope of the IAD framework more easily allows for a comparison of theories and models. Second, the assumption of institutional influences is less prescriptive than the confines of coalitions within a policy subsystem. This better targets environmental policy, where changes over time have historically been incremental, and the complexity of the demands of different agents is only in part, examinable through a coalitions-based approach. Third, the ACF has a more limited capacity for evaluation. The subjectivist, belief systems-oriented nature of the ACF makes it more difficult to evaluate using a falsifiable hypothesis or empirical measurement, given its development as a rejection of instrumental rationality. The focus of the framework on

belief systems and policy learning is more suited to descriptively analysing why changes in belief structures happen, rather than providing reasoned justification or empirical explanation for their translation to policy, or why such a change may be appropriate (Schlager, 1995, 246).

This is not to undermine the credibility of the ACF in other contexts, rather it is intended that this project contribute to the broader literature of competing policy perspectives:

> "Most importantly, the main point in comparing the ACF and the IAD framework is not to answer all the comparative questions, but to recognize that both frameworks represent different research programs marked by different research cultures, assumptions, scopes, and emphases on major concepts" (Weible et al., 2011, 358).

These specific questions were chosen to test the criteria most suitable to environmental policy evaluation. The IAD framework was therefore selected on this contextually specific basis.

2.3 The IAD Framework: Strengths and Limitations

This section presents an in depth examination of the IAD framework selected in the previous section. First, the IAD framework will be explored in detail for use in the preliminary application in chapter 3. Second, limitations of the framework are explicitly explored, to avoid common pitfalls, and to ensure the use of the framework is self-reflexive and can withstand critical scrutiny. Providing perspectives on possible interpretations and critiques that may be relevant for the application aims to strengthen and further justify the selection of the IAD framework.

2.3.1 The IAD Framework in Detail

The IAD framework helps to systematically determine the questions to be asked in policy analysis, a central contribution to addressing the problems with current environmental policy evaluation. The IAD framework is therefore a broad system within which to apply theories and models, not a prescriptive or blueprint approach

(Korten, 1980 in Polski and Ostrom, 1999, 4-5). This allows for an analysis that brings a rigour to reasoning in public debate. This framework therefore "provides a means to synthesise the work of multiple participants, including those who are directly involved in the policy situation and have an interest in policy outcomes" (Polski and Ostrom, 1999, 6).

Ostrom and her colleagues developed the IAD framework for comprehensive institutional analysis and development, and at its core is the acknowledgement of institutional forces (McGinnis, 2011, 171). The explanatory significance of institutions is often overlooked because of their abstract or invisible nature. Their analytical importance in policy is therefore reasserted in Ostrom's definition of institutions as "human-constructed constraints or opportunities within which individual choices take place and which shape the consequences of their choices" (McGinnis, 2011, 170). This is explicitly acknowledged in the exogenous variables of the framework, thereby allowing for an account of path dependent characteristics and outcomes. This is central to the nature of change in an institutional context, which is "incremental and sequential … rather than totally reconstructive or destructive … Institutional change transforms the structures of incentives within future decisions are made" (Imperial and Yandle, 2005, 503).

The reasoning for implementing the IAD framework is therefore twofold. First, as the end product of the work of disparate disciplines, it is convincing in its ability to address issues that are inescapably environmental, moral, economic and political. Its development stems from the need to systematically address ecological and institutional issues, and its design in this context makes it a suitable way to improve environmental policy analysis. Second, at the heart of the IAD framework is its ability to increase the transparency of assumptions in policy evaluation through the use of a framework for standardised comparison of policies, with common language and structure (Polski and Ostrom, 1999, 4-5). While the IAD framework has not always been applied with an evaluative component, its advantage as a systematic and interdisciplinary approach allow for broader notions of evaluation, and a broad range of theory and models in application.

2.3.2 Limitations of the IAD Framework

Any framework, theory or model has limitations. Addressing or acknowledging the potential limitations is vital in ensuring an evaluation of environmental policy that can engage with complex theoretical and practical issues. The limited methodological diversity in previous applications is one possible limitation to consider. The IAD framework is more akin to certain methodologies and theories, particularly derivatives of mainstream economics. This is attributable to the framework's use so far, where tools of mainstream economics are often used. The understanding of individuals and agents also often resembles a methodological individualist approach to social processes. There is no prescriptive approach to characterising the individual in the framework, which means flawed mainstream assumptions on perfect rationality are compatible (Ostrom, Cox and Schlager, 2014 in Cairney and Heikkila, 2014, 380). While any theory necessarily simplifies phenomena using assumptions, engaging with the language and structure of the framework whilst avoiding reductionist conceptions will be challenging (McGinnis, 2011, 171).

Those who were influenced by Ostrom and her colleagues tend to use game theoretic methods, or characterise individuals using Herbert Simon's theory of 'bounded rationality' or 'satisficing agents', in contrast to traditional utility maximisation assumptions. Both game theory and the theory of Simon attempt to conceptualise agents in a way that better accords with the actions of agents in reality (Ostrom, 2011, 14). However, approaches that do so are limited by their reliance on methodological individualism, as they are largely incapable of systematically theorising the social macrostructures of society.

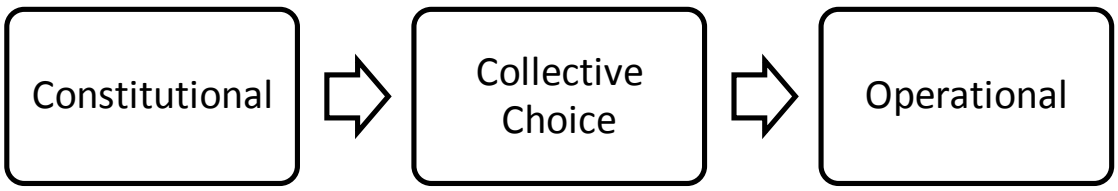
Simon was critical of the New Institutional Economics (NIE) discipline, and advocated his alternative approach of integrating social phenomena to augment the explanatory power of economics in opposition to NIE (Simon, 1991). According to Simon, NIE amendments to neoclassical theory "are typically introduced into the analysis in a casual way, with no empirical support except an appeal to introspection and common sense … giving it a very *ad hoc* flavour" (Simon, 1991, 27 [own emphasis]). However, Simon can be critiqued in the same way, as he uses a similarly 'ad hoc' approach to the incorporation of social phenomena. NIE and rational choice approaches that centre on individual utility maximisation are limited by their

"inability to account for the way in which normative and causal ideas (and changes in those ideas) shape interests, frame choices and establish norms" (Bell and Hindmoor, 2014, 475).

Other critics highlight the oversimplified treatment of agents that results from individualist applications. Hayden suggests that the uniformity of agents as individuals, boundedly rational, or otherwise, was overstated in applications of the IAD framework, including Ostrom's own application (Hayden, 2011, 468). This thesis will inevitably make simplifying assumptions about agents through classification. However, it will be acknowledged that size scope and the influence of agents matter: the operation of individual MP's or Senators in the houses of Parliament is different to large employer associations or lobby groups at the collective choice level.

Engaging with Ostrom's levels of analysis therefore helps to diversify conceptions of agents and avoid the reductive characterisations of mainstream economics (Blomquist and deLeon, 2011, 4). The layering of different levels, each with interconnected action situations is dependent on the phenomena under examination, and this flexibility allows for the broader applicability of Ostrom's framework. Multiple action situations within each analytical choice level exist, and each has agents, rules and other external factors that may be unique or shared. Ostrom separates these choice levels as follows:

Figure 2.3: Levels of Analysis in the IAD Framework



Source: Adapted from Ostrom, 2005, 62

It is hoped that consciousness of this in applying the framework, and the utilisation of theory that promotes nuanced characterisations of agents will mitigate this problem. The criticisms raised here are therefore attributable to the overreliance on orthodox economic theories and methods, rather than the framework itself. This presents a compelling case for the utilisation of heterodox theories and methods.

2.4 Post-Positivist Evaluation and the IAD Framework

This section reconceptualises the rational choice notions of evaluation in the IAD framework, thus broadening the characterisation of evaluation. First, the synthesis of rationalistic and constructivist (or realist) concerns will be discussed in order to move beyond the rational choice tendencies of the IAD framework. Second, the relevance of explicitly evaluating normative concerns will be examined, broadening the analytical abilities of evaluation mechanisms, in keeping with the critiques of economic methods of evaluation discussed earlier. Third, these components will be integrated into the IAD framework.

The IAD framework explicitly engages with evaluation through the 'evaluative criteria' component, the design of which stems from rational choice notions of evaluation. In order to facilitate and improve the translation of the IAD framework to an evaluative context, notions of post-positivist evaluation will be integrated. In Ostrom's 'Understanding Institutional Diversity', a book that presents a detailed vision of the IAD framework in over 350 pages, only 2 pages are dedicated to the 'evaluative criteria' of the framework (Ostrom, 2005, 66-67).

The use of mixed-methods in evaluation draws on post-positivist epistemology to characterise evaluation as an iterative process that is "principled, pragmatic and pluralistic" (Chelimsky, 2010, 16; Hanberger, 2001; Fischer, 1995, 227). This broader evaluation requires an account of the unintended consequences that are inevitable in environmental policy. Examining impacts of an influence outside the prescribed system is a key strength of constructivist approaches like the ACF. Accounting for these unforseen elements acknowledges the "mechanisms that intervene between the delivery of program service, and the occurrence of outcomes of interest" (Weiss, 1997, 73).

2.4.1 Synthesis: Balancing Rationalism and Constructivism

Post-positivist policy theorists acknowledge the possibility of a synthesis of rationalist and constructivist approaches, implying a spectrum instead of a dichotomous relation between the two. Increasingly, evaluation is conducted in this theoretical 'middle ground', where contextually specific analysis helps to mitigate the pitfalls of the 'panacea problem' (Huitema et al., 2011, 184-5; Ostrom and Cox, 2010, 2)[9]. In this approach, the selected elements to include in evaluation must be justified by the context of the subject, a notion raised by Chelimsky:

> "Evaluation has always required consideration of the factors surrounding its subject matter. And because the methodological choices for an evaluation spring precisely from the careful analysis of these factors, evaluators need to recognize their relevance and integrate them into the blood and bones of the work in progress" (Chelimsky, 2010, 2).

The unavoidable prioritisation of certain rationalist or constructivist elements is therefore a selective act that must be guided by the demands of environmental policy evaluation.

For rationalist policy theorists, questions of instrumental significance are prioritised. This may involve testing hypotheses regarding the fulfilment of pre-defined goals (Pawson and Tilley 1997, 84-85). Alternatively, constructivist perspectives acknowledge the 'autonomous character' of policy, and may consider broader questions regarding the "nature of problems", the "discourses and frames" used by actors, or policy "performance" (Huitema et al., 2011, 183). The IAD framework tends toward the rationalist approach, in contrast with the constructivist characteristics of the ACF.

[9] "The panacea problem occurs whenever a single presumed solution is applied to a wide range of problems. This problem has two distinct dimensions. The first dimension occurs in situations where a theory is too precise to be flexibly adapted to the range of cases to which it is applied. … The other dimension of the panacea problem involves theories that are excessively vague instead of excessively precise" (Ostrom and Cox, 2010, 2).

The development of the constructivist approach grew from criticisms of the rationalist emphasis on generalisation (Vedung, 2010, 268). Yet, critiquing the determinism of overgeneralisation does not imply the necessity of rejecting all forms of generalisation or 'pure' constructivism. Rather, the generalisation of approaches and concepts is distinct from the generalisation of results, and the conflation of these concepts perpetuates a rationalist-constructivist dichotomy (Mickwitz, 2006, 65). A pure rejection of causation is also not necessary to counteract the oversimplification of causation in certain rationalist theories and models. Instead, a cautious approach to how causation is described, modelled, or assumed may be sufficient to avoid the problematic conflation of correlation and causation.

2.4.2 Normative Concerns

The key criticisms explored in the first chapter of this thesis prompt a consideration of normative concerns in the evaluation process. This draws on constructivist rejections of definitive and objective truths in policy evaluation (Guba and Lincoln, 1989, 46). Rather, a middle ground possible through epistemological developments in the post-positivist tradition. For example, the synthesis of empirical and normative evaluation is at the foundation of Fischer's four tiered evaluation process, where public policy evaluation is broadened to include the evaluation of ideological commitments and social values (Fischer, 1995, 155). These are summarised in the table below:

Table 2.1: Fischer's Levels of Evaluation

Level of Evaluation	**Questions**
Technical verification	Are the policy goals achieved?
Situational validation	Are the goals an adequate solution to the problem?
System vindication	Is the policy compatible with political values and accepted societal aims?
Rational social choice	Is a fundamental change of life and new social ideals necessary?

Source: Fischer, 1995, 18

Recognising normative concerns in policy evaluation is a rejection of the neutral evaluator, and implies evaluation does not aim to extract unchallengeable objective truths (Vedung, 2010, 269; Chelimsky, 1997, 99). Acknowledging normativity in evaluation recognises the potential for interests or ideological motivations in the inherently political nature of actors in policy making. This is consistent with a pluralist methodology. Normative concerns may create potentially incommensurable perspectives, and pluralism embraces this by recognising the validity of this occurrence. Further, the necessary selectivity in a pluralist approach requires normative judgement to enact this selectivity. The IAD framework can therefore act as a mechanism to enact this pluralist approach and make selections explicit. Foundationally acknowledging the inherently political nature of environmental policy therefore improves the evaluative capacity of a framework.

2.4.3 Expanding 'evaluation' in the IAD Framework

The following integrates these post-positivist contributions to expand evaluation in the IAD framework. Changes to the framework can occur through two mechanisms: indirectly, through the way the framework is applied, or directly, through changes to the structure of the existing framework. In the former, indirect changes can occur through the pluralistic selection process of theories and methods. This is complemented by direct structural amendments to the framework itself. This two-tiered approach integrates evaluative concerns through both the application and design of the framework. Doing so avoids prescriptive design tendencies, and encourages the underlying notions of the framework to be explicitly challenged rather than implicitly assumed.

First, evaluation in the IAD framework does not need to be limited to a set of evaluative criteria for outcomes and interactions only (Ostrom, 2005, 66). Rather, the IAD framework as a whole can be used as a systematic mechanism to determine the questions for conducting a holistic evaluation. A broader definition of evaluation considers more than outcomes, and reconceptualising the IAD framework as explicitly evaluative encourages conceptions of evaluation as a process. Examining how the exogenous variables change over time, or analysing the action situation is an evaluative act in and of itself. Adopting this requires no structural or diagrammatic

change. However, it represents a significant shift from existing applications of the framework. For example, the rules-in-use encompasses different levels that change over time in a dynamic political environment. These rules may also change over time as a result of the policy evaluation, so a feedback mechanism exists that is unaccounted for by evaluation as a separate input to interactions and outcomes only.

Second, given the rational choice origins of the IAD framework, the integration of constructivist perspectives will strengthen its flexibility and applicability. Constructivists commonly critique the limited consideration of political power and its influence in the construction of policy in rationalist approaches. In the IAD framework, the axiomatic characterisation of rules-in-use may obscure nuanced considerations of power and social structures. Improvement is needed to account for the inherently political nature of policy development and the 'historically-specific structures of power, rather than simply calculated pay-offs' (Mosse, 2010 in Whaley and Weatherhead, 2014, 6). To rectify this, Clement proposes the inclusion of the 'political economic context' (PE context) as an exogenous factor that influences the action situation (Clement, 2010, 129-131). This acknowledges the historical path dependency of policy development and contextualises agent interactions as contingent on the dynamic political context.

Third, acknowledging constructivist and normative considerations can occur by incorporating the four-tiered approach of Fischer, which encourages broader evaluative criteria of the action situation interactions and outcomes (Fischer, 1995). Broadening notions of evaluation is achievable through a synthesis of Ostrom and Fischer's approach depicted in the table below. An explicit engagement with normative concerns will be a key aspect of encouraging constructivist analysis, and acknowledging the inherent interests of agents in the action situation.

Table 2.2: Synthesising Fischer and Ostrom's Evaluation Approach

Fischer's Public Policy Evaluation	**Ostrom's Evaluative Criteria**	**Synthesis**
Technical Verification *Are the policy goals achieved?*	Efficiency Equity Fiscal Equivalence Accountability Adaptability Legitimacy Participation Moral Values	**Technical Verification:** Efficiency
Situational Validation *Are the goals an adequate solution to the problem?*		**Situational Validation:** Equity Fiscal Equivalence
System Vindication *Is the policy compatible with political values and accepted societal aims?*		**System Vindication and Social Choice:** Accountability Adaptability Participation Legitimacy Moral Values
Rational Social Choice *Is a fundamental change of life and new social ideals necessary?*		

Source: Fischer, 1995, 18; Ostrom, 2005, 66-67

The "first-order" evaluative components, technical verification and situational verification, will be examined in the following chapter, as a form of provisional application of the approach outlined here. The "second-order" components examine policy in "the societal system as a whole", asking questions concerning the systems and ideological discourses of society, and evaluates accordingly (Fischer, 1995, 21). Given the scope and analytical detail required to evaluate "second order" systemic component, these will not be the primary concern of the application in Chapter 3.

2.5 Summary: From Design to Application

This chapter has selected and developed an existing policy framework as a foundational mechanism for improving environmental policy evaluation. Existing literature on frameworks was explored to justify a framework as an alternative to economic evaluation approaches discussed in Chapter 1. Explicit selection criteria were discussed to select the IAD framework as a suitable mechanism for this project. The second half of this chapter built on the selected IAD framework. The framework was examined in depth, and potential limitations concerns were discussed. Post-positivist evaluation theory was also explored to strengthen the evaluative capacity of the framework. This corresponds with the aims discussed earlier: to conduct evaluation from a holistic perspective that explicitly engages with the normative implications that manifest in theories, models, and their assumptions. The following chapter will pursue a preliminarily application of the amended framework developed here.

Chapter 3

Testing the Framework: A Preliminary Application

> The existing RET is broken. Both the Opposition and the clean energy industry know this. Since the RET was introduced in its current form six years ago market conditions have changed and there is now an oversupply of electricity. The RET is now out of step with the energy and consumer market in which it operates…"
>
> - Hon. Greg Hunt MP, Minister for the Environment
> "Government Focussed On Repairing The RET"
> Joint media release with Hon. Ian Macfarlane MP,
> Minister For Industry And Science, 16 March 2015

3. Introduction

This chapter undertakes a preliminary application of the IAD framework discussed in chapter two, aiming to systematically analyse a complex environmental policy issue in an evaluative way. This preliminary application will examine the major 2015 amendments to the RET legislation. It will evaluate the justification and the intended outcomes of the 2015 amendments, in relation to the objectives set out in the original policy legislation. The evaluation undertaken in this chapter will investigate the legitimacy of the Federal Government's justification for the 2015 RET amendments, as described in the above quote. The term preliminary is used to highlight the intention of the application: to selectively apply the framework and provide examples to demonstrate its use in further research, rather than offering a completed analysis of the RET or the Australian RE sector. This application therefore explores the capabilities of the framework when applied to a recent policy issue. This tests the strengths of this approach highlighted in Chapters 1 and 2, particularly its facilitation of evaluation through knowledge building, and its ability to explicitly engage with the interests of agents in the policy process.

3.1 Australia's Renewable Energy Target

The RET is a commitment by the Federal Government aimed at encouraging renewable energy sources for electricity and reducing Australia's greenhouse gas (GHG) emissions from electricity generation. Stemming from the previous incarnation known as the Mandatory Renewable Energy Target (MRET) in 2001, legislation for the current expanded RET was implemented in 2010 and contains mandatory targets that guarantee that 20% of the total amount of power is generated from renewable sources by 2020. This target was mandated in 2010 as a fixed figure of 41,000 Gigawatt hours (GWh) based on projected energy usage from 2010 forecasts. With recent electricity consumption falling below the 2010 projected increases, the target of 41,000 GWh would have been equal to approximately 27% of total electricity production in 2020 (Warburton Review, 2014, 15-16). This projected minimum generation change from 20% to 27% of total electricity became the primary catalyst for a major reassessment of the 41,000 GWh target by the Federal Government.

3.1.1 the 2010 RET Objectives

The objectives are outlined in the Commonwealth Renewable Energy (Electricity) Act (REE Act, 2000) as follows:

> "The objects of this Act are:
> (a) to encourage the additional generation of electricity from renewable sources;
> (b) to reduce emissions of greenhouse gases in the electricity sector; and
> (c) to ensure that renewable energy sources are ecologically sustainable" (REE Act, 2000, 1).

3.1.2 RET Reviews

A number of reviews of the RET (or MRET) have been commissioned by the government, such as the 2003 Tambling Review, the Climate Change Authority (CCA) reviews in 2012 and 2014 and the 2014 Warburton Review. Given the legislated requirement for review of the RET every two years, the Federal government, assembled an independent Expert Panel to conduct the 2014 RET Review (hereafter

the Warburton Review). The review included government commissioned modelling, public consultation through submissions from any interested parties, and culminated in a report to be presented the Federal Government in August 2014.

3.1.3 The 2015 Amendments to the REE Act[10]

Following the release of the Warburton Review, the Federal Government undertook extensive negotiations to alter the legislation dealing with the RET. The agreed changes were passed through both houses of parliament in June 2015. This evaluation will focus on the following two key amendments:

1. *"reduce the large-scale renewable energy target (LRET) from 41,000 gigawatt-hours (GWh) by 2020 to 33,300 GWh with this level to be maintained until 2030."*

The LRET is the RET component which legislates the minimum generation from RE sources. This is in contrast to the uncapped small-scale renewable energy scheme, (SRES), which is an uncapped mechanism to encourage household or small-scale commercial RE generation. RET. The 33,000GWh figure was a bipartisan compromise negotiated over a number of months, and was justified by the 2015 revised projections of electricity market conditions (Hunt and Macfarlane, 2015)[11].

2. *"allow full exemptions to be provided for electricity used in prescribed emissions-intensive trade-exposed (EITE) activities, so that they do not need to purchase and surrender large-scale generation certificates".*

This represents a significant change in the legislation, as EITE firms now allocated a number of exemption certificates that offsets the equivalent of 100% of the RET impacts. Previously, firms defined as "highly emission-intensive" were exempt at what was approximately a 90% rate, and "moderately emission-intensive" firms were

[10] Note that these are two of the four amendments that were enacted in 2015. Two additional amendments regarding review procedure and the re-inclusion of native forest biomass were also included, however the implications of these amendments will not be examined in the following evaluation.

[11] See Appendix 1 for a yearly comparison table of the 2010 target and 2015 amended yearly targets.

exempt at a 60% rate. The new 100% exemption now applies to both highly and moderately emission-intensive EITE businesses.

3.1.4 Real-time Evaluation: Linking Intended Outcomes and Policy Objectives

The evaluation conducted by applying the IAD framework is a practical example of the *ex nunc* or 'real-time' policy evaluation, which contributes to knowledge building as a component of the ongoing process of evaluation. Real-time evaluation can improve on current evaluation approaches by highlighting potential problems or discrepancies more immediately. The IAD framework is applicable at different stages of the policy process, and an evaluation of the intended outcomes of changes contributes to knowledge building at a time when evaluation of outcomes is not yet possible. Given the amendments were only implemented in 2015, appropriate empirical evidence of the impacts is not yet established. The information used in this preliminary application therefore draws from the Reviews conducted in 2014. The re-examination of these sources, and their contributions to the 2015 amendments highlights the versatility of the IAD framework in new contexts, and the ability of the framework to engage with the interests of policy agents in a way that was not wholly captured by the Warburton Review. Each of the sections of the IAD framework examined will conclude by highlighting the findings of the IAD framework in this preliminary application.

3.2 External Factors

The IAD framework includes assessments of external (or exogenous) factors, which are key components in breaking down complex policy scenarios. The biophysical conditions: community attributes, rules-in-use, and political-economic context, highlight factors that influence or constrain the institutional arrangement of the action arena. The action situation is therefore the dependent variable that is potentially a consequence of these given underlying and independent factors (Ostrom, 2005, 13-15). These factors may be determined as a result of separate action situations, particularly where inter-related policies or programs promote multi-factorial contributions to certain outcomes. In application, this considers the subject in a

constructed isolated way, whilst still acknowledging the existence of many other policies that directly or indirectly impact upon the subject of analysis.

3.2.1 Biophysical and Material Conditions

The unique Australian biophysical conditions have shaped the culture and the economic prospects of Australia. Australia's long history with, and reliance on, energy intensive industry has shaped the common narratives of Australia's prosperity (Crough and Wheelwright, 1983, 17). As a result, these industries have a significant path dependent political economic stronghold. For example, the recent mining boom continued the above trend levels of growth in Australia, and simultaneously entrenched the position of these global mining interests in the heart of the federal political system (Battelino, 2010 in Bell and Hindmoor, 2014, 471). While the utilisation of natural resources was contingent many factors, such as the global economic conditions, or the unprecedented growth of nearby countries, it would not have been possible without the natural stock of resources itself.

The geographic specificity of resources therefore influences policy. One example is the state-based concentration of natural assets. States such as Western Australia and Queensland contain the predominant stock of non-RE resources, namely coal and gas, and were the primary recipients of investment during the mining boom (Marsh, Lewis and Chesters, 2014, 715). Similarly, certain states have better natural conditions for the establishment of RE of fossil fuel generation facilities, as demonstrated in the generation of RE and fossil fuels in different Australian states Table 3.1. The importance of biophysical conditions is therefore twofold: it both shapes the outcomes themselves, and also shapes the other exogenous variables considered in the framework, such as institutions or political economic context.

Table 3.1: Renewable Energy and Fossil Fuel Generation by state, 2014

State	Total Generation (GWh)	Fossil Fuel Generation (GWh)	Renewable Generation (GWh)	Penetration of Renewables (%)
SA	11,933	7,115	4,817	40%
WA	18,425	16,082	2,343	13%
VIC	53,203	48,037	5,166	10%
TAS	11,004	584	10,420	95%
NSW	60,594	57,226	3,368	6%
QLD	57,683	53,797	3,885	7%

Source: Adapted from Clean Energy Australia Report, Clean Energy Council, 2014, 9

3.2.2 Community Attributes

The community attributes encompasses the culture and attitudes of the community affected in the action arena (Ostrom, 2005, 26). At a national level, the concern of households and firms regarding electricity prices was a primary issue in RE policy debate. This was a main concern of the Warburton Review and modelling, as well as dwarfing public discourse on the carbon tax/emissions trading scheme (ETS) legislation through the Labor Government's time in office (Saddler, 2013, 6; Commonwealth of Australia, 2014, 1) For example, on the issue of energy sources, 84% of respondents placed solar energy in their top three, where only 13% ranked coal. Over 70% of Australians support a commitment to 20% of energy sourced from RE by 2020 (Climate Institute, 2014, 4). The following table highlights the results of respondents when ranking their top 3 preferred energy sources for Australia.

Table 3.2: Survey Respondents' Preferred Australian Energy Sources

Energy Source	Respondents (%)
Solar	84%
Wind	69%
Hydro (Dams)	47%
Tidal/Wave	30%
Geothermal	24%
Gas	21%
Nuclear	13%
Coal	13%

Source: Climate of the Nation, Australian Climate Institute Publication, 2015

3.2.3 Rules-in-use

Rules-in-use, are referred to by Ostrom and colleagues as "shared understandings by participants about *enforced* prescriptions concerning what actions (or outcomes) are *required*, *prohibited*, or *permitted* (Ganz, 1971; V. Ostrom 1980; Commons, 1968 in Ostrom, 2005, 18 [emphasis from text]). Determining which of these rules is relevant, given they could be formally stated or more implicit institutionally based 'working' rules, is done so "according to their direct impact on the working parts of the action situation" (Ostrom, 2005, 20-21). One such example of these formal rules is demonstrated in Figure 3.1 below, which highlights a number of possible legislations a RE project may be affected by (Martin and Rice, 2015, 129). Conceptualising the relevant formal rules-in-use for evaluation in this context considers how these rules were dismantled, appropriated, or undermined. The introduction of the 'expert panel' for the 2014 Review despite the legislated role for the CCA Review is an example of this process (CCA Legislation Amendment, 2015; RET Amendment Bill, 2015). In this case, the circumvention of formal rules through informal processes reflects the Coalition Government position on RE policy.

Figure 3.1: RE-related policies, Legislation and Regulations in Australia

RE Project Approval	Policy, Legislative, Regulatory Area	Government Layer		
		Federal	State	Local
Environmental	*Environment* *Biodiversity* *Native Vegetation*	EPBC Act (1999)	Environmental Planning and Assessment Act (1979) [a] Native Vegetation Act (1991) [c]	Each local government – city municipality or shire – will have their own set of policies, plans and operating regulations in the areas of building and development planning; environmental health; environmental management; and roads and infrastructure. Developers will need to comply with these local government requirements to gain project approval.
Permitting	*Development & Planning (incl. Air Services & Civil Aviation approvals)*	Civil Aviation Safety Authority (2007) Advisory Circular 139-18(0) Obstacle Marking and Lighting of Wind Farms	Sustainable Planning Act (2009) [b] Development Act (1993) [c] WA State Planning Policies [e]	
	Native Title	Native Title Act (1993)	Native Title Act (1994) [c] Traditional Owner Settlement Act (2010) [d]	
	Indigenous Culture & Heritage	Aboriginal and Torres Strait Islander Heritage Protection Act (1984)	Aboriginal Heritage (SA) Act (1988) [c] Aboriginal Heritage (Vic.) Act (2006) [d]	
	Land Management		Land Act (1994) [b] Pastoral Land Management and Conservation Act (1989) [c]	
	Natural Resource Management		Natural Resource Management Act (2004) [c] Water (Resource Management) Act (2005) [d]	
	Roads & Traffic		Transport Infrastructure Act (1994) [b] Road Management Act (2004) [d]	
	Electricity Supply		Electricity (Qld) Act (1994) [b] Electricity (SA) Act (1996) [c]	
	Health & Safety		EPA (2000), NSW Industrial Noise Policy [a] Occupational Health, Safety and Welfare Act (1986) [c]	

Source: Martin and Rice, 2015, 129

3.2.4 Political-Economic Context

This external factor is an addition, as discussed in earlier [section number], has a major significance for the 2015 amendments. For example, a major catalyst for the alterations to the RET legislation was the change of government in September 2013. The current Coalition Government campaigned for, or made election promises on the abolition of the carbon tax, the CCA, ARENA, and the CEFC (Hannam, 2014; Abbott, 2014; CCA Repeal Bill, 2013). The governments RE policy stance was elucidated in the 2015 Energy White Paper, 2015. This implies Australia's continuing reliance on fossil fuels, with innovations limited to productivity and competitiveness measures.

The term ‘climate change’ is used only once (Energy White Paper, 2015). However, these earlier attempts to reduce the RET were blocked or amended in various deals by the senate crossbench (Hannam, 2014). These 18 senators therefore hold considerable influence over Australia’s RE policy, and are a major contributor to action situation outcomes.

Further, the biggest catalyst for the RET legislative changes was the unprecedented fall in Australia’s electricity demand, which peaked in 2010 (Warburton Review, 2014, 15; Saddler, 2013, 4). The contributors to this change in electricity demand include the increased energy efficiency programs (primarily regulatory standards and restrictions), a refocus away from electricity-intensive industries in the Australian economy, and the elasticity of demand in household electricity consumption (Saddler, 2013, 5). Coupled with a significant concern among consumers about further increasing electricity prices, the possibility of the RET causing over-generation or excessive capacity was a primary motivation for the Federal Government (Hunt and Macfarlane, 2015). This also coincided with the extensive debate regarding the carbon tax, further increasing consumer consciousness of electricity expenditure (Saddler, 2013, 6).

3.2.5 External Factors: Findings from the IAD Application

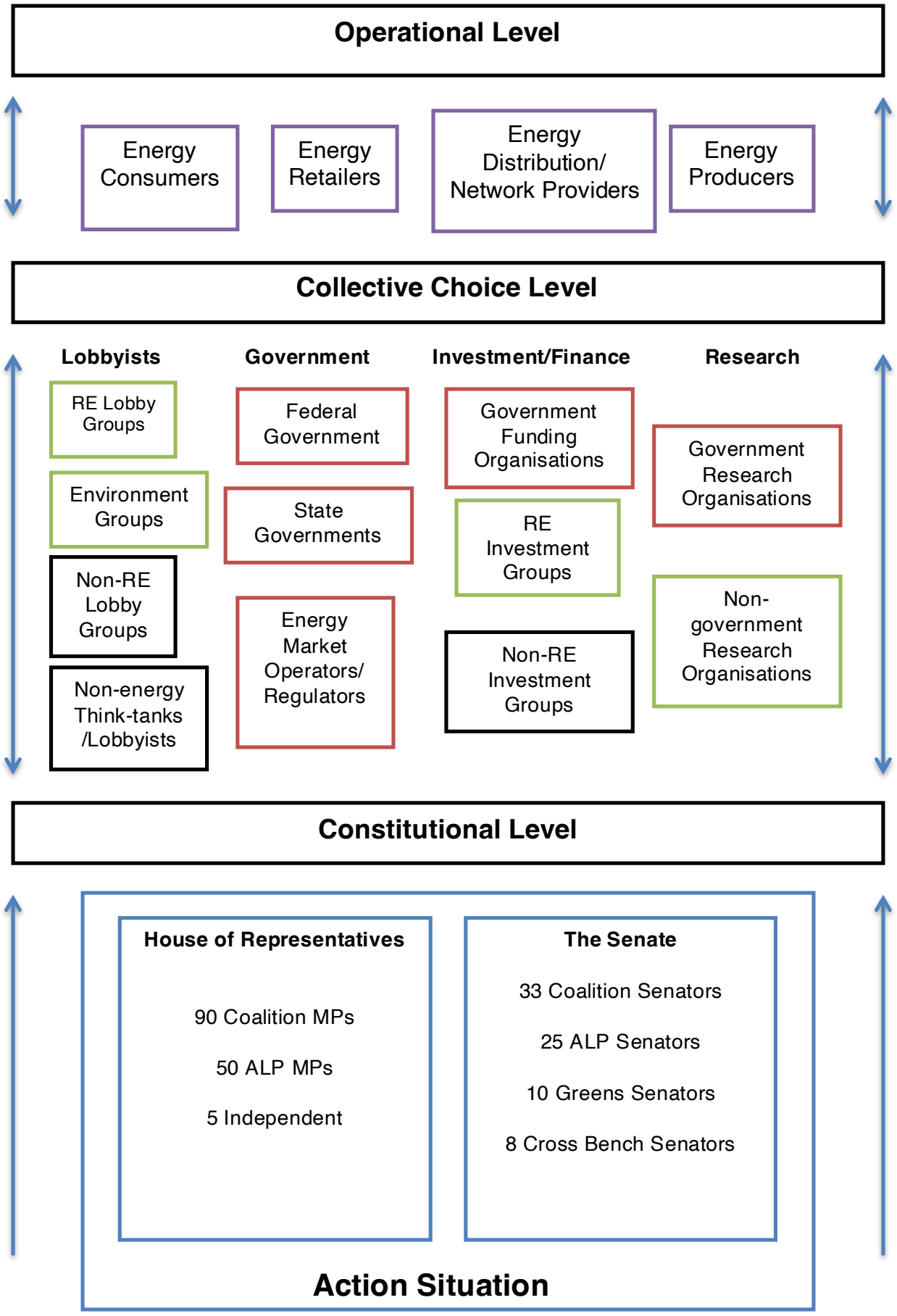
The use of the IAD framework in establishing these external factors highlights the relevant variables to consider for the influences on the action situation. External factors account for unforseen events or policy consequences that influence the action situation, such as the unprecedented fall in electricity consumption in Australia. This provides broader explanatory significance for evaluation by systematically investigating the relevant factors that contextualise policy. The consideration of external factors in evaluation encourages a holistic engagement with complex policy phenomena, whilst still providing focus for those that directly impact the action situation.

3.3 Situating the Action: Ostrom's Action Situation

The IAD framework also promotes assessment of the layering of different levels, each with interconnected action situations is dependent on the phenomena under examination, and this flexibility allows for the broader applicability of Ostrom's framework. In the 2015 RET amendments the primary action situation takes place at the 'constitutional' level as the pivotal decision-making takes place in Federal Parliament. Yet, the influence of other action situations and different levels of analysis, containing different (or overlapping) agents must be considered to contextualise the decision making processes of these parliamentary agents. For example, the decisions of government as connected to the interest groups and lobbyists with whom the agents of government consult. These agents at the 'collective choice' level are therefore considered in the evaluation of outcomes at the constitutional level.

However, Ostrom's characterisation of the levels of analysis of the framework is not only a 'downstream' relation, as represented in Figure 2.3 discussed in section 2.3.2. The flow of influence and relationships occurs in the opposite direction through more indirect, non-legislative channels (Blomquist and deLeon, 2011, 4). Formal regulatory requirements imposed by legislation do have downstream impact on the collective choice and operational level. However, the reverse flow of less explicit, institutional dynamics is also relevant, particularly in environmental issues. This is demonstrated in Figure 3.2.

Figure 3.2: Characterising the Action Situation for the RET Amendments



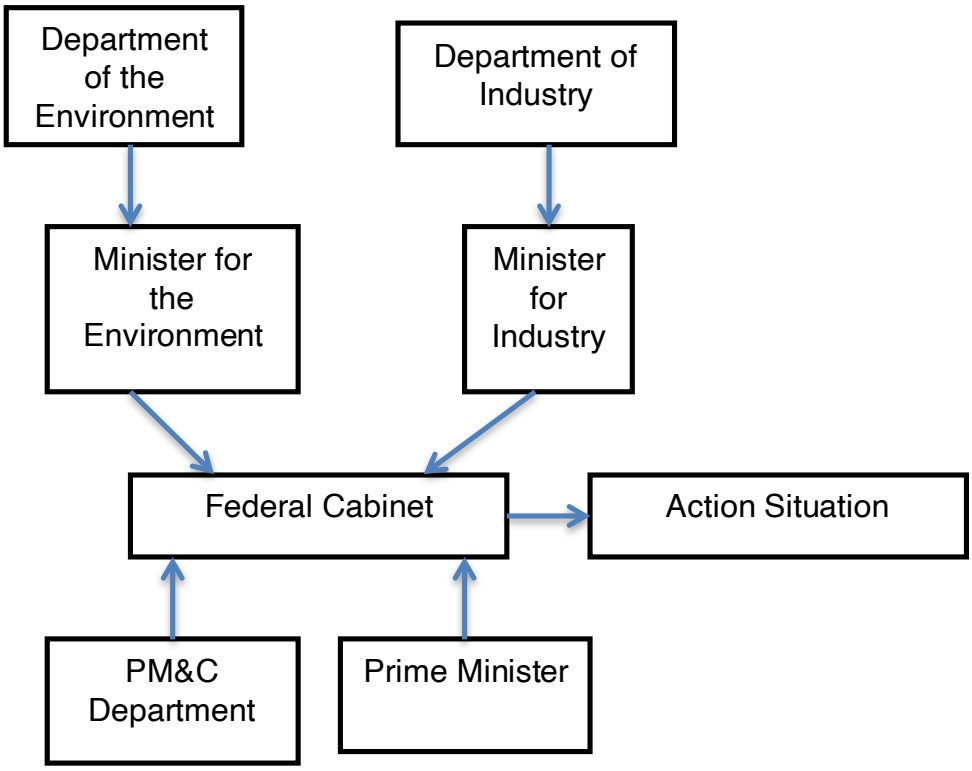
3.3.1 Actors

The following highlights some of the key actors (or agents) involved in the action situation, and the relevant related action situations. Each of these agents has specific interests in the policy process, and possible coalition of interests has been highlighted at the constitutional choice level in Figure 3.2, using colours to represent potential interest alignments: green - likely RE aligned, black – likely non-RE aligned, red – government institutions and agencies. Note that these categories simplify the characterisation of certain agents. For example, at the operational level, the increased uptake of solar photovoltaic generation (PV) among households and small and medium-sized enterprises (SME's) alters the kinds of agents involved in the production, distribution and consumption of electricity in Australia.

Table 3.3: Examples of Agents in the Action Situation

Agent Type	**Example**
RE Lobby Group	Clean Energy Council
Environmental Groups	Greenpeace, WWF
Non-RE Lobby Groups	Minerals Council of Australia
Non-Energy Think Tanks/Lobby Groups	Business Council of Australia
Federal Government*	Divisible into a number agents which may be in potential conflict *See Figure 3.2.
State and Territory Governments	NSW, QLD, VIC
Energy Market Operators/Regulators	Australian Energy Market Operator, Clean Energy Regulator (CER), Australian Energy Regulator (AER)
Government Funding Organisations	Clean Energy Finance Corporation (CEFC), Australian Renewable Energy Agency (ARENA)
RE Sector Investment	Southern Cross Venture Partners Pty Ltd Fund; Softbank China Venture Capital
Non-RE Investment Groups	Standard superannuation funds, equity firms Australian Ethical Investment; Australian Banks (eg. NAB Climate Bond, ANZ Green Bond)
Government Research Organisations	CSIRO
Non-government Research Organisations	Universities; private companies
Electricity Retailers	Representation by the Energy Retailers of Association of Australia: for firms such as AGL, Energy Australia, Origin Energy, Aurora Energy
Electricity Consumers	Households, SME's, Industry
Electricity Distribution and Network Providers	Ausgrid, Endeavour Energy (NSW examples)
Electricity Producers	RE and Non-RE producers themselves, for domestic consumption or export, represented by peak bodies

Figure 3.3: the Federal Government in the Action Situation: an Example



3.3.2 Action Situation

The action situation is what Ostrom refers to as the "social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or, fight" (Ostrom, 2005, 14). Given the complexity of environmental problems, most policies contain many interrelated action situations. Agents at the collective choice or operational level significantly influence constitutional interactions.

The foremost of these is business-based actors are business associations. The power of business in market capitalism is unlike the power of any other interest group. Their power stems from their structural position as integral to the operation of the economic system, through the provision of goods and services (Lindblom, 1977, 171). This is reinforced through the structural relationships between business and government, where businesses "do not appear simply as the representative of a special interest… they appear as functionaries performing functions that government officials regard as

indispensable" (Lindblom, 1977, 175). This may be through official roles in advisory boards, committees or other consultation positions, which have increased since the 1950's in Australia (Mathews 1976, in Warhurst, 2010, 339).

This suggests that businesses in the energy industry have significant influence over the decision making of government. The long-standing role of emissions-intensive industry in the Australian economy, and the strong tradition of business-government relations can be seen to highlight the structural and institutional power of mining, resource and fossil fuel intensive industries (Crough and Wheelwright, 1983, 23-25). The formulation of Energy White Paper's in previous years contained consultations with exclusively fossil fuel business interests, with no RE stakeholders included in these consultations under either the Howard or Rudd/Gillard Governments (Diesendorf, 2012, 46,53). This too can be seen in the Warburton Review, where the 'expert panel' was primarily composed of business representatives. This was most obvious in the appointment of Dick Warburton to lead the Review, as an ex-chairman of fossil fuel company Caltex Australia. He has also publically expressed his scepticism in the scientific findings related to anthropocentric climate change (Harrison, 2014).

However, this power does not stem exclusively from a firm's structural position of power. Bell emphasises the notion of agency of both government and business agents, highlighting that they are constrained by ideas, and are threatened by the perception of outcomes or changes (Bell, 2012, 662; Marsh et al., 2014, 714). The power of these agents in this scenario therefore may not be explicit. The role of business organisations, whether in a lobbying or a more explicitly integrated role is therefore one of both economic and political power (Bell, 1995, 29-30). The less explicit links between the demands of business and government decision-making are also evident in the RET Amendments. The power of ideas, and the perceived threat of 'green' groups becomes another mechanism by which non-RE interest groups dominated consultations. Animosity between conservative ideological traditions and 'green' interests may have encouraged the preference more traditional fossil-fuel intensive industry in the conservative agenda of the Abbott Government.

3.3.3 The Action Situation: Findings from the IAD Application

The analysis of the action situation highlights the institutional factors entirely unrecognised in mainstream evaluative techniques. It is able to explore the relations between agents through and within different levels of analysis, and how these influence the action situation relevant for evaluation of the amendments, namely the Federal Parliament, characterised here as the 'constitutional level' in IAD terms. Different agents can be characterised as complex multi-level organisations or individual agents, and this emphasises the actions of agents in Parliament as contingent on the operation of other arms of the Federal Government.

The link between the external factors and the impacts on the action situation facilitates the incorporation of the interests of agents, and provides explanatory significance of evaluating environmental policy. For example, the importance of the formal and informal rules that give the crossbench senators significant power in the action situation is one such relation. Further, the alignment of different state governments with the interests of different industry is linked through the biophysical conditions. The divergent review submissions of state governments in the Warburton Review can be explained by the differing concentrations of RE and fossil fuel industries (Warburton Review, 2014). The recommendations of state governments in review consultations was contingent on the industry influence in that state area, an outcome which was highlighted by applying theories of business power in the context of the action situation. The IAD framework therefore allows for systematic engagement with the interests of agents.

3.4 Technical Verification: Efficacy and Cost-Effectiveness

The outcome-based evaluative criteria discussed earlier in section 2.4.3 are used in a way that incorporates Fischer's public policy schema to draw evaluative conclusions about the intended outcomes of the 2015 RET Amendments. As discussed earlier, Ostrom's evaluative criteria are grouped into Fischer's two sections: first order evaluation as technical verification and situational validation, and second-order evaluation as systems-based vindication and social choice. The remainder of this chapter will examine the first-order evaluation considerations in this exploratory

application. The possibilities for second-order evaluation in further research will be discussed in the following concluding chapter.

In this context, technical verification compares how the policy has performed in comparison to the initial objectives, considering efficiency and cost-effectiveness of the policy. As discussed in section 1.1, economic use of the term efficiency is highly problematic, as its use normatively implies it is both a primary authority of policy and that this stems from "scientific objectivity" (Bromley, 1989, 87). This section will therefore evaluate a form of 'efficiency' as efficacy and cost-effectiveness against the original objectives, to examine the justification for the 2015 amendments.

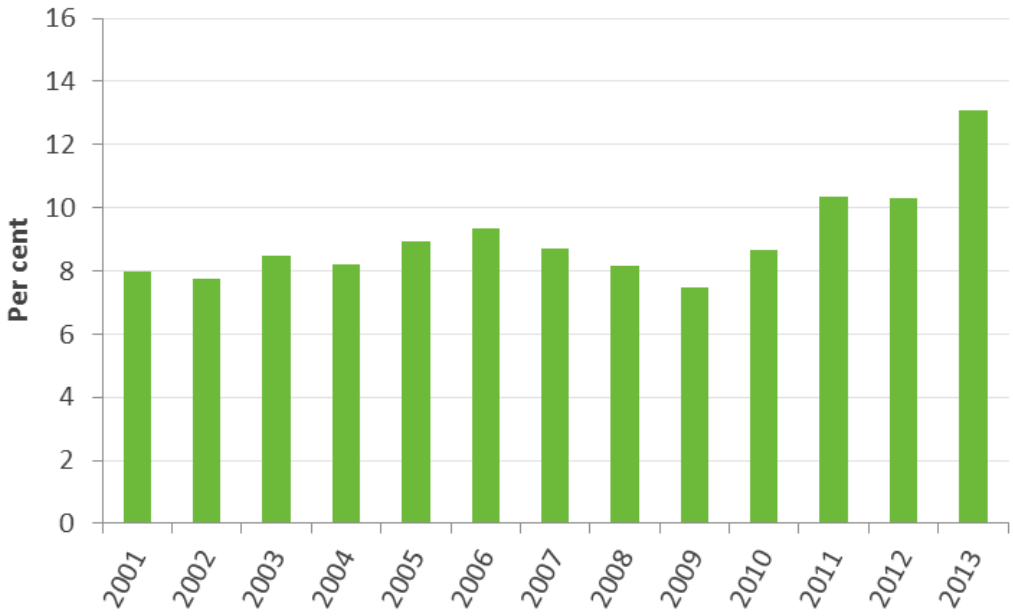
3.4.1 Encouraging RE Electricity Generation

The Warburton Review highlights several points that indicate the efficacy of the RET in encouraging renewable electricity generation:

> For the LRET, "capacity has grown by around 5,100 MW [since 2001] to 13,100 MW in July 2014. 2,400 MW of this capacity has been added since the RET scheme was expanded in 2010".
>
> For the SRES, "over 2 million small-scale renewable energy systems have been installed under the RET (CER, 2014)" (Warburton Review, 2014, 6-7).

The Warburton Review conclusion of the RET performance was reiterated in the submissions of interested parties, such that "most submissions acknowledged that the RET has delivered on the objective of encouraging the additional generation of renewable electricity" (Warburton Review, 2014, 10). The contribution of RE to total electricity generation is depicted in Figure 3.4, with the increase in 2010-11 corresponding with the implementation of the RET, and other targeted energy efficiency and environmental policies.

Figure 3.4: RE electricity generation as % of total electricity generation



Source: CCA Review, 2014, 12

3.4.2 Emissions Abatement

The Warburton Review and many submissions noted the contribution of the RET in emissions reduction. As a result of the RET, abatement was estimated by SKM to be around 20Mt between 2001 and 2012 (Warburton Review, 2014, 11). Using similar methodology, ACIL estimated the cumulative impact of an LRET repeal compared to the pre-amendment case, summarised in the following table:

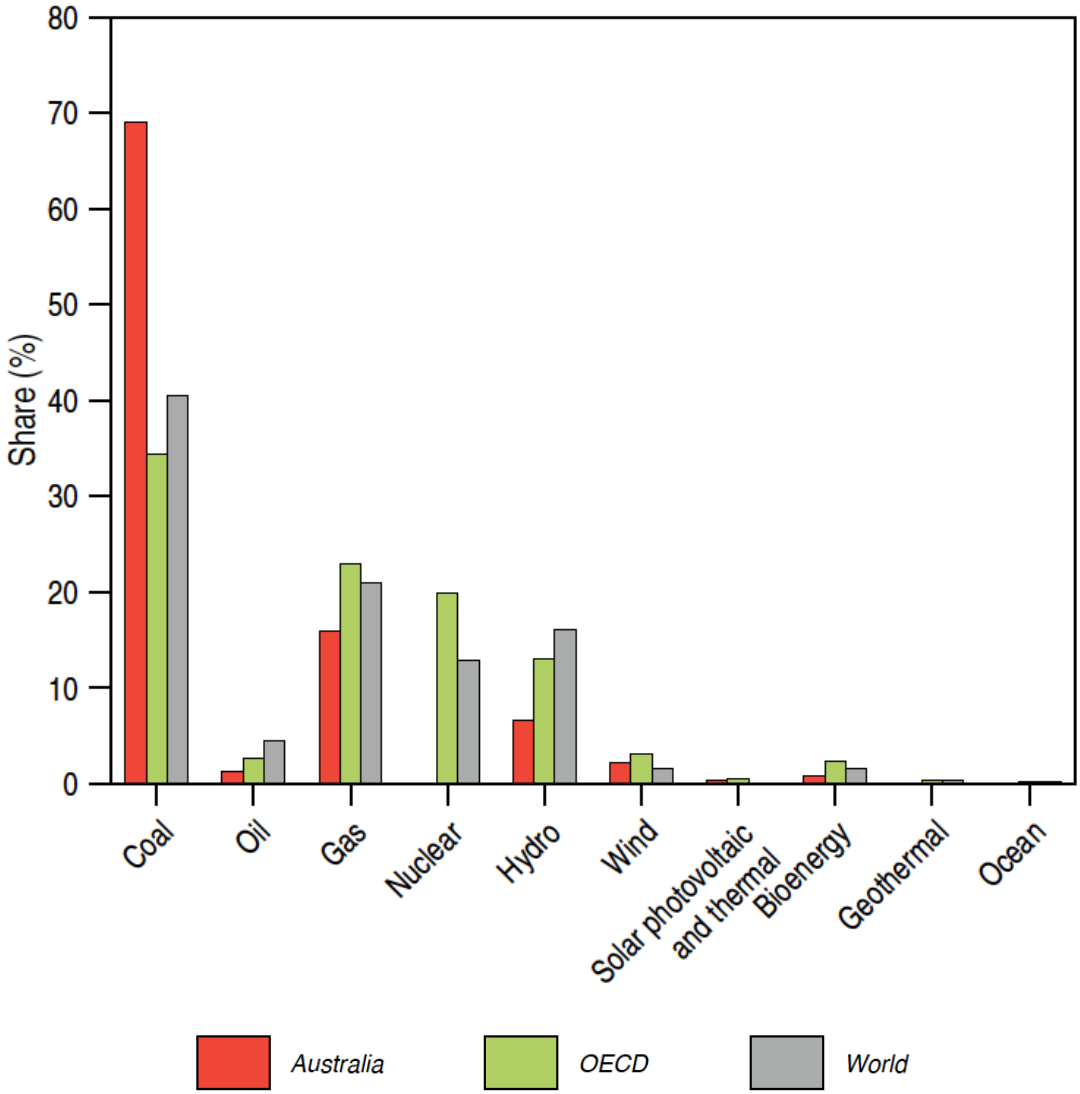
Table 3.4: Cumulative Abatement for Pre-amendment LRET

Time Period	Cumulative emission abatement (Mt CO2-e)
2001-2012	**20**
2015-2020*	58
2015-2030*	299
2015-2040*	520

Source: SKM, 2012, in Warburton Review, 2014, 60; * cumulative forecast

Australia's electricity generation has the highest GHG intensity of the OECD (Buckman, 2010, 74). This is a recent phenomenon, attributable to Australia's "dependence on coal and its relatively modest use of RE electricity" (Buckman, 2010, 75). Australia's dependence on coal in electricity generation is demonstrated in Figure 3.5. This presents the imperative for policy directed specifically at Australia's electricity sector for Australia's long-term emissions abatement project, domestic energy security agenda and international emissions obligations. This was reiterated in the 2014 CCA Review as an ongoing justification for the retention of the full RET target (CCA Review, 2014).

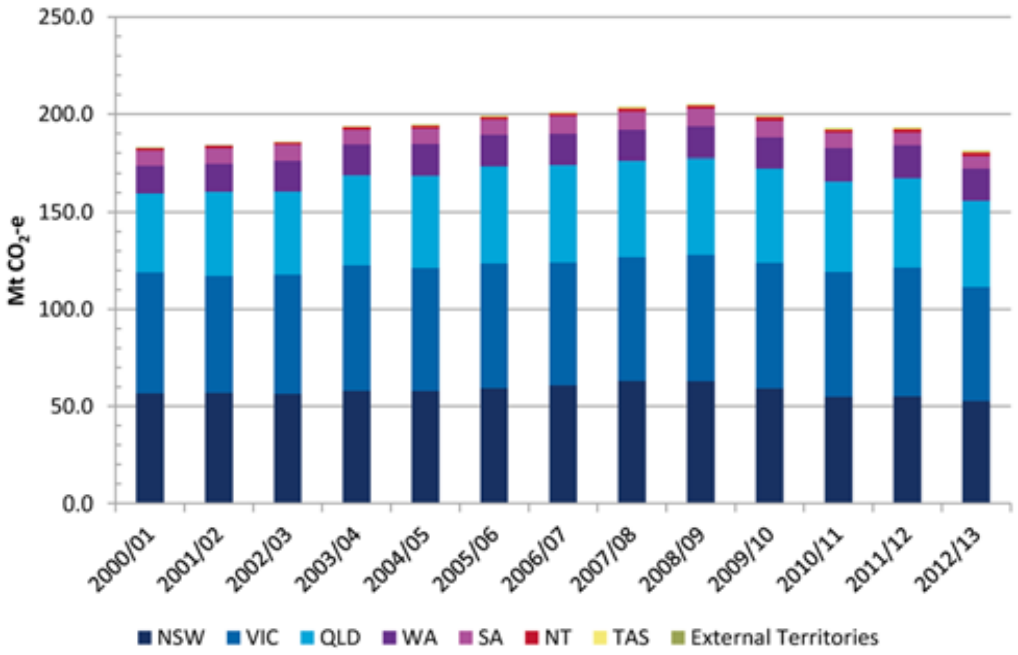
Figure 3.5: Fuel Mix in Electricity Generation, 2010



Source: Australian Energy Resource Assessment, 2014, 12, data from: IEA, 2012

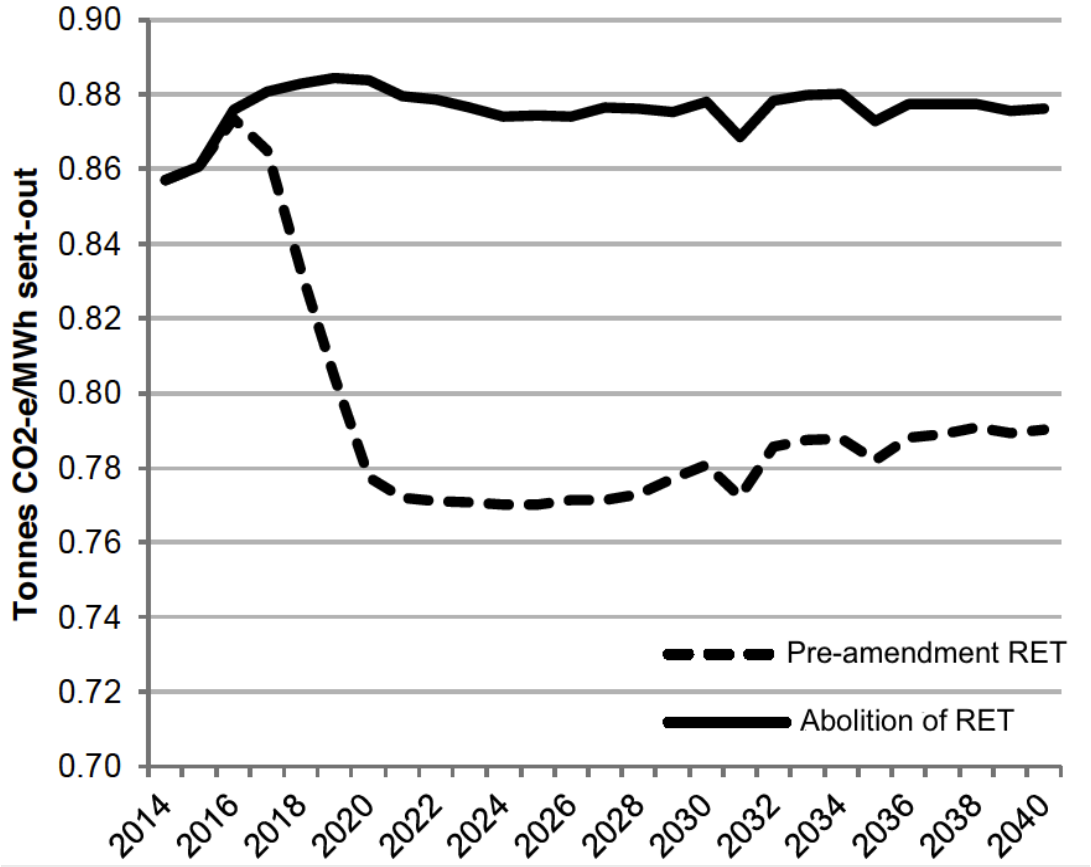
This is demonstrated in Figure 3.6, where reductions in CO2 emissions in the electricity sector significantly decline in the transition from the MRET to the full scale RET (both SRES and LRET). Note that emissions reductions are also attributable to the interaction with a number of other abatement and energy efficiency policies. The cumulative contribution of 20Mt over the period 2001-2012 therefore represents less than 10% of any given year at peak emissions, considered a "modest level of abatement" (Warburton Review, 2014, 11; CCA Review, 2014, 159). The impacts of the pre-amendment RET on electricity sector emissions intensity, which factors in electricity consumption (as MWh sent out), can be seen in Figure 3.7.

Figure 3.6: Electricity Sector CO2 Emissions by State, 2000-2013



Source: Warburton Review 2014, 12, data from Department of the Environment

Figure 3.7: Projected Electricity Sector Emissions Intensity



Source: ACIL Allen, 2014, 31

3.4.3 Cost-effectiveness

Economic policy recommendations imply either fixing a price on emissions, or fixing a quantity of pollution (GHG emissions) as the most cost-effective approach (Keohane and Olmstead, 2007, 151-153, 180). However, this economic theory relies upon optimality notions that have major real world limitations. Previous reviews have highlighted these limitations, citing real world complications and accountability issues, and the deficiency of a unilateral policy approach (CCA, 2012). The concept of 'optimal solutions' to problematising emissions abatement will be rejected (in contrast to other RE research, such as Muis et al, 2010; Moriarty and Honnery, 2011).

The reduction in the fixed figure target was argued for, in part, on the grounds of the lack of cost effectiveness compared to other abatement strategies (Hunt & Macfarlane, 2015). The ACIL modelling estimates the total 'resource cost' of the pre-amendment

RET[12] to be around $10bn to 2030 in net present value (NPV) 2014 dollars (ACIL, 2014, 116). A 2011 PC report comparing international policies concluded that renewable energy schemes such as the LRET were the second most cost-effective policies for emissions reduction in electricity supply, after an emissions trading scheme. It also found that policies such as Australia's RET that set a target for quantity of RE generation were more cost-effective than price based mechanisms (Productivity Commission, 2011, 80; CCA Review, 2014, 21).

Further, cost-effectiveness measures of the RET in marginal emissions abatement cost vary significantly. The range of estimates of marginal emissions abatement costs are contingent on many future uncertainties, and rely on the foundational assumptions made about unknown phenomena inherent to environmental policy. The table in Appendix 2 highlights some of the different estimates about the cost of reductions to Australia's GHG emissions. These estimates highlight how varying assumptions can alter the outcomes of modelling, as discussed earlier in section 1.4. A single figure or range is therefore limited in providing robust answers to cost-effectiveness concerns. Further, the assumption of discounting in abatement cost calculations (such as in the Warburton Review) is disputed, as argued in section 1.3. The CCA argue that unlike holding money over time, one tonne of emissions abatement is equally valuable to the overall task of reducing global emissions independent of the time scale (CCA Review, 2014, 14).

3.4.4 Technical Verification: Findings from the IAD Application

The use of the IAD framework facilitates the evaluation of the intended outcomes of the amendments against the objectives stated in the original legislation. Where current approaches often take efficiency as the absolute criterion for policy evaluation, the IAD framework presents a contextualised multi-criteria evaluation that corresponds with broader notions of evaluation in an improved way. Breaking down notions of efficiency to efficacy and cost-effectiveness facilitates an evaluation that diverges

[12] "The cost of the RET is commonly measured by its incremental resource cost to the electricity sector … the difference between the net present value (NPV) of the resources allocated to the electricity sector with or without the RET". The incremental resource costs include the costs of building and running a renewable plant, minus the avoided fuel costs of displaced fossil fuel plant, other avoided running costs, and any avoided capital costs" (CCA Review, 2014, 13).

from the current reductionist CBA techniques. While costs and benefits can be calculated to an extent, they are not necessarily commensurable, and equating these on a purely monetary basis may have ethical implications. The acknowledgement of this through the IAD framework application therefore improves environmental policy evaluation.

A rejection of unilateral cost effectiveness also broadens the policy options, as policy evaluation no longer concerns the search for the optimal policy, but a comparison of multiple alternatives using mixed-methods through a post-positivist evaluative basis. The evaluation of these decisions therefore requires consideration of broader components, namely, the distribution of these costs, and resulting equity concern, which are inseparable components in the process of policy examination (Vatn, 2002, 149). In the framework, elements of technical verification must be balanced with situational validation, which together comprise first-order evaluation.

3.5 – Situational Validation: Fiscal Equivalence and Equity

Under the RET legislation, the 'liable entities' are primarily energy retaillers, and a small number of large firms who directly source energy from electricity generators (REE Act, 2000). However, as indirect costs, these can be passed onto to consumers, as demonstrated in Figure 3.8, where the dark blue segment represents the 4% increase in electricity costs in the financial year (FY) 2013-14. As raised by both Fischer and Ostrom, consideration of how this impacts upon different agents in the action situation is key for evaluation, and will be a primary determinant of the interests of agents in the action situation.

3.5.1 Contextualising Costs and Fiscal Equivalence

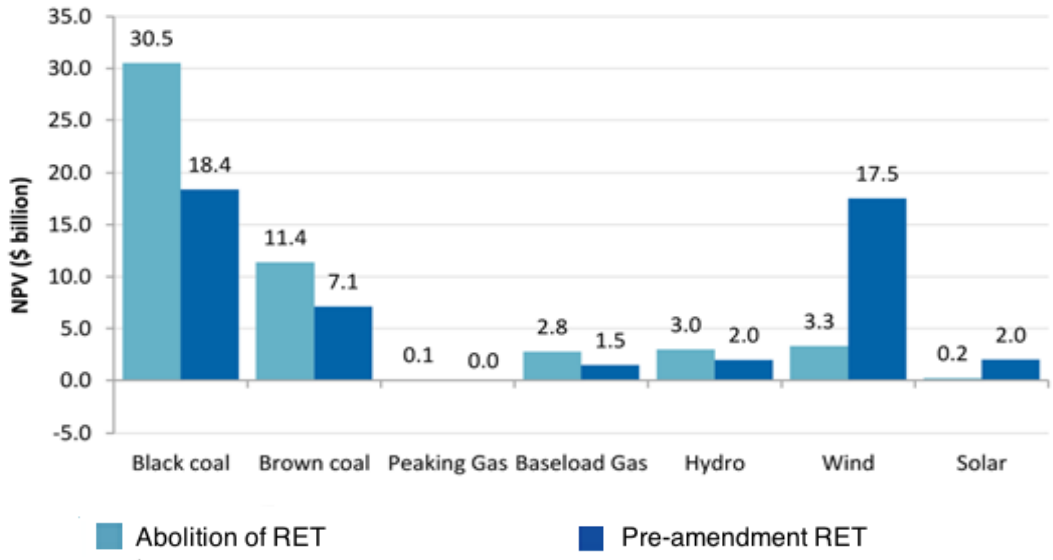
The IAD framework highlights the necessity of examining costs in the context of the agents who bear the imposition of these costs through the concept of fiscal equivalence. Both the Warburton and CCA Reviews acknowledge the asymmetric distribution of the 'resource costs' that result from the RET, estimated by ACIL to be around $10 billion NPV. The impact on electricity producers is demonstrated in Figure 3.8, where the costs of the pre-amendment RET scenario compared to the

abolition scenario is determined from the ACIL modelling. The burden of resource costs is weighted toward fossil fuel generators, in particular, coal-powered generation. This is an expected outcome, given Australia's reliance on fossil fuel generation and corresponding emissions intensity in electricity generation discussed earlier.

In the IAD framework, fiscal equivalence is described as "the extent to which the beneficiaries of a public good or service are expected to contribute toward its production" (McGinnis, 2011, 176). In the context of CO_2 production, normatively embracing the 'polluter pays' principle as an arbiter of fiscal equivalence, it can be argued that the polluters (beneficiaries) of clean air (a public good) are expected to contribute towards maintaining clean air. The justification of the amendment to reduce the target based on unnecessary costs is therefore in violation of the 'polluter pays' principle, a relatively weak normative concept from orthodox economic traditions. The reduction in the target therefore represents a redistribution of costs away from fossil fuel generators at the expense of RE generators, a notion that is at odds with the first legislated objective of encouraging RE generation[13].

[13] The 2014 CCA Review further justifies the imposition of the RET costs for fossil fuel generators on two grounds. First, the acquisition of many large fossil fuel generation plants (55% of total capacity) occurred after the announcement of the full 41,000 GWh RET or equivalent state based schemes, implying this cost was factored into investment in fossil fuel generation. Second, $2 billion assistance provided to the top emissions intensive coal-fired generators were not recouped upon the repeal of the carbon tax, despite its purpose to offset costs of the measure (CCA Review, 2014, 22-23).

Figure 3.8: Estimates of NPV Generator Revenue Pre-amendment vs Abolition



Source: Warburton Review, 2014, 38

Further, many costs were unaccounted for in the modelling submissions for the various reviews of the RET. For example, the Australian Academy of Technological Sciences and Engineering (ATSE) estimates the economically quantifiable externalities of fossil fuel generated electricity range from between A$42-$52 per MWh while the costs of solar PV energy were estimated at $5 per MWh and wind power only $1.5 per MWh (ATSE, 2009, ii). Despite justifying the RET and climate change policies through the concept of externalities as a cost to be internalised by the producer, these costs are not considered in any modelling submissions of the RET. Furthermore, submissions by parties included in the Warburton Review, such as the Institute of Public Affairs (IPA) Australia, are critical of the cross-subsidy to RE generators, without accounting for any of the subsidies paid to fossil fuel generators. The calculation of these also ranges significantly, and is contingent on the methodology used to calculate direct and indirect subsidisation. Examples are summarised in Appendix 3.

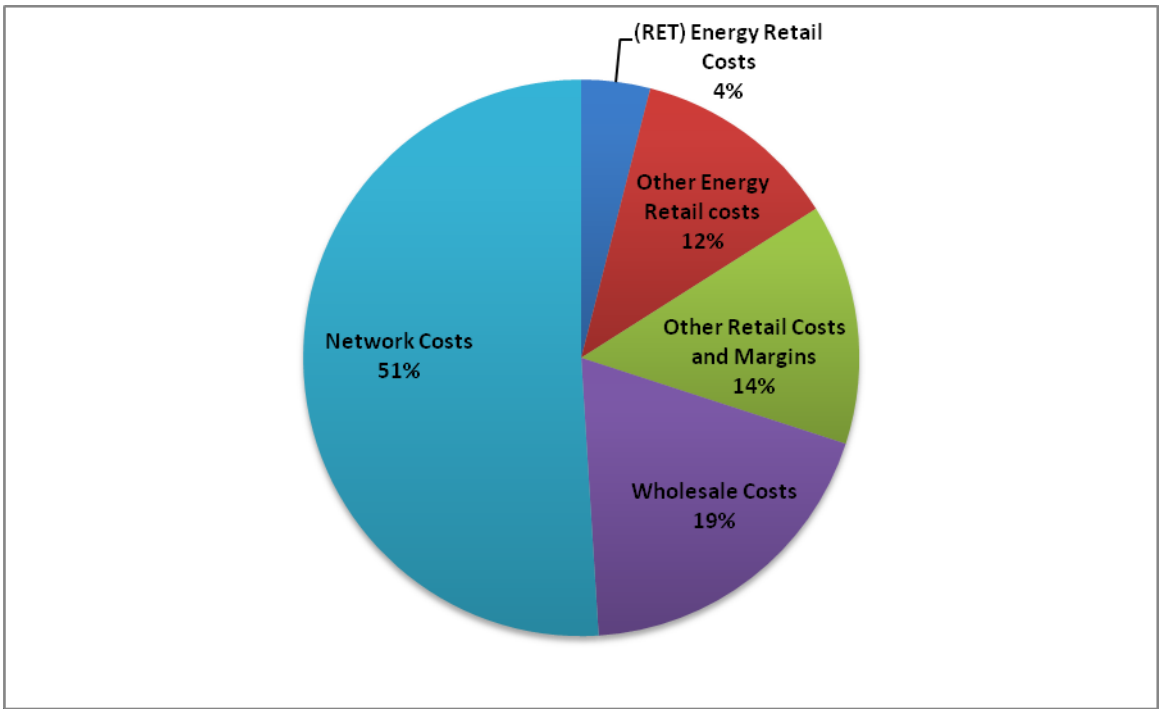
The inclusion of these costs may have significant implications for the determination of cost and policy outcomes, and the agents who may bear the cost burden. The estimated $10 billion NPV does not factor in any of these external costs. This emphasises that not only does the lower 2015 target not fulfill basic distributional

concerns of the polluter pays principle, but that the assumption of outdated considerations of economic costs has failed to incorporate the economic and environmental costs of continued coal production and CO_2 emissions. The perpetuation of these outdated ideas can be attributed to the alignment of these ideas with the interests of agents in the action situation, namely fossil fuel based generators.

3.5.2 Impact on Households: Electricity Prices and LRET

The impact on household electricity prices was a major imperative for the Warburton Review (Commonwealth of Australia, 2014). In contrast to expectations, impact of the RET on household electricity prices (NPV) is roughly neutral over the period 2015-2030 (Warburton Review, 2014, 77; ACIL, 2014). Further, as in Figure 3.10, extending the time scale to 2040 suggests that average retail electricity prices would be slightly higher for residential, commercial and industrial consumers in the longer term if the pre-amendment RET was abolished. Removing the RET "eventually leads to higher wholesale electricity prices because of the absence of additional (low marginal cost) renewable generation and less over-supply of generation capacity in the market" (Warburton Review, 2014, 77). This is known as the 'merit order' effect, where the effects of additional RE generation increase supply in the wholesale market. The extent of the RET distributional consequences is dependent on this effect, as well as the 'pass-through' of these wholesale price changes to consumers at the retail level, and the impact of any exemptions from the RET scheme (Cludius, Forrest and MacGill, 2015, 49). The 2013-14 contribution of these components to the average prices paid by consumers is summarised in Figure 3.9.

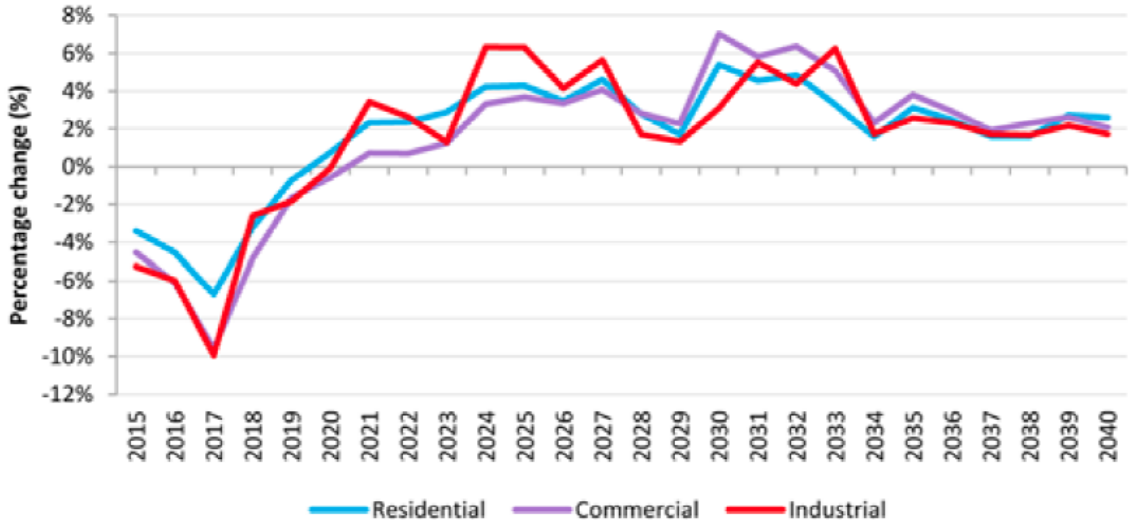
Figure 3.9:Average Australian Residential Electricity Costs Breakdown, 2013-14



Source: Adapted from Warburton Review, 2014, 18, with data from the AEMC Residential Electricity Price Trends Report, Dec 2013 for FY2013-14

Figure 3.10 compares the percentage change in electricity prices for consumers, if the RET was removed, where the 0% baseline represents the pre-amendment RET as the reference point. This demonstrates that repealing the RET leads to lower prices in the short time for consumers (in 2013-14 this cost was 4% of total costs, see Figure 3.9). However, over time the reduction of supply in the electricity market would cause an increase beyond 2020. The net effect of this to 2040 is therefore slightly higher costs to the consumer if the RET was repealed. A number of other models submitted to the 2014 Review also concluded this negligible impact on electricity prices for consumers (BNEF, 2014; ROAM, 2014; SKM, 2012 in Warburton Review, 2014, 18). The Federal Government's justification of the 2015 amendment to reduce the LRET target on the basis of the harm to electricity consumers is therefore at odds with the initial objectives of the policy (Hunt and Macfarlane, 2015; Commonwealth of Australia, 2015). It is furthermore an unfounded claim in the Warburton Review modelling.

Figure 3.10: Change in Average Retail Electricity Prices for Residential, Commercial and Industrial Consumers if Pre-Amendment RET is Removed



Source: ACIL Allen, in Warburton Review, 2014, 38

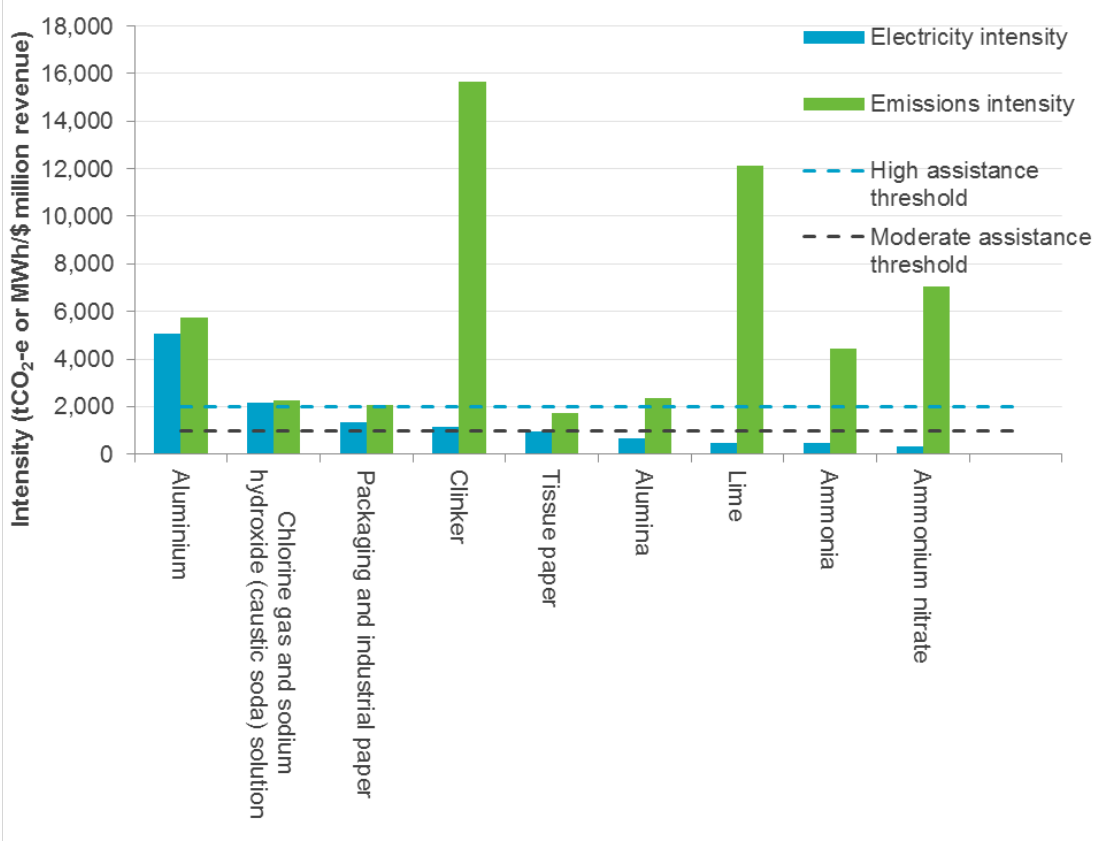
3.5.3 Equity Concerns and the Exemption Amendment

A significant concern in the academic literature on the impact of Australia's energy policies is the concessions given to EITE industries (Cludius, Forrest and MacGill, 2015; Perry, Rosewarne, White, 2013; Buckman, 2011; Clarke and Waschik, 2012). The Warburton Review raised the impact of any exemption changes for household and non-EITE industrial consumers. It estimated household electricity prices would add around $15 cumulatively to 2020 according to the modelling, and suggested an even greater burden would be faced by non-EITE industry with higher costs and no compensation (Warburton Review, 2014, 82). This represents a transfer of wealth from consumers, SME's and certain large-scale industry toward large emissions intensive industry, as there is an additional cost burden faced at the retail level through electricity price premiums. EITE industries receive the benefit of lower wholesale prices without the price impact at the retail level from the merit order effect (Cludius, Forrest and MacGill, 2015, 47-48)[14]. This issue is further exacerbated by the amendment to 100% exemption, as this places an increased burden on those remaining within the scheme.

[14] This study uses time series regression to examine these effects and their distributional implications.

Further, the 2014 CCA Review questions the qualification for exemptions based on emissions intensity rather than electricity consumption (CCA Review, 2014, 36-38). This may have disproportionate impact on certain industries, for example, the industries highlighted in Figure 3.11. The inclusion of the partial exemptions in the RET in 2010 was based reduce the impact of the synchronisation of the RET with the carbon tax and subsequent emissions trading scheme, which also included EITE exemptions. None of these considerations appeared to factor into the bilateral decision to increase exemptions for EITE firms to 100%.

Figure 3.11: Emissions Intensity and Electricity Intensity of Select EITE Industry

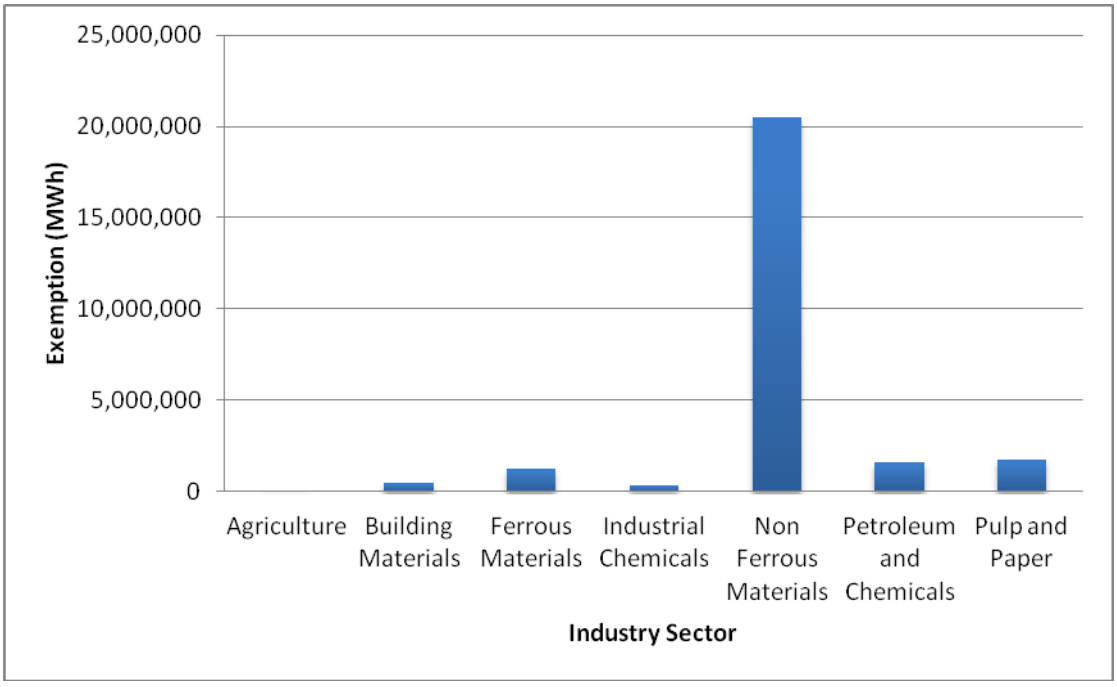


Source: CCA, 2014, 38; Department of the Environment data, emissions data for FY 2007 and 2008, revenue data for FY 2005 to 2008.

The distributional consequences of this amendment are exacerbated by the concentration of the beneficiaries. Those who qualify for the 'highly emissions intensive' category made up 97% of partial exemption certificates issued in 2013 (ACIL, 2014, A-55). As highlighted by the Independent Pricing and Regulatory

Tribunal (IPART), "these exemptions raise the costs of complying with the scheme for all other customers, particularly as the exempted industries can be large users of electricity and account for a significant proportion of electricity use in Australia" (IPART, 2012, 11). According to ACIL modelling, this proportion of exempted electricity consumption is projected to increase to 20% with the 2015 total exemption amendment, an increase from the 13% of liable electricity omitted under the EITE exemptions under the pre-amendment partial exemption scheme (Warburton Review, 2014, 81). Further, these exemptions are concentrated to particular industries, as demonstrated in Figure 3.12. The predominant beneficiaries of the 100% exemption amendment are overwhelmingly the non-ferrous materials and production industry. The concentration of this industry means these exemptions benefit a small number of firms, namely several large-scale firms in the aluminium industry. The reduction of burden to these selected agents is therefore at the expense of consumers and other industry.

Figure 3.12: Grouped EITE Industry Exemptions, 2014 by Exemptions Issued



Source: produced from Clean Energy Regulator data, 2015

3.5.4 Situational Validation: Findings from the IAD Application

The IAD Framework is a useful tool for revealing potential equity issues and their implications. Claims of economic costs, increased electricity prices for consumers, and an unnecessary burden on fossil fuel industry are unfounded. The IAD framework highlights that these justifications are perpetuated where they align with the interests of agents in the policy process, who are the beneficiaries of the potential outcomes of the 2015 amendments. Further, the perpetuation of orthodox economics approaches to evaluation are used to justify these normative positions, under the guise of 'scientific objectivity'. The use of 'efficiency' and economic costs in this way obscures their prioritisation over important distributional concerns in policy evaluation.

3.6 Application Summary

This preliminary application has demonstrated how the framework developed in Chapter 2 may be implemented to provide a pluralistic and interdisciplinary approach to environmental policy evaluation. This chapter has provided examples of how the IAD framework can be implemented in evaluating the intended outcomes of the 2015 amendments to Australia's RET. Following each section, the contributions of this preliminary application were discussed to highlight the implications of using the IAD framework to improve environmental policy evaluation. It is concluded that the 2015 amendments are at odds with the stated objectives of increasing RE generation and reducing emissions in the REE Act. Further, the justifications provided by the Government and in the Warburton Review do not withstand scrutiny. These results highlight the strengths of using the IAD framework for evaluating environmental policy, as it is able to engage with the interests of agents in the policy process and contribute to evaluative knowledge building. The implications of this application and potential future research will be discussed in the following concluding chapter.

Conclusions

"The contemporary political debate does not pit pragmatists against ideologists – rather, it pits advocates for the national interest against captives of vested interest."

- John Hewson

Former Liberal Party Leader 1990-1994

1992 Alfred Deakin Lecture

(The Australian, 15 October 1992, in Warhurst, 2010, 348)

This quote presents a common frustration with the policy process. The alternative approach to environmental policy evaluation presented in this thesis can be seen as a contribution to the mitigation of this problem. The modified IAD framework improves on current approaches by encouraging theoretical knowledge building and explicitly engaging with the interests of agents in policy.

The RET Amendments

The implementation of the IAD framework to evaluate the 2015 RET amendments presents a number of policy implications for the Australian RE sector. The inconsistency of the 2015 amendments with the established objectives of the policy, questions the legitimacy of these amendments in benefitting the RE industry or the common interest. The resulting outcomes of these amendments are likely to dampen the success of the RET, and undermines the stability of the RE industry in the near future. This is at odds with global trends toward increasing RE generation and questions Australia's commitment to the global mitigation of climate change.

Chapter 3 provides applied examples of the different components of the modified IAD framework in practice. However, there are several other aspects of these issues to be considered in order to continue knowledge building using this. This may draw in a number of other external factors, action situations, or considerations for the evaluation of the intended outcomes relevant for environmental policy. For example, equity issues in environmental policies may have distributional consequences that extend to socio-economic factors such as age, employment status, household size or regional factors (Buchs, Bardlsey, Duwe, 2011, 297-298).

Further, this application did not test for what Fischer calls "second-order" evaluative concerns (Fischer, 1995). As highlighted in Table 2.2, these are broader notions of systems-based social evaluation. Further primary research is needed to provide comprehensive conclusions with regard to these broader participatory, or social choice concerns. This speaks to the need for multiple contributors and perspectives in furthering the improvement of environmental policy evaluation, a notion that stems from the nature of interdisciplinary knowledge building. In this context, progress in environmental policy evaluation is a participatory and pluralistic process.

The Modified IAD Framework: Contributing to Knowledge Building

The flexibility of the IAD framework is highlighted by the modification and application in Chapter 2 and 3. While each framework is predisposed to certain applications and the use of certain theories and methods, the flexibility of the IAD framework when heterodox theories and models are embraced was demonstrated. This is a key strength attributable to the incorporation of an interdisciplinary approach. The framework can characterise a specific policy or it can be tailored to a more focused policy task such as evaluation. This reaffirms the continuing development of the IAD literature through further applications or modifications. The increasing diversity of IAD applications (see for example, Austen, 2015) is a testament to this, and this thesis contributes a new direction for the framework and heterodox analysis.

Contributions to two areas of theoretical synthesis have furthered the tradition of synthesis as knowledge building. First, the synthesis between the ecological and institutional approaches is a coherent progression of two disciplines that conceptualise phenomena in compatible way. This was demonstrated in the link between the ecological criticisms of economic approaches to environmental policy evaluation, and the subsequent proposition of Ostrom's institutional framework as an alternative approach in light of these criticisms. Second, a contribution has been made in linking the existing theoretical traditions of policy framework theory with developments in evaluation theory. The unification of these two extensive research traditions was shown to be well suited to environmental policy, and may be equally applicable to non-environmental policy areas to further the pursuit of knowledge building. This is particularly useful when faced with limited engagement with evaluation itself or relevant theoretical developments, as was the case in the RET application.

Further Research for the Modified IAD Framework

This provisional application has highlighted the interrelated impacts of the various components in the IAD framework. This issue may not be unique to an application in policy evaluation. For example, the importance of biophysical conditions in shaping the other exogenous variables, such as rules-in-use or political economic context is underemphasised in the framework. Further research would be valuable in formulating an explicit way to deal with this potential self-reflexivity. The rationalistic tendency of this framework may place an overemphasis on boundaries and categorisation at the expense of these considerations.

Although the framework encouraged a less prescriptive approach that is open to a range of theories and methods, a balanced range was difficult to achieve in this provisional application. This may point to the need to introduce more constructivist elements to counterbalance the categorical elements of the IAD framework. For example, Fischer (1995) highlights the analytical significance of discourse analysis at all four levels of evaluative considerations (Fischer, 1995). This is also reaffirmed by Clement, who attempts to encourage this more constructivist analysis in the IAD framework with the inclusion of 'discourses' as an external factor (Clement, 2012, 1). A productive way forward may be the inclusion of discourse analysis in either Clement or Fischer's form, and doing so may extend the explanatory capacity of the framework further.

Another consideration that emerged from this case study was the potential formation of coalitions that emerged with agents at the collective choice level. While the existence of these relationships was piecemeal and selective, evidence of alliances for example, between green groups and the RE industry or between state governments and the fossil fuel industries, came to light through this process. The 'coalition' as a unit of analysis in the ACF may therefore further strengthen the IAD framework in certain instances. Recent developments in policy framework literature highlight a focus on knowledge building through combining existing frameworks rather than the development of new frameworks (Niles and Lubell, 2012; Nowlin, 2011; Petridou, 2014, S27; Cairney, 2013). Synthesising the ACF and IAD framework may be a fruitful line of future research.

The proposition of this framework has major implications for how we evaluate environmental policy by rewiring the relationship between academic research and current policy evaluation. However, this may be difficult, as it requires overcoming the hegemony of orthodox economic techniques in current environmental policy evaluation (Beder, 2011). Further research into overcoming these entrenched links and forging new relationships between this approach and its translation to policy evaluation practice would be a progressive next step.

A continuing difficulty of this framework is discerning the theories and models that are relevant for the scope of analysis. Schlager critiques the lack of "metarules" for analysing complex policy issues, and the framework's inability "to provide any guideposts to direct the analyst to particular rules and not to others" (Schlager, 2007, 309; Hayden, 2011, 468-469). Yet, a set of 'metarules' may become overly prescriptive, a notion critiqued in Section 2.3.2 regarding the orthodox economic IAD applications. Rejecting prescriptive tendencies and embracing a range of theories and models makes the determination of relevant factors for each IAD component a challenging task. However, this difficulty is an important part of evaluation as a process for knowledge building. Determining the relevance of specific theories and methods is a process that necessarily includes critical scrutiny from multiple perspectives. A heterodox pluralist approach is better suited to this, with broader considerations of theories and models that can embrace potential conflicts.

Concluding Remarks

The proposed framework approach to environmental policy evaluation therefore improves current evaluation in a number of ways. First, the framework is a mechanism for systematically engaging with the interests of agents in policy. Second, this approach is highly flexible, able to discern theories and models and incorporate various rationalistic or constructivist components on a context-specific basis. Third, explanatory capacity is improved by explicitly grounding the framework in an engagement with normativity. Finally, this approach promotes interdisciplinary considerations of environmental issues that are, by nature, interdisciplinary. This provides a foundation for a holistic engagement with disparate literature, encouraging academic disciplines to talk to, rather than 'talk past', each other.

Appendix 1

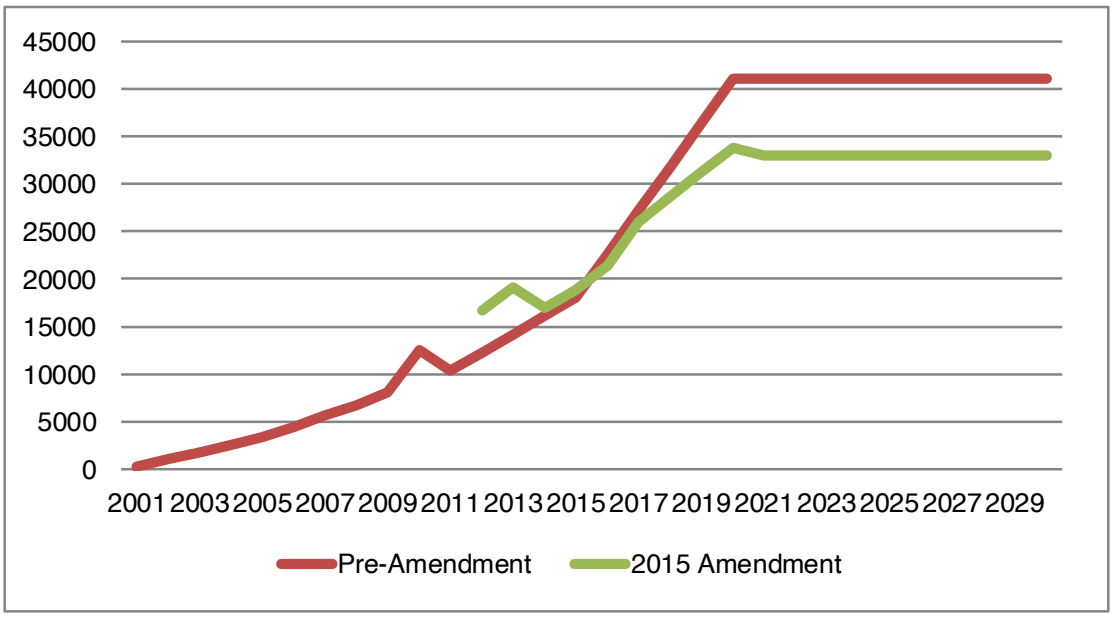
The 2015 Amendment to the RET Minimum RE Generation

Table A1: The 2015 Amendments to the LRET Fixed Figure RET

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 - 2030
Original Target	12,300	14,200	16,100	18,000	22,600	27,200	31,800	36,400	41,000	41,000
2015 Amended Target	16,763	19,088	16,950	18,850	21,431	26,031	28,637	31,244	33,850	33,000

Source: REE Act, 2000 and REE Act, Amendment Explanatory Memorandum, 2015

Figure A1: RET Minimum RE Generation Changes, 2015 Amendment



Notes:

1. The 2012-2014 figures under the 2015 amendment are the actual figures for RE generated electricity in those years, which are significantly more than the figures required by the legislation.

2. In this table, the reduction from 2020 to 2021 represents the 2012 commitment to include waste coal mine gas (WCMG).“The annual targets are effectively increased by 850 GWh to accommodate WCMG fired generation without displacing renewable energy under the RET” (REE Act Amendment Bill, 2015, 9-10). The additional amount above the target by 2020 is therefore the electricity generated by WCMG and is removed from the overall target after 2020 to ensure the 41,000 GWh target is entirely generated by sources defined by the Act as renewables.

Appendix 2

Estimates of Marginal Abatement Cost

Table A2: Range of Marginal Abatement Cost Estimates per tonne of CO_2 Emissions

Cost ($/t CO_2-e)	Duration	Year	Source	Notes (From source)
25-35 **62-68**	2014-2030 2014-2040	2014	ACIL Allen for Panel Review	Second range applies discount factor
55-65	2015-2030	2014	Frontier Economics for the AEMC	Noted that this will decrease over time
72 **82**	2020 2030	2014	Deloitte for ACCI, BCA and MCA	Used LGC costs only
40	2013-2030	2012	SKM MMA for 2012 CCA Review	Method from report by Dept. Climate Change
37-111	2011-2030	2011	Productivity Commission	2009-10 data
30-70	2012 -2030	2011	Daley and Edis, Grattan Institute	Contingent on certificate price
44-73	-	2002	Ministerial Council on Energy	-
60-80	-	2005	Electricity Retailers Association of Australia (ERAA)	-

Sources: ACIL, 2014; Frontier Economics, 2014; Deloitte, 2014; SKM, 2012; Productivity Commission, 2011. The following: Daley and Edis (2011); DCC (2010); DCCEE (2011e); ERAA (2005); Ministerial Council on Energy (2002) sourced from Productivity Commission, 2011, 85.

Note: All 2014 figures are pre-amendment RET calculations. All dollar figures are in the dollars of the year of estimation.

Appendix 3

Estimations of Fossil Fuel Subsidies

Table A3: Range of Fossil Fuel Subsidies Estimates in Australia

Source	Estimation	Notes from Text
Ashiabor & Blazey, 2007: Quoting an Australian senate committee report titled "Australia's Greenhouse Future", Nov 2000, xxxvi	Direct subsidies: $2bn AUD Indirect subsidies: $4bn AUD	Indirect subsidies include: tax incentives for industry, start-up grants, preferential purchasing agreements for oil and biased market structures.
Riedy & Diesendorf, 2003, *Energy Policy*	$6.54bn AUD in 2003	Note this excludes the "many subsidies cannot be calculated".
Peel, Campbell & Denniss, 2014; Grudnoff, 2013 (in Peel et al., 2014): Australia Institute Reports	Expenditures and concessions: $3.2bn AUD in 2013-14 financial year. Federal subsidies were $4.5bn in 2013.	The year discrepancy was based on the timing of the annual releases by the Australia Institute
Bast, et al., 2014, Oil Change International "Fossil Fuel Bailout"	US $3.5 bn per year [$4 bn AUD at Nov 2014 exchange rate at the time of paper release]	A calculation the subsidies for exploration by fossil fuel companies
Coady, et al., 2015 IMF Working Paper	$24.6 bn USD in 2015 [$41 bn AUD in July 2015 at exchange rate at the time of the paper release]	2015 projection, attempts to include the major environmental, social and health externalities associated with coal, petroleum and gas.

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