Creating an Integral Approach to Sustainability in the WA Public School System

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Declaration

I declare that this is my own account of my research and the work contained within has not been previously submitted for a degree at any university.

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Abstract

Moving towards a sustainable future will require the involvement of all sectors of Australian society. In 2012, South Fremantle Senior High School, a public school in Western Australia (WA), successfully became the first officially certified carbon neutral school in Australia. This achievement has demonstrated that sustainable, low carbon schools could indeed become a reality and confronted with the challenges of climate change, population growth and increasing energy costs, a public school system premised on the principles of sustainability will become a necessity.

With sustainability strategies readily available, yet little progress being made to prepare schools in WA for these future challenges, it is proposed that on a societal scale the barriers to creating change are psychosocial, behavioural and cultural: a symptom of conflicting perspectives or worldviews with competing priorities. The guiding aim of this thesis has been to determine how these different worldviews can be reconciled so that a concerted effort to transform the WA public school system can become a reality.

The major research strategy that was adopted was a two part literature review beginning with an analysis of policy documents, scientific reports and contemporary publications to critique efforts to introduce sustainability into WA. Next, a review was undertaken of theoretical approaches to sustainable development. This analysis exposed a gap between the theoretical understandings of sustainability and practical application of sustainability in the WA context with further research from the field of developmental psychology able to provide insights as to why this has occurred.

The results of the study revealed a number of policy, funding and resource deficiencies in integrating sustainability into the WA public school system: each deficiency a consequence of competing value orientations and worldviews within the WA State Government, public schools and the Australian Sustainable Schools Initiative (AuSSI). By reassigning functions such as funding, regulation and innovation with the institutions they are most naturally suited to under an Integral worldviews model, efficient and cost-effective change becomes possible through the processes of ecological modernisation.

This research has implications for other sectors of government and society which seek to undertake transformative change. The premise for the organisational model proposed is easily transferrable and provides the blueprint to overcome the stagnation in efforts to address climate change and issues of sustainability by ushering in new cognitive abilities under an Integral worldview.
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<tbody>
<tr>
<td>AuSSI</td>
<td>Australian Sustainable Schools Initiative</td>
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<tr>
<td>DER</td>
<td>Department of Environment and Regulation</td>
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<td>DoE</td>
<td>Western Australian Department of Education</td>
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<tr>
<td>EFS</td>
<td>Education for Sustainability</td>
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<td>GFC</td>
<td>Global Financial Crisis</td>
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<td>GHG</td>
<td>Greenhouse Gas</td>
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<tr>
<td>HVAC</td>
<td>Heating Ventilation and Air Conditioning</td>
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<tr>
<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IOCI</td>
<td>Indian Ocean Climate Initiative</td>
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<td>NCOS</td>
<td>National Carbon Offset Standards</td>
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<td>NEM</td>
<td>National Electricity Market</td>
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<td>SAP</td>
<td>Sustainability Action Plan</td>
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<td>SWIS</td>
<td>South West Interconnected System</td>
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<td>WA</td>
<td>Western Australia</td>
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Chapter 1: Introduction

1.1. The need for sustainable schools

The Western Australian (WA) Department of Education (DoE) regards a well-functioning public school system as the cornerstone of every successful society (Western Australia. Department of Education, 2014). The public school system in Australia is comprised of schools that are administered and funded by state and territory governments as part of the each government’s commitment to provide universal access to education (Australia. Department of Parliamentary Services, 2011). It affords the opportunity for an inexpensive education for all children of school age regardless of social or economic factors. In WA, well over half of students attend a public school (Western Australia. Department of Education, 2012), many of these in remote areas and small communities.

The cost of providing the infrastructure for public school education is far from trivial. In the 2012/2013 financial year, just over $500 million of public money was spent on new schools, infrastructure upgrades and school maintenance in WA alone (Western Australia. Department of Education, 2012). Over the coming four years, the DoE is investing $1.16 billion into building new schools and improving existing facilities (Western Australia. Department of Education, 2014).

At the same time, Australian schools are being encouraged to teach sustainability through the National Curriculum. Sustainability as a learning priority within the Australian school curriculum has been evolving for decades in response to the growing awareness of global issues, having existed in the previous incarnations of environmental education and outdoor education (Gough, 2011; Orr, 1992; Tilbury, 2006). Yet a gap exists between the pedagogical development of sustainability in the school curriculum and the realisation of sustainability principles within the school environment (Skamp, 2010; Tilbury & Wortman, 2006). It appears that the infrastructure and operations of schools have been overlooked as an opportunity to apply the same principles of sustainability that are being taught in the classroom.

There are pressing reasons why the gap between curriculum and practice should be bridged. Sustainability in the WA public school system is becoming an imperative as complex environmental, economic and societal challenges begin to emerge. These have been identified in this thesis as climate change, population growth and the transformation of the energy sector.

- The Indian Ocean Climate Initiative (IOCI) (2012b) projects a warmer dryer climate with longer, hotter heat spells, cyclones occurring farther south and more extreme weather events in WA, all within the lifetime of existing school buildings and infrastructure.
The Australian Bureau of Statistics (2012) reveals that the population of WA has been growing at a faster rate than other Australian states and growth will be needed in the school sector to accommodate the projected increase in students.

A pattern of increased energy use can be extrapolated into the future as a result of growth in the Public School sector. This is combined with an increase in heating and cooling requirements in classrooms to account for changes in climate and the expanding use of Information and Communications Technology (ICT). It is forecast that energy use will increase by sixty per cent across WA over the next two decades at a time when the cost of producing and distributing energy is becoming more expensive (Western Australia. Department of Finance, 2012; Western Australia. Office of Energy, 2012) and planned long term supply from conventional sources is being questioned (Fleay, 2007a, 2007b; McHugh, 2012; Western Australia. Chamber of Commerce and Industry, 2007).

The dynamics of these challenges suggests an increase in Greenhouse Gas (GHG) emissions from the WA public school system if no changes are made. WA’s overall emissions are increasing (Australia. Department of Climate Change and Energy Efficiency, 2012a) at a time when Australia, through the second commitment period for Kyoto, has committed to reducing emissions to 0.5 per cent below 1990 levels (Australia. Department of Climate Change and Energy Efficiency, 2012b).

Faced with these challenges, the WA public school system will be in need of transformation. A sustainable public school system would have particular characteristics: schools would be low GHG emitters; schools would be built or retrofitted to be responsive to the changing climate to protect children from the extremes of weather and natural disasters; renewable and decentralised energy would future-proof the energy needs of schools; lower running costs would lessen the financial load of operating an expanding school system; and schools that were inherently sustainable in their activities could provide endless opportunities for enhancing Education for Sustainability (EfS).

Given that the technology and capabilities to make the transformation are available and the challenges outlined are already having measurable consequences, the question arises of why nothing meaningful has happened to prepare the WA public school system for a new future.

Elsewhere, whole sectors of the global society have begun a process of decarbonising as a response to climate change. Ninety-nine countries have pledged to reduce emissions and global action on climate change is accelerating (Australia. Climate Change Authority, 2013). Major reforms are taking place in the energy, transport, land use and building sectors (ibid) accompanied by the development of regulatory and financial mechanisms through government and industry.
Parts of the education system are well underway in their journey towards sustainability. Within the Australian tertiary education system, forty-nine universities and TAFEs are registered as members with Australasian Campuses Towards Sustainability (ACTS) (2013), exhibiting efforts to transform their often city-like campuses into low-carbon, resource efficient and biodiversity rich precincts.

The primary and secondary school sectors in Australia however, do not exhibit many indicators of transformation. Only around one third of schools are registered participants with the Australian Sustainable Schools Initiative (AuSSI): the program most responsible for driving sustainability in schools within each state and territory. Around seventy per cent of those are primary schools, indicating a further disconnect from sustainability for the many students transitioning from primary to secondary school.

There are exceptions. The Victorian Government has no less than six programs to assist schools to become more sustainable (Victoria. Department of Education and Early Childhood Development, 2014) and the ACT Government has set an aspirational target for all government schools to be carbon neutral by 2017 (Australian Capital Territory. Environment and Planning Directorate, 2014). WA however is revealing itself to be lagging its journey towards sustainability. The WA Government has yet to announce any policies to create sustainable schools outside of the voluntary AuSSI program and furthermore, WA’s participation rates in AuSSI are lower than the national average.

As yet there has been little investigation into how sustainability has manifested in the Australian education sector. The literature reveals even less about the influence of the worldviews that create or hinder sustainability in government departments, schools and communities. An understanding of these worldviews is critical because it explains the subjective nature of our values: what we deem to be important in life. This thesis seeks to address this gap in knowledge: to consider the opportunities and barriers to a sustainable public school system in WA from the perspective of our deeply defended yet unconsciously constructed worldviews.
1.2. The role of worldviews

Climate change, energy, population and sustainability have been acknowledged as problematic for many decades. It is not that solutions are yet to be developed, in fact the intention to create sustainability can present a baffling array of options: green consumerism, appropriate technology, permaculture, Deep Ecology to name but a few. As Hopwood et al. (2005) reveal however, the many approaches to sustainability differ in the way they prioritise particular value systems, with some approaches placing more importance on human wellbeing over environmental concerns, while others favour the attainment of socio-economic equality over individual entrepreneurship. As approaches to sustainability are essentially values oriented choices, it becomes impossible for a diverse and democratic society to agree on just one course of action.

Those who propose solutions draw on their beliefs, values and experience which are all shaped by the culture in which they are embedded and this creates a plethora of possibilities. The Prometheans for example, present an unwavering faith in a scientific or technological fix; neo-liberals leave it to the market to innovate solutions; activists take matters into their own hands and the less emboldened place their faith in institutional politics and the processes of governance (Dryzek, 1997).

These perspectives on the world are not random or ad-hoc. They form part of an evolutionary pattern of change that can be recognised in the worldviews of individuals, communities, societies and corporations (Graves, 1981). Worldviews have always changed: a constant, never-ending, overlapping evolution of values orientations (Beck & Cowan, 1996; Graves, 1974, 1981; van Egmond & de Vries, 2011).

Historically, a worldview of control, authority and nationalism began to give way in the post-war era as safety, stability and security were achieved. To break free of the stifling conformity of this time, elements of society began to individualise and aggressively transform businesses and corporations, assisted by government regimes of deregulation. Gardner (1995) notes the proliferation of company restructuring and change programs consisting of “downsizing, delayering, strategic alliances, outsourcing, quality, technology and internal systems improvement...features of the Australian corporate landscape since the late 1980’s” (p. 1.2). In the 1990’s, the failure rates of these programs were enormous, upwards of seventy per cent (Gardner, 1996) as a new profit-driven worldview battled to dislodge a long standing, purpose driven worldview. Today, corporate power rivals that of the strongest governments (Korten, 2001).
The eighties mantra of ‘greed is good’ however saw corporations vilified, accused of contributing to the greenhouse effect, deepening poverty, damaging environmental support systems (Barbier, Markandya, & Pearce, 1989) and eventually of causing the Global Financial Crisis (Dawlabani, 2013a). Rather than compete to regain power, communities and motivated individuals sought to make a more fair and just society through changes at local levels. The result saw the uprise of peace seeking and environmental counter-cultures. An ecological and social consciousness developed, typified by the catch cry, *think global, act local*. Hawkins (2007) documents the rise of ecological and social conscience, estimating that there are millions of groups working to improve the places in which they live.

### 1.3. An Integral worldview

The previous section briefly described three dominant worldviews currently impacting on the success and failure of sustainability in Australia. The first worldview stems from a top down, government administered approach. The second is an economic approach, what Ayres (2008) calls “the science of resource allocation” (p.294) drawing on the principles of economic rationalism and a range of econometric tools to perform decision making. The third adopts a bottom-up, community based approach which provides clues to how schools have been able to initiate sustainability projects largely independent of government support. Van Marrewijk and Werre (2003) offer these distinctions: the Government approach is compliance driven, the Capitalist approach is profit driven and the Communal approach is about caring.

Competition between these approaches however can sabotage transformational outcomes. When applied to the sustainability effort, each approach reveals underlying currents that are not easily articulated and often present more questions than answers such as how much change is needed; who should change; how should things change; and what should the system change to? It is a debate that has plagued sustainable development from the beginning.

Transformation towards sustainability in the WA public school system would require more than a technological fix: it needs to consider advances in cognitive abilities and shifts in the behaviours of stakeholders; changes to the culture and collective psychologies which contribute to the contextual setting; as well as changes to physical infrastructure and systems through the employment of technology (Slaughter, 2012; Wilber, 2001). Even more so, it requires a shift in the worldviews through which solutions are proposed if the momentum of global change is to swing back towards civilisation’s favour. Tibbs (1999) explains that “The same set of beliefs and attitudes which has given rise to the problem is also impeding corrective innovation and policy responses. To achieve
sustainability it is essential that we begin not only to think in new ways, but to believe new things” (p. 59).

Kemp and Martens (2007) argue for a new kind of knowledge for sustainability calling for the investigation of a system’s deeper lying structures; to project into the unknown future; and to analyse the consequences of decisions. Graves (1974, 1981) identified a worldview that was capable of this many decades ago. He described this worldview as one with new cognitive capabilities, able to respond to the complexities of human existential challenges by harmonizing the array of worldviews that make up societies. It is this kind of worldview that is required to coordinate the responses to sustainability of the WA Government, WA public schools and the capitalist elements of society. This worldview which values knowledge and competence is capable of handling the increasing complexity that stifles other worldviews (Beck, 2006; Beck & Cowan, 1996; Graves, 1974, 1981; Wilber, 1997, 2001).

When applied to the task of addressing the WA public school system’s challenges, this new worldview would act as the host to a raft of responses, acting to coordinate and conduct public schools, the DoE and the AuSSI. It is not its intention to replace any worldviews, just to integrate the strengths of each worldview into one integral approach for the benefit of all.

1.4. Research aims

This thesis aims to contribute to a theoretical understanding of the worldviews that determine the way in which the WA public school system perceives and addresses issues of sustainability. This knowledge can then assist to create an approach that moves the WA public school system into a position of increased resilience to inevitable future challenges. This work is thus positioned at the nexus of theory and practice, as it infers to a detangling and streamlining of the functions of the DoE, AuSSI and public schools under a new worldview that can harmonise the role of each stakeholder.

Specifically, the thesis aims to:

1) identify the projected pressures on the WA public school system;
2) explore the worldviews that currently influence sustainability in the WA public school system;
3) investigate the limitations of current responses to bring about sustainability in the WA public school system; and
4) examine the application of a harmonized approach to sustainability in the WA public school system through an Integral worldview.
1.5. **Methodological approach**

The first sub-aim of this thesis will be addressed by reviewing contemporary publications, scientific reports and Government policy documents to determine the challenges that will face the WA public school system in the future and the responses to these challenges.

Sub-aims two, three and four will be rooted in a literature review that explores Gravesian Theory, Integral Theory, Integral Sustainability and Spiral Dynamics. This will provide the theoretical framework for examining the evolution of environmental and sustainability policy. The literature review will not only explore how worldviews shape responses to sustainability but also how sustainability might shape emerging worldviews.

The examination of worldviews will allow for an assessment to be made of the adequacy of various approaches being utilised in the face of increasing complexity of global issues. Some of these approaches will then be weighed for their application within an Integral approach.

Research on worldviews necessitates the author remove, as far as possible, their own assumptions, values and beliefs to avoid researcher bias (Van Opstal & Hugé, 2013). In striving to achieve this, it will be necessary to engage in a process of reflection which Hibbert et al. (2010) define as the observation of our own practice. This means constantly deliberating on how pre-existing inclinations to adopt a particular worldview when conducting the research influence the interpretation of the worldviews that are being examined.

In contrast to reflection - the holding up of a mirror to one’s assumptions (Hibbert, et al., 2010) - it will also be necessary to engage in the practice of reflexivity, another tool often wielded by the researcher to eradicate bias and maintain objectivity. According to Symon and Cassell (2012), reflexivity, 

> Goes beyond a simple reflection on the research process and its outcomes, to incorporate multiple layers and levels of reflection within the research. These would include considering the complex relationships between the production of knowledge (epistemology), the processes of knowledge production (methodology), and the involvement and impact of the knowledge producer or researcher (ontology) (p 73).

Adopting a multiple level approach to reflexivity means that it is not merely enough to reflect on personally held worldviews but it is necessary to make assumptions about the worldviews of the contributors within the literature in order to understand the context in which their work should be placed within my research.
1.6. Thesis structure

Chapter Two looks at three of the most significant pressures that will likely impact WA: climate change, population growth and the reluctant transformation of the energy sector. It explores the need for schools to prepare for these changes.

Chapter Three is an exploration of three worldviews that dictate government, corporate and civil society approaches to sustainable development. This investigation provides clues for constructing a response to the forecast pressures on the WA public school system.

Using the insights about worldviews garnered in Chapter Three, Chapter Four identifies the main barriers that have prevented a meaningful adoption of the sustainable initiatives that would allow the WA public school system to adapt to the pressures listed in Chapter Two.

Chapter Five uses these new understandings to explore the potential for an Integral worldview through which the barriers to adaptation might be overcome by harmonising the functions of the stakeholders in the WA public school system.

Chapter Six synthesises the key findings from the research and presents a discussion on the theoretical and policy implications inferred by this study.
Chapter 2: Emerging Pressures on Schools in WA

Whilst it is impossible to predict the future, there are observable patterns and empirical evidence that suggest that the WA public school system needs to prepare for inevitable change. This chapter looks at the climate science specific to WA to gain an understanding of the meteorological conditions and natural disaster risks that schools will need to adapt to. It then explores the pressure on schools from population growth as a demographic analysis shows that the school system will be significantly impacted by growth in student numbers. Finally, energy is identified as a sector that will be forced to undergo significant transformation. This will impact schools and their running costs.

2.1. Climate change

Climate change is caused by excessive GHG emissions (IPCC, 2007). In WA, GHG emissions increased by sixty-seven per cent between the years of 1990 and 2010 (Australia. Department of Climate Change and Energy Efficiency, 2010), well over the eight per cent allowable under the Kyoto Protocol agreement for Australia over the same period. This means a transformation will be required across many sectors of WA society as part of a national and global effort to limit the effects of climate change.

The Indian Ocean Climate Initiative (IOCI), a scientific body created when a partnership formed in 1997 between the WA State Government, the CSIRO and the Bureau of Meteorology (Indian Ocean Climate Initiative, 2012a), has been tracking changes in WA’s climate and has made projections through to the end of the century based on a current warming trend of the atmosphere and oceans.

These projections are important for the planning of schools, as many abatement measures such as building insulation or rain water harvesting must be considered with long term changes in temperature, rainfall and frequency of severe weather events in mind. Additionally, it will be a prerequisite that new schools that are intended to operate for four or five decades are designed to account for changes in climate over that time.

Climate modelling projections cover south west WA and north west WA. An analysis of climate trends through to 2100 by the IOCI (2012a, 2012b) reveals:
### Rainfall
- **South West WA – 2100**: Reduced rainfall by up to 43%
- **North West WA - 2100**: A drying trend in the Pilbara and Kimberley regions resulting in up to 24% less rainfall
- **South West WA – 2100**: Increase in prevalence of high pressure systems resulting in fewer storms and rainfall events
- **North West WA - 2100**: Projected decrease in intensity of extreme rain events in the Pilbara but an increase in the Kimberley region

### Temperature
- **South West WA – 2100**: Average daily minimum temperature increase by up to 4.3°C
- **North West WA - 2100**: Average daily minimum temperature increase by up to 5.1°C
- **South West WA – 2100**: Average daily maximum temperature increase by up to 3.5°C
- **North West WA - 2100**: Average daily maximum temperature increase by up to 5.5°C

### Extreme Weather
- **South West WA – 2100**: Decrease in frequency of extreme weather events in far south
- **North West WA - 2100**: Cyclones projected to decrease in frequency but increase in intensity and power whilst moving 100km further south
- **South West WA – 2100**: Increase in frequency of extreme weather events in the north
- **North West WA - 2100**: No change to frequency of hot spells and heat waves
- **South West WA – 2100**: Increase in frequency of hot spells and heat waves
- **North West WA - 2100**: Increase in intensity of hot spells and heat waves
- **South West WA – 2100**: Increase in duration of hot spells and heat waves
- **North West WA - 2100**: Increase in duration of hot spells and heat waves

These projections follow observed trends in climate changes. Whilst climate change is often thought of as an event occurring in the future, human-induced changes to long term climate patterns have already been established (Indian Ocean Climate Initiative, 2012b; IPCC, 2007).

IOCI's climate projections have significant implications for school building design and operations that should not be ignored by policy makers. Schools throughout WA will need to have the capacity to collect and store water, endure extreme weather events, maintain thermal comfort in buildings using little energy, maintain resilience in power supply and adapt to changing environmental conditions over time. Coastal schools must consider that a sea level rise of one metre is possible under some forecast climate scenarios putting coastal infrastructure at risk from inundation, coastal erosion and storm surges (Indian Ocean Climate Initiative, 2012a). School buildings will be tasked with protecting the health of children during the occurrence of heat waves and hot spells as well as natural disasters such as bushfires, floods and cyclones. Given the lifespan of buildings, good building design has the potential for substantial abatement of carbon emissions over time (Stern, 2009) as well as the capacity to handle the climate variables presented by the IOCI. Poor building design and quality will mean higher energy costs as mechanical systems seek to counteract building deficiencies and climate extremes. The risk from extreme weather events is expected to be reflected in higher insurance costs (Garnaut, 2008; Stern, 2009).

In formulating a framework for reducing emissions, the costs and benefits of climate change adaptation must be considered. Stern (2009) has indicated that the cost of adaptation now will be less than the cost of adaptation later.
2.2. Population

In Australia, GHG emissions per capita have fallen since 1989, however overall emissions have increased by thirty-two per cent during that same period because of a thirty-five per cent increase in population (Alexander, 2013; Australia. Department of Climate Change and Energy Efficiency, 2012a). With no State or Commonwealth Government policies to cap population growth, it is an imperative that population forecasts are considered in assessing any GHG emissions abatement strategy.

The population of WA has been increasing for several years at a faster rate than other states and this trend is expected to continue. In 2006, the population of WA was 1.95 million people (Australian Bureau of Statistics, 2011). By mid-2013, this number had grown to 2.5 million (Australian Bureau of Statistics, 2013a). By 2061, WA’s population is expected to be between 5.4 and 7.7 million (Australian Bureau of Statistics, 2013b). Perth, WA’s capital city is projected to experience the highest percentage growth (116%) of Australia’s capital cities, increasing from 1.6 million people in 2007 to 3.4 million in 2056 (ibid).

Comparatively strong economic conditions have drawn migrants to WA (Western Australia. Department of Planning, 2012b). These migrants are attracted by employment opportunities in the mining and resources sector and by an ongoing Federal Government campaign to attract international students to Australian universities. Importantly, these migrants are primarily of reproductive age\(^1\), a demographic trait which has halted the age creep typical of populations in western societies and a factor that is driving the need for new schools.

Population growth is forecast by the Government, not planned (Western Australia. Department of Planning, 2012b). A search of WA State Government literature did not reveal any policies pertaining to population targets or the estimation of an ideal population size. Inherent in the State’s urban and regional planning policies is the assumption that population growth is an economically positive, self-managing and perpetual process without ecological constraint, despite the challenges of transport, housing and health that various Government departments are currently grappling with. The Department of Planning (ibid) reports,

\(^1\) The Australian Bureau of Statistics considers reproductive age as between fifteen and forty-nine years of age for women (Australian Bureau of Statistics. (various years). cat. no. 33013.0, Births, Australia. Canberra: ABS.).
This population growth will place pressure on resources and will lead to the need for increased infrastructure and services. Concurrently, the State’s economic growth will enable the means to provide for increased infrastructure and improved services necessary to support its future population (p.10).

This circular argument is expressed in the WA State Planning Strategy, suggesting that the additional infrastructure required as a result of population growth can be funded by the economic growth assumed to accompany an increase in population.

In 2011 in WA, there were 679,825 people or 30.4% of the population attending an educational institution (Australian Bureau of Statistics, 2011). In the year ending on the 30th June, 2012, WA had recorded the largest percentage increase in the number of children aged 0-14 years (3.1%) of all Australian states (Australian Bureau of Statistics, 2012). In order to cater for this growth in school aged children, the DoE invested $518.5 million in the construction of new schools and improvements to existing school infrastructure (Western Australia. Department of Treasury, 2013).

Population growth is expected to slow over the coming decades. There is strong consensus amongst industry analysts that mining investment will peak within the next decade (Reserve Bank of Australia, 2013). This will see the end of labour intensive stages of project development and the beginning of production which requires relatively fewer workers. Economic influences such as the value of the Australian dollar are expected to keep in check the growth of commodity exports (Sheehan, 2011) also dampening the resources industry. Finally, recent changes to migration laws have closed previously open permanent residency avenues for international students, resulting in a reduction of international students arriving in Australia and students staying in Australia after completing their studies (Government of Australia, Department of Immigration and Citizenship, 2011).

Migration laws are evolving to ensure that levels of migration are controlled by the need for labour rather than the desires of migrants to permanently reside in Australia (ibid). This means that economic conditions drive migration. Despite the aforementioned factors that will keep population growth in check, the strength of the resources economy of WA and the increase in the national birth rate to 1.9 from a low of 1.7 means the education system will continue to expand. More schools will be needed and in some areas, larger schools.
2.3. Energy supply

WA is an energy intensive state. Measuring energy consumption per capita, Western Australians have amongst the highest ecological footprint in the world (Environmental Protection Authority, 2007).

Gas is the main fuel used to generate electricity in WA. The State’s gas reserves are currently under huge demand and costs are climbing as gas exploration is forced to move further offshore in search of more gas deposits. With current production and demand, gas reserves in Australia are expected to last sixty years (Geoscience Australia, 2011) however, supplies of gas from WA at this time are more limited than predicted suggesting the figure may be closer to twenty-five years (Fleay, 2007a). New exploration for gas has yielded smaller returns than forecast and competition between export markets and domestic markets have driven up the price of electricity for West Australian residents (Western Australia. Chamber of Commerce and Industry, 2007). Twenty year contracts to supply gas at discounted rates to domestic markets have ended, meaning prices will rise substantially in the near future and continue to rise as producers switch to shorter term five year contracts (Fleay, 2007b). The newest power stations supplying the South West Interconnected System (SWIS) have opted to burn coal because of the difficulties of long term gas supply (Logan, 2007). Even resources giant Rio Tinto has joined a chorus of companies who admit that Liquid Natural Gas (LNG) supplies are in doubt after 2015 (McCarthy, 2012).

Rather than planning for alternatives to gas and coal to power the energy sector, the recent release of WA’s long term strategic planning document, the State Planning Strategy, reinforces the long term dependence on fossil fuels (Western Australia. Department of Planning, 2012a) meaning that energy prices will continue on their upward trajectory for a while to come.

The main price drivers for WA electricity networks differ to the National Electricity Market (NEM) which supplies the eastern states. Increasing energy supply costs in WA are the result of expenditure on the network to ensure that peak demand for electricity that typically occurs on weekday evenings and hot days, can be met. McHugh (2012) however, argues that a unique regulatory structure that began in 2006 in which the WA State Government became electricity generator, distributor, retailer and regional supplier meant consumers pay extra for electricity, which goes to the government as an incentive to build extra capacity into the peak electricity generation capacity in a practice known as "gold plating" of the electricity network. McHugh (ibid) says that the WA State Government has continued to build in peak capacity and now peak capacity supply far outstrips peak demand due to...
$3.85 billion of over-investment. This has increased electricity prices by 48% between 2008 and 2012 (not including the price on carbon which was compensated for by the federal government (ibid).

The demand for energy by the WA public school system is climbing. Since 2006, there has been a net increase of twenty-one new schools in WA. Thirty-eight new schools are planned for completion between 2012 and 2015 (Western Australia. Department of Education, 2013b). Electronic appliances ranging from electronic whiteboards to purpose built vocational training facilities, are becoming more commonplace in learning spaces whether built into new school infrastructure or retrofitted into older schools (Keengwe & Kidd, 2010). In 2007, the Commonwealth Government initiated a funding program of $2.7b for digital technology to be implemented in Australian classrooms over seven years (Australia. Department of Education, Employment and Workplace Relations, 2012). This new technology increases electricity consumption and produces additional emissions.

Emissions are increasing because there are more schools that are using a greater proportion of fossil fuel generated electricity. Electricity for heating, cooling, ventilation and lighting represent the greatest sources of emissions in buildings (Cheng, Pouffary, Svenningsen, & Callaway, 2008) whilst a warming climate and the increased adoption of technology in schools will stimulate further energy consumption. The increase in heat waves and hot spells in particular will pose an increasing demand on energy use, further adding to the climbing emissions trajectory as air-conditioners and cooling systems are maximised (ibid).

2.4. Summary

This chapter has identified significant and unaddressed drivers of change that will impact on the WA public school system. It illustrates how the education system in WA will expand and schools that are not climate sensitive in their design and construction will demand more energy to provide indoor environments that protect children from increasing climate extremes. More energy will also be required to operate increasing amounts of ICT in classrooms as pedagogical practices continue to incorporate more technology. In defending the existing configuration of WA’s energy supply which is dependent on diminishing reserves of fossil fuels while electricity prices remain exposed to international market forces and over-investment, the WA Government will be unable to reverse the upward trending costs of supplying energy meaning that the cost to WA Public Schools of purchasing grid electricity will continue to be a worsening burden for the DoE. The delay of climate adaptation measures by the DoE only magnifies the scale of the effort that will be required for each year that action is deferred.
The development of low carbon, resilient, sustainable schools would seem to be the answer to these challenges, but there are strong psychosocial currents driven by the competing worldviews of the stakeholders in the WA public school system that add to the complexity of implementing a seemingly forthright solution. These worldviews and their interpretations of sustainability are discussed in Chapter Three.
Chapter 3: Sustainability as a Response

Chapter Two described three issues that will impact WA, necessitating forethought and planning if the public school system is to be prepared. Given that changes in climate, population and energy supply are already occurring, it would be pertinent for the WA State Government to prioritise the development and funding of adaptation initiatives, yet there are no publicly available policy documents that suggest this has happened. The reasons are not necessarily obvious. By examining the worldviews that drive government, the corporate sector and civil society in WA, reasons for this apparent procrastination begin to emerge. This chapter explores the responses to future challenges by stakeholders in the WA public school system and the worldviews that shape various conceptions of societal development.

3.1. A worldviews lens

There are a range of responses available to issues of climate change, population growth and energy security from different sectors of society and each of these responses are driven by discernibly different worldviews. Those approaches to sustainability examined here are broadly categorised as belonging to a Government, Capitalist or Communal worldview.

The reason for a closer examination of the worldviews of societal sectors is that some of their epistemological characteristics are useful in addressing global challenges, whereas others are not. Given the complexity of global challenges, older, more traditional worldviews may not be up to the task of delivering transformation whilst newer, contemporary worldviews are often accused of being the cause of problems.

Koltko-Rivera (2004) offers that a worldview “Is a set of assumptions about physical and social reality” (p. 3). These assumptions form the foundation for our beliefs, values, ethics and behaviours (Graves 1959; Kohlberg, 1984). Worldviews are based entirely on our subjective understanding of what the world must be like. Nin (1961) surmised, “We don’t see things as they are; we see them as we are” (p. 124).

Knowing about the worldviews that drive governments, corporations and civil society is important because it can explain decisions and behaviours that seem irrational to our own experience. It can explain why a government can ignore the advice of its scientists; why corporations can engage in the guilt-free exploitation of a natural resource; and why elements of civil society will break the law to protest for a cause. The differences between worldviews create confusion in defining the terms used in sustainability. According to Dryzek (2005), the meaning we ascribe to concepts such as ‘nature’,
‘environment’, ‘resources’ and importantly ‘sustainability’ are dependent on our worldview, indeed, Varey (2004) has mapped more than five thousand definitions of the term *sustainability*. Without giving some context and clarification to each stakeholder’s worldview, we could be debating on entirely different things (Van Opstal & Hugé, 2013).

The difficulty is that to understand other worldviews, we must step outside of our own. As it is impossible to be totally devoid of any values and beliefs, we must step into another worldview altogether, one that can perceive the entire spectrum of worldviews (Wilber, 2001). It is akin to a fish needing to leave the water to understand that it lives in an ocean. There are difficulties in describing the worldviews that differ to our own. Van Opstal & Hugé (2013) say, “We can speak with familiarity about our own worldview in which we are fully indoctrinated, but talking about/describing other worldviews incorporates some risks like ethnocentrism and researcher bias” (p. 696). Seeking an empathetic comprehension of one worldview, opens oneself to attack from another. Worldviews that cannot accept the validity of other worldviews will defend themselves vigorously as the one true way to live life (Wilber, 2001) and at the least tolerant and most dangerous end of the scale, this can lead to extremism and fundamentalism (Beck, 2006).

### 3.2. Gravesian Theory / Spiral Dynamics

Fortunately, the work of Graves offers an egress from the trap of subjective interpretation. From surveys of thousands of participants, he identified a set of seven worldviews active in psychologically healthy adults (Graves, 1970). These surveys revealed distinct interpretations of the world that arose in response to questions such as ‘What does it mean to have a healthy life?’ and were verified by a range of psychometric tests, designed to validate people’s responses (Beck, 2006). As varied as the results were, they could all be neatly organised into seven categories which formed the understanding for seven worldviews. Graves called this new model, ‘The Emergent, Cyclical, Double-Helix Model of the Adult Human Biopsychosocial Systems’ to describe some of the evolutionary and dynamic characteristics of this system of worldviews. It later became known as Spiral Dynamics however it is referred to in some literature and in this thesis as Gravesian Theory.

In developing the model, Graves’ work drew on the work of other researchers of human development including Kohlberg, Kramer, Torbert, Perry, Armon, Mumford, Howe, Rawls, Piaget, Selmen, Gilligan, Erikson, Loevinger, Calhoun, Broughton, Heard, Fromm and Maslow (Varey, 2004). He was able to define the boundaries of what represented a worldview elucidating,

That when the human is centralized in one state of existence he or she has a psychology which is particular to that state. His or her feelings, motivations, ethics and values,
biochemistry, degree of neurological activation, learning system, belief systems, conception of mental health, ideas as to what mental illness is and how it should be treated, conceptions of and preferences for management, education, economics and political theory and practice are all appropriate to that state (Graves, 1981, p. 1).

Graves (1974, 1981) had identified that worldviews were not just mental representations of the world, they were accompanied by specific physical, neurological and biochemical configurations.

Furthermore, these worldviews were seen to evolve sequentially with new worldviews overlaying, but not replacing, old ones (Graves, 1981). Van Egmond and de Vries (2011) refer to these jolted uprisings of new worldviews as a sequence of “punctuated equilibriums” (p. 853), periods in time when a person’s view of the world changed in reaction to a change in their life conditions. In describing the dynamic ebbing and flowing of worldviews, Graves (1974) wrote, “The psychology of the mature human being is an unfolding, emergent, oscillating, spiralling process marked by progressive subordination of older, lower-order behavior systems to newer, higher-order systems as man’s existential problems change” (n.p.). Wilber (2001) remarks how this evolution of consciousness has also been described by Maslow, Kramer, Sinnott, Habermas, Armon, Fischer, Wade, Kegan and Cook-Greuter, all with remarkable similarities.

On a societal scale, new worldviews arise in response to problems to which old worldviews have had no adequate response and if there is validity in the new worldview, it can spread throughout a society. Dawkins (2006) noticed that the bits or units of culture that characterise worldviews can replicate in a population like genes can in a biological sense. Those units of culture that serve the existing life conditions in the most advantageous ways, are imitated and replicated in favour of those with no survival advantages in the same way that evolution occurs in genetics. Using this ‘survival of the fittest’ strategy, as people, organisations or societies solved the problems of their existing life conditions, they evolved to a new worldview and a new set of existential problems (Beck & Cowan, 1996; Graves, 1970; Graves, 1981). This helps in explaining why some people, organisations and societies have no understanding or acceptance of global challenges: they are still grappling with challenges of an earlier worldview. Conversely, sometimes we ourselves have no understanding of what others deem to be so important: we are unable to grasp the complexity that they appear to thrive in. We solve our problems in order, satisfying the hierarchy of needs which Maslow (1943) described, however in Graves’ model, there is no point at which the evolution of consciousness stops.

Resolution to issues such as globalisation, poverty, climate change and ecological crisis has remained out of reach for the dominant worldviews operating in the world today. The remainder of this
chapter elaborates upon the three worldviews most common in Australian society. These worldviews dictate the rules of Government, promise the utopia of economic growth and rally the cause of local activism. It is these worldviews that most influence the way in which sustainability interacts with the WA public school system today.

3.3. A Government worldview

As the schools covered by the scope of this research are public schools administered by the DoE, the WA State Government is the institution that can most readily implement change across the sector. Feitelson warns however, "The root causes of the failure to plan sustainably are fundamentally institutional, and so the hardest to correct" (2004, p. 32). This suggests that to improve the sustainability of the WA public school system, it is worth examining the worldview driving the WA State Government for the solutions it can offer and its potential to change or create change.

The worldview common to most democratic governments is one that seeks to impose order and control for the collective good of the people (Beck & Cowan, 1996; Graves, 1981). This worldview, referred to in this thesis as the Government worldview, values hierarchical organisational structures, with those holding the power at the top creating prescriptive and inflexible rules, regulations and codes of conduct which apply equally to all, for the long term good of all. This worldview can also be found in religious institutions, monarchies and militaries where there is a united purpose, inflexible rules and strong hierarchies.

Codes of conduct are important to the Government worldview and creating legislation in a parliament ensures both the longevity of the rules, regulations and codes of conduct as well as the compliance of people and organisations. According to the Government worldview, everyone must recognise that penalties apply for non-obedience to the appointed higher authority. Ultimately, the purpose of legislation is to maintain the status quo (Wilber, 2001) and that is why for example, a constitution is so difficult to change. Sustainability in this realm is achieved through the prescription of standards such as the ISO 14000 series or the GHG Protocol which stipulate what not to do, more than what to do.

Beck and Cowan (1996) remark that the authoritarianism of this worldview has its utility when it comes time “to clean things up and get the trains running on time again” (p. 231). It excels at maintaining the status quo. When it comes to achieving significant reform, such as that needed to address major issues of sustainability, the more stubborn elements of the Government worldview activate like an immune response to preserve order. Change can only occur when values-dependent decisions about rules, goals and penalties are arrived at through consensus amongst the higher
orders of the controlling hierarchy. Opportunities for learning and feedback at the top levels of government are hampered by the structure of administration (Dovers, 2013). The difficulties in establishing uniform regulation across political boundaries have been well documented by those who examined the fallout from the Copenhagen Accord in 2009. The introduction of carbon pricing in Australia suffered from similar political turmoil.

In WA, a review of departmental policies shows that at present, there are no policies or regulations in place by the DoE that limit, prohibit, constrain or reduce GHG emissions from WA Public Schools. There are also no regulations within Commonwealth or WA state legislation that apply to the education sector for the reduction of GHG emissions. It is not through a lack of political consensus however, more so, a lack of intention amongst the upper hierarchy. Yencken (2002) suggests that politicians have been noted to give little importance to problems perceived to be environmental, when compared with social or economic problems, furthermore, politicians assume that moves to protect or enhance the environment come at an economic expense (ibid). The prioritisation of economics in government indicates the influence of another worldview: the Capitalist worldview, explored in the next section.

Australian governments have not been completely absent from sustainability in schools however, having their strongest influence in curriculum planning. The branch of education that addresses the need to prepare students for life in such a way that promotes sustainability and responsible citizenship is known as Education for Sustainability (EfS) and it is supported by a series of cascading policies introduced by the Commonwealth and WA State Government in the following documents:

- The Melbourne Declaration on Educational Goals for Young Australians (2008)
- The Australian Sustainable Schools Initiative: A Partnership Statement for the Australian Government and the States and Territories (2008)
- The Sustainability Curriculum Framework (2010)
- The Australian National Curriculum
- The West Australian Curriculum
The Environmental Education Strategy and Action Plan

These policy intentions are transferred into practice through the curriculum. The National Curriculum, currently being implemented across Australia, provides opportunities for EfS by establishing sustainability as a cross-curriculum priority. It is intended that sustainability themes are engaged in the teaching of all subjects (Australian Curriculum Assessment and Reporting Authority, 2012).

To support many of the EfS intentions in these policies, the Commonwealth Department of the Environment, Water, Heritage and the Arts (n.d.) have established a framework to resource and monitor schools in their sustainability endeavours. This is known as the Australian Sustainable Schools Initiative (AuSSI). This quasi-government organisation became a means for the Commonwealth Government to bypass many of the limiting characteristics of the Government worldview by outsourcing sustainability obligations. The Commonwealth Government also outsourced the ongoing funding needed for the program to the States (Parliament of Australia, 2012). Since 2002, $2.9 million in Commonwealth start-up funding was supplied for the AuSSI program with the States being required to maintain financial responsibility for their programs after 2011 (ibid).

AuSSI reports that as of 2013 there are 450 schools or 45% of public schools registered as participants in the program in voluntary AuSSI programs in WA (Western Australia. Department of Education, 2013a). Generalised survey data has shown that EfS has had the ability to include students in water and energy audits, surveys, local food production, water management and community initiatives. It is reported that some participating schools have been able to reduce waste by 80%, water use by 60% and energy consumption by 20% (Australian Sustainable Schools Initiative, 2010).

The allocation of government funding for AuSSI and the endorsement of the National Curriculum are two ways in which Commonwealth and State Governments have attempted to introduce sustainability into the WA Public School sector, in the process bypassing limiting aspects of the Government worldview. There is no evidence however that either of these actions has prepared the WA public school system any better for the challenges of climate change, population growth and energy sector reform.
3.4. A Capitalist worldview

The underlying worldview that drives the neoliberal agenda of most developed societies emerged more recently than the millennium old Government worldview (Beck & Cowan, 1996; Wilber, 2001). It is one that seeks to maximise efficiency, minimise losses and enhance profits for the gain of power, status and material wealth and it is referred to here as the Capitalist worldview. It emerged as a rebellion against the demands of conformity insisted upon by the Government worldview. Here, an individual regardless of gender, race, social standing or hierarchy, can rise above the rest and strive for more (ibid).

A side effect of this individualism is materialistic consumerism which powers globalism and the growth in natural resource exploitation. Wilber (2001) exposes one of the drivers of the Capitalist worldview: “Manipulate the earth’s resources for one’s strategic gain” (p. 10). Environmental exploitation is permitted under this values system, as ethical concerns about non-materialist values drop away and the economics of consumption takes precedence (van Egmond & de Vries, 2011).

Since the Thatcher and Reagan era of the 1970s and 1980s, the Capitalist worldview has been a major influence on governments (Dawlabani, 2013a). In the 1990s, many functions, roles and relationships in both private and government organisations were redefined to intentionally break traditional structures and flatten the hierarchies of management (Gardner, 1994). The allure of instant reward, status, achievement and material wealth that emerged at this time now permeates public and private sectors alike.

The Capitalist worldview approach to global issues and GHG emissions abatement dominates the current global political landscape so pervasively that governments commission economists such as Stern and Garnaut to advise on climate policy. Critics of this configuration of values draw attention to the unacceptable compromises some economists make to provide short term advantage to the government and corporate sectors, rather than resigning to the overwhelming scientific consensus about the consequences of issues like climate change (Christoff, 2010). When forced to reduce emissions either by regulation or social pressure, Capitalist approaches seek to quantify sustainability outcomes according to a dollar value. This neglects less tangible values such as equality, responsibility and care (Ille & Schwarze, 2009). It is difficult to put a dollar value on the environment and nature services given that they include emotional, aesthetic and spiritual values (Daily, 1997). Given the strong standing of Capitalist worldview values however, many have tried to do exactly that (Costanza et al., 1998). Ultimately, the short term focus of the Capitalist worldview means that exploiting resources appears more profitable than preserving the ecosystem services they provide.
This pattern of prioritising economic outcomes in Government is illustrated by Carter, Pisaniello and Burritt (2010) who cite seven case studies of government-commissioned sustainability initiatives in Australia. This research revealed disproportionality between the three widely adopted pillars of sustainability: environmental, social and economic. The study showed that programs with environmental outcomes were only supported if economic benefits could be achieved. In observing this disparity, Yencken (2002) pleads for a rebalance of priorities if government economic strategy is to intelligently prepare for an inevitable low carbon economy.

The Government worldview’s obsession with bureaucratic regulation cannot keep pace with the innovation of the Capitalist worldview, for this is the realm of the modernisers characterised by constant and rapid transformation. Scientific and technological progress is born from this worldview. In business, the Capitalist worldview created a suite of economic metrics to assist in achieving progress: tools such as marginal abatement cost curves, cost-benefit analyses and net profit value analyses. Sustainable development in this sphere is more so about development than sustainability. Yencken (2002) goes as far to argue that the Capitalist worldview sees the earth as an economic system, not a physical one.

The Capitalist worldview in WA schools is expressed more prominently in Non-Government schools (Independent and Catholic Schools). These schools function in the same way as private businesses and are free to operate at a profit though they also receive government funding. These schools have few barriers to investing capital into energy efficiency measures, renewable energy or climate change adaptation to reduce their operating expenses and insure against future shocks.

The Capitalist worldview plays a much lesser role in the WA public school system. In WA, public schools are under the direct control of the State Government. In these schools, revenue is derived from the State Government (81.6 per cent) and the Commonwealth Government (13.8 per cent) (Western Australia. Department of Education, 2012). Public schools also charge optional fees to students though this revenue represents only a very small proportion of school funding (Keating, Annett, Burke, & O’Hanlon, 2011). With the majority of public school funding coming from the Government, the Government worldview is the dominant influence on public schools and this means maintaining the status quo albeit a status quo obsessed with building wealth, resource exploitation and development.
3.5. A Communal worldview

Rayner (2010) declares that the top down style, government approach to climate change mitigation has failed, pointing to the disappointments of weak international climate agreements and the continuing global growth in emissions which currently sits around three per cent per annum. The alternative he proposes is a grass roots or bottom-up approach in which climate change action is taken at the most local level possible. In applying his thesis to this context, this would allow schools and their communities to use the local resources that are available to them to make changes that suit their own stage of the emissions abatement and sustainability journey. The advantage to this approach is that action can be achieved in the absence of any uniform agreement between politicians or government departments to develop the best strategies for sustainability within individual schools whilst allowing local partnerships and alliances to form opportunistically. A bottom-up approach also allows the best strategies for climate change adaptation to develop for each school’s geographical and cultural context (ibid). The bottom-up approach is about setting the direction, not the target (Rayner, 2010).

The worldview that drives the bottom-up approach is referred to in this thesis as the Communal worldview. It emerged as an awakening from the frantic pace of the Capitalist worldview when for many, materialistic consumerism inexplicably failed to bring the lasting happiness it was advertising (Beck & Cowan, 1996). The spoils of success became no longer satisfying and the realisation dawned that competition and individualism can be lonely. The effect was a swing away from egoism to pluralism and the rejection of autonomy for communitarianism. In advocating for a return to a simpler life (though still with the comforts that a capitalist society brings), values began to flourish around community, peace and the environment (ibid).

As this new consciousness emerged, a strong ecological sensitivity began to develop (Wilber, 2001). There opened an opportunity to look at the road travelled and to see that, “The glare of environmental fallout is disturbing – the planet appears to have developed for the worse and residues of the mechanical/chemical age percolate everywhere” (Beck & Cowan, 1996, p. 261). The environmental movement of the 1960s was the specific tipping point for the emergence of the Communal worldview in mainstream society. Dovers (2013) marks this period by describing the beginning of environmental policy in Australia, carried in by a ground swell of environmental activism campaigning on local issues, forcing the Australian Government to begin to create national policies on environmental protection. The Greens Party also emerged in the early 1970s, born from a campaign to protect the Franklin River in Tasmania from development and still today remain loyal to the ideology of grass roots action for sustainability, social justice, peace and participatory
democracies (Australian Greens, 2013). With most of the voting population subscribing to Government and Capitalist worldviews however, the Greens, driven by Communal worldview values, have never led government.

The Communal worldview has matured since its mainstream awakening, now characterised by individuals and local communities creating local, sustainable change. This bottom-up approach has emerged organically and expanded at an incredible rate. Hawken (2007) documented the phenomena, recounting how no one started it, no one is in charge of it and no one controls it. In the absence of top-down government regulation to push schools towards sustainability outcomes, or government assistance to pull schools along the sustainability continuum, climate aware schools around Australia have created their own systems to reduce emissions.

In WA, one such school that has harnessed the Communal worldview is South Fremantle Senior High School (SFSHS). After making the decision to become Australia’s first carbon neutral school, SFSHS appointed a Sustainability Officer, initiated a range of actions to reduce emissions and sought partnerships to assist in the journey. Local partners that provided expertise, funding and new infrastructure included Curtin University Sustainability Policy Institute, Simply Carbon, the Bendigo Community Bank, Murdoch University, City of Fremantle local councillors, Hotrock, Grid Solar, Solar Unlimited and a range of local community members (South Fremantle Senior High School, 2012). The benefits of partnerships in implementing sustainability projects include the sharing of solutions with others for mutual benefit; the acquisition of technical and financial expertise; and efficiency in creating visions and solutions (Gough, 2011).

Over five years, SFSHS reduced their emissions until being verified under the National Carbon Offset Standard (NCOS) in May of 2012 as Australia’s first carbon neutral school (South Fremantle Senior High School, 2012). In a unique arrangement with the DoE, one hundred per cent of the school’s utility savings are now returned to the school for further reinvestment in sustainability initiatives.

3.6. Summary

Chapter Three illustrates how individuals and organisations (both government and private) operate according to different worldviews. The three most active worldviews in Australia are the Government worldview which maintains order and the status quo; the Capitalist Worldview which pushes for economic prosperity; and the Communal Worldview which embraces environmental and social values. These worldviews operate in ways that determine how change for sustainability is approached. This chapter has argued that the WA State Government has not created specific policies to make Public Schools more sustainable, although there are intentions in place to teach students
more about sustainability. It then observed that the Capitalist worldview is a proficient agent of change but has limited scope to operate within the State run public school system. Finally, it could be seen that schools are harnessing the power of the community to run small projects that improve sustainability and SFSHS had even managed to become carbon neutral through such an approach.

Chapter Four examines how the Government, Capitalist and Communal worldviews have been unable to successfully transform the WA public school system because of barriers that stem from the weaknesses of these worldviews or the inability of particular worldviews to perform essential tasks.
Chapter 4: Barriers to Implementing a Response

This chapter looks to unpack some of the complexity that stems from the interaction of worldviews and sustainability initiatives. It explores the absence of any real intention to change the WA public school system; the barriers to creating sustainability without a framework to manage information and collate expertise; and the difficulties in creating sustainable infrastructure under current funding arrangements.

4.1. Lack of political intention in a Government approach

The effectiveness of political action on climate change has attracted strong criticism globally. Hamilton’s dire assessment of the impacts of climate change is particularly representative of many authors’ views that “climate change represents a failure of modern politics” (2010, p. 223). Dovers (1996) contends that “three decades of worldwide reform in environmental statutory and policy settings have not made much of a dent on the sustainability problem” (p. 309) and Benn and Dunphy (2007) add that “models of governance for sustainability need to concentrate more on change than stability” (p. 485). There appears no reason why the Government worldview would take up environmental causes. Australia has been slow to put climate change on the political agenda and now the politicisation of climate science, particularly at the Federal level, has made a meaningful national response slow and difficult.

Brueckner and Pforr (2011a) submit that political leadership on the reduction of carbon emissions in WA is seemingly unlikely in the short term, with climate change action perceived to be at odds with the developmentalist stance of the current Government. This attitude stems from the strong influence of the Capitalist worldview on the Government approach. Even if the political will to reduce emissions in WA should eventuate and policy frameworks are created by the DoE to lead the education sector towards a low carbon future, there is currently little chance of success of those policies without a suitable political setting and a capable public administration (Dollery & Hovey, 2010). It would require the integration of environmental policies into non-environmental sectors of government in what Lafferty and Hovden (2003) call Environmental Policy Integration (EPI). Over a history of several decades, EPI as a political framework has promised to be able to provide a common platform for seemingly incompatible environmental, economic and social goals in the political sphere but in practice, EPI introduces requirements for a new level of contingency and complexity into government and it must be integrated into a whole of Government approach to be most effective (Jordan & Lenschow, 2010). Furthermore, this policy integration must be ongoing, constantly refined, revised and reformed. It is far from the governance style that is currently in
place. The WA State Government is resistant to changing from developmentalist paradigms and without the potential to transform the economy and the political setting behind it, a meaningful effort to create sustainability in schools is unlikely to be led by the Government.

For a brief period during the early to mid 2000s, the WA State Government looked as if it might break free from the powerful influence of the Capitalist worldview into something resembling a more holistic and sustainability minded Communal approach. Brueckner and Pforr’s (2011a) analysis of the history of sustainability as a policy driver in WA reveals a brief flash of commitment in 2001 from a Labor Government elected on a campaign platform containing high profile environmental issues. An opportunity arose but evaporated when the newly created WA State Sustainability Strategy of 2003, which represented a genuine progression in political psychology and culture (Newman, 2006) and a genuine evolution of worldviews, failed to be enacted in parliament. When Premier Geoff Gallop and the Environment Minister Judy Edwards resigned, Alan Carpenter eventually took over leadership of the party and restored the developmentalist agenda. Without the formalisation of operational structures recommended by the State Sustainability Strategy, it became and remains merely a statement of goodwill intent (Brueckner & Pforr, 2011b). Concurrent elections have been fought on short term matters that have more immediacy for the voting public such as health, education and the economy. Today, Premier Barnett leads a second term government in which sustainability has been siloed within the Department of Environment and Regulation (DER) and ecological concerns only garner political attention when there is publicly apparent conflict with mineral resource development projects (Ross & Dovers, 2008).

Despite a brief window in which the WA State Government was open to a new psychology of governance, it has since reverted to a capitalist agenda cemented in place by a Government worldview. Brueckner and Pforr (2011a) provide long odds for the evolution of sustainability in WA politics, asserting that,

A new political 'heroism' may be needed to overcome the economic-ecological dichotomy that undermines efforts to harmonize economic development with social and environmental health...without critical engagement with the sustainability problematic and needed reflection on the values and ideologies behind many of today’s pressing social and environmental concerns, effective sustainability policy making is likely to remain a distant reach (p. 10 and 11).

Dovers (1996) reinforces this view that the Government worldview works towards maintaining the status quo, saying, “implicitly, the core criteria for policy success is the survival of the existing
process and short term tolerance of outcomes by key actors; not positive, lasting change in the environment, human use of it, or the human condition” (p. 308).

4.2. Information barriers in a Capitalist approach

The stagnation and dogged stubbornness of the Government worldview has shown to be incapable of addressing the future challenges to the WA public school system. The Capitalist worldview is better suited to change and it excels at achieving outcomes, however its approach relies on information and evidence upon which to create strategies and measure progress. In order for an economic or a regulatory approach to be effective, reliable data must be collected. An appropriate indicator for measuring the success of sustainability initiatives across the WA public school system would be through the tracking of GHG emissions via carbon accounting methodologies. Currently, data to track emissions from schools in WA does not exist in a format that is useful for developing a comprehensive portrait of carbon emissions across the WA school sector.

In a highly regulated environment such as the public school system, there can be many benefits to engaging schools in carbon auditing and reporting practices that typify GHG emissions assessments. Busch and Odden (1997) list seven areas in which school-level data collection is useful. Applied to the context of emissions reductions, these are:

- **Governance**: The information required for a carbon inventory can be used for site-based management of school facilities.
- **Accountability**: The Government can ensure that schools are improving in emission reduction efforts.
- **Efficiency and Productivity (Effectiveness)**: By engaging directly with the data, schools will be able to better target resource efficiency and carbon abatement measures.
- **Equity**: The government can ensure that resources for emissions reductions are best distributed across schools.
- **Adequacy**: Schools can ensure that efficiency and abatement measures are performing to an expected standard. Having immediate access to data can provide the opportunity for rapid responses to poor performing measures.
- **Comparability**: Data across schools can be compared and information about high performing initiatives shared whilst underperforming schools can be assisted.
• **Longitudinal Analysis**: Provides the ability to analyse the performance of allocated resources over time both at a State level and school level as well as the review of processes and policies and regulations for carbon reduction.

In a bottom-up approach to data collecting, schools conduct their own emissions data and report to the administrative authority. The major issue in this approach is that schools in other countries involved in these programs have been found to return incomplete or inaccurate emissions surveys (Global Action Plan, Stockholm Environment Institute, & Ecologica Ltd, 2006).

An alternative method of collecting information is through a top-down approach where data is mined at the departmental level to extract emissions quantities from sources such as utility providers. This typically involves extrapolating emission quantities from mathematical formulae to determine the approximate emissions for the whole sector (Global Action Plan, et al., 2006) however, it isolates schools from any involvement in GHG accounting.

In collecting data through either method, Picus (1998) identifies issues to be considered. These are highlighted below.

• **Cost**: The cost and burden of carbon accounting in addition to the current administrative duties required of public schools will be one of the most important considerations. Time will be needed for staff to collect and collate data from sources that are not particularly conducive to GHG accounting, sources such as bills, invoices, vehicle logs and air travel itineraries. GHG reporting requirements will be unfamiliar to school administrators requiring time and training to learn new reporting procedures. Some schools may need to hire new staff to manage these requirements and others may simply want to outsource the process to consultants because of the complexity of creating emission inventories. Either option contributes significantly to the fiscal burden on school budgets. At the departmental level, inventories must be collated, checked and consolidated adding further to costs.

• **Extraneous, Irrelevant or Obsolete Data**: Any sort of accounting and reporting system must produce information that is useful, not just to state level administrators but to policy makers in order that carbon abatement strategies can adapt and improve with the inevitable shift to a low carbon economy. A balance is required between the collection of as much data as possible that may be useful in the future and the cost and administrative burden on school-level administrators of collecting data.
• **Complexity:** For the data to be useful to state level administrators, it must be complete and accurate at the school level. In some of the complex equations involved in carbon accounting and the difficulty of visualizing quantities carbon emissions, it may be unreasonable for a school administrator with no background in carbon accounting to produce an accurate and complete inventory. Small mistakes can result in large errors that may not be detected due to the unfamiliarity of working in quantities of CO$_2$e. To overcome this issue, it is suggested by Farland (1997) and Goertz (1997) that school funding be tied to the accuracy of school level reporting as an incentive to create complete and useful data sets.

• **Comparability:** A lack of comparability between school level inventories would create significant difficulties in creating state level carbon management strategies such as emissions benchmarking, policy development and funding incentives. Given that emissions can be generated from a variety of sources that are inconsistent across schools, a universal template for reporting will be required. Comparability with the reporting of other sectors of government may also be useful in the future.

• **Technology and Training:** In order to handle the substantial amounts of data anticipated from school level data collection, a comprehensive reporting system would be required (Busch & Odden, 1997). Picus (1998) suggests that a software based database may be the best way to manage this data although this carries significant challenges. The creation of similar school databases in the United States revealed the need for the training of school staff to use and maintain the databases. An attempt at state level administration of these databases proved too costly and time consuming and school based administration was recommended (ibid).

A state-wide program for emissions abatement will require a methodology for collecting data universally across the sector so that progress can be measured; underperforming schools assisted; high achieving schools rewarded; and a minimum benchmark for acceptable GHG emissions established. Consistent and comprehensive sets of data from each school will also assist in the employment of economic metrics and funding mechanisms. A methodology based on recognised standards such as the GHG Protocol and ISO14064 may be able to provide comparability with other public service sectors that initiate emissions abatement programs. Brown (2002) says that it is imperative that governments convey information on key environmental indicators such as carbon emissions to the public in order to counter resistance that may arise from misunderstandings surrounding any kind of change to school operations.
An option for the management of carbon accounting across public schools would be to place this function with AuSSI. Under the present configuration for the role of AuSSI in Australian schools however, evaluation of emissions from schools by AuSSI is problematic. Firstly, AuSSI’s current purpose is to provide a framework for introducing sustainability into schools. Quantifying outcomes such as carbon emissions are not within the scope of the AuSSI program and states have the freedom to implement whatever sustainability initiatives they deem suitable, if any at all. With the states undertaking their own agendas, the collection and collation of data for measuring and comparing outcomes at a national level is not available.

4.3. A lack of expertise in a Communal approach

The Communal worldview imbues many benefits to implementing sustainability projects, including the sharing of solutions with the local community for mutual benefit; the acquisition of technical and financial expertise through partnerships; and efficiency in creating visions and solutions (Gough, 2011).

The freedom to act independently, without a central blueprint, allows innovation and creativity to emerge. Schools can base their actions on the specific context in which they operate, accounting for the actions they have already taken; the drivers of sustainability in their locale; the areas of operations in which they are least sustainable; the risks posed to them by climate change; and the opportunities afforded to them through their networks. Freedom of design also enables students to participate in the sustainability process, from the inception of ideas to monitoring and evaluation.

The preference of the Communal worldview is for these solutions to be shared in a horizontal plane, that is, from school to school. The converse would see solutions move vertically, as would be the preference of the Government Worldview, however as information flows up the management hierarchy, it becomes distilled and distorted into policy speak (Adams, 2004), losing much of its value.

Meaningful change for sustainable development in WA schools however is virtually non-existent outside of certain school yards. Grass roots efforts to date have resulted in improvements such as solar photo-voltaic panels installed on school roofs and the creation of vegetable gardens, but this is tinkering around the edges: little more than status quo sustainability. Jenson and Schnack (2006) assert that, “a school does not become ‘green’ by conserving energy, collecting batteries or sorting waste. The crucial factor must be what the students learn from participating in such activities, or from deciding something else” (p. 473).
Transformation is therefore more than a technological fix and Hopwood (2005) warns that funding that encourages technological change is not necessarily a reform. Instead, transformation is needed that incorporates shifts in cognitive abilities of individuals; changes in behaviours; changes to culture and collective psychologies; as well as changes to physical infrastructure and systems through the employment of technology (Slaughter, 2012; Wilber, 2001). In this regard, schools are like cities with people, economies, cultures and ecosystems, albeit at smaller scales.

Genuine sustainable transformation of this nature requires a specialised proficiency which is not readily available in most schools. There are very few sustainability professionals employed directly by schools in Australia. While a case can be made for the employment of sustainability officers in all schools, the number of qualified professionals required for these positions are just not available on a practical scale and once a sector wide transformation is complete, the need for sustainability officers in schools would be severely diminished. A central repository for sustainability expertise seems the most practical way of implementing a communal approach to sustainability in schools. This would assist schools to identify the areas in which they can improve their sustainability efficiently and effectively. With hundreds of actions that schools could take to be more sustainable, knowing what to do first requires expertise.

A framework for distributing expertise already exists in the AuSSI network, however with no standardised goals or outcomes from sustainability initiatives, a quantifiable assessment of the more than 3,000 schools participating in the AuSSI program can only be based on participation rates whilst qualitative assessments are by AuSSI’s own admission, limited (Australia. Department of the Environment, 2010).

The WA branch of AuSSI is focussed on introducing sustainability into WA schools (Australian Sustainable Schools Initiative, n.d.). The emphasis in WA is to create an awareness of sustainability issues amongst students, not specifically to reduce emissions. The development of Sustainability Action Plans (SAP) by individual schools does in some cases reduce resource consumption but a standardised methodology for quantifying or benchmarking progress is lacking.
4.4. Difficulties in funding

At the school level, principals at public schools are directly accountable for line items in their budgets to their respective regional executive director. There is little scope for these principals to manage their own budgets (The University of Melbourne, 2013). Independent public schools are afforded more flexibility, being provided with one line of funding for all expenses though they must manage their operations according to a delivery and performance agreement, reviewed after three years (ibid). The creation of independent public schools into the WA education system is an indicator of the evolution of the Government worldview towards a Capitalist worldview in what was traditionally a government service.

The Capitalist worldview has an opportunity to influence sustainability in schools by taking a sustainable approach to the management of utilities in WA public schools. There are several line items in WA public schools’ operating expenses that are linked to GHG emissions. These include:

- Purchased electricity
- Purchased natural gas
- Fuel for transport
- Fuel for stationary energy use
- Waste to landfill
- Reticulated water supply
- Office paper
- Business travel
- Field trips and excursions

In 2011/2012, the DoE devolved $60.4m to schools to cover the costs of utilities such as water, electricity, gas and waste (Western Australia. Department of Education, 2012).

A review of the DoE and broader WA State Government policies reveals no specific directives for the education sector in regards to climate change adaptation or mitigation. If emission reduction policies were to be created, robust funding arrangements to implement policy recommendations would be a core consideration. Funding structures for public schools in WA as they currently stand represent a barrier to the creation of sustainable schools regardless of which approach is used to implement sustainability initiatives.

There are ideological conflicts to financing arrangements when the Government worldview has partially adopted characteristics of the Capitalist worldview. The Capitalist worldview demands that
spending efficiencies are identified and that costs are reduced however the Government worldview has no expectations of efficiency or savings. In the case of the WA public school system, reducing the running costs of utilities would both save the Government money and imbue environmental benefits. The current funding arrangement for utilities however does not support this. The budget for utilities (particularly prior to 2011/2012) is calculated using formulae that base funding on the previous year’s utilities expenditure. If a school spent $x in one year, than roughly speaking, they would receive the same for the following year. There is no incentive for schools to implement efficiency measures because financial savings from abatement efforts cannot be realised by the school. Any savings made simply reduces funding for that line item in the following year. As a further disincentive for schools to implement resource efficiency, schools that overspend their budget allocation for utilities, can simply apply for additional funding through the Global Funding Supplementation scheme or receive a permanent adjustment to their allocation (Keating, et al., 2011).

Further illustrating that this is characteristic of the Government worldview and not just the WA State Government, this issue of funding at the school/State level can be shown to also apply at the State/Commonwealth level. The Average Government School Recurrent Cost (AGSRC) is a measure that is used to allocate Commonwealth funds to State Governments for the real costs of schooling incurred in each state. If States do not use their allocation of funds, funds are returned to the Commonwealth funding system (Australia. Department of Education, Employment and Workplace Relations, 2013) which actually provides State governments with an incentive to spend the entire allocation.

This circumstance in which the entity paying for the energy efficiency abatement is not necessarily the one who benefits is what Kesicki and Ekins (2012) term "Agency Issues" or "Split Incentives". For example, if a school reduces their electricity use by ten per cent and therefore their electricity charges by ten per cent, their funding allocation from the DOE will be reduced the following year by ten per cent, meanwhile the DOE reap the ten per cent saving from that school’s lower electricity charges. The school receives no financial benefit. The issue of split incentives provides no inducement for schools to engage in emissions abatement. Split incentive issues also apply at the State/Commonwealth level, as there is no incentive for the WA State Government to push schools to lower their utility expenses.

Another peculiarity within the Capitalist approach to implementing sustainability in WA schools is the Energy Efficiency Paradox. De Canio (1998) explains how corporations, governments and organisations which can be assumed to be economically efficient, fail to adopt energy efficiency
strategies which can reduce costs and increase profits. Whilst no hypothesis can be offered to why the Energy Efficiency Paradox exists, it can be observed in the operation of schools and government education departments around Australia. For all of the efforts made by different governments to boost school funding, little has been made of opportunities to reduce school expenditure in non-educational areas.

4.5. Summary

In this chapter, it was shown that the Government worldview’s tenacity in maintaining the status quo in governance and planning has meant that efforts over the last decade to introduce sustainability into government services have failed. Even more detrimental to sustainability efforts, the Government worldview in WA has evolved to take on particularly malignant qualities of the Capitalist worldview: namely the pursuit of wealth though the resources industry. This Government/Capitalist hybrid means that the process of natural resource exploitation is virtually locked in by Government and industry until life conditions force a change.

A Capitalist worldview approach holds signs for rapid transformation however intentions to integrate a more ecologically sensitive development paradigm in the WA public school system are dampened by the absence of a methodology for measuring sustainability in schools. Without a way to measure sustainability in schools, the Capitalist worldview preference to base change on empirical enquiry becomes impossible.

A ground up approach to sustainability driven by the Communal worldview is underway in many schools in Australia. A widespread adoption of this approach however is hampered by a lack of access to sustainability expertise that can guide schools to create the most effective and cost-efficient strategies. This approach therefore remains limited in the scale of change it can facilitate.

The issue of split incentives in current funding arrangements means that there is no financial incentive for schools to take on sustainability projects. Additionally, the energy efficiency paradox compounds the pessimistic outlook for a sector wide transformation by arguing that even when financial benefits are available for energy efficiency and renewable energy projects, organisations inexplicably tend to neglect to adopt these sorts of initiatives.

Chapter Five investigates how these issues might be overcome by integrating worldviews. In particular it looks at the strengths of each worldview to see how they can be configured to create a harmonious and productive environment for a transformation of the WA School System to emerge.

It then considers how these worldviews can be coordinated by a new worldview: an Integral worldview.
Chapter 5: Seeking a Harmonised Approach

As the urgency to respond to complex global challenges builds, there has been a tendency for the Government, Capitalist and Communal worldviews to fortify their resolve, choosing to defend their approaches rather than open to change. This response has in many ways, deepened the crisis. As van Egmond and de Vries (2011) explain,

Due to a number of societal and psychological centrifugal forces, worldviews become one-sided and finally end in fundamentalist value orientations which are synonym with overshoot, collapse and crisis (p. 853).

Listing the Global Financial Crisis (GFC) and the environmental crisis as examples, van Egmond and de Vries (2011) demonstrate that in the face of life changing conditions, the efficacy of underlying worldviews behind Government, Capitalist and Communal approaches is being challenged. This chapter contemplates the arrival of a new worldview: an Integral approach that can placate and harmonise the worldviews that emerged before it, opening the system to change. It looks at how the application of new values systems and competencies could address the increasing complexity of global challenges to bring sustainability into the WA public school system in a meaningful way.

5.1. An Integral worldview

Van Opstal and Hugé (2013) describe the nature of new life challenges that demand the competencies of a more advanced worldview. They explain that in the light of post-modernity, branded by the presence of complexity and the globalised intertwining of systems, life challenges are characterised as having uncertainties of multiple varieties and the multiplicity of reasonable perspectives on issues (Funtowicz, Ravetz, & O’Connor, 1998). In other words, there are no straight questions let alone straight answers.

Dryzek and Niemeyer (2008) ponder the possibility of an Integral worldview, one to integrate all underlying worldviews using dialogue and representation; Van Opstal and Hugé (2013) consider the co-evolution of underlying worldviews into one inclusive worldview under the banner of sustainable development; and Beck and Cowan describe a worldview that is self-determining yet not self-serving (1996).

An Integral worldview is the seventh worldview that Graves described in his model. It subscribes to what Beck and Cowan (1996) term a “FlexFlow” approach which "looks for ways to increase the range of options, available niches, manoeuvring space, and expanded opportunities" (p. 283). It is naturally able to grasp the theories of nested hierarchies, panarchies, universal flow systems and
other conceptual models that seek to explain the complexities of the world. In Integral management, efficiency is prioritised and achieved, not by limiting avenues for action, but by rewarding effective action. This worldview is about knowledge and competence (Wilber, 2001) and under its leadership, only change that has social, economic and environmental benefits can survive.

The Integral worldview differs from past worldviews. It is more than just an evolution. It is characterised not by the yearning to satisfy human desires like the previous worldviews but by the desire to express new human competencies (Graves, 1974). Furthermore, there is no competition with older worldviews because an Integral worldview contains healthy versions of the Government, Capitalist and Communal worldviews. Wilber (2001) defines its function as being, “to integrate, to bring together, to join, to link, to embrace...into a more comprehensive view” (p. 2). It is not just a new worldview, it is also all of the old worldviews (Graves, 1970; Graves, 1981).

Unlike the political correctness, ‘balanced’ media and freedom of speech (as long as it oppresses no one) that the Communal worldview espouses, the Integral worldview believes that not everyone has valid viewpoint and that only those with a better grasp of the complexity inherent in future challenges should be given the task of addressing these challenges. It says, “the price of keeping everybody happy is untenably high; the cost of harmony sometimes too steep” (Beck & Cowan, 1996, p. 273), for no amount of coming together, listening, hand-holding, group hugging, protesting or peace seeking is going to stop climate change, motivate governments or change the values of corporate giants. When the Integral worldview takes charge there is a return back to strong individualism but this time, rather than being self-serving, this individualism harnesses competence, knowledge, flexibility and functionality to do what is needed for the health of everyone (ibid).

5.2. Utilising the strengths of the worldviews

The insights of the previous chapters suggest there is little worth in evaluating the potential of another policy, initiative or government funded organisation to reduce GHG emissions without contemplation of the internal forces of worldviews. Current efforts are bound to be limited in success, held back by the competing values and priorities of government authorities, schools and influential elements in the education system. Furthermore, whilst many authors advocate that worldviews can be made to change (van Egmond & de Vries, 2011; Van Opstal & Hugé, 2013), it is the view of Graves (1970) that worldviews evolve on their own, according to the life conditions they are presented with. They will change when conditions dictate.

Rather than change worldviews, a new Integral worldview promises to integrate the functions that each of the prior worldviews excels at. In this regard, Van Marrewijk and Werre (2003) describe the
Integral worldview as synergistic. Each worldview has healthy and unhealthy expressions. It is not that worldviews are good or bad: that would amount to a subjective judgement using our own values and beliefs. Instead Graves (1970; 1981) explains that healthy versions of each worldview support the existence of other worldviews, whilst unhealthy versions attack other worldviews.

Each worldview has natural strengths that can be utilised to address the challenges facing the WA public school system. It was seen in Chapter Three that the Government worldview is well suited to creating a regulatory environment that aims to maintain a long term focus on the welfare of all people. Its tendency for stability and tenacity can be a great strength. It can unite multiple entities under a common goal. The Capitalist worldview was described as being innovative, driven, evidence based and economically advanced. It can accept feedback and turn the ship quickly. Finally, the Communal worldview adds a social conscience: reintroducing criteria around culture, morality, ethics, intergenerational equity and environmental stewardship into decision making. It tempers the Capitalist obsession with economic growth by maintaining a focus on social and environmental benefits (Pearce, 1998). The Communal worldview enables a bottom-up approach, allowing for the smallest voices to be heard and for locally adapted solutions to be developed in response to context specific problems. An approach led by the Integral worldview means that the Government, Capitalist and Communal worldviews still function simultaneously but each worldview supports the existence of the others in such a way that enhances the competencies inherent within each.

According to Beck and Cowan (1996), the Integral worldview draws on the strengths of the previous worldviews at the appropriate times, for the appropriate functions. The Government worldview will light up if the task calls for patience, an authoritarian climate and self-denial. The Capitalist worldview will come to the fore if information is required or progress is stymied. When collaboration or local knowledge is needed, the Communal worldview will step forward. Each worldview does what is it is naturally best at, in such a way that it does not prohibit the flourishing of other worldviews. In this operating environment, the Integral worldview is a conductor, instructing others to dim or brighten, coordinating outcomes and reprimanding when necessary those who put up obstacles (ibid).

5.3. Integral sustainability in the WA public school system

In order for an organisation such as the DoE to address concerns of climate change and carbon emissions, DeCanio et al. (2000; DeCanio, Watkins, Mitchell, Amir-Atefi, & Dibble, 2001) argue that organisational restructuring needs to occur to be able to place more resources where they are needed. For an Integral worldview to function, a host would be needed for these resources. This
host would provide the platform for the complex integration of policy, funding, technology, regulation and participation. It would house expertise in these areas and be able to act independently, as the Integral worldview does, immune to the pressures of lobbyists from any particular area of society. It is possible for AuSSI to be this host. AuSSI is already accepted as a legitimate entity by the WA Government and WA public schools, and it has already developed the antibodies to protect its existence within the system.

AuSSI would lead the delivery of emission reductions and the development of sustainability initiatives in the WA public school system. As an already established entity, AuSSI is well placed to lead a change, currently let down only by its lack of human and financial resources and government regulations to drive sustainability in schools. It is already engaged in promoting voluntary sustainability programs in schools, has national networks and the financial support of State Governments. Furthermore, AuSSI has the capacity to open avenues for a dialogue between stakeholders however, methods for conducting a dialogue must be sensitive to worldviews. Gardner (1999) says, “different interpretations of strategic dialogue are required to achieve the blend of internal (people and systems) and external (commercial, social and environmental) outcomes required” (p. 15) meaning that the same script will not convince all stakeholders to collaborate.

5.4. Ecological modernisation as a tool

In order to create sustainable change, AuSSI would need to adopt an approach that could provide a rapid technological shift to improve the resilience and sustainable performance of schools. This shift requires the strengths of the Capitalist worldview, drawing on its capabilities to innovate, measure and collate information, harness technology and achieve results. The Capitalist worldview however, has been criticised for its lack of ecological conscience and dogged pursuit of profits. Ecological modernisation may provide the answer to this dilemma.

Ecological modernisation is premised on the theory that economic growth need not be correlated with environmental degradation (Barry, 2003; Christoff, 1996; Hajer, 1995; Weale, 1992). Whilst WA State Government ownership of the WA public school system removes it from any profit driven obligations, the sector must still plan financially for an expansion caused by population growth as well as the inevitable investment needed for the replacement of ageing and arguably unsustainable infrastructure. In this sense, the adoption of sustainable technologies in a way that still caters for growth, holds great appeal.

The application of ecological modernisation in building resilience within the WA public school system is premised on the argument that sustainable transformation does not necessarily need to do away
with the fundamentals of modern economies but instead to correct some of the structural design
defaults (Mol & Spaargaren, 2000). Just as the Integral worldview seeks to harmonise existing
worldviews, ecological modernisation seeks to harmonise attributes of environmental stewardship
with the drive of the capitalist economy through the employment of sustainable technologies. The
type emerged in the 1980s (Mol & Spaargaren, 1992), around the same time as the
mainstreaming of the Communal worldview in western society, in response to the growing
dominance of the Capitalist worldview. Specifically, Mol and Spaargeren (1992) identify the debates
in the 1970s around demodernisation, deindustrialisation and counter-productivity as the spawning
ground for ecological modernisation theory.

Whilst criticisms of ecological modernisation are often founded on the premise that the growth
fetish of capitalism can never be reconciled with environmental limits and, as such, cannot provide
anything more than a cosmetic treatment of environmental deterioration (Fisher & Freudenburg,
2001), Mol and Spaargeren (2000) claim that ecological modernisation is not intended to be an
alternative economic model. They clarify the context for its use, explaining that, “in the processes of
institutional reform technological transformations have their place, although they are not as central
as its critics wants us to believe” (pp. 20,21). The critics of ecological modernisation reject the
strengths and utility of the existing Capitalist worldview. They fail to recognise that ecological
modernisation is actually the evolution of the Capitalist worldview in the direction of the more eco-
conscious Communal worldview in such a way that maintains the Capitalist worldview’s ability to
innovate and conceive technological solutions. It is therefore appropriate that ecological
modernisation is not adopted as an approach across the whole socio-political territory of the WA
public school system, but as a tool predominantly used to guide the transition of the public school
sector to a place where short and medium term challenges have been addressed and further
contemplation of the next institutional approach is possible.

Ecological modernisation is a viable avenue because it fits with an Integral approach. It has merit
because it is seen to be economically and politically feasible (Fisher & Freudenburg, 2001) and it is
non-threatening to Government, Capitalist and Communal worldviews. The benefits are substantial.
The Green Building Council of Australia (n.d.) reports that schools built or retrofitted to meet
sustainable design building codes cost less to run, create healthy and productive learning
environments, reduce the rates of absenteeism in staff and students and create learning
opportunities for students. With the adoption of this approach, AuSSI could roll-out system wide
renewable technologies, building retrofits and new green buildings, using this as a platform for
further cultural, epistemological and pedagogical change.
5.5. The role of government

As was shown in Chapter Four, the WA State Government has a poor track record in sustainable development. Attempts to integrate development in such a way as to create resilience from climate change and energy insecurity have revealed the WA State Government to be firmly ensconced within a decades old developmentalist agenda based singularly on economic outcomes: the quintessence of a government embodying a Capitalist worldview. Whilst in this arrested and locked-down state, the potential for a government led program to prepare for future challenges facing the WA public school system is limited.

There is a role however for the WA State Government within an Integral approach. Using the Government’s strengths in creating regulation, a framework for compulsory participation by all WA public schools would be created and control over the funding of utilities in the WA public school system would be relinquished to AuSSI where an approach for ecological modernisation can be orchestrated.

Dryzek (2013) argues that government regulation favours end-of-pipe policy measures, that is, policies that are prescriptive in the nature of the outcome, not of the process. Applied to this context, the WA State Government could mandate compulsory participation for schools in a sustainability program and determine a state-wide target for emissions from the WA public school sector, leaving AuSSI to create and manage the process. Sabel et al. (1999) propose a style of regulation that would suit this approach called a “rolling rule regime” in which the government sets standards and maintains accountability while methods of compliance are negotiated with stakeholders: AuSSI and the Public Schools. It is intended to be a collaborative and flexible approach, yet one that sets firm definitions around the outcomes to be achieved (Dovers, 2013; Sabel, et al., 1999).

To address the issues around funding for the sustainability transformation, the WA State Government could entrust the utilities budget for all WA public schools to AuSSI along with a quantum of start-up funding for sustainability initiatives. Using econometric tools to allocate and invest funds in the most profitable way, AuSSI would assist schools to reduce their resource use thereby reducing their expenditure on utilities. The savings would be returned to the utilities budget thereby growing the pool of funding available for further sustainability initiatives. Removing funding responsibilities from the WA State Government eliminates the problem of split incentives.

The adoption of market mechanisms to achieve environmental outcomes has been seen before in Australia in the management of water, carbon and fisheries (Dovers, 2013). It is further evidence of
the Government worldview fondness for Capitalist approaches. In this proposal for the WA public school system, Capitalist functions are quarantined within AuSSI in order to preserve the integrity of the Government worldview and remove the conflicts in values and priorities that lead to barriers.

5.6. Characteristics of an Integral program for sustainability

When the healthy expressions of the Government, Capitalist and Communal worldviews are simultaneously accessible and coordination of functions is provided by the Integral worldview, a new organisational model that can address climate change, population growth and energy security challenges in the WA public school system becomes possible. It would have a particular set of characteristics which Dawlabani (2013b) has identified.

<table>
<thead>
<tr>
<th>Current Dominant Worldviews</th>
<th>Integral Worldview</th>
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</thead>
<tbody>
<tr>
<td>Hierarchical and Rigid</td>
<td>Functional and Distributed</td>
</tr>
<tr>
<td>Too Big to Fail</td>
<td>Failure Occurs naturally without affecting the entire system</td>
</tr>
<tr>
<td>Concentrated Wealth</td>
<td>Distributed Prosperity</td>
</tr>
<tr>
<td>Proprietary and Secretive</td>
<td>Collaborative and Open Source</td>
</tr>
<tr>
<td>Manipulate to Succeed</td>
<td>Innovate and Disrupt</td>
</tr>
<tr>
<td>Subsistent and Exhaustible</td>
<td>Sustainable and Renewable</td>
</tr>
</tbody>
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In his critique of how unhealthy expressions of the dominating Capitalist worldview and a weakening of the authority in the Government worldview led to crisis and overshoot in the global financial system, Dawlabani proposes this list of characteristics. He describes it as a twenty-first century model of economics: one that is more sustainable and resilient, and one that accounts for a broader, more integrated range of values from multiple worldviews whilst also enabling the long term prosperity of people and the planet. An Integral model of a sustainable WA public school system would subscribe to these same characteristics.

5.7. Summary

Chapter Five proposes the adoption of an Integral worldview: one that coordinates the strengths of the Government, Capitalist and Communal worldviews. In practice this means that AuSSI would expand its capabilities to take over the funding of school utilities from the DoE and apply the tools of ecological modernisation to transform schools in a cost-effective way to prepare them for future challenges. AuSSI would supply expertise and funding to schools to achieve outcomes mandated by
the WA State Government. The new arrangement would mean that the WA public school system would exhibit characteristics of a new paradigm: resilient and sustainable.
Chapter 6: Conclusion

WA public schools were chosen as the focus of the study for two reasons: schools play a large role in the development of students’ capacities to create a liveable and thriving society in adulthood, and schools should therefore represent sustainability in their buildings and operations; and schools on the whole, as neither large GHG emitters individually, nor insignificant emitters as a sector, are a neglected part of the sustainability effort even though they are a discernible and even familiar feature of most communities. The achievement of South Fremantle Senior High School in becoming Australia’s first carbon neutral school raised a line of inquiry: to discover how one public school’s success in improving its sustainability could be replicated across the entire WA public school sector.

This is a timely study, as WA’s GHG emissions continue to increase when Australia’s international obligations demand that emissions fall. In seeking to inform policy, this thesis set out to identify the challenges that the WA public school system is likely to face in coming decades. These challenges were established as being climate change, population growth and the transformation of the energy sector. Preliminary research suggested that barriers to addressing these challenges stemmed from the varying perspectives on sustainability of the WA Government, the corporate world and individual school communities in WA. The findings prompted an investigation of the nexus between worldviews and sustainability, which in turn instigated a search for a worldview that could integrate and unify the Government, Capitalist and Communal worldviews in the WA public school system.

This chapter provides a synthesis of key findings from previous chapters, concluding that the new degree of complexity inherent in issues of sustainability has confused the roles that Government, corporate and community sectors play in society to bring about sustainability. The theoretical implications are discussed, demonstrating how this thesis builds upon the literature on sustainability perspectives and approaches. Finally, areas of further research are identified, indicating the utility of this research in further lines of inquiry.
6.1. Key findings

The key findings are presented in the respective chapters: Emerging pressures on schools in WA; Sustainability as a response; Barriers to implementing a response; and Seeking an Integral approach.

Chapter Two of the thesis identified that climate change, population growth and the inevitable transformation of the energy sector provided the impetus for creating sustainability in the WA public school system. Given that much of the existing public school infrastructure is ageing and new schools are being built to accommodate growth in the WA public school system, it would seem an opportune time to address these challenges by creating sustainable school buildings and school environments.

In Chapter Three it was demonstrated that a government sector cannot undertake a successful transition to sustainability without firstly addressing the worldviews that influence it. Worldviews determine an individual’s, organisation’s or society’s perspective on sustainability and thus their response to creating it. The three main worldviews operating in Australian society which are the Government worldview, the Capitalist worldview and the Communal worldview, each have weaknesses. It was found that failures in addressing issues of sustainability and resilience arise from worldviews not possessing the necessary cognitive capacities to handle the complexity of sustainability issues; worldviews taking on operational functions to which they are not suited; and worldviews sabotaging the outcomes of other worldviews.

The fourth chapter of the thesis highlighted how these failures have presented in various ways in the WA public school system. There has been no large scale effort to reduce GHG emissions from schools largely because of a lack of intention by the WA State Government to engage in sustainability initiatives; EfS has remained peripheral to the core of the National Curriculum; and the Government funding framework for WA Public Schools means that there are no incentives for schools to embark on resource efficiency projects. Overcoming these barriers requires an ability to comprehend a new degree of complexity.

The inherent complexity in global challenges means that often the actions nominated to create an effective approach to sustainability are misdirected and fall to the wrong sectors of society. It would be incongruous for a corporation to create government policy; a government department to organise a protest; or a community group to drive large investments, yet the misalliance of tasks is not uncommon and it has prevented a meaningful transition towards sustainability. This thesis has provided some insight as to how worldviews which dictate approaches to sustainability allow the functions of governments, businesses and schools to be confused, leading to a binding friction in creating any sort of major transformation within a sector of society.
By classifying the various functions of carbon accounting, technological development, EfS, regulation and energy efficiency according to the main worldviews, an aligned approach to sustainability emerges. This approach would have a particular set of characteristics which allows it to be flexible, resilient, distributed, collaborative and functional: the inverse of current societal structures which lead to overshoot, crisis and collapse.

Chapter Five explored how these characteristics of a sustainable system could be adopted by the WA public school system by integrating the Government, Capitalist and Communal worldviews, not by replacing them. A system of diversity is more resilient than one of uniformity and the dominant worldviews can be harmonised to illuminate their strengths and mitigate their weaknesses.

A fourth, Integral worldview is emerging in response to the complexity that impedes the success of the Government, Capitalist and Communal worldviews. An Integral worldview conducts and coordinates an approach so that knowledge and competence have priority. Its focus is on the health of society and all of society’s worldviews. For the WA public school system to adopt an Integral approach would mean that the DoE, AuSSI and schools would all take on roles that would result in resilience and sustainability. Functions would be distributed in line with the strengths of each worldview.

- The WA State Government would set regulation and compliance measures to ensure compulsory participation of all Public Schools. They would provide funding, loans and guarantees for the initial start-up of a green revolving fund to be administered by AuSSI.
- AuSSI would take over the budget for utilities in WA Public Schools in order to fund an ecological modernisation approach to resource efficiency. Savings from efficiency measures would be returned to a green revolving fund for further projects. AuSSI would employ specialists to ensure the distribution of the necessary competencies required to transition to sustainability: specialists such as finance experts and sustainability experts. Finally, AuSSI would set GHG benchmarks and set up GHG accounting frameworks.
- WA Public Schools would contribute local knowledge and outline their particular sustainability ambitions to AuSSI and the State Government. They would work with AuSSI specialists to create informed strategies and they would report on their progress towards GHG targets. Finally, schools would harness the support of community partners and create alliances with other schools to share ideas and information.
6.2. Theoretical implication

The theoretical case for a realignment of functions in the WA public school system through the introduction of an Integral approach is strong. The evolutionary development of worldviews in response to the increasing complexity of existential problems (Graves 1959; 1970) is evidenced in the way that environmental policy in Australia, traditionally a Government worldview function, has adopted market mechanisms (Dovers, 2013) from the Capitalist worldview. Meanwhile the market driven by the Capitalist worldview, has begun to adopt roles of social and environmental responsibility which are values of the Communal worldview (Van Marrewijk & Werre, 2003).

It is this capacity for worldviews to evolve that has been lacking from other conceptual maps of sustainability perspectives such as those proposed by Hopwood, et al. (2005) and Dryzek (1997). Whilst these authors have succeeded in identifying how various approaches differ from each other, their treatment of sustainability perspectives neglects to address the potential for these perspectives to evolve. The analysis of ecological modernisation in Chapter Five is one example of the evolutionary process in sustainability as the Capitalist worldview moves towards a Communal worldview to implement sustainability through technological change.

Another point of difference from this thesis to previous interpretations of sustainability perspectives stems from the credibility ascribed to different approaches. Most of the literature on sustainability stems from the Communal worldview. This worldview is dogmatic that all points of view and all perspectives are valid (Wilber, 2001). The emphasis on evolutionary development within Graves’ work views only those approaches with real merit as remaining viable as theoretical or practical approaches, whilst others disappear from the conceptual gene pool in what amounts to survival of the fittest (Dawkins, 2006) in approaches to sustainability.

The choice to adopt Gravesian Theory to piece together the gaps in the understanding of sustainability perspectives was deliberate yet not without risk. Varey (2004) reasons the value of Graves’ model, writing,

> While it could be said that an understanding of the concepts behind Gravesian theory are central to an understanding of the management of sustainability, it is more likely that an understanding of sustainability (and our own unsustainability) is central to an appreciation of the significance of Graves’ work (p. 20).
Inherent within this argument is that the interpretation of this thesis is subject to the perspective of the reader, which is determined by the reader’s worldview and by inclusion, their conceptual understanding of sustainability.

6.3. Policy implication

The literature on sustainability maps many different paths through which to engage with sustainability (Hopwood, et al., 2005). This thesis and other work based on Gravesian Theory, Spiral Dynamics and Integral Theory suggest that not all of these pathways are open to society and that new levels of cognitive reasoning are required to match the increasing complexity of sustainability challenges (Beck, 2006; Beck & Cowan, 1996; Graves 1959; Wilber, 1997).

This study used empirical findings to propose an Integral approach to increasing the resilience of the WA public school system to future challenges. The theoretical arguments for this add a new dimension to the mapping of sustainability approaches by adding the dimension of time: in particular, the evolution of worldviews over time.

The implications of this research extend beyond WA and beyond the education sector. The proposed restructuring of societal functions can be transposed across states or government departments. Whilst future challenges can vary depending on geographic context, an organisational model is proposed in which a third party is placed between the relevant government agency and the end-of-pipe stakeholders, to host integral capacities and avoid the unresolvable and often politicised debates about a correct course of action. This integral approach would allow for the reorganisation of functions and the bypassing of barriers to sustainability in any government department.

6.4. Recommendations for further research

Research on worldviews is multifaceted and multidimensional both in space and time. In the boundless search for the answers to life, Graves remarked,

As he sets off on each quest, he believes he will find the answers to his existence. Yet, much to his surprise and much to his dismay, he finds at every stage that the solution to existence is not the solution he has come to find. Every stage he reaches leaves him disconcerted and perplexed. It is simply that as he solves one set of human problems, he finds a new set in their place. The quest he finds is never ending (cited in Beck & Cowan, 1996, p. 16).
In this regard, it must be acknowledged that the solutions presented here will inevitably come up against complexities that require another new worldview. At this time however there are many endless pathways for further inquiry that stem from this study. This thesis invites the need for further research in regards to:

- **Worldviews** – The four worldviews discussed in this thesis are four of seven worldviews in the Gravesian model. Two (or possibly more) new worldviews of the Integral type have since been identified since Grave’s death, making a total of at least nine. The role of older worldviews should be examined for their contribution to sustainability whilst the emergence of new worldviews provides ongoing impetus for this line of study.

- **Integral Theory** – Wilber (1997) elaborated on Gravesian theory, creating a more complete model of the human experience which he named Integral Theory. This model would allow the issues discussed in this thesis to be addressed more comprehensively by introducing the consideration of internal and external expressions, and individual and collective expressions of sustainability.

- **The evolution of studies in the emergence of human social systems** - As human capacities have evolved, so too has our understanding of developmental and evolutionary emergence in human social systems. New theoretical models are being developed that will integrate or supersede Gravesian Theory and Integral Theory.

- **The emergence of new approaches to sustainability** – Each Australian state adopts a different approach to sustainability in the education system. Further research could see the findings presented here used to critique the efficacy of sustainability programs in other states.

6.5. **Concluding Statement**

The central tenet of this thesis is that a new perspective is needed to enable the WA public school system to transition to a state of resilience and sustainability. Implied in this study is that the necessary solutions to create sustainability are already available in a range of different approaches, however these solutions must be arranged, organised and coordinated in such a way that they do not throw up barriers and create stifling debate.

Through the lens of worldviews, a clear approach emerges, one that unifies other approaches and smooths over the usual impasses. In the WA public school system, this means the introduction of an Integral worldview, hosted by AuSSI to free up the role of the WA Government to govern in its traditional sense and to allow schools to be the cauldrons of creativity, expression and discovery that
they are meant to be. By harmonising the strengths of the Government, Capitalist and Communal worldviews, a sustainable public school system becomes a viable, effective, self-funding proposition and an example of how to overcome clashes in worldviews.
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