



**Is Renewable Energy a suitable investment choice for South African non-bank institutional investors?**

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## **ABSTRACT**

The research set out to examine the investment & economic suitability of Renewable Energy (“RE”) assets for South African institutional investors. Data was collected through a series of structured and semi structured interviews and further triangulated and cross-checked through a thorough literature review of available policy documentation and academic literature. The limitations concerning this study have much to do with the nascent nature of the renewable energy program and therefore the lack of availability of hard economic and financial historical data. Further there is very little academic literature on renewable energy investing pertaining to a South African context. To mitigate some of the risks presented by the aforementioned limitations, interviewees were mainly subject-matter experts on the issue of RE investing and therefore provided key insights through a series of structured and semi-structured interviews. Within a South Africa specific context, there is very little academic material dealing with RE or infrastructure finance and investment. The implications of this study are therefore crucial in helping set the basis for the development of future theories around this and related topics. Interview discussions and review of other material revealed key themes, which allowed the researcher to discern some key findings:

Firstly, there’s a cautious but emerging consensus that the economic and financial features of RE assets make them suitable (and even attractive) for consideration in asset class allocation decisions. Further and related: the merging view was that RE assets could offer the benefit of both reducing risk and increasing expected returns within a given portfolio. A key related sub-theme and finding was the need to establish a common set of nomenclature, which would describe and ultimately help benchmark the economic and financial features of RE assets – the ability to benchmark financial and economic data being a key aspect of the asset allocation framework. Secondly data collected indicated that there is strong institutional support for government’s energy policy and how it has been implemented to date. Thirdly, in working out the suitability of RE assets investors tend to default to comparable proxies such as bonds, equities, REITS. The emerging theme coming out of the data is that RE assets are likely to resemble fixed income assets in their financial and economic characteristics. Lastly, for all the emerging consensus in support of the government’s RE policy, many investors seem to hedge their optimism and remain generally unsure and in some instances sceptical of the overall sustainability of the program, citing the fact that there are still too many unknowns regarding RE assets and their respective futures. This research therefore has some useful practical applications for institutional investors, hopefully further demystifying a sector that could be a lynchpin of the South African economy for some time to come.

Key words: infrastructure investment, asset allocation, renewable energy, and institutional investors

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## GLOSSARY OF TERMS

BEE	Broad-Based Black Economic Empowerment
CAPM	Capital Asset Pricing Model
DBSA	Development Bank of South Africa
EPC	Engineering and Procurement Contract
DOE	Department of Energy, Republic of South Africa
IDC	Industrial Development Corporation
IPO	Initial Public Offering
IPP	Independent Power Producer
IRP	Integrated Resource Plan
NERSA	National Energy Regulator of South Africa
NT	National Treasury, Republic of South Africa
O&M	Operator and Management Contract
PPA	Power Purchase Agreement
RE	Renewable Energy
REBID	Renewable Energy Bidding Mechanism adopted by DoE
REFIT	Renewable Energy Feed in Tariff
REIPPP	Renewable Energy Independent Power Producer Procurement
REIT	Real Estate Investment Trust
REPA	Renewable Energy Purchasing Agency
RFP	Request for Proposal (officially 'Request for Qualification and Proposals for
SPV	Special Purpose Vehicle
Treasury	Department of National Treasury

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# 1 INTRODUCTION

## 1.1 Research Area

### 1.1.1 REIPPP

As little as under 20 years ago (1998), South Africa experienced an oversupply electricity generation, so much so that Eskom, under policy directives from DOE, was mothballing its available generation capacity (DOE, 2015). By the start of 2008 however, this situation had reversed itself. With a growing economy and increased demand for electricity, South Africa began experiencing structural supply problems: struggling to meet growing electricity demand whilst at the same time supply itself had dwindled (Baker, 2015). As Marquard (2007) indicates, before 1990 just over a quarter of the population had access to electricity, whereas a decade later that number had more than doubled, with an electricity penetration rate just over 60%. This trend continued, with penetration rates of circa 85% having been achieved by 2011 (DOE, 2015).

These structural shifts in demand and supply planted the seeds for private investment opportunities within the South African energy sector, with renewable energy identified as an early potential investment target (Winkler, 2005). As far back as 2003 DOE published a white paper, which included for the first time in the country's energy mix, an intention to develop renewable energy ("RE") technologies in order to diversify Eskom's reliance on coal (DOE, 2015), (Eskom Annual Reports, 2008-2014).

In August 2011, the DOE issued Request For Proposals ("RFPs"), inviting private investors, developers and other interested parties to bid and table their respective plans to provide RE into the grid as Independent Power Producers ("IPPs") (DOE, 2011; Msimanga and Sebitosi (2014). Thus the Renewable Energy Independent Power Producer Procurement ("REIPPP") program was born, with REIPPP located firmly within the DOE's long-term energy plans to introduce private energy producers to augment Eskom's generation capacity (Baker and Wlokas, 2014). From the onset therefore, government identified the crucial role that private sector capital would play in helping DOE develop a long term, sustainable energy-mix plan. This paper looks at how the role of particularly institutional investors could prove critical in helping DOE roll out its renewable energy platform – a key aspect of DOE's overall, long term

energy plan (IRP, 2013). More particularly, the paper examines how institutional investors currently perceive RE assets and whether investment into RE assets will help them fulfil their current investment aims and objectives.

The REIPPP program involves a series of bidding rounds occurring approximately once year. To date there have been four bidding rounds under the REIPPP program with a fifth round<sup>1</sup> expected close was in November 2015. In the first round of bidding, in November 2011, 53 bids were received by DOE, with twenty eight being adjudged successful, representing 1416MW of wattage and total investment size of nearly sixty-billion Rands (Eberhard, Kolker, Leigland, 2014). The first of the IPPs plugged into the national grid in December 2012 (Creamer, 2012, November 16).

In the second round of bidding in March 2012, seventy-nine bids were received with nineteen being awarded. The third round of bidding occurred in May 2013 with 93 bids submitted with only seventeen bids successful. A fourth round of bidding is currently underway as of time of writing (Creamer, supra).

The REIPPP program has been considered an extra-ordinary success even though it is still in its infancy stages. With 64 new IPPs (to date) expecting to yield additional 3922 MW into the national grid, the program is amongst the most successful RE programs in the world. As Eberhard et al, (2014) puts it: *“Since 2012, South Africa has ranked among the top ten countries globally in terms of renewable energy IPP investments. In less than three years, South Africa has signed up more investment for more independent power generation than has been achieved across the entire African continent over the past 20 years.”*

Technology	MW awarded Round 1 (Dec 2011)	No. of projects awarded Round 1	MW awarded Round 2 (May 2012)	No. of projects awarded Round 2	MW awarded Round 3 (Oct 2013)	No. of projects awarded Round 3	MW awarded Round 3.5 (CSP only) (Dec 2014)	No of projects awarded Round 3.5 (CSP only)	Total MWs awarded Rounds 1-3	Total projects awarded Rounds 1-3	MW capacity remaining
Solar PV	632	18	417	9	435	6	n.a	n.a	1 484	33	1 041
Wind	634	8	563	7	787	7	n.a	n.a	1 983	22	1 336
Solar CSP	150	2	50	1	200	2		2	400	7	100
Landfill gas	0	0	0	0	18	1	n.a	n.a	18	1	7
Biomass	0	0	0	0	16	1	n.a	n.a	16	1	43
Biogas	0	0	0	0	0	0	n.a	n.a	0	0	60

**Figure 1 Selected projects in Rounds 1 - 3 of REIPPP (Source: Baker and Wlokas, 2015)**

<sup>1</sup> Colloquially referred to as Round 4,5 (Business Day, 21 September, p3)

Per the bid program, an IPP entity builds, owns and operates a RE power plant off the back of, inter alia, a 20 year Power Purchasing Agreement (DOE, 2012; Msimanga and Sebitosi, 2014). The winning bidders develop, build, own and operate the IPP utility for the duration of the PPA (Eberhard et al, 2014).

The REIPPP program has attracted an array of stakeholders – financiers, developers, technology manufacturers, suppliers and international utility companies. At time of writing there were sixty-four successfully bid projects across different RE technology platforms (solar, wind, biomass, hydro).

Per the REIPPP program, an IPP bids to build, own and operate a project utility off the back of a twenty year Power Purchase Agreement (“PPA”) from Eskom. National Treasury (“Treasury”) in turn underwrites Eskom’s obligations under the PPA. All REIPPP PPAs are structured on a ‘take or pay basis’ for the full 20 year duration. Furthermore, typical to infrastructure projects of this nature, the projects are financed with a combination of debt and equity (DOE, 2012; Baker, 2015).

The sustainability of the REIPPP will be dependant on the long-term participation of investors into the sector. Kaminker and Stewart (2012) write that institutional investors play a key role in determining the sustainability of utility assets and are key partners to policymakers in developing clean-energy policy. It therefore follows that policymakers, practioners should concern themselves with the views of institutional investors on the REIPPP program and what role they can play over the long term.

The South African institutional market however, does not have an established track record as investors into utility assets, generally, let alone RE assets specifically. Within a South African context we have yet to develop what Blanc-Brude et al (2014) refers to as the relevant infrastructure benchmarks. Benchmarks that would allow us to accurately measure the financial viability and success of REIPPP. **Given the newness of the REIPPP we simply do not have enough hard data.** Gratwick and Eberhard (2008) explain that some of the reasons for lack of private investment into the utility space is a consequence of what they refer to as the absolute dominance of Eskom as the sole end-to-end provider of electricity and that the prevailing technology of choice has been coal-powered utilities (this particular point has formed the bedrock of South Africa’s energy policy for decades). Since its inception therefore, the REIPPP program has ushered in a hive of not only policy activity but also

investment activity. RE assets require large capital outlay, outlay that Eskom itself cannot spare. REIPPP thus presents some potential investment opportunities, particularly for institutional investors looking to diversify their current asset allocation outlook. (Baker and Wlokas, 2015)

### *1.1.2 Funding the REIPPP*

RE assets are typically funded via a combination of debt and equity funding via a ring-fenced special purpose vehicle (“SPV”) (Yescome 2013). Debt and equity providers capitalize a ring fenced SPV, which in turn develops, constructs and ultimately operates the REIPPP asset on a specified contractual basis. Therefore, like other large-scale utility infrastructure projects, RE projects follow a relatively linear investment trajectory (Baker and Wlokas, 2015):

- a. Project development
- b. Construction
- c. Operate

Equity financiers are often involved in the project development phase, typically seeking to exit upon conclusion of project construction (Baker Wlokas, 2015). Debt providers on the other hand, time their involvement to coincide with what is known as financial close<sup>2</sup> (Gecelter, 2013).

The REIPPP marked a significant departure in policy by the South African government, in that for the first time and on a systematic basis, private capital participated in the development, construction and ownership of large-scale utility assets (Barker, 2011). Once again this paper looks at the potentially critical role institutional investors (as providers of both equity and debt capital) could play as both funders and investors into the REIPPP.

## **1.2 Problem Statement**

The aim of this research is to determine the suitability and viability of RE assets within the asset allocation frameworks of institutional investors, that is, will institutional investors consider investment into RE assets attractive vis-à-vis their current investment

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<sup>2</sup> Financial Close is the point in the project life where all fund arrangements have been fully contracted. Usually the point at which the project is ‘construction ready’ (Eberhard et al, 2014)

considerations. A key determinant of both suitability and viability lies in determining whether the key economic and financial features of RE assets benefit the overall investment aims and objectives of institutional investors. In other words, whether RE assets – viewed, as a separate, distinct class of assets – would satisfy the asset allocation mandates of institutional investors. In an ideal research context the researcher would have preferred to analyse reams of financial data generated from RE assets under the REIPPP and from that data glean what the actual financial and economic data says about potential asset allocation decisions. But given how nascent the REIPPP is, this approach simply was not possible and instead the research relies on collating the views of subject matter experts within the REIPPP and asset management world, gauging the fundamental question of whether investment into the REIPPP will prove to be ultimately good for business.

It's newness notwithstanding, the success of the REIPPP program thus far has put RE assets firmly on the investment radar of local and international investors (Wlok 2014). RE assets, like other infrastructure assets, typically have long dated cash flows, which escalate in accordance with inflation. The twenty-year PPA contract is underwritten by Treasury, therefore making RE cash flows akin to SA Treasury bonds in overall risk profile (Eberhard et al, 2014).

This research therefore examines the suitability of RE assets as a potential investment class for local investors; examining what the overall investment considerations in determining the viability of RE asset investing. Kritzman (2007) makes the point that for an asset to be considered within an asset allocation framework it needs to either improve the expected return of an overall portfolio and/or reduce the risk of the overall portfolio. A key part of this research therefore, was to determine the suitability of RE assets vis-à-vis institutional investors' broader aims and objectives.

A core part of this research focused on how the economic and financial characteristics of RE assets influenced their viability suitability or lack thereof of for institutional investors (Meeder, 2000). The research particularly emphasised the views of financial participants from the various financial institutions in South Africa; what perception they held of RE assets

Arguably, investors now have an additional choice to consider in their asset allocation decisions, but as mentioned above, the REIPPP is still very much in its nascent phase and knowledge of the mechanics and detail of RE assets remains limited for many institutional investors. Critically though, the long term success and sustainability of the REIPPP program will be highly dependant on the long-term availability of private institutional sector capital (Dodd 2014) and RE assets have certain characteristics that may make them suitable for institutional investors.

In a study conducted for the South African Reserve Bank “(Sarb”) Nhlapo and Gumata (2011)<sup>3</sup> looked at the investment patterns of non-bank institutional investors from the period 1990 to 2010. In their study Nhlapo and Gumata (2011), showed that during that period the non-bank institutional investor market grew from nearly R200 billion to over R4 trillion – outstripping growth in traditional bank assets during the same period. Nhlapo and Gumata (2011) also find that non-bank institutional investors account for over 140% of GDP (versus 120% for banks).

Non-bank institutional investors are composed of pension and provident funds, unit trusts, insurers – all of whom with significant local South African presence. Within this group insurers are the largest group (Nhlapo and Gumata, 2011). What was interesting about this particular study, was how it showcased both how active institutional investors are in South Africa and also what their respective asset allocation outlooks are. The research question herein relates to how such investors view RE assets from an investment perspective.

Leape and Thomas (2011) in a paper they wrote for CREFSA, LSE<sup>4</sup> highlight how changes in regulations (Regulation 28 – which is discussed in more detail below) impacted asset allocation frameworks for institutional investors. In this same study, it is shown that asset allocation outlooks for institutional investors have increased in both mandate and scope, with investors continuously seeking new avenues of investment for their funds. According to

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<sup>3</sup> In this particular study the term ‘non-bank institutional investor’ typically refers to pension, provident, annuity houses and all other non-banking financial institutions. The authors also use the words ‘institutional investors’ as opposed to ‘non-bank institutional investor’. For the purposes of simplicity, this research paper adopts the use of the term ‘institutional investor’ to refer to non-bank institutional investors who seek to invest over the long term.

<sup>4</sup> Centre for Research into Economics and Finance in Southern Africa (CREFSA), London School of Economics

Leape and Thomas (2011), alternative assets such as unlisted equity will continue to receive greater consideration in asset allocation frameworks. This is a critical development because an increase in mandate scope allows for institutional investors to theoretically consider RE assets within their asset allocation frameworks.

Much of the starting point of the research, was to examine the body of literature that deals with the theoretical nomenclature of the terms “asset class”, “infrastructure” and whether RE Assets correspond adequately enough to the current theoretical and practical consensus as to what constitutes an “infrastructure asset class” (Bitsch, Buchner, and Kaserer, 2010). This paper sought to find ways in which the developing theories and consensus benefit the local context and given the dearth of information available locally, an examination of international text and data was not only useful but also necessary.

Internationally, there is a wide body of developing literature, which deals with the economic and financial features of infrastructure assets, particularly within developing market economies contexts (Henckel, and McKibbin, 2010). Fedderke, Perkins and Luiz (2006) comprehensively underscore the role successful infrastructure investment will have on a country’s long-term growth prospects. They also indicate that South Africa has an infrastructure investment-funding gap, which should be funded with the involvement of the private sector. The REIPPP program is in some parts a policy response to this infrastructure-funding gap described by Fedderke et al (2006) & (Baker, 2015).

With nearly R140bn in direct investments, REIPPP has been described as the single largest cause of foreign direct investment into Africa (Eberhard et al, 2014). Within a South African context it certainly is one of most active, rapid and largest infrastructure programs implemented by the South African government since 1994 (Baker 2015). The program is still however in its nascent stages, with only c35% of the targeted 10 000 MW being fully implemented (DOE, 2012). In other words a greater investment and funding commitment will be required in the short to medium term. This paper effectively examines what that level of commitment could be from institutional investors. This is a critical research problem given how long term sustainability of the REIPPP will invariably rely on long term investors of which institutional investors such as pension funds are best placed to provide (Kaminker and Stewart, 2012).

Although local investors are regarded as being highly robust and sophisticated (OCED, 2013), compared to their counterparts in Australia and Canada, South African institutional investors are relatively inexperienced investors into the energy infrastructure space (Inderst, 2009). Up until the REIPPP program, Eskom was the single largest investor in the South African utility space (Waller, 2010). Private investment was crowded out up until the introduction of the REIPPP program.

This research therefore seeks to fill that theoretical and practical gap with research findings that would guide investor and policymaker outlook regarding RE assets. Success of the REIPPP is predicated on the continued involvement of private sector capital investment into the various project companies and bid rounds. There are some practical applications of this research for portfolio managers, analysts and trustees of large institutional funds.

### **1.3 Purpose and Significance of the Research**

Sustained private investment into electricity generation will have the twin effect of alleviating the state's funding burden and would support overall economic growth (Fedderke et al, 2006). Private sector capital, in the form large scale institutional funding and investment could play a critical role in ensuring the success and sustainability of government's policy imperatives and supporting much needed economic growth.

The purpose of this study is to determine whether the REIPPP program represents a viable investment opportunity for local institutional investors. It is hoped that the research will benefit investment practitioners and other relevant stakeholders, helping them increase their own understanding of RE assets as a possible investment choice.

### **1.4 Research Questions and Scope**

***The primary research question of this study is:***

*"Do Renewable Energy assets represent a viable investment choice for South African institutional investors?"*

***Sub Question 1:***

Are RE assets considered an asset class and is investment in RE assets likely to benefit investor asset allocation outlooks?

### ***Sub Question 2:***

What factors determine investor outlook of the REIPPP program?

#### **1.5 Research Assumptions and Ethics**

##### **a. Research assumptions**

This research partly relied on first-hand accounts of interviewees who are subject matter experts on the research subject at hand. The researcher compiled the list of interviewees based on their proximity to REIPPP program.

The underlying assumption is that the interviewees have participated in good faith and have proffered information to the researcher in good faith - untainted with undeclared agendas. Research data was also collected by a careful study of government policy regarding renewable energy. Material pertaining to policy outlook and other sources of literature and reading material was also relied on, mainly to triangulate interviewee-generated data.

This research assumes the DOE's Renewable Energy programs will be implemented as stipulated in the IRP and other related policy documentation – with no significant deviations from the set targets for RE generation capacity.

In this paper the researcher uses the term 'infrastructure assets' or simply 'infrastructure' in the normative sense, as it applies to economic theory and literature (Hulten, 1996). For the purposes of this study however, uses of the term is meant to reflect the narrow meaning ascribed to the term 'economic infrastructure' as articulated by Inderst (2010).

The researcher also defines 'institutional investor' as a South African based, typically non-bank investor (Nhlapo and Gumata, 2011) (the researcher concedes that in a relatively small financial services market such as South Africa's, the distinction between banking and non-banking institutional investor is often more artificial than real). Therefore mainly pension and endowment funds, insurers, annuity houses and their various representatives and similar.

This restriction on the definition above is useful because it helps in the overall mapping of the direction of the research.

Lastly, given the dearth of listed instruments (debt and equity) in RE assets under the REIPPP, this study was primarily focused on the suitability of unlisted instruments for institutional investors. Although for completeness' sake, examples of non-local studies conducted on listed instruments are referred to in this work as well.

#### b. Research Ethics

As will be discussed further below, data forming the basis of this research was primarily collected through a series of interviews. Interviewees were made fully aware of the research objectives and were made aware of the voluntary nature of their participation. Where requested, interviewee details were kept anonymous.

## **2 LITERATURE REVIEW**

### **2.1 Overview**

Institutional investors in South African invest across a wide spectrum of asset classes (Leape and Thomas, 2011, Nhalpo and Gumata, 2011). Furthermore, as Petrella (2005) highlights, investors typically make investment decisions based on pre-existing asset allocation frameworks. Writing on behalf of the OECD, Inderst (2009) makes the point that since the 2008 financial crisis institutional investors have sought investments that both provide greater diversification and consistent long-term income returns. The concept of expected return and diversification (lowering the variance of a portfolio) has been the focus of extensive academic research ever since Markowitz (1952) published his now seminal paper on modern portfolio theory.

The concepts of expected return and diversification benefits serve as a useful starting point in helping determine whether RE assets' financial and economic features are observable as distinct and unique traits, particular to RE assets alone. The study therefore examines in some details what constitutes a separate asset class. More particularly, whether RE assets form what Idzorek and Armstrong, (2009) refer to as a 'mutually exclusive, non-overlapping opportunity set' within the asset allocation universe of institutional investors.

Definitions and nomenclature therefore matter a great deal in determining where in the investment universe RE assets may fit in.

The literature review focuses on five main areas (in list form below), each of which helps the researcher build the theoretical basis upon which to answer the research questions posed above. As will be detailed in chapter three below, literature review in this paper plays a critical role in helping triangulate data collected from interviewees, allowing the researcher to interrogate information received via interviewees from different perspectives.

There isn't much South African literature or text focusing on South Africa's REIPPP program. There is a small but dedicated group of local writers like Eberhard, Wlok, Barker et al who continue increasing the scope of available literature. Therefore a lot of the literature under discussion herein describes theoretical frameworks that are applicable to a non-South African context.<sup>5</sup> The researcher nonetheless found many useful academic texts, whose theoretical prescriptions are both relevant and applicable within a local context.

In assessing the available literature the study looked at literature that seeks to answer the stipulated research questions.

## **2.2 Nomenclature: 'asset class', 'infrastructure assets'- reaching consensus**

As institutional investors seek to diversify their asset allocation choices, infrastructure as a potential asset class has begun receiving serious consideration in both practice and academic literature (Blundell, 2006). From both a practical and theoretical perspective therefore, the taxonomy of terms such as 'asset class', 'infrastructure' and 'infrastructure asset' begin to matter because as Blanc-Brude (2014) explains; there is value in creating normative descriptions in trying to develop new tools of understanding infrastructure as a potential investment.

Idzorek and Armstrong (2009) adopt a narrow of definition of 'infrastructure assets' they refer to 'unique infrastructure'. Per Idzorek and Armstrong: *"Unique infrastructure refers to*

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<sup>5</sup> This limitation is itself not debilitating and in fact underscores the researchers motivation for undertaking this particular research

*the direct infrastructure assets that are not already considered part of the other established asset classes, most notably public equity, private equity, or commercial real estate.”*

In similar fashion to Idzorek and Armstrong (2009), Inderst (2009) makes the argument for a narrow, succinct definition of ‘infrastructure asset’ within an asset allocation context. Inderst mentions the term ‘economic infrastructure’ in reference to assets such as ports, utilities, roads, tunnels - concluding that infrastructure assets under this category display a key set of discernable financial and economic characteristics: long-dated cash flows, low correlation to other assets, natural inflation hedge.

Newell and Peng (2008) also identify the characteristics Idzorek and Armstrong (2008) described above in their study. What is also clear in their paper, is that there is broad academic consensus that utility assets such as RE assets are regarded as an established and acceptable sub-set of the broader ‘infrastructure asset’. There is broad consensus on this latter point (cf Bitsch et al, 2010)). In other words, there is some strong academic backing of the view that RE assets would qualify as a type of ‘infrastructure assets’, a type of asset – given its economic and financial features – would be worthy of investment consideration by institutional investors.

Newell and Peng (2008) (mainly describing the Canadian and Australian context) write that there are some ‘clearly identifiable’ economic and financial features of RE assets. Namely:

- Monopoly characteristics,
- Predictable earnings and cash flows
- Low volatility of cash flows
- Low correlation of returns vs. other asset classes

An interesting study by Blanc-Brude (2013) regards the physical make-up of assets, in of themselves (i.e. “what kind of infrastructure asset is it?”), as not particularly helpful in determining relevant benchmarks for institutional investors. Blanc-Brude argues that infrastructure assets primarily derive their characteristics from their underlying contractual undertakings ‘which better embody the financial economics of infrastructure’. Faull (2012) argues that infrastructure assets fully embody the characteristics of ‘long-term finance’, which he describes as multi-decade, long dated investments. At this point it is worth

reiterating that the PPA under the REIPPP is twenty years long. Haldane (2011) makes an interesting point concerning such long dated investments, namely that investors are likely to over-discount the value of such investments given the 'short term focus of investors'.

Finkenzeller, Dechant, Schäfer, (2010) provide granularity to the definition of 'asset class' and more particularly, whether infrastructure assets satisfy the necessary requirements of this definition. They examine in some detail, the economic and financial features of real estate assets, examining whether such assets are legitimate *infrastructure assets* – suitable to institutional investors looking for long dated cash flows with relatively low volatility. They conclude that although property and infrastructure assets have some common themes, the two assets are in actual fact distinct assets – given variant risk, return profiles. In other words *they conclude that infrastructure assets are their own, distinct separate asset class category*. A key aspect of their research findings is that real estate assets can serve as useful proxy in understanding the economic and financial features of infrastructure assets. This latter finding is particularly useful within a South African context given the relatively large and sustained participation of institutional investors within the South African real estate market. As knowledge of RE assets improves it will be interesting to see if property investors find a natural home in RE assets.

There is however some debate as to whether infrastructure assets are indeed a sub-set of the real-estate asset class as opposed to their own distinct grouping. (Mansour and Nadji, 2007, Newell and Peng, 2008 and Beeferman, 2008).

Idzorek and Armstrong (2009), in making their own argument as to why infrastructure assets are a distinct asset class - describe 'asset classes' as "having inherent non-skilled based return." further describing asset classes as "logical groupings" of assets displaying similar characteristics. In this instance Idzorek and Armstrong (2009) identify specific economic and financial features of infrastructure assets in justifying their conclusions that infrastructure assets are themselves a separate and distinct asset class. As indicated above, properly framing the relevant nomenclature regarding RE assets will allow institutional investors to begin categorising the various economic and financial features of RE assets. Ultimately allowing them to construct relevant benchmarking for instance, which (benchmarking) plays a key role in the asset allocation framework (Blanc-Brude et al, 2014).

A key consideration for investors looking to invest in RE assets will be whether there is some modicum of uniformity across various RE assets. On the face of it there are some key common features: twenty year PPAs, typically project financed structures with ring-fenced SPVs, inflation hedge (contained in the PPA), Treasury backed cash flows. There are however some non-extraneous differences amongst RE assets, even within the same category of technology (eg: Solar), which could make it difficult to standardise investors' understanding of RE assets' risk and return profiles across different assets.

Weber and Alfen (2010) make the point that within an investment context, the term 'infrastructure asset' is 'heterogeneous'. They indicate that it is difficult to generalise observations of existing data on the risk-return profile of infrastructure assets without defining the parameters of observation properly. They further highlight that there are aspects of such technology, which impact the return and risk profile of an infrastructure asset (to further underscore this point within the REIPPP, different solar projects apply differing solar panel technologies with differing technology risks and ultimately potentially varying return profiles). They further highlight that the difficulty in extrapolating findings is compounded by the fact there is a lack of historical data, which would allow us to appropriately benchmark infrastructure returns vis-à-vis other assets.

Peng and Newell (2007) in their important work on pension fund interest into infrastructure assets, manage to successfully analyse both listed and unlisted infrastructure assets in Australia. Australia is arguably the most mature and experienced market for infrastructure assets (Peng and Newell, 2007).

Asset class	Average annual return (%)	Annual volatility (%) <sup>1, 2</sup>	Sharpe index	Performance rank <sup>3</sup>
Composite infrastructure	22.38	16.03	1.05	3
Listed infrastructure	24.89	23.42	0.83	5
Toll roads	25.65	24.39	0.82	6
Airports	8.05	30.67	0.08	9
Utilities	21.93	15.65	1.05	4
Unlisted infrastructure	14.11	5.83	1.47	2
Direct real estate	10.90	1.46	3.67	1
Listed equity	12.91	10.97	0.67	7
Bonds	7.20	4.28	0.39	8

Source: Peng and Newell (2007). Authors' calculations from UBS (2006), PCA/IPD (2006)

<sup>1</sup> Annual volatility is the annualised standard deviation of the respective quarterly returns

<sup>2</sup> Property volatility has not be adjusted for valuation-smoothing

<sup>3</sup> Performance rank is based on the Sharpe index

## Figure 2 Infrastructure risk-adjusted performance analysis: Q3 1995 - Q2 2006

They look at 19 unlisted infrastructure funds (with a 144 infrastructure assets) comparing their respective risk-adjusted returns. Unlisted infrastructure was found to deliver returns of 14,1% at relatively low risk of 5,83%. Listed infrastructure on the other hand, produced higher returns at 24,9% but with significantly higher volatility 23,24%. This, the authors conclude, may be due to the fact that listed infrastructure is more correlated with listed equity. Their findings indicate that infrastructure assets satisfy what Blanc-Brude, (2013) refers to as the infrastructure narrative - namely, that infrastructure assets have some distinguishable economic & financial features (long dated income-assets, display relatively low volatility and show low correlation to other assets such as bonds and equity). However, they also conclude that even assets that satisfy the so-called infrastructure narrative may struggle to find a home within investors' asset allocation framework. The reason being that infrastructure assets don't always satisfy the asset allocation requirement of offering risk diversification. Particularly if they are listed (More work needs to be done on the differences between listed and unlisted infrastructure assets). As mentioned above however, RE assets are primarily unlisted SPVs but if it is found that listed RE assets will correlate listed equities' risk (as opposed to being counter-cyclical) then their suitability as an alternative asset class may be harmed in the long term. As commented upon above, Nhlapo & Gumata (2008) highlighted the impact of Regulation 28 on influencing institutional investment into the unlisted sector. It's easy to conclude that the long term interests of institutional investors interested in the REIPPP will focus on ensuring that RE assets are listed, which given the findings of Peng and Newell (2007) and their potential replicability in SA, may lead to an unsustainable paradox for the REIPPP.

The jury is still out on this latter point. Building off their 2007 (Peng and Newell, 2007) study, Peng and Newell (2011) reaffirm their initial findings that including infrastructure assets within a portfolio produces optimal portfolio outcomes over the long run. This study is critical in that it analyses performance over a longer period than previous studies and **it has a particular focus on unlisted infrastructure**. This fact makes it easier to extrapolate the findings to some local contexts.

There is obviously very little data available of a similar magnitude and depth describing the South African landscape, particularly data pertaining to REIPPP program. As reiterated elsewhere in this paper, there simply isn't enough data to perform the type of analysis Peng and Newell (2007 & 2011) performed for the Australian context (although their study is Australia-specific it also extensively references other major infrastructure markets such as Canada, China and Europe).

The developing consensus for European and North American institutional investors has been that infrastructure, although similar to other asset classes such as property, infrastructure can legitimately claim its rightful place as a stand alone asset class (Peng and Newell, 2008; Preqin Survey 2008, 2009, 2010, 2011, 2012, 2013). Furthermore, recent research reveals that not only is infrastructure its own asset class, it is also an appropriate asset class for institutional investors because it provides stable, long-term return with little volatility (Mansour and Nadji, 2007b; Newell and Peng, 2008).

Research pertaining to the local investment market is minimal – the RE sector is still in its infancy, with only some of the first of the Round 1 projects having reached full operational status (Creamer, August 2014)

At this stage some common themes begin to emerge in the literature regarding the question of whether infrastructure assets are a legitimate asset class. The long dated nature of infrastructure cash flows, the regulated monopoly under which they operate and relatively low volatility of these assets - describe the economic and financial features that asset allocators would need to discern in making the appropriate asset allocation decisions. It still remains to be seen however whether this developing consensus can be applied

interchangeably for both listed and unlisted infrastructure assets. The readings differ on this.

Given the data available on infrastructure assets, Australian institutional investors can more ably make asset allocation decisions than their South African counterparts. The researcher does however hope that such foreign examples may prove to be useful to South African institutional investors.

### **2.3 Asset allocation and Investor Profile**

Kritzman (2007) describes a series of steps that institutional investors need to traverse in reaching asset allocation decisions. Using Kritzman (supra) as a guideline, local institutional investors considering investing in RE assets, the determination would be: firstly, identify the asset class, secondly estimate expected return and downside risk, thirdly identify the most optimal trade-off between risk and return within a portfolio, lastly identify the optimal portfolio were RE assets are included. Kritzman (supra) like many other writers on the subject relies heavily on Markowitz' still seminal 1952 work on modern portfolio theory, which outlines that an efficient portfolio is one that delivers maximum return at the most appropriate risk. It therefore follows for the purposes of this work, that the researcher was concerned with determining how the theory around asset allocation affects investor views of RE assets. It remains therefore that the key aspects influencing asset allocation decisions for local institutional investors looking at RE assets would be the following:

- i. Risk: do RE assets provide risk differentiation benefits (non-correlation)
- ii. Return: do they enhance estimated expected return of the investors current portfolio over the long term

Blanc-Brude (2014) writes of the challenges investors face in estimating return and risk in infrastructure projects. He writes that difficulty in this process emanates from what Meeder (2000) refers to as the 'heterogeneous' make-up of infrastructure assets. Assets can vary in their contractual make-up. The very point made by Weber and Alfen (2010) above.

Msimanga and Sebitosi (2014) in their paper however show that the advantage of the REIPPP is that contract standardisation across all projects gives rise to some useful common denominators across RE assets. They show that the financial and commercial features of the

PPA for instance, allow for a set of common financial features to be identified across all RE assets (a point reiterated by Baker, 2011 as well). Contractual standardisation may therefore make it possible to successfully begin the process of benchmarking certain features for the purposes of asset allocation.

Institutional investors analysing RE assets, need to develop asset allocation strategies that are rigorous enough to properly understand the risk/reward make up of RE assets, build-out suitable proxies for RE assets in order to benchmark them and ultimately assess these assets' overall impact on their respective portfolio (Weber and Alfen, 2010).

The standardisation of the REIPPP could be useful in helping the institutional market develop a common outlook for evaluating RE projects. Friebe and Flotow (2011) outline that tenor, counterparty risk and other financial and economic features (that will be discussed in detail below) determine the risk and return profile of RE assets and therefore their suitability for investors. Therefore once these features are standardised, as per the PPA, an assessment of risk and return and how they relate becomes possible.

Inderst (2009) writes that globally, the largest investors into infrastructure assets are pension funds, with eight of the top ten investors globally being pension and/or endowment funds. In Preqin's 2013<sup>6</sup> survey on asset allocation outlooks for infrastructure nearly sixty percent of surveyed institutional investors had infrastructure as a stand-alone asset allocation category. A separate thirty percent classified it under private equity and sixteen percent under so called real assets. In the same Preqin (supra) study it is concluded that infrastructure assets make the grade, as it were, because they minimise portfolio risk and enhance expected return of respective portfolios.

As indicated above, Blanc-Brude (2014) makes the point that the difficulty for asset allocators looking at infrastructure assets is the lack of appropriate benchmarks. Benchmarks typically allow investors to compare whether the level of return and the risk associated with that return is comparable. In effect, benchmarking quantifies the opportunity in an investment world full of mutually exclusive decision-making. There is some strong literature however that adequately outlines proposed investor benchmarks for asset

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<sup>6</sup> Preqin 2013 survey of over 800 investors in infrastructure worldwide

allocation on infrastructure assets, indicating some emerging consensus. Inderst (2010) for instance, writes that the investor trend is to utilise absolute return and CPI-indexation as relevant benchmarks to gauge expected return. As described above, expected return is a key cog for asset allocators. Many authors have cited the high visibility of infrastructure asset earnings and cash flows, given the contracted nature of their earnings and cash flows (Bitsch et al, 2010, Blanc-Brude, 2014, Peng and Newell, 2008 et al) and therefore the ability to derive return and risk benchmarks from the contractual nature of the various RE assets.

As Baker (2015) outlines, there are some highly standardized and highly discernable features of RE assets under the REIPPP. The tariff for instance is indexed to inflation, the PPAs are twenty years, Eskom is the single buyer across all projects, and Treasury provides a guarantee on the tariff. All of which could help in developing key measurement and performance metrics for RE assets thus providing asset allocators the ability to workout if RE assets would satisfy their relevant risk and expected return objectives.

There is however ongoing debate as to whether these discernable features of RE assets would make them automatically suitable for asset allocation consideration as their own, stand-alone assets. Beeferman (2007) writes extensively about the current lack of consensus regarding asset allocation of infrastructure assets - even amongst investors who deem infrastructure assets as legitimate investment targets. Citing an Australian study he indicates that 47% of Australian investors have a separate asset allocation for infrastructure assets whereas 43% include it in their private equity allocation with just fewer than 10% including it in the real estate allocation mandates. As Nhlapo and Gumata (2010) indicate in their study of the local institutional market, South African investors' preferred asset allocation categories include equities, bonds, real estate with a small growing focus on alternative asset classes. South African investors have not begun to reflect the trend overseas to include infrastructure as part of their asset allocation mandate, although there is some debate (see Gecelter, 2013). The reality is RE assets would have to compete with other assets within the investment universe in investor asset allocation analysis. The table below is instructive; showing different types of assets investors consider.

	<b>Infrastructure</b>	<b>Institutional Bonds</b>	<b>Institutional Real Estate</b>	<b>Private Equity</b>
<b>Nature of Asset</b>	Typically operating company dependent on control of large, physical assets	Financial security	Physical Property	Operating Company
<b>Asset Availability</b>	Asset scarcity, many in unique, monopoly situations	Deep volume in most markets	Moderate to deep volumes in most markets	Moderate volumes in most markets
<b>Acquisition Dynamic</b>	Competitive tenders, regulatory, environmental, social and political issues, often held for the long run	Efficient, on-market purchase	Competitive tenders, environmental and social issues common	Competitive tenders, management buy-out, negotiated trade sale, typically medium-term exit strategy
<b>Liquidity</b>	Moderate	Very high	Moderate in most sectors	Moderate
<b>Income</b>	Once assets mature, very stable, inflation/GDP growth relative. Typically higher than bonds and core real estate	Fixed coupon: sensitive to interest rates	Mixture of fixed and variable interest rate and sector dependent	Typically dominated by capital returns
<b>Growth</b>	Dependent on asset stage: modest (late-stage) to high (early stage/development) assets)	Low	Dependent upon asset characteristics; moderate to high	Dependent on asset characteristics; typically high
<b>Volatility</b>	Moderate (early stage) to low (late stage)	Moderate (market factors)	Low/Moderate	High (early stage) to Moderate (late stage) depending upon industry sector
<b>Typical return expectation per annum post fees</b>	Mature portfolio: 7-10% Development portfolio >10%	Approximately 5-7%	Core: ~7.9% Value added: ~12-18% Opportunity: >18%	Diversified portfolio >15%

**Figure 3 Table of Asset Allocation Characteristics (source: Beeferman, 2007)**

For local investors, inflation indexation of cash flows (via the PPA linking tariff increases – revenues – to inflation over its twenty year duration) is a key feature of RE assets and may increase the asset allocation profile of RE assets, *especially for investors who would prioritise risk non-correlation in their asset allocation framework*. This inflation-indexation feature could make RE assets particularly important for institutional investors such as pension funds who prioritise liability driven investment strategies. From as early as the mid 1990s Campbell and Schiller (1996) discussed the benefits institutional investors enjoy when they include long-dated, inflation-hedged cash flow instruments into a portfolio. They found that long dated inflation linked cash flows allow investors to implement liability-driven investment

strategies – i.e. allow investors to hedge inflation induced asset depreciation risk by matching liabilities with asset growth. Moreover allowing them to match cash flow obligations that may exist within a fund with cash in-flows received from such instruments. The question arises therefore, what benefits would accrue to local investors looking into invest in RE assets. As can be seen from Figure 3, infrastructure assets are long dated income assets with relatively low cash flow volatility with the added benefit of a PPA that accounts for a relatively high inflation outlook. Key features, which may be useful to a local pension fund, look for some diversification.

Weisdorf (2007) takes Campbell & Shiller's (Supra) point further by discussing the suitability of infrastructure assets such as RE Utilities, and their suitability for pension funds, endowments and annuity funds – he surmises that given their long dated cash flow profile, and inflation hedge (through tariff indexation), RE asset cash flows are highly suitable for liability driven investment strategies. Therefore making such assets suitable candidates for pension funds and other long-term investors. As Nhlapo and Gumata (2010) highlight, pension funds are key feature of the South African institutional investor landscape many of which seek to manage long-term liabilities through strategic asset allocation processes by prioritising assets that contain some element of inflation hedge.

In considering RE assets (or any other asset class) what will remain critical for long-term investors is the relationship between risk and reward that RE assets represent. In other words, is the expected return they are receiving via exposure to RE assets justified given the measure of risk? Bitsch Buchner Kaserer (2010) examine and describe the normative economic and financial features of infrastructure assets. They do this within the context of examining whether such assets' economic and financial features fit in well with the overall investment objectives of large institutional investors such as pension funds, namely from a risk/return perspective is their inclusion in the asset allocation framework justified. Their work effectively counters the 'infrastructure narrative' that states that infrastructure cash flows and earnings are, as a whole, less volatile than non-infrastructure assets. In other words, they question the diversity benefits of infrastructure assets cited by other authors looking at this subject (see Peng and Newell. 2008). Bitsch et al (2010) do however find that infrastructure assets show low default frequencies compared to non-infrastructure assets. Default risk being a key measurement of the risk represented by an asset. An interesting

take away from their study also indicates that infrastructure assets have higher median returns (as measured using IRR) than non-infrastructure assets of a similar risk profile. The authors explain though, that their findings could reflect the higher than normal market premium investors expected immediately after the financial crisis of 2007/8.

Idzorek and Armstrong (2009) study, detail, the role of infrastructure assets within the asset allocation frameworks of institutional investors. They develop and apply CAPM based tools to estimate expected return of infrastructure asset classes. Using mean variance optimisations they conclude that 'including infrastructure in the opportunity-set results in a slight improvement in the efficiency of the resulting asset allocations. Moreover in their study they find that there are some diversification benefits to including infrastructure assets within a portfolio. *On this point they diverge with Bitsch et al (2010)*. As discussed elsewhere in this paper, Blanc-Brude (2013) also discuss some of the limitations in the findings indicating that there is little correlation benefit for investors who include infrastructure assets.

Underscoring this discussion and review on asset allocation is the expectation that investors would approach RE assets as rational investors. A rational investor would be primarily concerned with maximising their overall risk/return trade-off (Singh and Ling, 2003). Thus assuming that SA institutional investors are rational investors, when looking at RE assets their objectives will be to determine whether an investment in the REIPPP will improve overall portfolio efficiencies. As Eberhard et al (2014) document, there is already substantial participation by a small handful of institutional investors such as Old Mutual into REIPPP, further understanding the asset allocation trade-offs can help set the basis even more investor participation in the REIPPP program.

The debate around nomenclature and benchmarking notwithstanding, the trend amongst institutional investors internationally has been to include infrastructure into the asset allocation mix. Preqin (2010) tracked over 800 worldwide investors with defined asset allocation frameworks for infrastructure assets, with pension funds making up the largest grouping. In this same Preqin (supra) study it was found that 56% of the investors surveyed have distinct asset allocation frameworks for infrastructure assets – with utilities making up the single largest category.

In November 2013 Ernst and Young published the findings of a 6-month survey testing the attitudes, perceptions and participation of global institutional investors (pension, insurance funds mainly) regarding Renewable Energy Infrastructure. Some of the 75 participants were South African focused participants and REIPPP featured prominently in the survey. The key findings were as follows:

- 61% of institutional investors have no investment in RE – although a third expected this change within 3 years
- The response on “how” to invest into RE impacted asset allocation
- Clear government policy – for both RE and the investment space – were key drivers in determining asset allocation.

What is clear from the EY survey (2013) is that when it comes to asset allocation a confluence of factors impact the outlook. It is not merely limited to mere economic and financial considerations – investors have to consider regulatory imposed prudential limits, non-financial considerations (ESG mandated allocations)<sup>7</sup>. The EY study echoes some of the academic literature discussed herein in highlighting the need to develop adequate benchmarks regarding RE assets to enable greater involvement of RE assets in asset allocation frameworks.

As mentioned above, given the nature of the PPA pricing mechanism (Willis, 2014) – tariffs are indexed to inflation over a 20-year period – one would expect some overlaps and correlation (in both return and risk) in inflation-linked bond cash flows and RE asset cash flows. Assuming South African institutional investors apply standard portfolio theory in determining their asset allocation strategy, South African portfolio managers will seek out correlation/non-correlation return patterns of RE assets vis-à-vis the universe of other assets they manage (see Petrella, 2005 for an interesting discussion on whether small cap stocks are a distinct asset class). But as Bitsch et al (2010) indicate, the narrative regarding ‘diversification benefits’ of infrastructure assets would have to be carefully scrutinized by asset allocators.

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<sup>7</sup> supra, per CDC Toolkit and World Bank’s Equator principals

Investors also operate within a series of both internal and external constraints. Regulations and internal policy issues will also affect asset allocation patterns for institutional investors, especially given the sheer dominance of pension fund money as a component of non-bank institutional assets (Andonov, Bauer, and Cremers, 2014). Nhlapo and Gumata (2011) also find that even though local institutional investor participation in the broader economy has exponentially grown, asset allocation patterns have not changed much, with Cash, fixed interest instruments, property and equities making up asset allocation mixes. During the period observed, equities maintained a dominant position of circa 40% within asset allocation mixes with fixed income securities, also at circa 40% during the 1990s dropping off to just 20% of assets.

As highlighted above, pension funds, insurers make up a significant number of the total circa R4 trillion in assets that non-bank institutional investors hold (Nhlapo and Gumata, 2011), and this figure comes off a low base.

Given the dominance of pension funds and insurers in the South African institutional space, regulation 20 of the Pension Funds Act has significant impact on determining asset allocation outlooks (Leape and Thomas, 2011) and will therefore inevitably have an impact on the decision making around inclusion of RE assets. Regulation 28 of the Pension Funds Act<sup>8</sup> significantly impacts asset allocation patterns as Treasury has the power to define and determine asset allocation spreads for pension funds. In 2011 there was a modification to the allowable asset classes within pension fund asset allocation mandates. Whereas the restriction on unlisted equity was 5% across the board, i.e. inclusive of other termed 'alternative assets'. The new guidelines make allowances for up to a 30% allowance across capital structure and different types of unlisted instruments – private equity, hedge funds (unlisted debt and unlisted equity). Given the fact that RE assets are typically unlisted, these developments could augur well for local investors looking to invest into RE assets.

Once again the limitations of this study make it difficult to construct the relevant benchmarking tools for RE assets. Future studies for instances, may be able to compare say absolute return data series of RE assets within the REIPPP program, juxtaposing those findings against other asset classes. Further, other studies could also look at the impact on

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the overall portfolios' standard deviation – as a measure of risk.

## **2.4 Project Finance as the preferred investment vehicle**

In determining the viability of RE assets as an investment target, investors will be influenced by the legal structure and form of their investment. In fact as Brealey Cooper and Habib, 1996 argue, the legal form of an infrastructure vehicle can determine how investors approach pricing and risk. To date, project finance has been the preferred form of investment of investment vehicle for REIPPP (Eberhard et al, 2014). This follows the international trend of utilising project finance as the preferred funding and investment vehicle for utility investments worldwide (Yescombe 2014). Gratwick and Eberhard (2008) indicate that the move towards project finance followed a wave of restructuring and privatisation of utility assets of developing countries in the 1980s and 1980s. Given the political and economic environment of 1980s South Africa, Eskom – the main government owned utility in South Africa – missed this wave.

Although each RE project is different, the financing and investment structure largely follows similar investment and capital structures, namely investors and promoters have sought to use ring-fenced SPVs, in which they apply a relatively high degree of leverage within thus minimising the equity layout required (Baker and Wlokas, 2015).

Idzorek and Armstrong (2009) make the point that institutional investor interest in the RE space will be highly dependent on the kind of investment vehicle utilised as this speaks directly to the assessment of overall risk. They further argue that a transparent and highly recognizable legal structure for instance, will attract less investment risk versus structures that are opaque and un-rooted in the familiar. Standardization of legal structure is therefore also an important component in helping determine the nomenclature of RE assets as a distinct asset class

It is therefore useful, for asset allocation considerations, that most RE assets in SA are, to date, structured on a project finance basis. There are however, some other useful examples and modalities to consider. Nelson and Pierpont (2013), referring to international examples, identify three main investment vehicles for utility infrastructure assets:

- i. Special Purpose Vehicles (typical to a project finance structure employed in South Africa RE assets)
- ii. Pooled Investment – Unit trusts, typically termed Collective Investment Schemes in South Africa, which have an exclusive focus on RE assets. These type of vehicles are non-existent (bar private equity funds) (Preqin 2013)
- iii. Direct, where institutional investors take a direct stake in RE assets. There is already some evidence of this form of investments in the RE space – PIC, IDC, Old Mutual (Eberhard et al, 2014)

Brealey et al (1996) however make the argument that project finance is arguably the most optimal investment structure for infrastructure finance because, inter alia, it allows for wide use of debt on a limited recourse basis for equity sponsors. They further make the argument that project finance is also a useful way to usher in private capital into government-backed initiatives - (like the REIPPP). Its usefulness arises from the fact that project finance allows for compartmentalisation of different risks, allowing for the right type of capital to be matched with the most appropriate risks. RE assets like most infrastructure assets have a long life cycle with the arguably the riskiest form of capital being deployed in the development phase of an asset's life, conversely the least riskiest being deployed once the project has been fully commissioned and is post revenue (Davis, 1996). In this scenario institutional equity capital for instance, may be suitable for some of the early stage investment whereas debt capital may play a role as the project de-risks. Project finance therefore allows large-scale infrastructure programs like the REIPPP to attract a wide array of investors – often each with a differing risk outlook.

Weber et al (2010) describe four key features of project finance:

- a. Special purpose Vehicle – a ring-fenced, new entity as the asset owner
- b. Cash Flow lending - Investors participate on the basis of a stream of highly visible cash flows
- c. Categorisation and Spreading of risk – specific project partners take up specific project risks, risk is spread
- d. Non-recourse – the project SPV's liabilities are limited to the capital contributions of the various project partners

Implicit in the features listed by Weber et al (supra), is the fact that investors into RE assets

typically invest in three ways: via equity, via debt and via mezzanine finance (equity and debt in this instance).

#### **2.4.1 Debt**

Debt plays a critical role in project finance as it allows project sponsors to optimally allocate their equity capital by seeking long-term semi-permanent capital partners. More importantly the utilisation of debt also allows project sponsors to reduce their own capital outlay through the use of leverage (Weber et al, 2010). As is highlighted elsewhere in this paper, project finance allows debt providers to invest into a ring-fenced structure where the legal mechanisms are highly visible and rooted in the familiar (Brealey et al, 1996). Thus when speaking of institutional investors regarding RE assets, it is important to recognise that depending on their risk outlook, mandate and regulatory profile, institutional investors into the REIPPP may participate in a variety of ways and at different components of the capital structure.

The major banks in South Africa are the main initial providers of debt capital into the REIPPP. Over and above the big banks, the IDC has also played a critical role in providing debt finance to RE projects, having financed R7,8bn to date (interview with IDC employee, Baker and Wlokas, 2015). Other contributors to debt financing include large fixed income houses that are typically backed by pension funds and annuity houses (Baker and Wlokas, 2015 & Eberhard et al, 2014). Debt has played a critical role in underpinning the success of the REIPPPP (Eberhard et al, 2014). Gatti (2013) makes the point (touched on above) that project finance allows for the optimal use of high levels of debt into project companies thus effectively increasing the scope of the investor universe. Moreover, given the explicit government underpin, cost of debt funding is made affordable thus helping increase the commercial viability of projects. In a recent study by Ruester (2015) highlights that it is in fact typical for debt to be syndicated amongst a group of investors by the primary lenders, namely banks. Given the size and importance of the institutional market, within a South African context syndication would therefore seem to play an integral role in determining the sustainability of investor participation within the RE asset universe. Twinamatsiko, (2009) outlines the benefits and rationale of loan syndication in project financing, highlighting the critical role debt syndication plays in the mobilisation of funds from non-banking financial

investors. Twinamatsiko (supra) also makes the crucial point that loan syndication plays a critical role in determining risk and pricing of debt instruments issued by project SPVs. Point being that syndication allows for a level of pricing discovery within underlying instruments by effectively introducing market making for debt instruments. Thus syndication could play a lynchpin role in ushering in investor participation within the RE space.

Writing in an industry focused study Gecelter (2013) makes the point that South African banks have tended to participate in the REIPPP via syndicated loan arrangements – with syndication occurring either at financial close or shortly thereafter<sup>9</sup>. Gecelter (supra) further states that banks typically off load their positions to non-institutional investors such as pension and annuity houses but questions whether there is sufficient capacity for direct bond issuances by RE asset SPVs. This could be an interesting area for further research.

#### **2.4.2 Equity**

Equity plays a crucial role in essentially de-risking an infrastructure project, particularly within a project finance context (Yescombe, 2014). Equity investors are usually first in line to put money into a project and therefore assuming much of the early risk (Ruester, 2015). Equity investors assume what is colloquially referred to as ‘first loss positions’ in RE projects (Yescombe, 2014). The structured nature of project finance however allows for equity investors to not go in ‘naked’ (another colloquialism) into a project, i.e. project finance typically allows for high visibility of earnings distributions for equity investors. Davis (1996) argues the project finance in fact enables the participation of capital market; non-bank institutional investors by optimally re-ordering risk and return (a by-product of which, is to create different classes of investors into infrastructure projects).

#### **2.4.3 Project Sponsors**

Beyond capital providers, Baker (2015) writes that project finance attracts the participation of other stakeholders, namely technical partners – EPC, O&M mainly and of course government by transferring relevant risks to those sponsors who are most suitably able to carry them (Ahlfeldt, 2013). Peter and Frank (2000) write that a properly constructed project

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<sup>9</sup> see also Gecelter’s ,(2013) discussion on the feasibility of RE asset bonds

structure allows for appropriate disintermediation of risks within a project company and therefore allowing for the relationship between risk and return to be appropriately priced and evaluated. For example construction risk is transferred from the project SPV to a third party construction party (Ahlfeldt, 2013). All of which is critical for institutional investor trying to determine both the make up of risk and return within RE assets. The highly contract driven nature of project finance provides for a highly transparent and legally certain entry point for investors. One where investors can observe and measure the risks that, inter alia, y technology, construction and regulatory bring to bear into a RE asset (Nevitt and Fabozzi, 2000). All of these considerations are the building blocks of the asset allocation process because they speak directly to measuring, assessing and ultimately pricing both risk and return profiles of RE assets (Weisdorf, 2007).

Lastly, Nelson and Pierpont (2013) also make a connection between the investment vehicle type and the overall finance costs. It is therefore important to consider how institutional investors view the project finance model, given that it is so far the preferred mode of financing RE projects in South Africa (Eberhard et al, 2014, Supra, Baker and Wlokas, 2015).

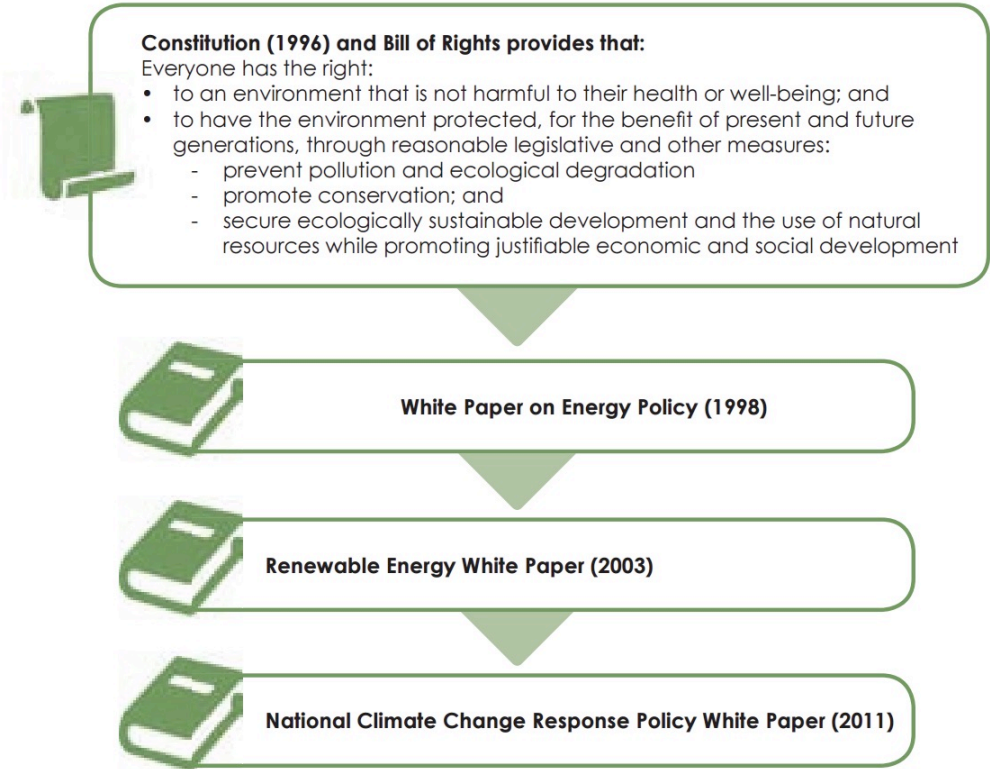
The type of investment vehicle utilised, also speaks to the particular type of financing methodology employed into SA REIPPP investing. Per above, Baker (2015) & Eberhard et al (2014) identify project finance as the most utilised investment vehicle for RE projects in rounds 1, 2 and 3 (Round three had 6 corporate financed projects, that balance sheet financed vehicles).

#### **2.4 Regulatory and Policy imperatives**

Aschauer (1989) showed the critical role infrastructure investment plays in a nation's overall economic prosperity. Governments around the world recognize the policy benefits that good infrastructure investment can have on the nation's fiscal outlook. Sutton (2007) takes this point further by highlighting the positive benefits that investment into utilities can foster for economic development. In South Africa, in 1998 the state moved towards an integrated generation mix, including different type of energy technologies recognising that over reliance on coal generation was unsustainable (Winkler, 2005).

Government has thus played a prominent role in the REIPPP program and has in effect

underwritten its fortunes (DOE 2015). The REIPPP program followed a developing trend internationally, of introducing large-scale private investment into the utility sector (Winkler, 2005). Many writers such as Mansour and Nadji (2006) have recognised the benefit of adopting a mixed development model in developing a countries utility sector. Such a model recognising that the right mix of government and private sector capital is usually the most optimal way to underwrite large-scale infrastructure funding gaps. South African government has itself adopted this approach. Since 2003 DOE has followed a pretty detailed and rigorous policy trajectory:



**Figure 4: Renewable Energy: Policy Trajectory (Source: State of Renewable Energy, 2015, DOE)**

In 1998 when the white paper was published South Africa’s energy policy was almost exclusively orientated around carbon rich coal (DOE, 2015). And at the time of its formulation, renewable energy was at best a marginal part of the energy sector.

The REIPPP program is predicated upon a competitive pricing regime. Where private players bid, per the RFP, based on a number of factors; price being the most important, IRP (2010).

This is an important fact given the development of relatively low price regime. South African RE assets have amongst the world's most competitive tariffs, which are inflation indexed for the duration of the PPA (DOE, 2015). This is a direct consequence of government policy as outlined in the 2011 White Paper. Government's intention was to usher in private investment into the power sector that would be affordable. Moreover private investment would occur within a policy framework that located government as a critical role player (Gaunt, 2008).

REIPPP program with its partial commitment to privatisation whilst keeping government as a key stakeholder in all likelihood represented a policy balance by Government given the political costs associated with privatisation (Phaahlamohlaka, 2008). The policy trade off for privatisation is in all likelihood cheaper electricity although Baker and Wlokas (2015) have raised some concern regarding the rapidly declining tariffs in successive bid rounds, asking whether from a financial perspective, the program has reached its peak.

The REIPPP program is implemented through a series of standardised agreements where government is a main counterparty with the two main agreements where government is counterparty being (Baker and Wlokas, 2015)"

- a. PPA
- b. Implementation Agreement

The PPA is the agreement where tariff, duration, technical specification requirements are determined. National treasury in part underwrites the PPA provisions (Eberhard et al, 2014). The implementation agreement governs the relationship between DOE and the respective project companies (Implementation Agreement – Project X, 2012). It includes terms and provisions around saleability, how long a project company can take to construct, when the equity owners of a project can dispose of their equity. Therefore even though government is not a direct project owner, it is able to impact and influence the commercial considerations of a project over its entire lifetime.

DOE for instance, restricts the outright sale of RE project equity and the selling down of debt (DOE, 2012). The rationale was to introduce investment certainty into a new industry where large capital investments were being made.

A key pillar of any infrastructure program is ensuring that there's an ongoing legal and policy framework upon which investors can base their investment decisions (Nellis, 1999). The highly contracted, standardised, nature of the REIPPP program conforms to this view. A recent survey by the audit company Ernst and Young, the REIPPP program is a highly transparent program (Ernst and young, 2013).

## **2.5 Literature review conclusion**

The term "asset class" is contested and whether infrastructure assets meet some agreed-to definition of asset class even more so. From the literature cited above, there is some emerging consensus around what the economic and financial features of RE assets looks like. Internationally, more and more investors are including infrastructure within their asset allocation frameworks. Moreover, some studies indicate that there are real benefits to portfolios that include infrastructure assets within their mix. Inderst (2009) for instance finds that expected return increases and risk lowers with the inclusion of infrastructure assets.

The literature also seems to find consensus that RE assets are a legitimate sub-set of infrastructure assets. Eberhard et al (2014)'s study indicates the rapidly growing REIPPP program and the cascade effect it is having on investor allocations. Other local authors such as Wlokas and Baker (2015) also show that there is developing consensus locally as to how to fund and invest in RE assets. This standardisation relates to capital structure, legal structure, risk-return expectations.

The literature reviewed does however highlight exactly how much work still needs to be done in assessing the South African institutional market's response to REIPPP program. There is very little data by way of benchmarks and thorough analysis. At this stage, understanding the REIPPP program often means extrapolating imperfect, foreign examples into a local context.

Lastly the literature indicates that in the absence of established benchmarks, investors will glean and determine asset allocation suitability for infrastructure assets by performing a thorough examination of such assets economic and financial features often in a non-

standardised manner. Thereafter juxtaposing such features against the features of more established asset classes.

Very little of the available literature deals with the South African context. South Africa does have one of the most sophisticated institutional investor bases in the world, therefore it may only be a matter of time until relevant asset allocation models are developed to cater for RE assets.

### **3 RESEARCH METHODOLOGY**

#### **3.1 Research Approach and Strategy**

Given the nascent nature of the RE space in South Africa there is a dearth of available data. It would not have been feasible to adopt a quantitative research approach given the lack of financial data for RE at the present moment. The research therefore followed an inductive qualitative approach.

An inductive, qualitative research approach allows the researcher to formulate a theory-building approach to the research (Cresswell, 2013). A series of in-depth, focused interviews allowed the researcher to identify emerging themes, which were then triangulated with other available data and an extensive literature review.

This research approach also provides the benefit of allowing the researcher to reflect and glean non-binaries, non-quantifiable insights in the interviewee responses, thus capturing nuance in a way a deductive approach would make difficult if not impossible given the nature of this research topic. An inductive qualitative approach also allowed the researcher to iteratively build theoretical frameworks, testing them through observations and a thorough literature review. Further, an inductive theory approach allows for the researcher to formulate what they observe through data collection, interviews into theoretical concepts, which could inform the basis of future research in this field (Marcoulides, 1998).

The approach to data collection was primarily through a series of interviews with RE project sponsors (owners, financiers, developers) plus a series of interviews with various institutional investor representatives (pension funds, life houses, DFIs, fixed income money managers). Aforementioned representatives, reflecting what the researcher considers the

very best available expert viewpoints in South Africa. In order not to contaminate the research findings, the researcher endeavoured to ask interviewees non-leading questions, avoiding binary enquiries and letting the interviewees describe in their own words their own experiences and perceptions of the REIPPP program's viability for investors.

The research relied on Grounded Theory (Glaser and Strauss, 1967, Shields and Tajalli, 2006) to help triangulate the set of findings and observations collated from the interviews and other data observations (such as a study of DOE policy documentation and legislation). The use of Grounded Theory therefore helped 'sanity-check' the data collected from the interviewees by cross-referencing data findings and conclusions from interviews with other information sources gleaned from literature reviews, policy & legislations documentation, media and news analysis and intra-interview data from various respondents themselves. As mentioned, the primary mode of data collection was through a series of interviews with a specified pool of participants. Interviews were in both structured and unstructured formats. Unstructured interviews were utilised primarily to gain new or nuanced insights into the RE space whereas structured interviews were utilised to garner specific information from participants. As mentioned above, all data garnered from interviews was triangulated with other data sources – thus strengthening the validity and interpretation of the collected data and minimising the potential for confirmation bias by the researcher.

### **3.2 Data Collection, Frequency and Choice of Data**

The REIPPP is a mere four years old (DOE, 2010) and therefore the outlook and prospects of the program is as of yet undetermined. Research design is the 'map' the researcher utilises in order to properly answer the research question (Saunders, Lewis and Thornhill, 2009). Given the newness of REIPPP, an exploratory research design was the most optimal research approach. There are relatively very few areas of research on this topic within a South African context, that is compounded by the fact that there is also a dearth of financial and economic data from which to draw hard conclusions. Reliance therefore predicated on the experience and outlook of actual market participants in REIPPP or those seeking to obtain exposure to the space.

Exploratory research allows the researcher to ventilate new thinking on a particular topic, helping develop new insights on existing literature and findings, ultimately helping build upon existing theory (Shields and Tajalli, 2006).

More importantly though, the researcher hopes that this research will help form the basis of future research – as the REIPPP matures and more datasets become available over longer periods.

Research interviewees were selected for their respective insights into the REIPPP space. As mentioned briefly above, all the respondents are active stakeholders in the REIPPP and therefore are able to share first hand, expert insights about the space from their particular perspectives. Given the fact that the research design is exploratory, the interviewee list can never be exhaustive.

The researcher interviewed 26 individuals all either directly or indirectly involved with REIPPP either as financiers, investors, project developers, project sponsors, regulators, advisors. Of the 26 interviewees, over 90% are direct investors in the REIPPP program, representing some of the major investment and financing houses in South Africa.

Interviews were mainly semi-structured via a set of well-designed interview questions (Appendix 1) and then followed by a series unstructured interviews and conversations. Furthermore the researcher consulted a wide range of published information in the form of academic and non-academic literature to collect further data and triangulate data emanating from the interviews. The triangulation went both ways, testing both the interview findings via the literature review and vice versa.

Corbin and Strauss (2014) stipulate that research can be validly collected and collated through a variety of means including interviews, questionnaires and observations and that this cross-sectional approach to data collation helps reinforce the data's validity via triangulation. Therefore Interview generated data was cross-referenced with the available literature via media reports, policy and regulatory reports from DOE and various industry presentations made by various industry participants who are experts in one or more aspects of the REIPPP.

Secondary sources of data beyond literature review and interviews were also relied on mainly in the form of a review of existing policy documents published by the DOE.

Given the dearth of literature on this topic directly relevant to the South African context, reliance had to be placed on literature describing and quantifying market scenarios in places like Australia, Canada, Europe and the United States. This literature nonetheless helped

contextualise the data collected from the interviewees and other local material and in some instances, vice versa. The benefit of using unstructured interviews is that it allowed the researcher to elicit responses from the interviewees that provided some very useful insights into a new sector. Of particular usefulness were the insights from portfolio managers.

### **3.3 Sampling**

The nature of the newness of REIPPP dictates that exploratory research design outlined above is perhaps the most appropriate research approach. The study relied on interviews (26), cross-referenced with a detailed literature review plus an extensive analysis of existing policy documents in order to analyse the data. Interviewees represent some of the most experienced REIPPP program participants in South Africa. All are key decision makers in their respective organisations and generally represent decades of experience in financial services, project finance and other relevant spheres. Collectively the individuals interviewed represent nearly R2 trillion of economic interests through the respective organisations (with the PIC representative making up for half of this amount)

In order to ensure that the research findings are reflective of a sufficiently wide enough range of REIPPP stakeholders, the researcher intends to interview stakeholders across the following categories:

- i. Institutional investors and financiers (Pension Funds, DFIs, Fixed-Income managers) (“Investors”)
- ii. Regulators Government and Eskom representatives (DOE, Treasury, Eskom)
- iii. Transaction Advisors (“Advisors”)

Following Gorman and Clayton’s (2005) definition of non-probability sampling. The researcher understands the dangers of this approach in that it can introduce confirmation bias given that the sampling process is inherently subjective and may reflect the researchers own outlook and biases. With this in mind the researcher constructed the sample cases to be as relevant as possible to the research question by focusing on parties that have an intimate knowledge of the investment landscape of REIPPP to date.

To this end, the researcher also adopted an iterative interview approach which in turn ultimately determined the sample profile and breadth - that is: structured interview questions -> semi-interview/conversation that begets further conversations and/or

interviews → then follow up and further semi-unstructured interviews. Another point worth noting is that given the newness of the REIPPP most participants were familiar to one another either directly or indirectly which made it easier to get in touch with other prospective interviewees). There was also, therefore, an easier ability to cross-reference and triangulate emerging data and themes within the sample grouping itself. Moreover further cross-referencing this emerging data by referring to existing literature - both academic texts and policy and legislation documentation (Berg and Lune, 2004). Where the researcher found that interviewees differed on a particular point or finding, the researcher would ventilate that contradiction with other interviewees further cross-referencing the research findings with the literature review findings

Given the overall standardization in the REIPPP process (i.e. the standardised bid process, standardised project legal agreements such as the PPA and Implementation Agreements (DOE, 2015)), there are some usefully common features across the various RE projects. This factor helped in testing the validity of the merging data and themes given the fact that respondents, irrespective of which RE project they're involved in, all typically contended with the same framework.

### **3.4 Data Analysis Methods**

Data was collected in a number of different ways. The main mode of data collection was via a series of interviews and discussions with people who have extensive experience with the REIPPP. Initial discussions and interviews were framed via a series of structured interview questions that were communicated to the participants. Follow-up discussions and communication then followed up the structured interview responses. The researcher identified themes in the responses and discussions, coding each theme with a view to returning to it either via further discussion with participants and triangulating the thematic findings with other material gathered under an extensive literature review.

Data collected was then cross-sectionalised through an extensive literature review of applicable, existing academic theory on the research scope at hand. Eisenhardt (1989) outlines the importance of cross-checking and interrogating collected data through a variety of means and methodologies (grounded theory). In this instance, and as intimated directly above, the researcher augmented the data analysis process by reviewing other relevant

materials – this allowed the collected data to be analysed through a variety of different and sometimes differing perspectives.

Applying the grounded theory approach further allowed the researcher to split the data analysis process in to two broad frameworks:

- i. Data collation, sampling
- ii. Categorisation or Coding (thematic approach)

Data was collated then synthesized, and streamlined into applicable categories based on emerging themes. Categorising the collected data in such a structured manner enabled the researcher to appropriately contextualise data whilst gleaning from it emerging patterns within each particular grouping. This process of collation and categorisation was iterative, repeated at each stage of the data sampling process. In practice categorisation was performed once all interviews were completed, where themes were identified. The researcher then went back to some of the respondents to clarify and perform follow up questions via semi-structured interviews. All the while sorting out the emerging themes into applicable categories. This approach also allowed the researcher to scope out any gaps in the data collection process, making allowance for further data to be collected and once categorised, where applicable. This theoretical sampling approach underscores the data analysis process by providing a rigorous framework to cross-reference data.

### **3.5 Research Reliability and Validity**

The danger in this research process outlined above is that the researcher can insert their own biases into the data collection process, skewing sample of interviewees, unwittingly emphasising certain data sets over other. To mitigate this danger, the researcher cross-sectionalised their data collection – triangulating data collection methodology as described above by applying grounded theory concepts; seeking out anomalies in the different data collection processes. Thus it was critical that external, secondary data collection methodologies (namely literature reviews) corroborate the overall primary data findings, thus validating data collected from interviews (Patton, 1990). Moreover it is important that the data findings were easily extrapolated and generalised. In other words, ensuring that the data findings weren't too context-specific, lacking external validity. Once again, triangulation

of data collection methods strengthened the research collection framework and limited this latter-described risk.

### **3.6 Limitations**

The researcher acknowledges that time, resources and an overall lack of South Africa-specific material and data hampers the scope of this research. A single-researcher approach also limits all available perspectives

## **4 RESEARCH FINDINGS, ANALYSIS AND DISCUSSION**

### **4.1 Introduction**

The list of interviewees the researcher communicated with can be considered to be at the forefront of the REIPPP. Many highlighted various motivations for participating in the REIPPP, but the underlying theme that emerged was one of financial consideration. Many interviewees explicitly described their participation in REIPPP as driven by a financial motivation. This is an important starting point within the context of this paper given the fact that this research concerns itself with investigating the motivations and (financial) incentives of institutional investors looking to participate in the REIPPP. A key underlying assumption is that investors are acting rationally, in that they seek to maximise return whilst minimizing associated risks.

A senior portfolio manager at one of the largest pension fund houses in SA (personal communication, 11 September 2016) described their participation in REIPPP as an 'opportunity to access cash flows with relatively low downside risk [given the role of Treasury in underwriting the PPA]'. What this respondent was alluding to is that in their view; RE assets present a viable investment opportunity given what he termed a favourable relationship between risk and return. However, echoing a common sentiment amongst the interviewees, this respondent further stated that the difficulty his organisation faces when it comes to RE assets, is in developing what Brealey, Cooper and Habib(1996) refer to as the taxonomy of finance. There was a feeling expressed that it was still difficult to determine where within their respective investment universe RE assets would fit in. Further whether existing mandates and definitions would suffice in understanding this emerging new

investment target or whether new nomenclature would need to be developed in order to appropriately categorise RE assets within the asset allocation framework

Nearly all participants viewed the REIPPP as a favourable policy development and more importantly viewed DOE's commitment to it as sustainable and long term. However, some interviewees expressed the view that Independent Power Office ("the IPP Office") should be located within a firmer legislative framework. In other words its functions should be institutionalised in order for the program to be fully sustainable thus echoing a view expressed by Msimanga and Sebitosi (2014).

A-1<sup>10</sup>, a very senior official within the IPP Office, disputed the assertion that the IPP Office may suffer from a lack of a highly identifiable institutional framework. Her view is that the IPP Office enjoys support from both the National Treasury (A-1 herself being a Treasury official) and The Presidency) thus ensuring a successive policy framework for the REIPPP.

For many interviewees, the mechanics of **how** they participated in the REIPPP influenced their asset allocation outlook. For instance, some investors were attracted to the economic and financial profile of RE assets but were restricted from investing into an asset with unlisted instruments. This '**how**' question which is essentially a mandate question often links itself to a normal asset allocation process. As more than one respondent pointed out, an asset can theoretically be considered favourably for asset allocation purposes but investor mandate issues can make it impossible to invest. This latter point was a recurring theme emanating from interview discussions.

Other considerations that relate to both mandate and pure economic considerations related to perception of risk given the composition of RE asset capital structures. A-2 for instance, a portfolio manager in a large fixed income investment house (personal communication) makes the point that capital structure considerations weigh heavily on their outlook regarding RE assets. A-2 oversees institutional money that invests in high yielding fixed income instruments such as REITS. He pointed out that emanating from legacy issues and current internal credit policy considerations, his funds were restricted from investing in

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<sup>10</sup> Some respondents have been anonymised. Full profiles in Appendix 2

REITS where the underlying blended loan to value of the target property company was higher than 40%. RE assets as described elsewhere in this paper, are usually funded via ring-fenced SPVs where the applicable leverage is way in excess of the 40% restriction A-2 contends with. This latter point introduces a quandary for him when considering RE assets for asset allocation purposes *irrespective of whether he is satisfied with the overall risk and return economics, the credit policy restrictions (essentially mandate restrictions) make it difficult to argue for RE asset inclusion within his mandates*. What is interesting to observe, was that even where investors could make a financial case for investing in RE, many respondents expressed the view that their own internal mandates severely proscribed their participation as investors in RE assets. Revealing that there is a lag between objective (financial) analysis of RE assets and how they are perceived.

#### **4.2 Renewable Energy: Investor perceptions and expectations**

Given Eskom's longstanding monopoly in South Africa's energy sector, the private sector has historically played a tangential role in financing and investing within the utilities space (Eberhard 2007). Private sector capital has typically been crowded out by the state's singular investment focus into Eskom over nearly 70 years. Therefore, to many portfolio managers, pension fund trustees, analysts and other involved in the asset allocation process the question of whether RE assets should form part of their formal mandates is a new and untested consideration. Traditionally South African investors' preferred asset classes are: Equities, Bonds, and Property (Nhlapo and Gumata, 2011).

In the early rounds (Rounds 1, 2) of the REIPPP, there were a handful of institutional investors, namely Old Mutual (via IDEAS Fund, AIIM, Funds, and A large fixed income house), DFIs (IDC, DBSA) and a handful of private equity funds that in part represented mainly foreign DFIs such as the IFC, Norfund, Geerf.

According to A-3, who works at a large, listed financial services house<sup>11</sup>, (per telephonic interview and discussion) his organisation much like its peers, hadn't anticipated REIPPP and further, they had very little in-house project or infrastructure finance expertise to assess its viability for their clients, who are mainly a mix pensioners and other retail investors (A-3, supra).

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<sup>11</sup> A-3 is very senior and sits on the Exco of this company. One of the largest on the JSE

Kingdom Mugadza, formerly of Omigsa's IDEAS fund, indicated (personal communication) that many institutional investment houses had not adequately developed the necessary nomenclature in order to appropriately categorise RE assets within their existing mandates. The conversation around RE assets still centred on where in the investment universe money managers should allocate (if they allocate at all) RE assets. The lack of history and outright newness of the sector often trapped any serious discussion around RE assets at often very preliminary and basic analysis focused on determining exactly what this new sector looks like, determining nomenclature. He made the further point that many institutional investors were still ignorant of the detail surrounding RE assets and would therefore take 'longer than the short-term' to develop informed views and perceptions of the sector.

Mugadza also expressed a viewpoint echoed by other respondent that RE assets - at both debt and equity levels of investment - represented a type of fixed income opportunity for investors.

Underlining this latter expressed viewpoint was the fact once RE assets reached their post-construction phase they were expected to represent long term and steady streams of cash flows to both debt and equity investors. An interviewee who is a senior dealmaker at the PIC (telephonic interview) revealed that the PIC had in fact 'missed the boat' on the first round of the REIPPP. There was no internal policy or mandate or even expertise within that would have allowed the PIC to participate as an investor in the REIPPP. The PIC is the government's pension fund manager representing over one trillion Rands in funds of their various members. They are by all measures the largest fund manager in the country. Making the respondents revelation even more remarkable. In that by the commencement of the REIPPP program the mainstream institutional market hadn't even considered putting on their radar let alone formulating a sophisticated asset allocation outlook to RE assets. The PIC respondent did however indicate that by the time the second round of bids had come around they had both capacitated and formulated internal mandates, which placed the REIPPP at the centre of their investment policy. A key consideration for the PIC (and other organisations as expressed by other interviewees) was determining whether they would invest across the capital structure or merely limit themselves to investments of a debt nature.

In constructing a view around the REIPPP and therefore RE assets many of the respondents expressed a near-instinctive viewpoint that from a risk adjusted perspective (and therefore

asset allocation perspective) it would most likely be 'easier' to invest in debt instruments. There were however, some interesting opinions regarding whether there is in actual fact any material difference between debt and equity from a risk adjusted perspective. This point of view underscored by the fact that most RE assets were structured as ring-fenced project finance SPVs

Mugadza (Old Mutual) finds that distinctions between equity and debt instruments within a project finance context were often superfluous. According to him, the additional contractual protection that debt investors enjoy over equity investors, is not sufficient to yield vastly different returns for debt and equity. As Eberhard et al (2014) show in their important paper on the REIPPP; over the last three rounds the return on both debt and equity has contracted but equity has re-priced downwards at vastly higher rate than debt pricing.

In a paper from the EDHEC-Risk Institute, Blanc-Brude, Hasan and Ismail (2014), argue that the probability of default for a ring-fenced infrastructure project, is similar across the capital structure, given that recoverability in the event of loss is limited within a project finance context. Mugadza is in effect reiterating Blanc-Brude et al's (2014) viewpoint. How investors perceive and ultimately analyse debt and equity instruments will have a direct and immediate bearing on their asset allocation decisions. The relationship between debt and equity and the risk return profiles of the two is an important marker in shaping investment perception of RE assets and ultimately, an asset allocation strategy involving RE assets within the investment make-up. The data collected from interviewees indicated that even where participants had formulated internal mandates and their overall perception the REIPPP was favourable (as an investment target) many still expressed a level of bias towards participating as debt investors. Indicating that institutional investors need to still wrap their minds around equity investments. This is discussed further below.

A-5 from a large fixed income house, in a telephonic interview (personal communication), reiterated the above view (as expressed by Mugadza), that there is often difficulty in appropriately differentiating between debt and equity for the purposes of firstly categorising the investment from a mandate perspective and secondly, from a pricing perspectives (pricing – i.e. ultimately measuring and quantifying both risk and return and their respective relationship). She cites the emergence of Yieldco both in South Africa and internationally. Yieldcos are effectively packaged cash flows of mainly equity-backed cash flows – but have bond like qualities and in the U.S. are typically listed. A-5 cites the participation of fixed

income investors into Yieldcos (buying exposure to what are essentially equity cash flows whereas such investors would typically buy fixed income bond instruments) as evidence of the conflation between equity and debt pricing. A-5 indicated that she expects to see a contraction in pricing differential between equity and debt instruments of RE assets.

In the REIPPP both debt and equity investors have a contractual right to a stream of long dated cash flows generated via sale of electricity to Eskom over a 20 year PPA period. Debt investors have contractually more rights and are in a very real sense, better protected in the case of liquidation and/or default. A-5 however stated that two occurrences took place in subsequent rounds of the REIPPP, that could impact their view on the sector: - Firstly, overall tariffs have come down by as much as 45% in some instances (a view reiterated by DOE (2015)) – meaning overall project returns have reduced. Secondly, the yield differentiation between debt and equity within projects has diminished, with Round 3 project returns indicating a differential as low as 3%. (that is, in nominal terms equity yields on some RE projects are only three percent higher than debt yields on the same project).

In A-5's view, these two related events reflect the changing perception of risk associated with REIPPP and project finance in general, but moreover, this movement also indicates that there is return and risk correlation between debt and equity cash flows. She emphasised this latter point by highlighting that in so called 'catastrophic loss events' (personal communication, supra) the timing of loss to equity would be similar to the timing of the loss to debt holders (that is, if equity providers lose money in a project, there's a near certainty that debt providers would also experience some loss albeit at a slightly differing time differential). She underpins this latter point by indicating that recoverability (given a specific event of default) for debt providers would not be significantly higher than that of equity holders.<sup>12</sup>In her view, with government as a major stakeholder the normal avenues of liquidation and recoverability could be complicated. Moreover she stated that solar farms and wind farms for instance, with 20 year contracted PPAs to Eskom are not easily broken up into various components and thereby sold to recover losses. Investors – both debt and equity – are saddled with the losses in A-5's view. A-5 echoes a common sentiment across respondents that views RE assets as a form of income investing, cash flow backed investments as opposed to say pure asset back-lending, which would heavily favour lenders.

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<sup>12</sup> examining the probability of default for both equity and debt investors in RE projects could be another viable avenue of research

Put simply the emerging consensus is that both equity and debt investors into RE assets would need to take a primary view on the long term integrity of RE cash flows in order to appropriately price both return and risk. Ultimately what will drive perceptions and therefore investment allocation decision-making regarding RE assets, will be how investors perceive both risk and return associated with the assets – and how those particular assets actually perform in the long term.

Many respondents repeatedly expressed the view that they would participate in the REIPPP if investing in RE assets maximised their overall portfolio returns without introducing disproportionate risk. So whilst a thorough cash flow analysis represented a critical starting point in determining overall pricing a key component of the analysis centred on determining REIPPP longevity as this spoke directly to assessing the long term integrity of project cash flows. For many respondents what seemed like a key aspect of this consideration was the belief that government was, in the words of one of the respondents, ‘married to the REIPPP’.

Tafadzwa Mhlanga, a private equity practitioner in the REIPPP since its inception, explained how perception of the REIPPP improved with each subsequent bid round. According to Mhlanga, government’s reputation had taken a severe knock initially because of the repeated program delays (Baker, 2015) in implementing renewable energy policy. The delays between 2007 and 2011 resulted in many projects being severely delayed and falling off, because as Mhlanga says, investing into an RE asset requires that you ‘upfront and commit all your capital’ and yet one has to take a long-term view on how government and Eskom will perform as a project partner. A senior credit analyst from DBSA reiterated Mhlanga’s view, although he still feels that government has been responsible for some missteps and thus inadvertently introducing some ongoing risks to the program.

Some of the risks the DBSA respondent highlighted as threatening the REIPPP’s viability included what he considers Eskom un-readiness for the REIPPP roll out. His primary concern related to grid-connection issues. Roelf (2015) writes that Eskom would need another R149 billion by 2022 in order to strengthen the grid and transmission network in order to connect the expected capacity coming on stream from, inter alia, the REIPPP. Colin Matlala, CEO of Lebone Engineering (personal communication) echoes a view that by resolving generation capacity constraints Eskom could solve one problem and yet create another. His view is that REIPPP’s success or failure will be dependant on able and ready Eskom is to take on new grid capacity. Matlala, an Electrical Engineer with extensive project finance experience across

Africa, says that there is at least 35 years of under-investment in the electrical grid and that grid connection issues pose a greater problem for electricity supply than generation itself. His suggestion is that the IPP's mandate be expanded to include private investment into portions of the grid – where Eskom would lease from the private sector.

Although many respondents expressed strong confidence in government's commitment to REIPPP, Mike Brooks (CEO of Inspired Evolution – a leading investor into the REIPPP - telephonic correspondence), highlighted that in his view government doesn't always execute the plans and policies it signed off on. Although he sees minimum risk in government renegeing on its commitment to the REIPPP, he does however question what impact the government's commitment to nuclear will have on the current commitment to the REIPPP. Per government's IRP (2013), it has been determined that nuclear power is essentially superfluous given the country's economic prospects. Moreover the IRP suggested that Nuclear is an expensive form of investment and that gaps in supply should be augmented through regional hydro projects and other RE projects. Brook's view is that government seems to be ignoring its own advice and this puts a small question mark around the DOE's long-term commitment to the REIPPP. He was however careful to point out that government wouldn't necessarily renege on existing arrangements but rather, could slow down the roll out of successive rounds.

Obakeng Moloabi from Pele Energy Group (personal correspondence) participates mainly as an equity investor in the REIPPP and a provider of BEE and local equity as per the REIPPP requirements (DOE, 2012). His view of RE assets is that they represent the most optimal arrangement between private sector and government in tackling the problem of supplying a very public good, namely electricity. Moloabi's view is that the REIPPP will be an investment model that government expands into other policy considerations such as water, health, public works. He therefore sees an investment in the RE space as an explicit investment into South Africa Incorporated – that is, it's an indirect play on the sovereign.

He views institutional investor participation as a crucial underpin in determining the overall sustainability of the REIPPP. Investors are of course driven by various considerations both endogenous and exogenous. One of the key drivers of investor participation in the REIPPP would be whether RE assets represent a viable financial fit and the starting point of that conversation is whether they qualify for mandate and asset allocation recommendations into investor portfolios.

### 4.3 Asset allocation and investor mandates

As expounded upon above, an asset class has been, inter alia, defined as a “logical grouping of sub-assets” (Idzorek and Armstrong, 2009). For most respondents the starting point for assigning a common set of characteristics (in order to ‘group’ RE assets per Idzorek and Armstrong’s 2009, definition) was to firstly discern and analyse their economic and financial characteristics. To be viable contenders in any asset allocation process, RE assets (like any other asset under consideration) should effectively satisfy two broad requirements: raise expected return of an overall portfolio and/or lower overall portfolio risk (Kritzman, 2007).

Implicit in this determination, is an assessment of return and risk and furthermore, an assessment of correlation RE assets would have with other assets already included within the portfolio (Markowitz, 1952). Once again, underpinning this type of analysis would be availability of more data analyse.

As mentioned elsewhere in this paper, to date there have been three Rounds of REIPPP at time of writing, with a total of 88 projects approved to date. Many of these projects are either newly constructed, with very limited operating lifespans and therefore very little long term data for investors to work with. This has made it difficult formulate a research viewpoint on purely objective factors such return and standard deviation analysis of RE assets.

Any real assessment of both expected return from RE assets and the associated risks they carry has to begin with an assessment of their economic and financial characteristics. Given the lack of historical data many respondents and interviewees defaulted to firstly gleaning and measuring the economic and financial features of RE assets as best as they could observe and then making a determination as to whether they should be included in their current and existing asset allocation mandates. Many respondents across the spectrum considered their return analysis as being primarily driven by the tariff analysis as contained in the PPA.

The PPA contracted tariff essentially drives and underpins the narrative around expected return. As A-5 indicated above, tariff has fallen dramatically in each subsequent round of the REIPPP. This is because of the competitive nature of the REIPPP bidding process, which weighs tariff disproportionately higher in the scoring winning bids. So the key question for

many respondents has been to determine exactly what constitutes a fair expected return for RE assets. As Eberhard et al (2014) and Baker and Wlokas (2015) indicate in their respective studies there's been a near 50% drop in tariff numbers between Rounds 1 – 3 in the REIPPP.

The impact on return is still as of yet hard to quantify. A-5 does however indicate in interview discussions, that their initial in-house return expectation for round 1 was in excess of 20% real IRR, with debt return middling in the mid-teens nominal. For round three however the picture had shifted considerably with equity returns sitting in the low to mid teens *nominal* and debt returns having nearly halved to circa 300 – 350 bps above three month Jibar (at time of writing, 5.1%). Many respondents however did indicate that the initial round one returns represented what one respondent termed 'a once in a lifetime event' from a risk adjusted return perspective. Steven Faure from private equity house Inspired Evolution expressed the view that they would most likely never again see what were essentially text book private equity returns for what he perceived to be low risk infrastructure risk. There was therefore a prevailing view that the new round 3 pricing reflected what was essentially a normalisation in the risk-adjusted profile of RE assets. This sentiment is echoed by other respondents such as Mugadza who, as indicated above, who see RE assets as essentially a form of fixed-income assets - representing steady cash yields with relatively low volatility and therefore fore relatively low upside.

The motif in the respondents' views was the difficulty in extrapolating precise views on both return and risk of RE assets with very little historical data available. Even where investors were comfortable with working with the little data available to construct an asset allocation point of view many found that internal mandate constraints impacted on their overall asset allocation outlooks.

A-3's response in some sense reflected the views of many other interviewees - namely, that even where he and his team could clearly make out the economic and financial features of RE assets, they still struggled with assigning the relevant nomenclature to RE assets. This in turn made it difficult to benchmark and therefore articulate observed features within a comparative context.

Echoing an approach communicated by other respondents, A-3 indicated that the starting point for him and his team was to determine whether or not their current investor mandates – across product lines – allowed them to even consider RE assets into their respective

investment baskets. In order to answer this starting point enquiry, A-3 (personal communication, supra) said he and his team needed to determine what the exact financial and economic features of such assets are (even if this is merely a normative determination), further determining whether they fit into existing mandates. So for A-3, issues around asset allocation and mandate are regarded interchangeably – even though he recognises and accepts the difference between ‘mandate’ on the one hand and ‘economic viability’ on the other. His initial view was that RE assets satisfy asset allocation criteria of fixed income portfolios particularly as potential inflation-linked fixed income instruments but at the same time he expressed encountering some difficulty from his legal and credit committees, namely as to whether RE assets would be permissible investments within their current fixed income funds.

RE project companies receive contracted cash flows from Eskom via a Power-Purchase Agreement (“PPA”), which in turn, receives a full guarantee from National Treasury (Treasury) (DOE, 2012i). Effectively, the sovereign underwrites the PPA. For A-3 this is an important factor from a mandate and asset allocation perspective, because many of the fixed income funds they manage require a minimum credit profile and having a sovereign underpin on the PPA could justify relying on South Africa’s sovereign status as an investment grade destination. A-3 is careful to make a distinction between ‘mandate fit’ (which he considered a regulatory and internal policy consideration) and ‘asset allocation decision’ (which he expressed as a function of the impact on expected return and standard deviation with an overall portfolio – personal communication).

Effectively by highlighting this distinction A-3 is underlining the fact that RE assets could satisfy asset allocation requirements and still not be eligible to be included within a given portfolio because of mandate and regulatory restrictions that a given fund may carry.

Reiterating A-3’s view, A-6 from a large CPT based institutional investor fund manager (who is an active participant as an RE asset manager), (personal correspondence) regards RE assets as part of the fixed income asset class universe. A-6’s view is that the overall absolute return of RE assets should ultimately correlate to the long-term government yield curve.

This is an important assertion from A-6 because it reiterates two aforementioned principals embedded in any asset allocation decision: is there an impact by the RE asset on portfolio expected return and secondly, do RE assets provide long term diversification benefits (non-

correlation benefits). For many of the respondents those were the two key questions determining the economic and financial bona fides of RE assets. A-6 further states that he views the issue of correlation in two ways. Firstly, in order to justify being included into particular mandates (and what he refers to as RE assets establishing its 'asset class bona fides') RE assets must as matter of course 'look and feel' like an asset class that institutional investors, pension fund trustees know and are already comfortable with (personal communication). In this way, from A-6's perspective, the conversation around mandate fit becomes easier if investors feel that RE assets display relatively similar features to other asset classes, for e.g. REITS. It makes the 'ideological leap' easier for institutional investors if they feel that RE assets represent a largely interchangeable opportunity set. In A-6's view investors are guided by economic and financial features that seem familiar and easily identifiable.

The second aspect regarding correlation that A-6 highlights relates to the diversification benefits RE assets could bring to a given portfolio.

A-6's view is that the long-term, contracted nature of RE cash flows (under-pinned by Treasury) will yield long term returns with relatively low standard deviations over the long run. So in his view, RE asset returns would perform the function of reducing overall portfolio risk, as the expectation is that RE asset cash flows are highly visible (given their contracted nature) over the long term, and critically benefit from a Treasury underpin. On this latter point, A-6 is expressing a variation of the point made by A-3 (supra) the view that RE assets are a close proxy for government backed securities. He summarises his view by describing investing into RE assets as 'buying government bonds with a yield pick-up'. This 'pick up' A-6 believes, compensate investors for the inherent technology, regulatory and market risk associated with RE assets. The researcher pointed out to A-6 (and others) that the findings of the Bitsch et al (2010) study found that infrastructure assets do not necessarily provide more stable cash flows than non-infrastructure cash flows and that in some instances infrastructure utility cash flows are highly variable. A-6 pointed out however that in the instance of REIPPP the market risk (which may give rise to variability of cash flows) is mitigated by the contractual make up of the REIPPP. Firstly, he mentioned Treasury's backing of the PPA, secondly he mentioned that Eskom is obligated to buy whatever energy resource the RE projects produce. Thus severely limiting off-take and market risk.

Gqi Raoleka from Pele Energy (formerly of JP Morgan), (personal communication) in some ways takes A-6's above points further whilst effectively reiterating them. Given the inflation-adjusted cash flows of RE assets, Raoleka views long term inflation yields as crucial proxies in establishing a house view on RE asset as a suitable asset class. Pele Energy raises capital in order to invest in mainly pre-construction RE assets. The type of capital they raise is usually inflation-linked funding given the inflation-linked nature of RE asset cash flows, per PPA (DOE, 2012). The tariff agreed to in the PPA is adjusted annually in line with the prevailing inflation rate. Thus from Raoleka's point of view, the long-term inflation curve is the best proxy in determining overall RE asset pricing and therefore asset allocation suitability.

Raoleka believes that the inherent inflation-hedge that RE assets provide is the singular defining feature of RE assets that make them eligible for inclusion within investor portfolios. Like A-6 and A-3 (supra), Raoleka's view is that RE assets are subsets of the fixed income asset class universe (much in the same way as listed property stocks – although a very distinct asset class in their own right – are usually included within specialised fixed income portfolios).

Consistent with other interviewees, Raoleka highlighted that to properly understand the asset allocation suitability of RE assets, one needed to have a comprehensive understanding of **what** downside risk entails. Specifically understanding whether there are certain types of unique risks associated with RE assets which could disqualify them from an asset allocation process and what are the chances of such risks materialising (personal correspondence). In Raoleka's view, the investment approach adopted by his team primarily focuses on analysing and quantifying downside risk as a starting point. This is because in his view revenues and cash flows are highly visible and determinable given the relatively low market risk. Put succinctly, Raoleka's approach to RE investing is to first and foremost make sure that the downside is continuously managed and the upside (namely revenues and cash flows) 'take care of themselves' as he put it directly (personal communication). This approach entails thoroughly understanding the technology, resource (wind, solar) risk, construction risk of a project.

Given that many interviewees saw an investment in RE assets as an investment in long term cash flows, the risk assessments and concerns expressed by many of the interviewees related to how repeatable the cash flows emanating from the project companies would be.

In other words, what factors – apart from Eskom not honouring its obligations under the PPA – could result in investors not receiving distributions.

Interviewees across the spectrum highlighted technology risk as a key risk, including those those who viewed RE assets as suitable proxy for government backed inflation-linked bonds. Many expressed some frustration at being unable to properly quantify the technology and resource risk associated with the RE assets.

In both solar and wind assets, pre-commissioned assets are evaluated using a stochastic assessment of either the wind resource or the solar resource. Namely this approach works out how likely wind or solar resource, as it were, would be available at a particular yield and therefore how much energy and therefore revenue can be generated from an RE asset. Gqi Raoleka (personal communication) said his organisation looks at pre-commissioned investments based on a number of factors, he emphasised that they prioritised assessed availability factor for wind and solar as key metric. Moreover pertaining to wind RE assets their key metric is the net capacity factor and pertaining to solar RE assets the key metric was performance ratio (“PR”) (Deloitte, 2015).

Raoleka describes Available Capacity Factor as the amount of time a RE asset (wind, solar) spends generating actual electricity onto the grid. This metric is useful because it underpins any analysis around the variance of revenue and cash flows. Put differently, a consistently high Available Capacity Factor points to a consistently healthy cash yield. Raoleka describes net capacity factor as measure of the actual energy generated vis-à-vis what a plant would generate at full capacity. PR on the other hand, Raoleka describes as the overall efficiency of a solar plant – i.e. how much energy it gets onto the grid vis-à-vis its total capacity.

Raoleka foresees strong correlation between the metrics above and overall financial return. His view is that both solar and wind technologies have proved their efficacy over several decades in other jurisdictions - jurisdictions with arguably less solar and wind resources than South Africa. Therefore it would be reasonable for South African RE asset technology to perform equally well if not in excess of global means.

A further motivating factor that Raoleka highlighted, was that RE assets allow them to invest into UN PRI<sup>13</sup> compliant asset class, that is, investments that are underpinned with an Environmental, Social, Governance (ESG) ethos. For Pele Energy this is an important asset allocation consideration. Mhlanga and Brooks from Tirisano RE and Inspired Evolution respectively (both active investors in the REIPPP) also underlined the importance of ESG in their investment allocation and mandate process. Brooks indicated that they measure return in a variety of non-financial ways - with the key theme for them being sustainability.

Key themes that emerged from investors allocating or seeking to allocate RE assets into their respective portfolios where that RE assets are likely to be long term income assets, that they would face very little market risk vis-à-vis listed equities (i.e. offer some diversification benefits), the real and ultimate counterparty was sovereign. What was also interesting was that many interviewees saw the regulated monopolistic feature of the REIPPP as a positive as it also mitigated aforementioned market risk. Nonetheless many interviewees expressed some concern that the highly price-biased bid rounds will have the effect of ‘dragging return downwards, too quickly’. Many other respondents also expressed the view that there was often a lag in current mandate policy and a pure economic asset allocation determination. Further that institutional investors across the spectrum needed to readjust investment and credit policies to take into effect the introduction of RE assets into the investment landscape.

#### **4.4 The mechanics of investing into RE assets**

Weber and Alfen (2010) use the word ‘heterogeneous’ to describe infrastructure assets, further stating that a large part of this ‘heterogeneity’ is underscored by the wide array of mechanism investors can use to participate in infrastructure assets. It is not only the economic and financial descriptors that serve as determinants of investor outlook regarding RE assets, but the legal structure of an RE asset can ultimately determine how an investor participates (see also Nelson and Pierpont, 2013). As discussed previously in this paper, a decision to invest will be driven by economic/financial considerations as well mandate and regulatory considerations. Issues around mandate are often interlinked with the legal structure of the investment. Interviewees expressed a view that they consider the legal

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<sup>13</sup> United Nation Principles of Responsible Investments. A set of six ESG principles which many fund managers have agreed to be bound by.

structure of an investment in their asset allocation analysis because it directly pertains to how they view risk in the project, more particularly how risk is shared within an RE project.

Balebetse Leuta, project finance head (Africa): Standard Bank (personal communication) breaks down the nomenclature in the following two ways:

- i. Mode of investing – describing the instrument that gives rise to the investors RE asset exposure (eg: Fixed Income Bonds or Listed Equity)
- ii. Market Vehicles – describing the legal structure and investment pool (listed equity, private equity, listed bond, dedicated unit trust)

Leuta says in his view, the decision to invest is made up of the asset allocation decision (discussed above) and the decisions pertaining to the two categories he outlines above. That is, once the asset allocation decision has been made, an investor needs to determine firstly if they'll fund and/or subscribe for equity or debt (or combination) in a project asset (mode of investment). Secondly they need to determine the investment vehicle or legal structure for that investment. Leuta describes this as the 'how' of the overall investment decisions, viewing it as equally important in some respects as the asset allocation decision.

As has been evidenced in the REIPPP, Project Finance is the preferred mode of investment into large infrastructure projects (Yescombe 2014). Project finance allows for the demarcation of risks into a specified, ring-fenced special purpose vehicle ("Project SPV"). A defining feature of project finance is that it allows the various participants to share risks "on the basis of their ability to influence and control the risks" (Weber and Alfen, 2010).

Leuta (supra) describes project finance as 'the most optimal' mode of investing for the REIPPP and particularly for institutional investors. Leuta's view is that the highly contract driven nature of project finance, 'ventilates and reveals project risks upfront'. Investors are then able to quantify and measure risk of a project well before money is committed. Furthermore his view is that within a project finance SPV, specific types of risks are usually allocated to those parties best able to price, evaluate and ultimately manage and mitigate.

As it stands therefore, the dominant investment structure for RE assets (to date) is the project finance structure. Investors therefore have to contend with what the implications are in considering such structures. Leuta's view describing project finance as 'the most optimal mode' of investing into RE assets was a view reiterated by other interviewees. It

emerged as a strong theme. Some interviewees did however lament the high costs associated with this mode of investment, with at least one of the interviewees describing it as an overly-cautious, expensive approach (given the contracted cash flows and the technology efficacies of both wind and solar).

Obakeng Moloabi (personal communication) from Pele Energy Group says that as far the REIPPP is concerned their internal requirement states that the project SPV must be a company incorporated under the applicable laws of the country. His view is that company law in South Africa is extremely well established and the provisions well understood, making it easier for investors to consider an investment via registered company SPV.

Pele Energy Group, under Moloabi's stewardship, lead the listing of the first bond for a RE asset in South Africa ("Touwsrivier Bond")<sup>14</sup> in 2011. Per his account, the exercise was interesting in that investors spent more time in their due diligence focusing on the legal make-up of the project SPV than they did assessing aspects such as technology, market and even construction risk. A ring fenced SPV allows for the appropriate sharing of risks amongst project stakeholders (Brealey et al, 1996). In the Touwsrivier Bond transaction, investors subscribed for a fixed coupon bond, which represented circa 50% of the total required project expenditure outlay. The construction contract was guaranteed by Group Five (in excess of 100% of the construction contract amount was guaranteed by Group 5's balance sheet for instance) thus enabling bondholders to not assume wholesale construction risk. Essentially a risk financial investors they were probably ill placed to assess and therefore price.

Moloabi does however state that the mode of investment was critical in placing the bond with institutional investors. He mentions that investors wanted to invest in something that looked familiar, that had a legal reference point. And the ring-fenced project SPV offered investors exactly the comfort they required. What also helped the Touwsrivier bond from an investor point of view was that Moody's rated the bond (Moody's, Touwsrivier Credit Report, 2013).

A Senior Credit Analyst at a leading local DBSA explained that from a credit perspective, a ring-fenced, project finance SPV is useful because it allows for high leverage and it's a clean pass through vehicles for all project cash flows. Typically all allowable cash distributions in

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<sup>14</sup> See Moody's note on Bond Structure. See references for citation

the SPV are paid out to investors, similar to a REIT. There are no other activities within the SPV and therefore from an investor's perspective operational risk is highly visible and highly quantifiable. The DBSA analyst also expressed a view that lenders and investors express a strong preference for legal transparency and that the project finance model adopted by many REIPPP participants, provided high degrees of transparency.

A key theme that kept arising amongst interviewees was that project finance allowed investors not to assume risk that they are otherwise not suited to take on. Technology and construction risk were identified as the key risks that a project finance model dis-intermediates. Moloabi for instance, explained that within a project SPV structure, the technology risk is assumed by the O&M whereas the EPC underwrites a large part of the construction risk (see point made about Touwsrivier immediately above). That is, the O&M guarantees, for a fee, a minimum technology performance level. On the construction side, Moloabi explains that the EPC will underwrite via cash bonds and guarantees, the entire construction outlook (from building timeously, building with requisite quality and building within agreed budget).

At the time of writing this paper, there was no direct listed debt or equity instrument that gave exposure to RE assets (other than the Touwsrivier example briefly discussed). The overwhelming mode of investment has been via unlisted equity and debt instruments. This factor may be attributed to the nascent nature of the REIPPP. Many interviewees expressed the view that South Africa will see a rapid emergence in so called 'Yieldcos', as has been evidenced elsewhere. Leuta (supra) describes Yieldcos as pooled, listed investment vehicles, which have a sole focus on infrastructure RE assets.

A-6 (personal communication) believes that as more investors become familiar with RE assets, the investment sector will begin to organise itself into pooled investments, much like the Yieldcos that have emerged in the United States. He believes that Yieldcos are merely specialised form what the South African regulatory framework calls Collective Investment Schemes<sup>15</sup> - which covers everything from Exchange Traded Funds to Unit Trusts and more. A-6's view is that we already have the necessary infrastructure and expertise to make the emergence of local Yieldcos an inevitability.

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<sup>15</sup> Collective Investment Schemes Control Act, Act No. 45 of 2002

Some of the interviewees expressed less enthusiasm for the rise of Yieldcos. A respondent, who works at one of the largest investment houses managing pension funds, (personal communication) expressed some concerns regarding pooled investments into RE assets. His view is that Yieldcos (and similar) will introduce cheap money into the system and serve to increase overall valuations of RE assets. He wasn't against this in of itself, but rather cautioned that this RE asset valuation reratings should occur at a measured pace in order to avoid pockets of valuation bubbles. This respondent's view was that RE asset prices should generate at least five years of post construction cash flows before investors started looking at setting up Yieldcos or any other similar pooled investment vehicle, i.e. the unlisted project SPV structures should endure for the short to medium term.

Many respondents viewed the project finance model as the most optimal funding vehicle however, a finding that is supported in large measure by the available academic literature. Respondents viewed project finance as introducing transparency and risk dis-intermediation. The main funding trend many respondents agreed upon was the emergence of pooled investments like Yieldcos, with many interviewees predicting more listings of pooled infrastructure vehicles in South Africa.

#### **4.5 Capital Structure and impact on investment considerations**

As seen from the above interview remarks and responses, a key determinant of whether RE assets are considered viable will arise from what their key economic and financial features are. What Leuta (supra) above describes as 'the how' (of the overall investment decision) is usually determined by mandate, regulatory, tax considerations. Investors will also concern themselves with investing where they think they'll get the best risk-adjusted returns. Perception of risk is often influenced by where in the capital structure an investor participates. Investors into the REIPPP have to date invested across the capital structure; equity, mezzanine, and debt. Each aspect of the capital structure would invariably attract different types of investors, given both mandate and risk/return expectations.

RE assets typically have a very high debt to equity ratio, often as high as 80:20 in favour of debt. Some writers have argued that the right capital structure is one, which produces the lowest WACC and thereby maximising overall value (De Wet 2006). For many respondents, where in the capital structure they are able to invest matters a great deal - given issue of mandate and perception and assessment of risk. Some interviewees viewed equity

investments as being *materially riskier* than investing in debt for instance. Highlighting the typically contracted legal protections that debt holders enjoy over equity. Some respondents however expressed a level of agnosticism in the decision to invest in debt or equity. Their view was that given the nature and structure of RE project SPVs, the fundamental counterparty risk would always be government via the Treasury backed-PPAs. Typically interviewees who saw technology risk as a pronounced risk would emphasise the distinction between equity and debt risk/return profiles. One respondent, countering A-6's view above, stated that given the inherent technology risk, RE asset are not a useful proxy for government bonds as technology risk and resource risk may introduce significant variability in long term cash flows. But even this respondent conceded that an investor would be more than compensated for risks like technology and market risk and that over the long term we should see return correlation between government bonds and RE assets.

#### **4.5.1 Economic and Financial Characteristics of RE assets**

RE assets have some discernable economic and financial features that could serve as useful markers for investors considering how to structure their participation. In follow up unstructured interviews, some respondents were asked what they thought the three defining economic and financial features of RE Assets are. Kingdom Mugadza's (personal communication) response can be considered as an accurate representation of the overall interviewee response, summarised as follows:

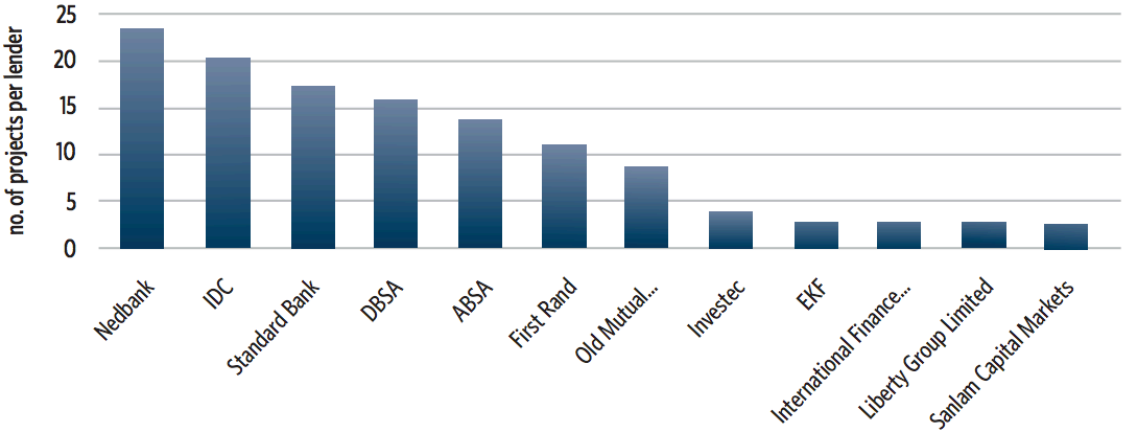
- i. Long dated, contracted cash flows (of the back of the PPA)
- ii. Inherent inflation hedge (given the tariff inflation indexation)
- iii. Low Market risk on revenue and cash flows

Mugadza further indicated that RE assets operate under a regulated monopoly, one that created an effective barrier to entry. This latter feature has the attended result of ensuring the long term integrity of RE project earnings and cash flows. These economic and financial features do however differ depending at which level into the capital structure an investor participates.

#### **4.5.2 Debt**

Debt providers, as legal custom would dictate, enjoy preferential rights in relation to say equity investors in a RE project. Debt by its very nature though has a lower overall yield and

return vis-à-vis equity. As A-5 (supra) and Kingdom Mugadza (supra) above indicate, within the RE space (and infrastructure investments generally) the real protection to debt providers manifests itself through preferential timing regarding cash flow distributions – both in normal operating conditions and when default arises. That is, debt holders always receive their cash flow distributions first and equity holders receive distributions only once certain requirements in favour of debt holders are met.



**Figure 5 Main debt providers Rounds 1 - 3 (source: Eberhard, 2014)**

Nonetheless, there is a view amongst some investors that debt financing into RE assets is essentially a form of cash flow lending, with very little asset cover.

Johan Human from Alluvia Finance<sup>16</sup> (an actuary by training. Personal interview,) is of the view that the primary advantage of debt holders in RE assets, is the cash cover requirement provided for debt holders by the project company. The most prominent representation of this cash cover requirement according to Human is the debt service cover ratio (“DSCR”). DSCR reflects the cash reserves funded by the project company’s owners that are meant to make the lenders ‘whole’ in an event of critical default. The Higher the DSCR the better the credit of the loan (Blanc-Brude et al, 2014).

Human contends that given the highly contracted nature of RE project cash flows, the DSCR is usually contracted upfront and remains relatively flat over the project life. The PPA allows for a short loan tail (plus a lower DSCR) arguably because the market risk of an RE asset is mitigated through PPAs, Treasury underpins, etc. Human’s point is that debt providers into RE projects seem to be content to enter into debt agreements that reflect relative certainty

<sup>16</sup> (Alluvia Finance is an active equity investor into the REIPPP)

of (contracted) cash flows whilst trading that feature for relatively lower DSCRs. Moreover the credit analyst from DBSA indicated that RE assets typically have shorter debt tails (that is, the duration of the debt loan arrangement vis-à-vis the overall project life). The quicker the debt is paid down the longer the tail. A longer tail arguably gives the debt investor a longer runway to account for any restructures that may arise from default events – a long tail is therefore seen as a strong credit feature. This is an interesting point by Human because it may reveal key insight into how debt providers in the RE space perceive risk. The fact that they are willing to accept a relatively low DSCR over a long dated period indicates that they perceived risk of default and variability of cash flows possibly low.

Human's views are echoed in a study into the performance of Private Infrastructure Debt undertaken by Blanc, Hasan and Ismail (2014) which found that knowing the statistical distribution of the DSCR "is sufficient to predict default and compute distance to default measures, allowing the development and implementation of a powerful structural credit risk model à la Merton (1974)".

Thus per Human's view, RE project debt would typically have a short tail and relatively low and stable (i.e. non-rising) fixed DSCR over the life a project. It's worth reiterating the fact that the contracted nature of RE asset cash flows mitigate the risks that may emanate from the two aforementioned features of RE debt. Human's decision making regarding whether to invest in a RE project is therefore driven by the two considerations immediately discussed here; what does the tail look like and how is the DSCR distributed over the life of the proposed debt. In considering all of the above herein, Human and other respondents' approach to debt will help in developing standardised approaches in determining the risk and return profiles of RE assets, in this instance Human refers to a discussion around valuing debt instruments. Other respondents however expressed a different view as to how the perceive and ultimately quantify RE asset debt.

A-7, a senior transaction advisor at a leading investment bank in Sandton (personal interview) makes the point (touched on by A-5, supra) that whilst they view probability of default within their RE debt book as low (default defined as a RE project company generating cash flows available to debt "CFAD" that fail to satisfy the contracted DSCR –  $CFAD < DSCR$  - over two consecutive 6 month periods), they see strong correlations between

CFAD and CFAE (“Cash Flows Available to Equity”). This correlation matters if we take into account the fact that even on an intra-basis, investors make asset allocation decisions regarding whether they want exposure to debt or equity within RE project companies (mandate allowing). And if there’s no strategic advantage vis-à-vis a diversification benefits, then we have to ask what the intellectual basis of differentiating between debt and equity in RE projects is. Human’s view is that debt is in effect mispriced.

Unlike equity investments, debt in RE projects has a capped upside. As described by A-5 (supra) and Human (supported by Eberhard’s 2014 findings) the differential in yield between equity and debt has drastically reduced between rounds 1 and 3 of REIPPP, in some instances to as low as 3%. Human’s view is that equity returns still have the capacity to outperform where, for example the wind or solar resource is better than the initial forecasts. The benefit to debt holders in such an outperformance scenario, is that the DSCR is likely to increase with the life of the project and the loan tail will become longer – both favourable from a credit worth perspective. Nonetheless, Human’s view is that as debt de-risks in a RE project (in an outperformance scenario), equity receives a disproportionate amount of the overall benefit. This is because in such an outperformance scenario, equity would receive more distributions, that is, the overall cash yield for equity investors would increase. Whereas for debt providers, the debt yield is indexed and limited to some external component such as Prime or even inflation in the case of inflation-linked bonds.

There was however an oft-repeated point of view that debt and equity instruments may, in some instances, be looked at interchangeably by investors. A-4 an employee and director of a BEE RE Investor (an investor in the REIPPP through its investments in rounds 1-3 in both solar and wind assets. Personal interview) indicated that he views the distinction between debt and equity as ‘near-superfluous’. From their perspective as investors, A-4 and his team prioritise absolute or total return, measuring this feature in a variety of ways. Firstly, they view RE debt as a fully realisable asset with a terminal value. Their business model includes acquiring secondary debt positions from banks when projects reach financial close. Therefore in order to measure the robustness of his acquisition purchase price, the return metric A-4 emphasises is total return – which is a composition of both yield received from a debt instrument and the mark to market adjustment made on the face value of the debt. Yield in this instance is measured as the yearly cash return on the initial outlay (to acquire

the debt). The mark to market adjustment is calculated by performing a net present value calculation on the expected cash flow distributions due to the debt holder over the life of the instrument. A-4 applies this investment approach across the capital structure, that is, his investment approach is not driven by the nomenclature of whether they invest in debt or equity. In other words A-4 and his team evaluate both debt and equity investments by applying exactly the same approach described above. His view is that analysing their participation in this manner normalises what he terms the 'fictitious differences' between debt and equity pricing in RE assets.

In some respects A-4 echoes A-5's (supra) view that investors should price RE assets along a blended curve composed of both debt and equity metrics. A-4's view is that the weighted cost of capital of a project is the most optimal indicator of expected return. His view is that a lower WACC means more cash flows available to distribute to equity, therefore greater project equity value (see De Wet, 2006, a similar argument is made regarding what an optimal WACC looks like). What was interesting is that A-4 regards WACC as a valuation metric, as opposed to merely using the cost of debt figure to calculate his carrying value. His reason is that he cannot look at the value of his debt in isolation, he needs to take a view on the entire capital structure in assessing risk and pricing of his debt holding. He further states that as assets continue to mature further into their project life, the yield of both debt and equity should tend towards the overall project SPV WACC.

A-5 and A-4 stated a preference to use a static WACC as the discount rate in determining the holding value of the debt investment they make into an RE asset, WACC therefore serves as the investment hurdle rate. When calculating return he then further overlays the yield onto his debt instrument to determine total or absolute return. Preference for using absolute return as the return measurement metric emerged as a key finding in this paper. This could have significant implications in establishing future benchmarking metrics, especially as the industry begins developing standardised assessment metrics. Using an absolute return metric with debt instruments is slightly unusual in that debt pricing is usually determined by assigning a coupon to a debt instruments, ones which in the primary instance, concern themselves with measuring downside risk.

The approach of A-4 and other respondents of utilising absolute return to measure debt returns, as opposed to merely yield/coupon is an interesting departure point. Some respondents argued strongly that it arguably allows investors to appropriately locate RE debt instruments within the realm of fixed income asset classes (or similar) as opposed to looking at debt purely as a funding instrument. Assigning an absolute return metric makes a comparison with REITS for instance more plausible. Another important consideration (highlighted by respondents) that arises with the use of absolute return as a metric is that it allows institutional investors to appropriately develop internal benchmarks against which they measure the viability of their investment

This is an important consideration because many interviewees expressed the fact that RE assets needed to satisfy a specific hurdle rate, one that was usually determined by benchmarking and quantifying a notional opportunity cost (i.e. if say an RE asset provided a yield of 8% annually and risk free bonds for instance could provide an investor with say 5% annually, an investor may use 5% as their starting point in calculating a hurdle cost. Reason being that 5% is essentially what they would forgo by investing into an RE debt instrument, i.e. the opportunity cost which they would need to be compensated through the provision of the hurdle cost). For many investors however analysing a potential debt investment was explicitly a matter of satisfying mandate issues.

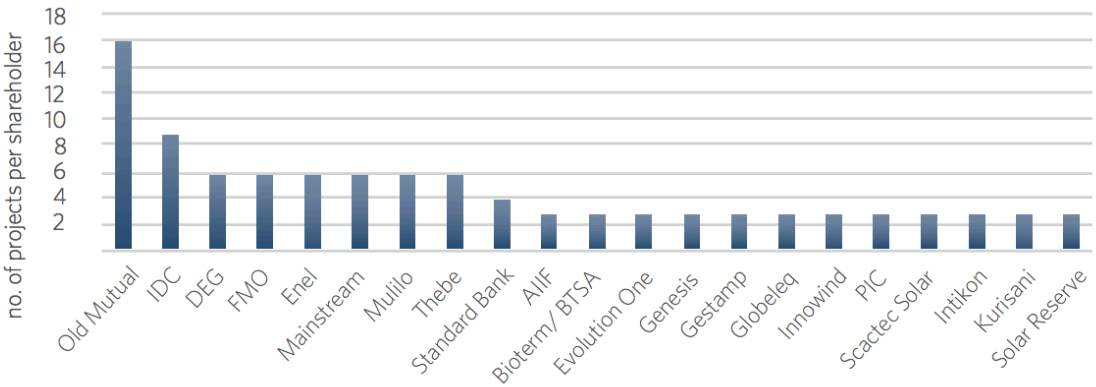
One of the interviewees the researcher spoke with (personal communication) views the mandate distinction as very important. They invest on behalf of one of the largest pension funds in South Africa and he indicated that they have very strict mandate requirements, which would preclude them from investing into non-debt instruments such equity and mezz equity. These mandate restrictions included elements such as tax considerations – which made it difficult for them to invest in non-debt instruments that would return non-interest income thus introducing the tax risk of being regarded as so called Hybrid instruments.<sup>17</sup>

### **4.5.3 Equity**

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<sup>17</sup> Hybrid instruments in terms of section 8E of the Income Tax Act 58 of 1962

RE assets, like other infrastructure projects, typically follow a linear and chronological lifecycle (Bitsch et al, 2010). A project is developed, constructed, and then operated over the life of a PPA. Equity investment plays a critical role in financing RE assets in the earlier, riskier phase of their lives. Project development is a very risky enterprise. Methuli Mbanjwa of project developer G7 Renewables, (telephonic conversation) describes how it took them over a 6 years to secure a construction-ready asset. Equity investors play a very crucial role, effectively as first-loss providers, developing assets and de-risking them. Thus when participants and interviewees speak of equity investing into the RE space, they could be referring to very different investment propositions.



**Figure 6 List of major equity providers Rounds 1 - 3 (Source: Eberhard, 2014)**

To date in the REIPPP, early equity investment and development has been the preserve of international developers and private equity infrastructure funds such as Inspired Evolution Investment Management (“IEIM”) (see Figure 6). Mike Brooks, CEO of IEIM (telephonic correspondence), says that the only way they could justify the investment case – that is financing early risk development of RE assets – was by partnering up with Developmental Funding Institutions (“DFIs”) such the African Development Bank (“AfDB”), who have social responsibility imperatives as opposed to a pure commercial outlook. DFIs therefore, by their very nature, would be in a position to assume more equity risk. Brooks believes there’s a economic opportunity for local DFIs such as the Industrial Development Corporation to play a bigger a role as equity partners to developers. His view is that if DFIs don’t occupy that early-risk funding gap, it will be left to the foreign utilities to assume that role, which in his view represents a deviation from DOE’s long term outlook for the energy sector – namely foster the participation of local participants.

A-2, a portfolio manager in a large institutional house, (personal communication) views equity investors as the lynchpin of the REIPPP. His view that equity is more resilient than debt funding and by its very nature can absorb greater risk than debt. In some sense he's reiterating the view expressed by Brooks, that equity investment plays a crucial role in de-risking RE projects, elevating them from mere speculative investment propositions to fully fledged operating project companies. A-2's view is that equity, like debt, should be priced on the long dated government bond curve, namely the R186<sup>18</sup>. He does however highlight the fact that he expects CFAE to show more variance over the long term (as opposed to the relative stability of CFAD). This being due to the fact that any resource (wind, solar efficacy) variability is likely to impact CFAE first and therefore impact dividend distributions. Equity doesn't have a cash cover like the DSCR. A-2 is in some sense is countering A-5 and Human's views that equity cash flow yields will correlate highly with debt yields over the long term. His view is that equity investing in RE usually assumes a highly specialised function and that comes with some attendant and unique risks that debt investors are typically shielded from.

A-6 (personal communication) manages an equity infrastructure fund that invests into REIPPP. They use absolute return as an investment metric for their equity fund and his hurdle rate is a CPI-indexed rate. His opinion is that equity investors should view RE assets much in the same way they view listed property and other specialised fixed income instruments. He states that they took a conscious decision not to use IRR as metric of overall return because they feel that an IRR metric unfairly penalises the return of the RE asset in the early years, given the large cash outflows during development and construction. Whereas an absolute return metric effectively smoothens out return over the life of an investment. A-6 also states that the industry norm for fixed income instruments (of which he considers RE assets to be a subset) is to use an absolute return metric. Thus applying the same metric to RE assets would make it easier for investors to compare and analyse RE assets off an acceptable benchmark.

A-6 does however make the point, one echoed by other respondents, that investment via equity into the RE space is itself quite 'heterogeneous'. He believes that you need two different types of equity products into RE assets. Firstly, you need the kind of 'patient' equity

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<sup>18</sup> Maturity 2026

capital that A-2 refers to above, typically DFI development capital. This type of equity would be made available on a termed investment horizon, that is, it would be released back to investors upon the RE project reaching certain pre-agree milestones. A-6's view is that the early risk capital would then develop into its own specialised subset, attracting a particular type of equity investor, one looking to take high risk for high reward.

The other type of equity investment A-6 envisages, would participate further into the project life. Participating from what is termed financial close (i.e. all permits have been obtained, legal agreements including funding agreements have been agreed to, all project partners appointed and contracted and all that remains is for the funding to be deployed to enable construction). This second type of equity investment would suit more risk averse investors unwilling or unable to take development and construction risk.

According to A-6 most participating institutional equity investors do however participate right across the life of the project. In his view this is sub-optimal because it distorts asset pricing – given the very different nature of early and late(r) equity risk. This in turn makes it very difficult to develop the necessary nomenclature and benchmarking regarding the various modes of investing.

Another key theme that emerged from interviewees was the restriction around re-sale of equity positions in RE Assets (DOE 2012). This restriction is contained in what is referred to as the Implementation Agreement, an agreement entered into between the DOE and the various RE project companies. This agreement covers the obligations and responsibility of both the DOE and the project SPV over the lifetime of the PPA. The agreement is also standardised across all REIPPP companies.

The equity lock-in clause prevents equity investors from disposing their equity position in an RE Assets at anytime prior to the expiration of three years post operation date of the RE asset. Given the relatively long development cycle of RE assets, a three-year lock is in effect longer than three years. The lock-in is only measured from end construction/operating date, not accounting for the often many years developers spend in bringing a project to stream. One respondent indicated that they typically develop assets over a three to five year horizon. An equity lock-in therefore makes their investment horizon a minimum of six to eight years. Which is not ideal for them.

Most of the interviewees expressed a view that they would be long term investors in the REIPPP, but simultaneously expressed concern at their inability to dispose the equity quickly if the need arose. Obakeng Moloabi (personal communication) indicated that his organisation invests as a BEE investor. The implementation agreement has an additional layer of restriction (equity lock in) for BEE equity. Many other respondents echoed his view that a three year lock-in could be detrimental to their equity valuations. The relationship between valuation and asset liquidity is well studied and well established (Easley and O'Hara, 2010). An interviewee, working as a senior transaction advisor at Absa (personal communication) echoed a view expressed by some other participants, namely that the equity-lock in may prove to be a problem for investors that need to mark to market their equity holding on a continuous basis (eg: liability driven investors) as the lock in could introduce some distortions in determining the value of the asset.

Interviewees across the stream, agreed that equity finance is a distinct form of investment. They however differ in how they perceive risk and return benchmarking when it comes to debt and equity. What is clear is that there is some developing consensus, albeit developing slowly. Investors seem to indicate a preference for absolute return as the return metric for measuring return performance of RE assets. Many investors view RE assets as a form of income asset and generally feel that the market risk that would be associated with tariffs and Eskom by extension are mitigated via the various contractual undertakings between DOE, Treasury and the respective project companies.

## 5 RESEARCH CONCLUSIONS

The research set out to examine the suitability of RE assets for South African institutional investors. Interviewees were mainly subject matter experts on the issue of REIPPP and therefore provided key insights through a series of structured and semi-structured interviews. There is very little academic material on this particular context within a local context. The implications of this study are therefore crucial in helping set the basis for the development of future theories around this and related topics.

Interview discussions and review of other material revealed key themes, which allowed the researcher to discern some key findings:

Firstly, there's a cautious but emerging consensus that the economic and financial features of RE assets could make them suitable for consideration in asset class allocations. Many respondents expressed the view that RE assets could both reduce volatility within their existing portfolios and increase expected return: two key features well established in modern portfolio literature. A key caveat to this last point is that interviewees viewed RE assets as a good proxy for other fixed income assets such as property and government bonds which could indicate that where there are some diversification benefits through the inclusion of RE assets into a portfolio, they could be limited if RE assets merely correlate existing asset class subsets such as listed equities.

It was found in the literature review and through data collected through various interviews that the notion of what constitutes an asset class remains highly contested. So investors typically defaulted to what looks familiar.

As one respondent put it: "finding suitable proxies is useful because it helps to demystify what is otherwise a new asset class". Many respondents defaulted to categorising RE assets – with their long dated cash flow profiles, sovereign underpin – a subset of the fixed income universe. Critically many investors included in the interviews expected a healthy relationship between risk and return of RE assets. A key, often-repeated view was that RE assets could serve as an attractive proxy on government bonds with a yield ratchet. In other

words similar risk to government bonds, but providing a higher overall return, a so-called yield pick-up.

Secondly there was a view amongst interviewees that one had to approach the issue of 'suitability' and 'viability' from different points of view. As some interviewees indicated, RE assets could be deemed to be economically and financially viable from an asset allocation perspective but still fail to be allocated because of mandate issues. 'Mandate', as used within this context, described the regulatory and internal policy considerations that had to be factored into any investment decision process. A key theme around establishing a common set of nomenclature emerged in the data collection process.

Thirdly, respondents overwhelmingly expressed confidence in DOE's (and by extension Treasury) commitment to the REIPPP. This commitment was deemed as very critical to investors looking at developing their long-term outlook regarding viability of the REIPPP. The explicit and most immediate benefit of government backing was identified as the Treasury provided underpin. Moreover, given South Africa's energy requirements, most participants viewed government's commitment to REIPPP as long term and sustained.

Lastly, regarding the challenges of investing into RE assets, there was a view amongst interviewees that REIPPP remained untested and therefore all discussion and analysis around return and risk was highly conditional. Some investors rejected the 'government proxy' analogy in analysing RE assets, citing the variability on earnings that aspects like technology and resource risk may bring to bear.

Once again, this research was limited to a study of DOE policy, applicable legislations and interviewee responses. It's real use is not in offering hard, settled conclusions, but rather helping formulate theory-building markers which may be of use to future researchers on this topic. As mentioned above, although the interviewees represent the leading industry thinkers on renewable energy investing in South Africa, the pool of interviewees represents a relatively small sample size. The reasons for this could be directly attributable to the fact that there are very few people in South Africa with the relevant knowledge in infrastructure finance. This research therefore has some useful practical applications for institutional

investors, hopefully further demystifying a sector that could be a lynchpin of the South African economy for some time to come.

## **6 RECOMMENDATIONS FOR FUTURE RESEARCH**

The theoretical literature and framework regarding renewable energy investing in South Africa is very limited. As mentioned above this paper could be useful to both academic and industry practitioners. The researcher believes that the research direction could be extended to the study of local asset allocation practice and considerations. There is dearth on South African infrastructure financing and investments generally, and renewable energy in particular. Moreover, project finance as financing technique and discipline within a South African context has received relatively scant attention in academic writing. This could be a very useful area of further study.

Other important factors to consider in future research relate to a study in what would constitute the optimal capital structure for project financing large scale utility projects in South Africa. Many respondents spoke of how issues around capital structure make-up influenced their outlook of RE asset investing. This could be an interesting area of future research.

The limitations associated with this research disallowed the researcher from conducting a thorough quantitative study on both the return and risk profile of RE assets. An interesting point that arose during the course of this research was the potential usefulness of appropriate stochastic models in developing both pricing and risk models. The researcher touches on the study conducted by Blanc-Brude, Hasan and Ismail (2014), which sought to develop robust valuation and risk measurement frameworks for investing in particularly unlisted infrastructure.

With the development of the right analytical tools many of the limitations imposed on this particular research may be resolved.

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## **APPENDICES**

### **Appendix 1: Structured Interview Questions**

1. How are you and /or your organisation involved in the REIPPP program and what is your level of seniority in your respective organisation?
  - 1.1. What are your overall perceptions of the REIPPP program?
  - 1.2. Does your organisation have a formal mandate, policy of any kind to participate in the REIPPP program, either as an investor, advisor or in any other tangible manner?
2. Do you consider RE assets as representing a distinct asset class, with their own set of economic and financial features?

- 2.1. What would you describe as the main economic and financial features of RE assets?
  - 2.2. How would measure return and risk when considering your participation in REIPPP program. What metrics would rely on and how are they derived?
  - 2.3. What would you consider to be suitable asset proxies for RE assets? In other words which other investable assets would you consider similar to RE assets, do you expect correlation with said asset(s) and RE assets over the long term,
  - 2.4. What do you believe is the most optimal project structure for RE assets?
  - 2.5. Does the make-up and nature of a project’s capital structure have any bearing on how you assess a project company’s economic and financial outlook?
3. What would you highlight as the major challenges and major financial benefits that you and/or your organisation face as a stakeholder in the REIPPP?
    - 3.1. Do you feel that the challenges outweigh the potential financial benefits, or vice versa?
    - 3.2. Do you feel that there is a healthy relationship between risk and reward as a REIPPP program participant
    - 3.3. What is your view of the project finance model for RE assets? What do you think of any other financing models you may have encountered and what are the trends?
    - 3.4. Does the legal structure of an RE project influence your ultimate perception of either the benefits and/or risks you describe above
  4. How do you and/or your organisation view the long-term prospects of REIPPP?
    - 4.1. How well do you feel that you or your organisation currently understands the REIPPP program?
    - 4.2. Would consider your participation in REIPPP program to have been successful or otherwise, to date?

## Appendix 2

Name	Institution and Designation	Type
Bassy Makwane	Exco Member: IDC	Investor

Mpho Makwane	Eskom: Former Chairperson	Developer
Tafadzwa Mhlanga	Partner: Tirisano Renewables	Private Equity
A-5	Senior Analyst: A large fixed income house	Institutional Investor
A-3	Senior Portfolio Manager: Sanlam	Institutional Investor
Steve Faure	Senior Associate: Inspired	Private Equity
A-6	Portfolio Manager: A large CPT based institutional investor	Institutional Investor
A-2	PM/MD: Fix Income Co.	Investor
Obakeng Moloabi	CEO: Pele Energy Group	Developer
Senior Dealmaker	PIC	Institutional Investor
Lawyer	Leading Law Firm - JHB	Attorney Proj
Portfolio Manager	Allan Gray	Institutional Investor
Old Mutual	Old Mutual	Institutional Investor
Hlompo Ntoi	Senior Dealmaker AIIM	Private Equity
Lawyer	Leading Law Firm - JHB	Attorney: Project Finance
A-7	Proj Finance Deal Team leader	Banker
Mike Brooks	CEO Inspired	Private Equity
A-1	Head: IPP Office DOE	Regulator
Balebetse Leuta	Allan Ovary	Attorney: Project Finance
Kingdom Mugadza	Old Mutual	Private Equity
A-4	CEO: BEE RE Investor	Developer
Gqi Raoleka	Director: Pele	developer
Mark Tanton	CEO: Red Cap	developer
Methuli Mbanjwa	Project Developer: G7	developer
Consultant	DOE	regulator

Senioe  
Analyst

Credit

Credit: Analyst DBSA

Institutional  
Investor

Colin Matlala

CEO: Lebone Engineering

Consultant/EPC