

Financing strategies for growth in the renewable energy industry in South Africa

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Abstract

This study analyses empirical qualitative data collected from key stakeholders in the renewable energy industry in South Africa. As a step on the path towards developing better success in financing for renewable energy entrepreneurs, a financing framework is proposed and used to create a holistic view of the financing process in the renewable energy sector. It allows stakeholders to get an understanding of all the motives, barriers, sources of capital and possible destinations of capital in one system. Many good reasons exist for South Africa to invest in renewable energy with motives dominated by environmental concerns, diversity of supply, job creation and economic development. Internationally, investment in renewable energy projects has been growing despite a significant slump in overall global investment trends. In a decentralised business model, smaller renewable energy based businesses will continue to have difficulty in raising finance in South Africa. Key barriers include the high price of energy and equipment resulting in poor profitability, the reliability and quality of government policy, a lack of awareness and experience and a lack of innovative financing solutions. The study finds there are many expectations for government to address the needs of the industry within the context of its current regulated status. There appears to be a preference for demand side interventions, which rely on levies, subsidies and tax incentives. This paper strives to offer new ways of looking at the financing problems currently being experienced in the industry and proposes an innovative framework to assist the stakeholders in the industry in structuring financing for renewable energy ventures.

Keywords: renewable energy, financing process, seed capital, venture capital, carbon credits, carbon

trading, sustainable development, clean development mechanism, investment motives, barriers to investment

Introduction

With the rising price of fossil fuels and the continued emphasis on global warming, entrepreneurs look to the potential of renewable energy (RE) with great interest. But when innovative technology meets a conservative source of finance, assistance is required. The authors believe that the models and research in this paper will provide such assistance. In this paper, we have clarified the state of play in the energy market between suppliers, distributors and consumers, the financial mechanisms active in the market, the present and possible financiers who might be persuaded to invest in renewable energy ventures and a variety of concerns which might persuade them to do so.

Many good reasons exist for South Africa to invest in renewable energy with motives dominated by environmental concerns, diversity of supply, job creation and economic development. The published Department of Minerals and Energy White Paper on the promotion of renewable energy and clean development (DME 2003) sets a goal to increase the amount of energy generated from renewable resources by 10 000 GWh by the year 2013. This target represents growth in the renewable energy industry and will require financing, the lack of finance being regarded as a possible barrier to the Department's achieving its target.

South Africa's present energy consumption is summarised by Ward (2002:18) as being 27% electricity, 26% consumer coal combustion, 32% liquid fuels, 14% biomass and the balance (1%) from other renewable sources.

Why use renewable energy sources when 85% of the world's energy used to generate electricity and heat are produced by burning fossil fuels relatively cheaply and efficiently?

The reason is not only the concomitant production of the pollutants carbon dioxide, sulphur dioxide, nitrous oxides and particulates which cause acid rain, smog, and lung ailments in people in heavily polluted areas, but the carbon dioxide build-up which is now broadly accepted to lead to global warming. Ward (2002:8) summarises the 1995 Intergovernmental Panel on Climate Change (IPCC) conclusion that the balance of evidence suggests that there is a discernable human influence on global climate.

This leaves renewable energy sources that are naturally replenishing but that are not easily concentrated since they are diffuse. They are virtually inexhaustible over time but limited in the amount of energy that is available per unit of time, mainly due to constraints in the economies of technologies. These sources of energy are the only sustainable sources of energy and are referred to as renewable energy sources. Renewable energy resources include biomass, water flow (hydro), heat differences with depth in the earth (geothermal), solar, wind, ocean thermal, wave action, and tidal action. All these produce pollutant-free energy except for the burning of biomass or methane produced from biomass, although the carbon dioxide produced is reabsorbed in the biomass/energy production cycle, and the remains of renewable energy plants when they have to be replaced. It should be noted that biomass can only be truly renewable if managed in a sustainable manner.

Global investment in renewable energy is on the increase, despite a slump in global investment trends. Krumm's study on investment shows a distinct decrease in the number of deals and the size of investments as compared to investments in renewable energy projects between 2000 to 2002 (Krumm 2003). Krumm reports an increase in the number of deals in the energy sector from 20 in 1998 to 140 in 2002. He reports that the renewable energy sector is a fast emerging sector with an annual turnover of \$10 Billion in Europe alone. He also indicates that Europe plans to double their renewable energy share of the energy market to 12% by 2010. Erik Martinot (2003) indicates that the total worldwide investment in renewable energy for 2002 was \$17 Billion.

Salter and Volpi (2003:4) state, 'Renewable energy is big business'. They report that the G8 renewable energy taskforce proposed that an additional one billion people can be served by renewable energy technologies over the next decade. They also stated that Export Credit Agencies (ECAs) have a central role to play in supporting the development of renewable energy.

In April 2002 UNEP released a report which outlined nineteen resource based trends that were reshaping global markets and changing the roles and strategies of corporations (UNEP, 2003a). They claim that world energy production has risen by 42% between 1980 and 2000 and will continue to grow by another 150-230% by 2050. They also claim that renewable resources only account for 11.5% of the world's current energy consumption.

Investment in renewable energy production is increasing worldwide. In order to understand the issues that could prevent similar investment in South African renewable energy production, one has to explore the motives to investment and the barriers that will prevent such investments from taking place. In attempting to determine ways in which to overcome these barriers the authors sought insight by discussing the problem with over 40 stakeholders in the renewable energy industry. These included manufacturers, financiers, academics and government officials.

Motives

Interviewees were asked what they considered to be the principle motives that they presented to various stakeholders as being good reasons for investing in renewables.

The discussion of motives was dominated by environmental issues, socio-economic development, diversity of energy supply and profit incentives. Yet there was a wide range of motives for investment. This means that finding financing for renewable energy projects can be difficult and complex due to the lack of clarity of motive for investment in comparison, for example, with a typical retail or construction project. At the same time, this means that opportunities exist for viewing the financing opportunity in a more differentiated way – i.e. different funding sources will apply to different motivators. We build on this later in the paper.

Sources of finance

Interviewees were asked where they expected to be able to obtain finance for renewable energy ventures.

Many interviewees expected government to provide the financial support needed to make renewable energy a viable business. International funds were also a popular source but the details of exactly which international source was rarely specified, if known. Carbon-based finance from prototype carbon funds was also popular. Several interviewees spoke of financial mechanisms like debt and subsidies as being the same as financial sources. The differentiation between the source and the financial instrument or mechanism seemed to be poorly understood in some cases. What this indicated was that some education of entrepreneurs and funders alike may well enable the two to meet in a better

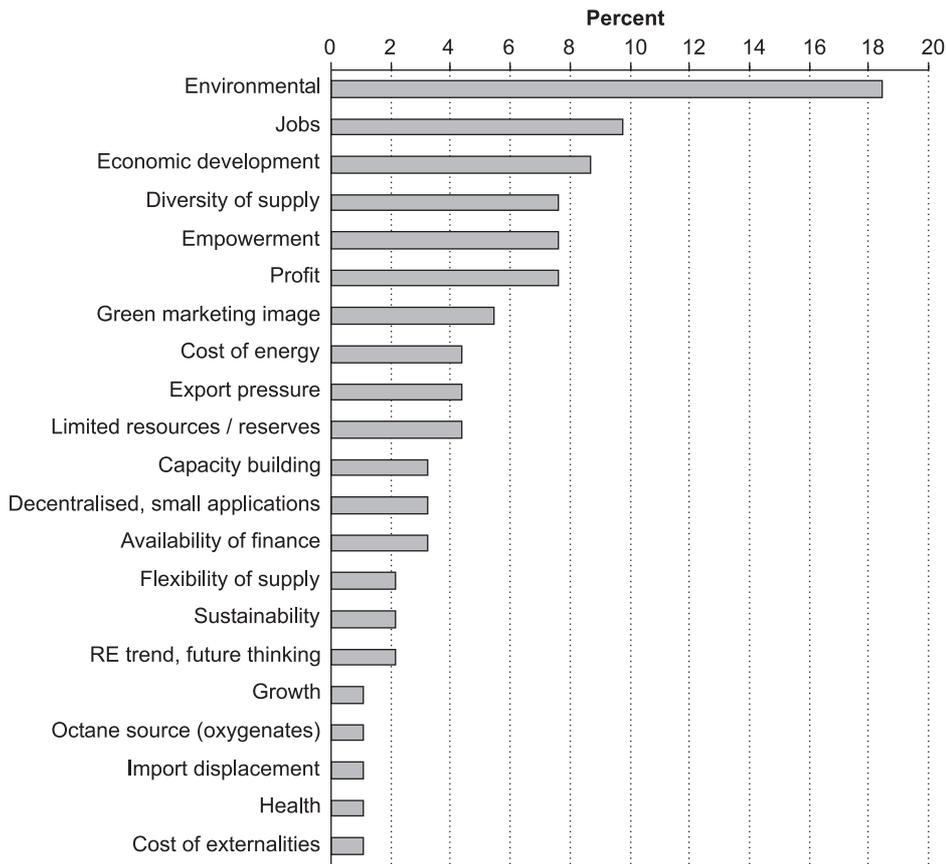


Figure 1: Motives for investment

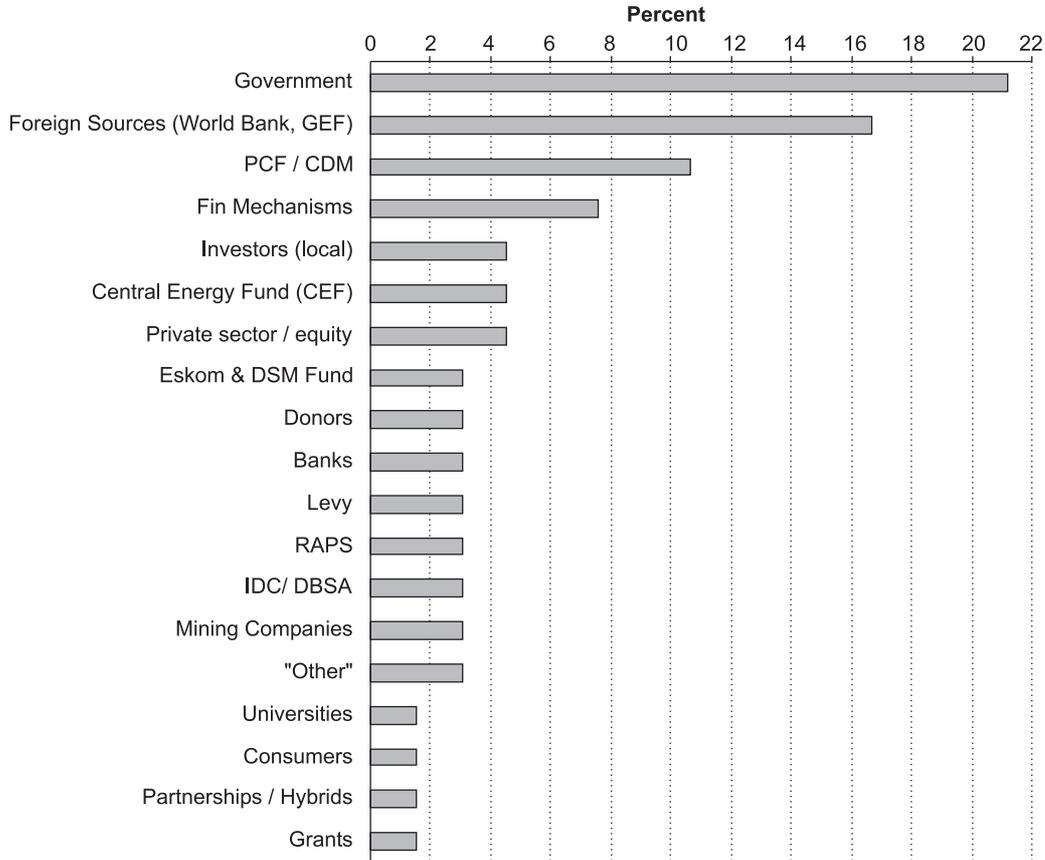


Figure 2: Sources of finance

understanding of the opportunities. The perception of lack of funding on one side and lack of fundable projects on the other may well be driven by communication issues as much as by the facts.

Financial mechanisms / instruments

The interviewees were then asked what mechanisms they suggested would be appropriate for financing renewable energy ventures.

Levies and subsidies dominated the suggested methods of financing renewable energy initiatives. Carbon based financing methods like the clean development mechanism (CDM) were also popular. Several interviewees suggested that tax incentives should be used as both an incentive as well as a disincentive (carrot-and-stick principle). Donations and grants were mentioned in a negative tone and were not supported because they were seen as been unsustainable.

It is interesting to observe that the mechanisms suggested were generally reasonably simple in form, yet complex in terms of the multiple stakeholder groups that would need to be brought to agreement in order to enable the mechanisms to be effective. This led us to consider possibilities of creating differentiated packages, or financing bundles, in order to appeal to different stakeholders, rather than attempting to create quite complex multi-stakeholder agreements

Financial barriers

The interviewees were then asked what they considered to be the principle barriers to investment.

Poor business cases were mentioned in conjunction with pricing parity as dominant barriers to

renewable energy financing and growth. Energy prices based on renewable sources were described as being higher than those based on conventional forms of energy. This cost difference was often attributed to high equipment, technology and transaction costs. Poor policy development and the supporting legislation were often cited as a barrier.

The long-term stability and consistency of the policy were a serious concern to those who had long-term business interests and investment decisions to make. Policy concerns also extended to target definitions and clarification.

A lack of awareness, knowledge, experience and skills related to renewable energy ventures was evident among financiers. The lack of innovative financing mechanisms and general availability of finance featured as a key barrier. Some interviewees felt that there is an inhibitive 'big is beautiful' mentality amongst financiers. Renewable energy projects are much smaller and more decentralised than the traditional large power station and centralised refinery models that South African financiers are used to. Such big projects are more attractive to financiers as it ensures that they make more money per deal.

While traditional wisdom might imply that it is up to the financiers to become more aware of the renewable energy sector, a more fruitful approach might be to create more collaboration between entrepreneurs around the development of their business skills. For example, a quite simple facilitated action-learning style of collaboration would involve regular meetings to firstly explore ways to 'bundle' projects and create more concentration of opportunity for the financiers, and secondly, to find

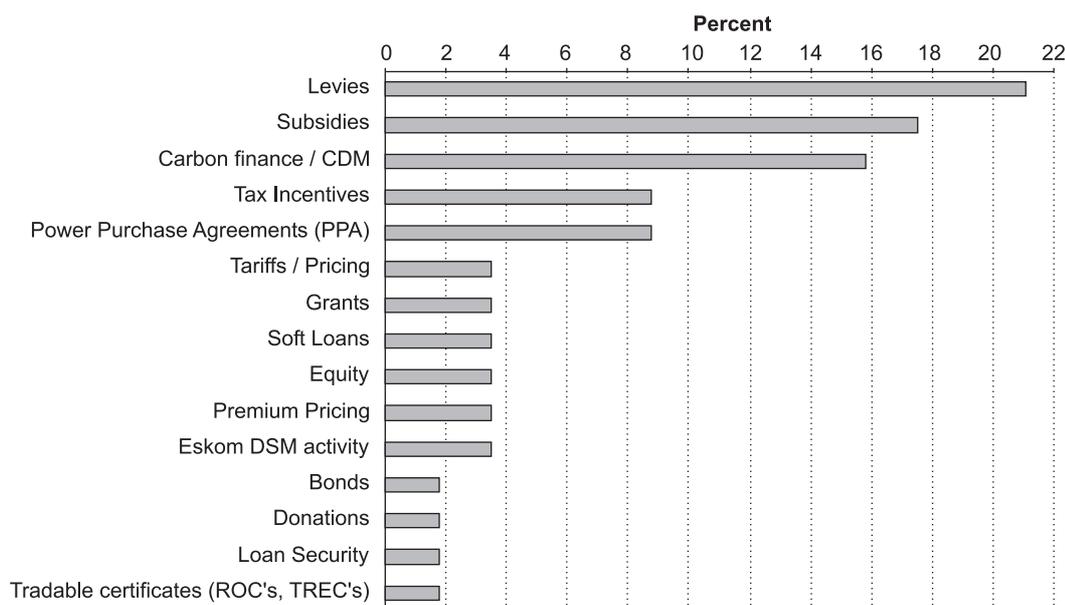


Figure 3: Financial mechanisms / instruments

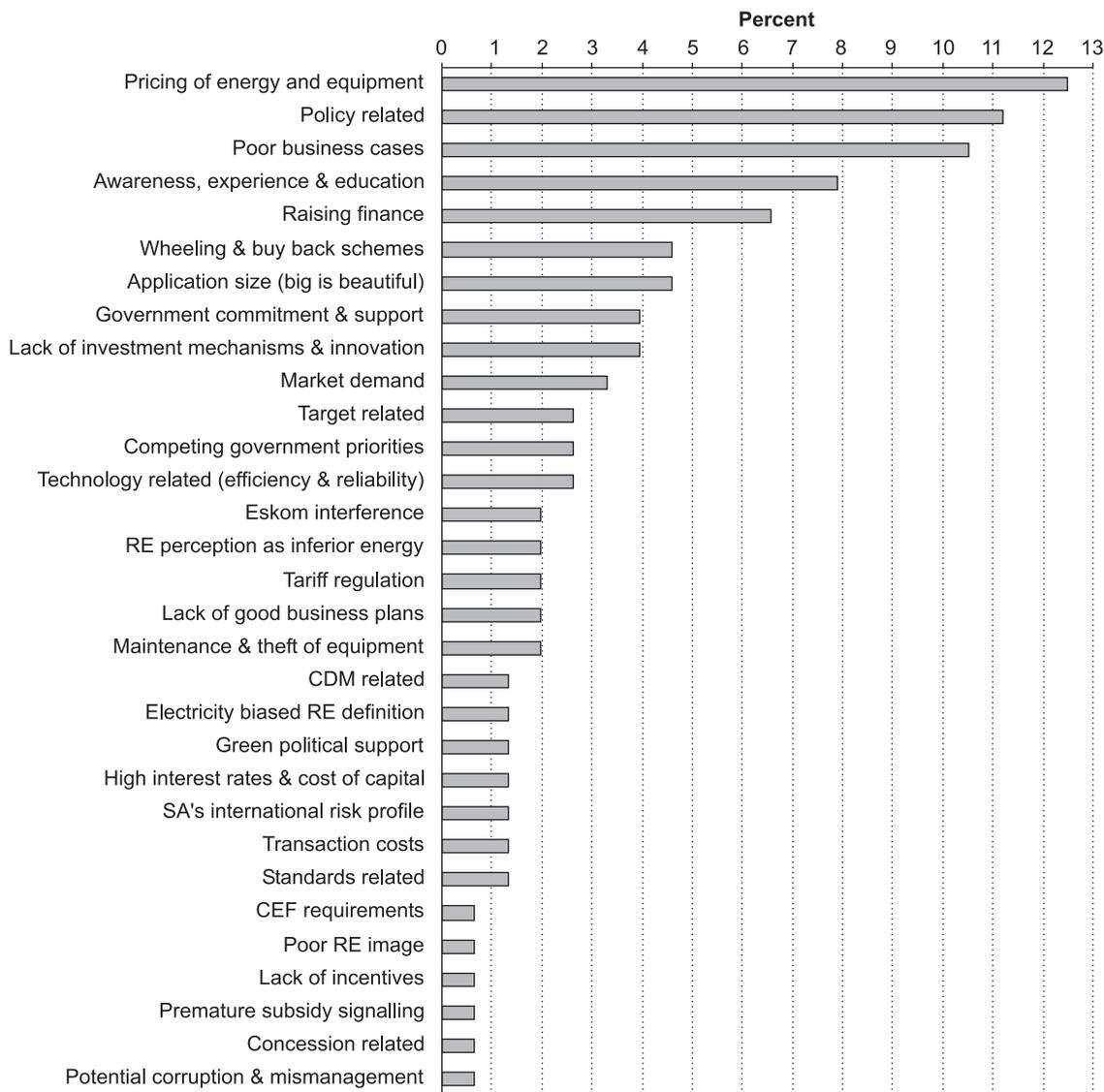


Figure 4: Barriers to finance

ways and language to communicate and educate financiers of the opportunity. In this situation, the 'locus of control' and initiative to improve the situation passes from the financiers to those with most at stake in the process – the entrepreneurs themselves.

Some renewable energy entrepreneurs are financially inexperienced; they have relatively little expertise in finance and are more comfortable with technical issues. Professional financiers evaluate renewable energy ventures too narrowly. They often compare investment opportunities purely via return on investment, but forget that fossil fuel investments usually do not take the cost of externalities or legacy subsidies into account. This results in fossil fuel investments being favoured despite the fact that they are not sustainable. Financiers see renewable energy as a high-risk investment. Financiers are often not familiar with the technology and as such tend to steer away from investment

opportunities where they do not have the requisite technology knowledge.

Many people seemed to only consider electricity when thinking of renewable energy. Some financiers considered that there was no business case for renewable energy. Clearly they were only thinking in terms of electrical applications. They had not taken bio-fuels, biomass pellets and briquettes, anaerobically digested methane production, solar cookers, passive solar water heating, and passive solar architecture into account. These are all examples of profitable applications of renewable energy. Often the initial investment costs are too high for even the enthusiasts to seriously consider installing these types of applications. This is an example of how other factors besides profitability affect the industry.

There is a distinct lack of innovation and imagination in financing renewable energy, which may be a result of the issues mentioned above. Renew-

able energy entrepreneurs tended to undertake the financing task in a relatively unsophisticated if not naïve manner, through conventional channels approaching government or commercial financiers. Commercial financiers generally assessed the financing proposition as unattractive and too risky.

The solutions

The interviewees in this research have raised, we believe, some interesting insights into the financing process for RE. What struck us was that the situation was driven at least as much by perceptions, language used and by how the opportunities are 'framed' as by the hard facts and logic. This seemed to us to offer considerable room for exploration and hope as these matters of perception, language and framing can be, and are, addressed imaginatively and effectively in many ways in other sectors, be they design, arts, IT start-ups, advertising or creative consortia in consulting or education. Arguably, history is on the side of renewable energy – i.e. as the problems of using non-renewable resources become more central to public awareness and more immediate in impact, financial solutions will be created to enable commercial and research activities. At the same time, mainstream organisations will at least partially adapt to adjust to the new commercial realities.

One answer might be for renewable energy entrepreneurs to create more sophisticated, multi-stakeholder financing mechanisms in which a number of different finance sources are solicited for single projects. In terms of game theory, this may hold up well. Renewable energy is subject to interest from policy makers, international agencies, philanthropists, banks, venture capitalist, 'angel' investors, pressure groups – each of whom have different motives in their financing – some to support environmental purposes, some to assist start-up ventures, and some to encourage energy diversification.

Game theory is interested in payoffs and benefits – in how collaborative activity is enabled in competitive environments by reaching equilibrium of interests. By presenting undifferentiated finance packages that are uni- or perhaps bi-dimensional at best, then many of the possible drivers to finance these ventures remain dormant or unexploited. In other words, payoffs to some of the different financing interest groups are unexpressed, thus they remain opaque and unutilised.

Another game theory principle is to focus on 'complementors'. These are firms, services or individuals who are not in the same industry, but who, by doing their work add value to yours, and vice-versa. An example might be Google's willingness to give away Google Earth, online auction and online word processors – all increase Internet usage and ultimately its sales of online advertising. In a similar

vein, an efficient security industry is a complement to hotels and retailers. In the renewable energy arena, a rigorous look at who else benefits from the innovations being created by the industry and who else benefits from the competition the industry creates may well lead to innovative sources of support and financing.

As an initial example of how this process might be developed and to illustrate the players and factors affecting them, a new financing framework that uses the National Energy Regulator's (NER) 1999 model of the South African electricity supply industry as a departure point was created. Figure 5 shows that the model consists of four concentric layers:

1. The central energy flow between suppliers, distributors and consumers. This can take the form as exists between current big suppliers who supply consumers at present, or between renewable energy suppliers who may supply consumers directly, or supply producers who have established distribution networks in place.
2. The next layer consists of the financial mechanisms, which could in one way or another be used to finance ventures in the renewable energy sector.
3. In the third layer, the stakeholders that may be able to supply finance for renewable energy entrepreneurs; and finally
4. This layer contains the motives, which might persuade the suppliers of finance to invest in renewable energy ventures.

This framework and methodology allows entrepreneurs to see the many options in creating a financing strategy to further their endeavours. By analysing the financing possibilities from the viewpoint of various vendors, renewable energy entrepreneurs can construct finance opportunities that speak to the aims of the different funders. By creating composite and synergistic financing opportunities in this way, funding for renewable energy ventures can be created where opportunity is not evident from a less inventive perspective. In short, renewable energy entrepreneurs need to create financing mechanisms that reflect the innovation of their technical projects. Financiers or consultants can also use this system to help understand the sector in which they want to finance a deal and to help create innovative financing mechanisms.

The research showed a number of problems that viewed in a different way can be presented as opportunities and a number of options are open to renewable energy entrepreneurs. Rigorous analysis of stakeholders, payoffs and complementarity could provide valuable insights to different funding formulae. As in other entrepreneurial fields, the need exists to create firms that combine a number of talents beyond the technical and operational. Why not match the innovation with technology with innovation in organisational design and in approaches to

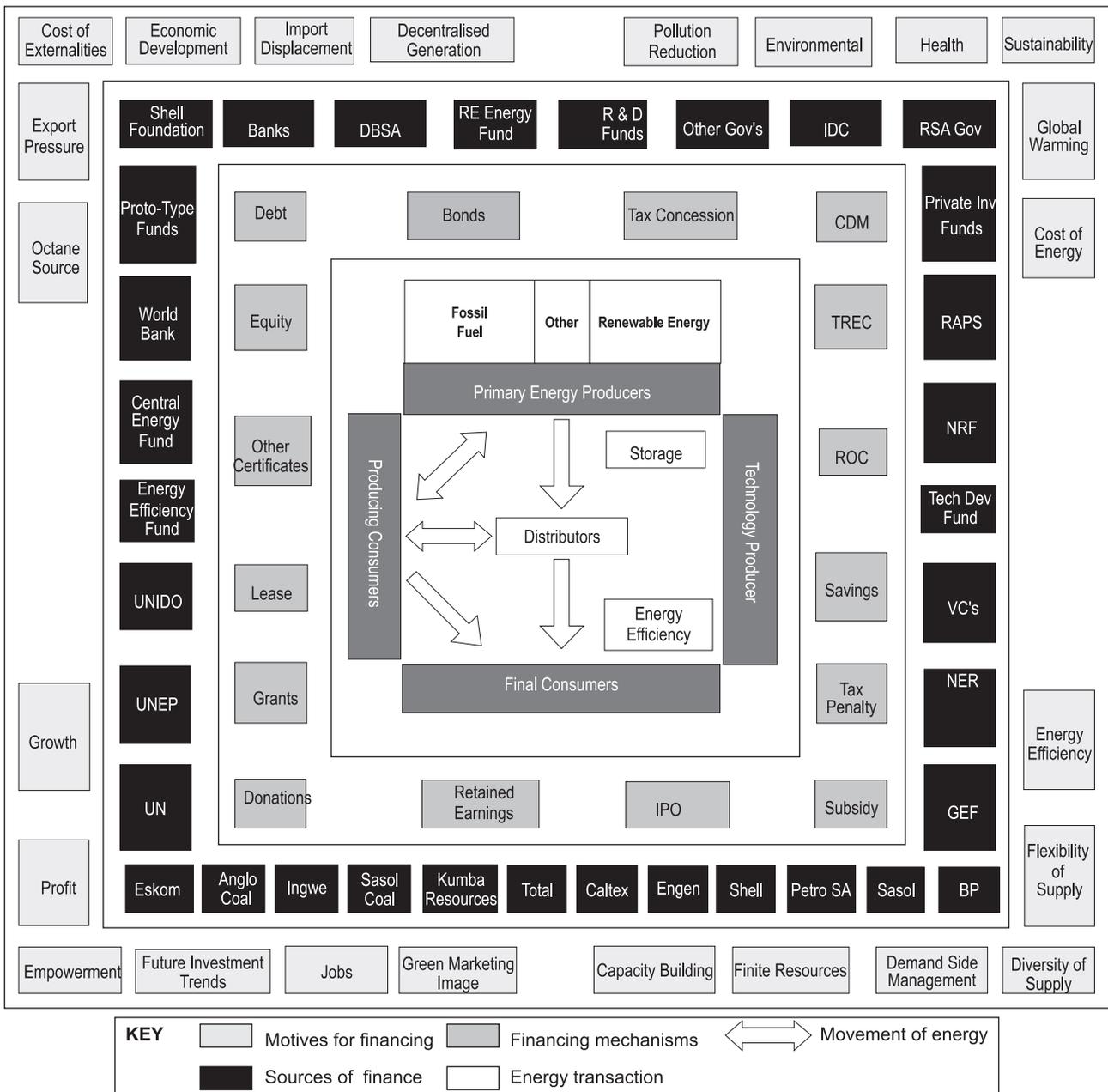


Figure 5: Proposed financing framework

funding? By looking at the industry in a holistic manner and bringing all the motives, barriers, stakeholders and investment opportunities together in one system, a renewable energy entrepreneur can approach a bank or other commercial financier with a financial proposition that may be better targeted to their investment motives or better suited to a given risk profile.

Note

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