

# 10. Renewable Power Purchase Agreements

## 10.1 Overview

Power Purchase Agreements (PPAs) can be used to make renewable energy more accessible to residential and commercial consumers. A PPA is a legal contract between a generator and a purchaser of electricity. These agreements are important in the financing of electricity generating infrastructure, particularly concerning renewable energies. The owner of the infrastructure is able to use the PPA to get financing, given clearly defined electricity outputs and the revenues associated with them. It is often private developers that seek to develop renewable energy projects, where the electricity generated would be sold to electricity distributors, namely Eskom or Municipalities. These distributors would, in turn, sell this green electricity to willing buyers.

## 10.2 The case

Fossil fuel based electricity production is one of the largest industrial sources of carbon dioxide, a primary greenhouse gas linked to climate change. It is also a major source of pollutants including nitrous oxide, sulphur dioxide, mercury and particulate matter. The majority of South Africa's electricity is provided by coal-fired power stations, the highest energy-producing polluters in the world.

Coal is a non-renewable resource, which, at present production rates, will last only for 50 more years. In combination with South Africa's strong economic growth, rapid industrialization, and mass electrification this illustrates the need for a shift to renewable energy. The City of Cape Town has a self-imposed target of 10% of its electricity purchases to be from renewable sources by 2020.

The purchase and installation of renewable energy systems is not always an option for the average electricity consumer. PPAs provide citizens with a convenient way to support locally generated renewable power. They encourage residential buyers to demonstrate their commitment to reducing their carbon footprint and investing in a sustainable future by voluntarily purchasing green electricity. Companies are also encouraged to enhance their image by reducing their environmental impact through purchasing green electricity for their facilities. Once it is obvious that there is a demand for green electricity from voluntary purchasers, policy makers will be forced to acknowledge that further investment in renewable energy generation is financially viable and socially responsible.

## 10.3 Potential for rollout

It has been calculated that there is potential to generate 160 GW of renewable power in South Africa. This is four times the current demand levels in the country. The key to unlocking these sources is the development of effective financial mechanisms to stimulate the growth of the renewable energy market. South Africa is about to embark on the renewable energy feed in tariff (REFIT) route to achieve this.

The feed-in tariff will ensure that renewable power producers are paid a rate for their energy that makes their business feasible. NERSA, the national energy regulator has developed a feed in tariff structure, which provides the national framework for the purchase of renewable power. Currently, only Eskom is permitted to purchase this power, although it makes sense to allow municipalities to purchase power generated inside their area of jurisdiction. The additional cost for the purchase of this power can either be built in to the overall end user tariff, or be paid for as a per kilowatt-hour levy to willing end users.

Evidence from other countries that have followed this route shows a marked increase in renewable energy generation after a feed in tariff is implemented.

## 10.4 Barriers to implementation and efforts to overcome these

The following issues have been barriers to the implementation of PPAs:

**Lack of national renewable energy feed in tariff (REFIT):** There are high risks involved in initiating green electricity development, making it currently unattractive to private investors. A renewable energy feed in tariff provides the risk reduction required for the renewable energy industry to grow.

### **Effort to overcome**

A feed in tariff framework has been announced by the National Energy Regulator NERSA in South Africa. The rates are applicable to the following technologies: Wind, Concentrated Solar Power, Hydro and Landfill Gas. The proposed tariff rates are attractive to project developers, and will undoubtedly stimulate the renewable energy market in South Africa. There are some concerns around this still, the primary ones being:

- ☀ Only Eskom can purchase this power, not municipalities
- ☀ A tender process needs to be followed by developers to qualify for their renewable energy generated to be purchased. This creates risks in the market again

**Lengthy processes:** Technical and legal complexities existing around institutional and contractual arrangements with NERSA, Eskom, etc. cause implementation to be a lengthy process. Drawn out Feasibility Assessments and Environmental Impact Assessments also hinder progress.

## 10.5 How to go about implementation

### **Develop a Feed in Tariff which includes Municipal rights to buying renewable electricity:**

It is critical that municipalities are included in the feed in tariff framework as players who have the right to buy renewable energy if it is in their best interests. This includes the legal mechanism to allow them to carry the additional cost over into all the electricity sold by the municipality, or to allow them to sell green electricity to end users at a premium rate. Nationally acceptable power purchase agreements can then be drafted for use by any player – in this case Eskom or municipalities to purchase renewable power from an independent source.

### **Develop a Micro Feed in Tariff for individual power generators**

Cities can consider purchasing green power from micro generators within the municipality's jurisdiction. An example of this could be a photovoltaic array on the roof of a house which is connected to the grid and feeds into it. The city could measure the energy supplied and pay the end user at a rate higher than the municipal selling rate. This will incentivise homeowners to become micro generators within the city. Financing for such systems could come through a levy on the electricity bill. Once again, the legal framework around power purchase must be supportive to allow this to happen.

## 10.6 Case Studies

### *Case Study: Darling Wind Farm, Western Cape*

*The Darling Wind Farm, South Africa's first commercial wind farm, currently consists of four 1.3 MW wind turbines that provide electricity to the City of Cape*

*Town. In 2006 the mayor of the City of Cape Town signed a PPA with the CEO of Darling Wind Farm. The city became involved in the project by providing financial assurance and carrying the risk as a guaranteed buyer of the electricity that was going to be produced. For the next 20 years the 5.2 MW wind farm will supply green electricity to the City of Cape Town, taking the city one step closer to having 10% of its electricity purchases being from renewable sources by 2020.*

*Over 20 years, the Darling Wind Farm is expected to save 142 500 tons of coal and 370 million litres of water. A significant reduction in pollutants will also result, namely:*

- *258 100 tons of carbon dioxide*
- *2200 tons of sulphur dioxide*
- *1100 tons of nitric oxide*
- *58 tons of particulates*
- *42 200 tons of ash*

*The City of Cape Town is responsible for selling the electricity obtained through the PPA. Willing buyers will pay a premium for this green electricity, which is set at 25c/kWh above current electricity rates. The Darling wind farm was officially powered up in May 2008.*

*The wind farm is located 10 km north of the town of Darling in the Western Cape of South Africa, an area that gets strong and consistent winds. The R75-million project was developed by a group of private investors including the Darling Independent Power Producer, the Central Energy Fund, the Development Bank of South Africa, and the Government of Denmark. There are plans to add 6 more 1.3 MW turbines to the farm, bringing the capacity up to 13 MW, providing there are no significant impacts found from the existing turbines.*



### **Case Study: Energy from Bagasse, Tshwane**

*By 2020 the City of Tshwane aims to have 10% of their electricity supply met by local renewable sources. Tongaat Hulett Sugar Limited and Tsb Sugar generate electricity through the burning of sugar cane fibrous matter called bagasse. Amatola Green Power is an electricity trading company that buys the surplus electricity, giving them a green electricity capacity of 3-5 MW. In 2007 the City of Tshwane signed a 3 year PPA with Amatola Green Power for the purchase of approximately 2 MW of green electricity, which it then sells to customers serviced by the city.*

*Amatola obtained approval to buy and sell green electricity in a voluntary market from the National Energy Regulator of South Africa and the Department of Minerals and Energy. The green electricity is fed into the National Electricity Grid by Amatola, who then has access to the network in order to sell it to customers. In an attempt to demonstrate its environmental commitments, Mercedes-Benz South Africa Limited became the City of Tshwane's largest customer and the first commercial buyer of their green electricity.*