Fact sheet

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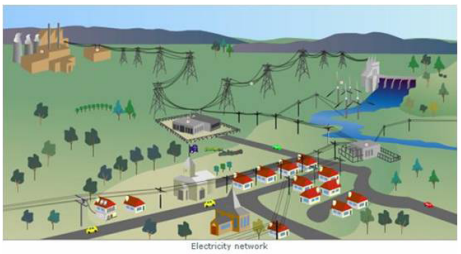
Distributed generation

Moreland Energy Foundation



Inefficiency in electricity generation through coal-fired power plants increases the amount of greenhouse gases produced and hence has a great impact on the environment. These issues can be dealt with through producing energy through smaller decentralised power plants, rather than large centralised units.

Why is distributed generation needed?

Today many industrial countries generate most of their electricity in large centralised facilities. Examples of centralised energy include electricity generated from black or brown coal or natural gas, nuclear and hydroelectricity. Large centralised energy production is often built based on a number of economic, logistical or geographical factors.

Most of Victoria's electricity generation is centralised and produced through burning brown coal in the Latrobe Valley, using an inefficient system developed in the 1930s. Of the total amount of energy used in producing electricity, only about 30% of the primary energy actually reaches the end user as electricity. A significant amount is lost through the conversion process and approximately 7% of electricity transmitted from power plants is lost during transmission and distribution.

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What is distributed generation?

The basic principle of distributed electricity generation is that efficiency of energy supply can be greatly increased by substituting few large centrally-located power plants with many smaller, decentralised ones.

Distributed generation is defined as an electricity generator smaller than 30MW in capacity and connected to the distribution network. This may range from a small solar array on the roof of a house to a gas-fired cogeneration unit supplying heat and electricity to an office or industrial site to a community-owned renewable energy facility such as a wind park.

What are the benefits?

There are benefits with both centralised and decentralised generation. Economies of scale are gained by generating electricity at larger scale, and sometimes it is more efficient to build a power station near an energy source and transport the electricity to homes and factories rather than fuel to the power station. However, frequently these economies of scale are outweighed by losses in the system.

Transmission losses are reduced by distributed generation since the electricity is produced at or near the point of demand. Further, as electricity supply and demand are better linked, peak load demand can be reduced and security of supply is enhanced.

With 47% of a typical Victorian household electricity bill paying for poles and wires to deliver electricity to your home, reduced peak demand, reduced transmission losses and the location of the generator close to the point of consumption all means that distributed generation can lead to significant savings to customers.

Additional efficiency gains can also be achieved by utilising the waste energy, such as heat from the thermal generation of electricity. This waste heat is typically lost as steam from large coal-fired power stations.

Finally, distributed generation technologies are often low- or zero-emissions technologies, whereas in Victoria centralised generation is largely highly-polluting brown coal. Hence, at a time when climate change is increasingly realised as one of our largest threats distributed generation can greatly assist in reducing greenhouse gas emissions, through both an increase in efficiency and a switch to cleaner fuels.

For further information about distributed generation

For examples of distributed generation see MEFL's fact sheets on cogeneration and trigeneration.

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