Steps to an Energy [R]evolution
Cogeneration

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Cogeneration: heat and power to the people

Cogeneration is ready to roll out on a large scale and is one of the quickest ways we can start substituting for coal-fired electricity. By generating power where it is needed while using the heat byproduct to warm buildings and districts, cogeneration offers massive potential to lower total energy demand and make our power network more stable and secure.

- Cogeneration avoids the electricity losses that take place in transmission and distribution of power by creating electricity at the point it is consumed.
- By harnessing the waste heat and using it to warm buildings, cogeneration lessens electricity demand as well as producing electricity with far less emissions.
- The deployment of cogeneration in Australia could allow us to replace 7,000 Megawatts of polluting coal-fired electricity, the equivalent of the largest power stations in New South Wales, Victoria and Queensland combined.

Cogeneration – how it works:

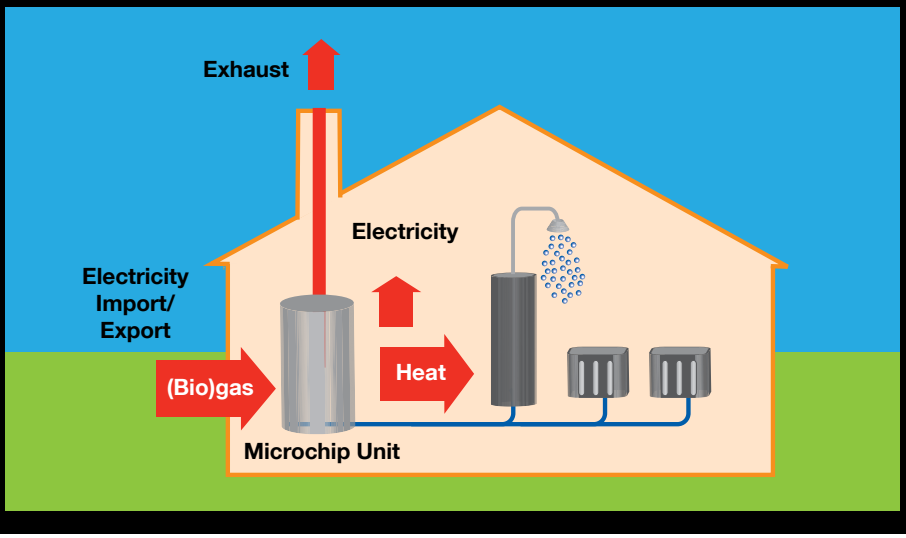
A cogeneration unit is typically small, the largest units having a power capacity equivalent to one-third of an average wind turbine, and are powered with either gas or biomass.

Power is generated directly from the unit to supply the building where it is installed, as well as feeding electricity back into the grid if there is oversupply. Generating power where it is needed avoids losing electricity through transportation across long network cables. Typically, 4% of total electricity generation is lost in transmission. Further losses take place in local distribution networks. Decentralised energy solutions such as cogeneration would avoid these losses and make our power sector more efficient as a whole.

Generating electricity where it is needed also means that local power supplies can be maintained, even if the broader electricity grid is disrupted. For example, if a technical fault temporarily cuts off a district, those with cogeneration units are unlikely to be affected.

Creating steam-driven electricity generates a lot of heat, which is usually disposed out of a conventional power station through cooling towers and chimneys. Although some large power stations harness this heat and channel it for residential or industrial use – another application of cogeneration – this is much easier on a small scale. Cogeneration plants take their "waste" heat and feed it directly into the heat supply of buildings or for industrial use. This has the additional benefit of lowering demand for heat using electricity, further increasing the cogeneration plant's efficiency.

Diagram of how Cogeneration Power works



Cogeneration around the world

Cogeneration is not a new concept or technology; it is already being used in buildings such as hospitals, where it is essential to maintain a constant supply of energy. Urban areas are rolling out cogeneration to decentralise and strengthen their energy supply.

It is important to remember that as most cogeneration units use gas, which is a fossil fuel, it should be used only because of its ability to substitute for coal-fired electricity and help drive down Australia's emissions as fast as possible. We need to move quickly to a situation where all new energy needs are met by renewable energy.

One example of effective cogeneration use is in the UK, where the Borough of Woking enacted a plan to make use of cogeneration and renewable energy technologies to lessen the area's environmental footprint. The Borough's emissions fell by 17% as a result and Woking has become more energy independent, being unaffected by power shortages in the national grid.

The City of Sydney is developing a model for reducing its greenhouse emissions similar to that of Woking, making widespread use of cogeneration to make itself more energy independent and lower its greenhouse gas emissions.

The potential for cogeneration in Australia

Australia is well placed to make use of cogeneration and examples exist of where businesses have reduced their electricity bills, greenhouse gas emissions and actually become a net energy supplier to the grid. Coopers Brewery in South Australia has managed to cut its emissions by 50% in eight years, in part due to purchasing a cogeneration plant in 2002.

Modelling commissioned by Greenpeace has revealed it is technically and physically possible that by 2020, all of Australia's greenhouse-polluting coal-fired power stations could be replaced with a combination of seven renewable energy technologies and energy efficiency. Cogeneration can also be deployed quickly to reduce total power demand, helping to replace coal-fired power stations.By 2020, its use could replace 7,000 Megawatts of coal-fired power plant, the equivalent of replacing the largest plants in Queensland, New South Wales and Victoria combined.

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How can we deliver cogeneration in Australia?

Australia urgently needs policies that revolutionise how we produce and use energy, moving us to zero-emission and energy efficient power as soon as possible. Governments must introduce policies that ensure no new coal-fired electricity plants are built, and the renewable energy industry is able to meet its full potential.

Australia firstly needs to ensure that all renewable energy technologies are given the long-term certainty necessary to grow steadily and sustainably to meet their full potential. The best example of such a policy is the feed-in tariff, which pays owners of renewable energy a premium rate for the emission-free electricity they generate.

In addition, technologies such as cogeneration need to be supported through programs such as rebates, which lower the upfront costs of installation, as well as fixed tariffs for electricity fed back to the grid from cogeneration units. Changing legislation to ensure the maximum use of cogeneration of new and refurbished buildings will also help ensure the widespread deployment of this technology.

You can make the Energy [R]evolution happen!

We need Australians to use their power, as consumers, voters and active members of the community to help make the Energy [R]evolution a reality. The planet is teetering on the verge of triggering catastrophic climate change but we have the solutions to prevent it. You can:

- **Stay informed** – visit the Greenpeace website: www.greenpeace.org.au/climate to sign up for our monthly emails or learn more about climate and energy issues.
- **Contact your local MP** – use your power as a voter and make sure your local politicians are aware that this issue matters to you.
- **Put your savings to work** – like all working Australians, you've got savings in a superannuation fund.

  Unfortunately, the chances are that your hard-earned savings have been used to invest in risky, unsustainable, coal-fired power stations.

  Super funds have a legal obligation to consider inquiries from members – so write to yours and ask them to stop investing in coal and start investing in renewables.