

Backgrounder on Lignite



Coal Action Network Aotearoa

Lignite

The recent expansion of the mining industry to develop Lignite in Southland and Otago represents a very real and major threat to our climate. Coal Action Network has prioritised this as a major focus and have vowed to fight this incredulous expansion of the industry.

Two companies, State-owned Solid Energy and privately owned L & M Lignite, are currently assessing the feasibility of lignite conversion schemes in Southland.

Solid Energy will soon announce resource consent applications for the first of its projects.

At least 6.2 billion tonnes of lignite is technically and economically recoverable in 10 major deposits in Otago and Southland. The in-ground lignite resource is approximately 11 billion tonnes.

Key points:

- * 6 billion tonnes of economically recoverable lignite in Southland
- * Solid Energy own land over 1.5 billion tonnes
- * New Zealand coal production in 2009 was 4.5 million tonnes
- * In November 2010, the Parliamentary Commissioner for the Environment said *any* use of lignite would be a bad choice for New Zealand

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What is Lignite?

Its a yellow to dark brown, rarely black, coal that has been formed from peat under moderate pressure; it is one of the first products of coalification and is intermediate between peat and subbituminous coal.

Dry lignite contains about 60 – 70% carbon. Almost half of the world's total coal reserves contain lignite and subbituminous coal, but lignite has not been exploited to any

great extent because lignite is inferior to higher-rank coals (e.g., bituminous coal) in heating value, ease of handling, and storage stability.

There are 6 billion tonnes of economically recoverable lignite in Southland. This would lead to approx. 8.89 billion tonnes of carbon dioxide emissions.

Solid Energy

Solid Energy is currently investigating several options for converting its lignite resources in Southland (estimated at 1.35 billion tonnes) to energy forms and products. This includes developing a lignite-briquetting plant, a lignite to diesel plant, and assessing the viability of a lignite-to-urea plant with Ravensdown. These could all be built in one large Industrial Park. Three possible sites for this plant have been mentioned, one near the New Vale mine, one near a disused Mataura paper mill, and another near a mine pit south of Mataura. Solid

Energy is currently in discussion with Environment Southland regarding resource consents and these sites.

Lignite Briquetting

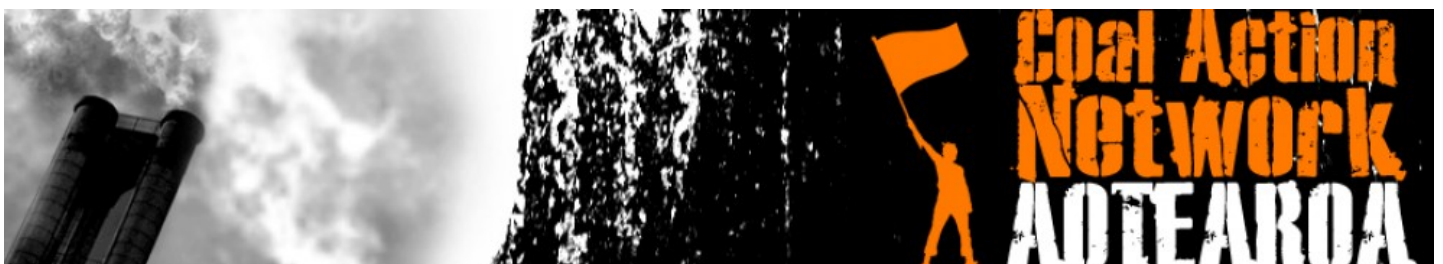
Solid Energy recently announced plans to next year (2011) start building a lignite briquetting plant producing 65,000 to 100,000 tonnes a year for the domestic market with a proposed expansion to 1 million tonnes for the export market by 2014. Domestically briquettes would most likely be going to Fonterra. Internationally, the briquettes would have to compete with sub-bituminous coal on the international market. The site for this plant would most likely be part of the proposed industrial park discussed below.

Lignite to Liquids

Solid Energy recently announced it will next year (2011) start construction of a lignite to liquids pilot plant. This plant will initially be capable of converting lignite or biomass into higher quality coal or synthetic crude oil. Solid Energy had an agreement with Australian company, Ignite Energy Resources Pty Ltd (IER) securing the exclusive New Zealand rights to a technology which converts low energy feedstocks, such as

lignite and biomass, to high-grade coal and synthetic crude oils which have the potential to be upgraded to transport fuel. The proposed commercial pilot plant initially produce 10,000 barrels of crude and 5000 tonnes of char, a powdered form of pure carbon. Solid Energy hope it will be capable of expansion to a 1 million tonnes per annum facility in 2017..
 UPDATE: In October Solid Energy ended its existing agreement with

Ignite Energy Resources after being unable to seal a licence agreement.



Lignite to urea plant

In September Solid Energy announced it had engaged a joint venture with agricultural fertiliser supplier Ravensdown to assess the viability of building a US\$1 billion plus coal-to-fertiliser plant with a view to making New Zealand self sufficient in, and potentially an exporter of, urea-a nitrogen fertiliser used to enhance

grass growth. Solid Energy recently announced the plant could be built in 2016, producing up to 1.2 million tonnes a year of urea from up to 2 million tonnes a year of lignite. Government subsidy-In September 09 the Sustainability Council raised the fact that the proposed urea plant would qualify for subsidies worth

more than \$500 million over the first 20 years of the plant's life under changes to the ETS.

**L & M Lignite
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L & M Lignite

L & M Lignite are the other big player in lignite. Part of the larger L & M Group their Lignite subsidiary L&M Lignite Limited currently has five exploration permits covering 210 square kilometres in Hawkdun, Maitua, Edendale, Morton Mains, Waimatua, Kaitangata and Ashers Waituna. Their exploration has identified resources of approximately 2 billion (plus privately held coal which may be able to be acquired). Environmental and feasibility studies into the production of liquid fuels, petrochemicals, electricity generation and methanol are being conducted.

Fischer-Tropsch method

At an Otago Chamber of Commerce meeting in Alexandra in May, L&M Group financial controller Shirley Herridge said the company was "looking at (the possible Hawkdun plant) very seriously". Conceptual plans for a mining plant at their Hawkdun site near St Bathaans in Central Otago reveal a multibillion-dollar refinery covering 70ha. The firm proposed using the Fischer-Tropsch method to convert lignite to gas, which in turn can be converted to diesel.

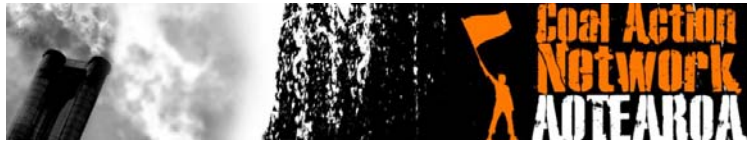
**KEEP COAL
IN THE HOLE.**
*why southland lignite
shouldn't be mined*

COAL ACTION NETWORK
PUBLIC MEETING · WEDNESDAY 16 FEB · 7PM

Speaker: Jeanette Fitzsimons climate change campaigner,
former co-leader of the Green Party

St John's Church Hall
cnr Willis and Dixon Streets, Wellington
FOR MORE INFO: coalactionnetwork@gmail.com

www.coalactionnetworkkaotearoa.wordpress.com



Coal Action Network Aotearoa

The Coal Action Network (CAN) is a network of climate campaigners committed to fighting the continuation of coal mining in Aotearoa New Zealand.

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CAN's objectives are to:

1. Phase out coal mining and coal usage within 20 years, initially by opposing new and expanded coal mines.
2. Promote a cultural change so that mining and using coal are unacceptable.
3. Work towards a society where people and the environment are not exploited for profit.
4. Be part of a just transition to a coal-free Aotearoa New Zealand.

Keep the coal in the hole!

To get involved, please email coalactionnetwork@gmail.com and ask to be put on our mailing list <http://coalactionnetworkaotearoa.wordpress.com/>

coalactionnetworkaotearoa.wordpress.com

Health Risks

Dr. Michael Hendryx (2008) conducted a study on the human health impacts of coal mining. Accounting for variables of age, income, education, poverty, smoking, and obesity, he found that residents of coal mining communities have a 70 percent increased risk for developing kidney disease; a 64 percent increased risk for developing chronic obstructive pulmonary disease like emphysema, black lung or coal miners disease; and are 30 percent more likely to report hypertension (Hendryx, 2008).

These illnesses are caused by inhalation of coal dust released into the air during surface mining, preparation, cleaning and transport operations. Another exposure pathway is the chemically treated water which is

used to wash the coal and then discharged into surface waters or injected into groundwater (Hendryx, 2008). Residues in these waste waters contain significant amounts of potentially polluting compounds, such as pyrites and marcasites, clays and various trace elements, like heavy metals (Zocche, 2010). These pollutants can increase turbidity and siltation, which impact aquatic life. People who live downstream from coal mining areas may be at risk of accumulating potentially toxic tissue concentrations of some non-essential elements (Zocche, 2010).

Insectivorous bats can be used as bioindicators of human health risks because these animals are at the same trophic level in the food chains as humans (Jones et al., 2009). Bats

use the space above streams, ponds or riparian vegetation as feeding sites (O'Shea et al., 2001; Zocche, 2010) and frequently forage on emerging adult aquatic insects (O'Shea et al., 2001). An extensive study conducted on bats in the lignite mining area of the Catarinense Basin in Brazil showed dangerously high levels of toxic heavy metals such as Chromium, Nickel, copper, lead, iron, manganese, cadmium and aluminium in the livers of bats.

This results in high levels of DNA damage in blood cells (Zocche, 2010). The carcinogenic potential of non essential heavy metal compounds has been well established both for humans and animals (O'Shea et al., 2001).