



<http://www.greenprospectsasia.com/content/danish-technology-converts-coal-biomass-plants-asia>

## Danish technology converts coal-to-biomass plants in Asia

Posted: July 26, 2012

- **Coal plants can now convert to biomass feedstock more quickly and affordably**
- **Danish technology cuts fuel consumption by 20%**

*By Eleanor Chen*

**Why pay US\$40 million** for a new biomass power plant when you can convert a traditional coal-fired boiler plant to achieve the same result for half the price? Companies intending to build biomass power plants now have the option of lower capital expenditure.

The advantages of switching from coal to biomass as fuel are plenty. For one, emission levels are lower. Biomass produces less nitrogen oxide, sulphur dioxide, mercury and carbon dioxide. Local communities benefit too; farmers and smallholders can sell their agricultural waste for additional income while feed-in tariffs (FiTs) offer a guaranteed price for the electricity generated. This is especially helpful when raising capital from a bank.



The TPK plant in Thailand where a 30-year old coal boiler is currently being converted to run on biomass. On the foreground is the foundation where the boiler will be erected (photo credit: DP CleanTech)

One company that has effectively leveraged its technology to help businesses take advantage of these opportunities is **DP CleanTech** (DPCT), one of the many industry solutions providers present at the EU-Asia Biomass Best Practices & Business Partnering Conference 2012 in Kuala Lumpur in May.

“Our high pressure, high temperature technology is able to reduce fuel consumption by 20% compared to medium temperature and medium pressure technology,” says Robbert Klein Langenhorst, business developer for DPCT (Southeast Asia).

“With our European technology from Denmark, we’re able to lower fuel consumption using our core competency, which is basically the water-cooled vibrating grate. It provides better pressure and better temperature, and prevents a lot of corrosion. That’s what we’ve been doing for 22 years with straw, for example,” adds Langenhorst. Straw has a low caloric value (18 MJ/kg) and high moisture content (15–25%).



Robbert Klein Langenhorst (photo credit: DP CleanTech)

Besides having developed 70% of the biomass power plants in China, DPCT provides technology not only to burn industrial waste such as empty fruit bunches (EFB) from the palm oil industry, but also municipal waste and other difficult-to-burn fuels.

### **Making the switch**

An existing thermal plant can be converted more quickly than building a new power plant, and for a reasonably good price. Doing this could reduce capital expenditure by 50% or more, depending on specifications.

As an example, DPCT was contracted in 2011 to convert an ageing coal-fired power plant to operate on biomass instead. Acquired by **TPK Ethanol Co Ltd (TPK)** of Thailand for US\$1 million, the 30-year-old coal boiler is currently being converted by DPCT to run on waste wood and eucalyptus bark from the forestry and paper industry in the surrounding area. The retrofitted facility will provide green electricity and steam to Thailand’s largest bioethanol plant, currently being built by TPK.

The plant, located in Nakorn Ratchasima, is expected to produce one million litres of bioethanol a day. Co-fired with biogas, it can produce 220 tonnes of super-heated steam per hour compared to 180 tonnes per hour without co-firing. Key factors driving this project, therefore, are plant efficiency, FiT, low interest rates and lower capex.



Part of the conversion process includes sandblasting and repainting the old boiler walls (photo credit: DP CleanTech)

DPCT's operational experience, European technology and Chinese manufacturing expertise enable DPCT to convert coal-fired plants to biomass plants with higher efficiency. In addition to rebuilding and retrofitting, DPCT also develops new-build biomass plants, with combinations of 3 x 30 MW being the largest.

### **Asian expansion**

The company offers more affordable solutions to owners of palm oil mills or plantations in countries like Indonesia and Malaysia who wish to set up power plants for their own needs or to supply to the grid. "We show them a financial model, or the potential clients do their own financial models, and it shows that there's so much more efficiency for fuel consumption. With EFB or PKS (palm kernel shell), you need a lot less to generate the same amount of energy," says Langenhorst.

With recently-awarded projects in the Philippines and Indonesia for a 12 MW biomass power plant and a 10 MW PKS/EFB plant respectively, as well as projects in India and Pakistan, DPCT hopes their conversion service can help clean up small, polluting power plants that abound in Vietnam and Indonesia.

Amid tightening regulations and rising environmental awareness, governments and companies are seeking to reduce their dependence on coal quickly and cost-effectively. "We are seeing an increase in demand for conversion projects all over the world as ageing coal plants look for life extensions and energy producers look to expand their renewables portfolios," says Langenhorst. "DP CleanTech has expertise in this area as biomass is very different from coal and requires a specialised approach to mitigate challenges with fouling and corrosion."

He elaborates: "EFB has one of the highest moisture levels at about 60%. With low heating value, EFB requires a different method of combustion. It needs to stay on the grate longer, it needs a certain temperature for a certain time in the boiler, which are difficult factors to control. When a customer wants to mix any of their fuels – EFB, PKS, woodchips or bark – with coal, it can be done but only up to a certain percentage."

Companies considering biomass power plants should begin soon as it takes time to develop or convert such a plant and the economy can overtake events. A sales cycle generally takes three years to develop, while manufacturing the parts takes about 11 months, depending on the project size. The conversion itself could take another six to ten months, depending on the plant size and location.