GREEN ENERGY

NEWS LETTER
Bio Energy Association of Sri Lanka

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"North Central Province Agro Exhibition"

More than **20,000 people** participate for our awareness program at NCP- Agro Exhibition site at Polonnaruwa and received remarkable response from community groups.

It was estimated that around **10,000** farmer, **5,000** government/ privet sector representatives and **5,000** School children visited the dendro stall. (Pix by Mr. P R Wijewardena)

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True Cost of Coal Power

Coal power is given as a solution to cheap power. But the hidden costs are not accounted for. These play a major part in viability and economic feasibility of coal power. I hope a detail study would be undertaken before we install more power plant hoping coal is cheap. I am attaching extracts from two studies on coal power done in the US:

1. Power production through coal combustion, written by economists **Muller**, **Mendelsohn**, and **Nordhaus (2011; MMN11)**.
2. Dr. Paul Epstein, associate director of the Center for Health and the Global Environment at Harvard Medical School

(COAL) www.businessweek.com

To the electricity customer, coal is relatively cheap. But missing from the sticker price are coal's major impacts on ecosystems, human health, and our economy.
Collectively, these are known as "externalized costs", because they are not paid by those directly involved in the buying and selling that sets the market price (the coal mining companies, the coal-using power plants, or their electricity customers).

Coal has many externalized costs, therefore its market price doesn't reflect its "True Cost." Although it appears to be cheap to the buyer, it is much more expensive to society as a whole. For a more detailed discussion of True Cost, see our article here.
In 2009 the National Resource Council calculated that the total hidden costs of coal combustion in the United States This study further calculated that if all the externalized costs of coal were accounted for, it would at almost 18 cents/kWh to the price of coal. Yet another study, also released in February 2011, looked in detail at the benefits of increased electricity generation versus the much larger detrimental effects of coal consumption. A detailed report on the true cost of energy released in May 2011 calculated the true cost of coal to be 170% of the retail price. An analysis in August 2011 found the external damages caused by coal combustion to be about twice the "value added" of the commodity.
Coal combustion wastes (CCW) include ash, sludge, and boiler slag left over from burning coal to make electricity. These wastes (120 million tons/year in the US) concentrate toxins such as arsenic, mercury, chromium, cadmium, uranium and thorium. In addition, these wastes create an expensive storage problem "in perpetuity". Coal combustion emissions released into the atmosphere contain nitrous oxides which are responsible for industrial and urban smog, sulfur dioxide which is the primary reactive agent behind acid rain, mercury which accumulates in the food chain, and large amounts of carbon dioxide which is the most important greenhouse gas contributing to climate change.

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Coal-fired power plants are a major source of atmospheric mercury, which accumulates in the food chain and can damage the developing nervous systems of human fetuses, as well as leading to reduced immune function, weight loss, reduced reproduction rate, mental defects and other neurological problems. Negative effects on the economy lead to worse health in the population, which has an impact on health care costs, compounding the economic impact. Some people have used this to argue that coal has additional benefits to society. The argument is that coal provides cheap electricity, which is a boon to the economy, therefore health is improved, and health care costs are lowered. While this additional health effect should indeed be considered, it should be applied after the economic impacts discussed above. Once the costs of pollution, global warming, and habitat destruction are added to the benefits of cheap electricity, the economic impact of coal is no longer positive, and this additional health effect only makes it even more costly. In a groundbreaking article to be released this month in the Annals of the New York Academy of Sciences, Dr. Paul Epstein, associate director of the Center for Health and the Global Environment at Harvard Medical School, details the economic, health and environmental costs associated with each stage in the life cycle of coal – extraction, transportation, processing, and combustion. The electricity derived from coal is an integral part of our daily lives. However, coal carries a heavy burden. The yearly and cumulative costs stemming from the aerosolized, solid, and water pollutants associated with the mining, processing, transport, and combustion of coal affect individuals, families, communities, ecological integrity, and the global climate. The economic implications go far beyond the prices we pay for electricity. The National Research Council found in 2009 that burning fossil fuels costs the U.S. $120 billion a year not counting mercury or climate impacts! That relatively narrow analysis found that "In 2005 the total annual external damages from sulfur dioxide, nitrogen oxides, and particulate matter" from burning coal for power "were about $62 billion," and averaged "about 3.2 cents for every kilowatt-hour (kWh) of energy produced." Dr. Epstein says: The public is unfairly paying for the impacts of coal use. Accounting for these 'hidden costs' doubles to triples the price of electricity from coal per kWh, making wind, solar, and other renewable very economically competitive. Policymakers need to evaluate current energy options with these types of impacts in mind. Our reliance on fossil fuels is proving costly for society, negatively impacting our wallets and our quality of life.

Discrepancies in Social Cost of Carbon (SCC) (By Eng. L P Jayasinghe)

Difference between MMN11 and Epstein 2011 estimates of the external costs of coal emissions were more than 3 times lower than the estimates in Epstein et al.

The SCC discrepancy accounts for the difference in climate externality estimates. Epstein et al. used an SCC value of $30 per ton of CO2, where as MMN11 used $7.36 per ton of CO2. The Epstein et al. value is much more realistic and consistent with current-day SCC estimates, but even $30 per ton of CO2 is likely on the low side. In fact, a recent Economics for Equity and Environment Network report concluded that the SCC in 2010 likely lies between $28 and $893 per ton, and will rise in 2050 to between $64 and $1,550 a ton.

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Gliricidia as a plant nutrient

This commonly found leguminous plant (fixes nitrogen from the atmosphere through root-nodular bacteria) is widely used to enrich the soil, in different ways.

In-situ Compost

The gliricidia leaves could be used for insitu production of compost. The leaves, either green or dry, could be mixed with paddy straw and retained in the soil which can be quickly converted to compost by adding cow dung slurry and using a hoe to chop and mix thoroughly.

Liquid-fertilizer

The following preparation is sufficient to supply nutrients for one acre of vegetable plants:

- 100 l of water
- 10 kg of wet cow dung
- 25 kg of green gliricidia leaves
- 5 kg of Baloliya, Higuru *or* Gandapana leaves
- ½ kg of Murunga leaves
- A handful of fresh soil from the surface layer

The mixture must be kept in a vessel and mixed well for about 14 days. At the end of the 14 days, the not decomposed material that comes to the surface should be removed and the remaining liquid is diluted with three parts of water to one part of the liquid.

Add 100 g of soap to 10 l of the prepared liquid and sprinkle the plant every seven days as a foliage fertilizer.

(By Dr. Gamini Kulathunga)

'Compost Making'

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Jeewamrutha (a microbial culture)

The following preparation is sufficient for application to one acre of vegetable plants:

- 200 l water
- 10 kg cow dung from indigenous cattle
- 4-5 l of cow urine
- 2 kg of jaggery (*Sakkara* – cane-sugar jaggery)

(*Alternative* – use 4 l of coconut water or 2-3 kg of ripe fruit)

- 2 kg of flour of a pulse such as cowpea, green-gram or black-gram

(*Alternative* - use 6 -8 kg of gliricidia leaves dried for two days and shredded)

- A handful of earth from the top surface

Prepare the mixture in a barrel and stir vigorously three times a day, for 5-6 days. The filtered solution must be used within two days by sprinkling on the plants. As it is a microbial culture it cannot be kept too long unlike the liquid-fertilizer

(By Dr. Gamini Kulathunga)

'Jeewamrutha Preparation'

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BEASL Participated at the Techno 2013 Exhibition

'BEASL Stall at TECHNO 2013'

BEASL took an active part at the **Techno 2013** Exhibition held at the **BMICH** on **11th, 12th** and 13th of October, 2013. BEASL was able to take a 3 m x 3 m stall. Finance for this was made available with the following three institutions becoming new Corporate Members of BEASL:

- United Dendro Energy (Pvt) Ltd.
- Lalan Engineering (Pvt) Ltd.
- Desha Shathi (Pvt) Ltd.

BEASL requested all seven Corporate Members to display suitable posters or products at the stall. Only Desha Shathi (Pvt) Ltd. displayed and demonstrated their biomass pellet-based stoves.
In addition to displaying our own posters and banners, BEASL also displayed some videos illustrating the virtues of bio energy and distributed a leaflet on the subject.
BEASL wishes to thank all the Corporate Members and the Council Member who manned the stall during this period.

'Desha Shakthi Demonstrates at the BMICH stall'