

To: Gunasekara, Mandy[Gunasekara.Mandy@epa.gov]
From: Eames, Frederick R.
Sent: Fri 4/7/2017 4:12:50 PM
Subject: RE: Coal technology

You mentioned three types of technology you would like to discuss:

- High efficiency low emission (HELE) technology
- Ultra supercritical technology (USC)
- Integrated gasification combined cycle (IGCC)

Here's some quick background.

- HELE technology is a broad category. Probably the two main technologies under HELE would be the other two categories above - USC and IGCC. There are other types, but those are the main two.
- USC needs some brief explanation. An "ordinary" coal-fired power plant is fired by pulverized coal. The coal is smashed into powder and combusted in a chamber. The heat turns water to steam, and the steam turns a turbine. Plants before about the mid-80s, I believe, were subcritical. They had an efficiency of turning coal into power of about 33%. Supercritical plants operate at higher temperature and pressure and might have an efficiency of 37-40%. Ultrasupercritical plants operate at even higher temperature and pressure and might have an efficiency of 45% or so. To get to the higher temperature/pressure you need different metallurgy, design, etc.
- IGCC doesn't burn the coal, it essentially bakes it under pressure. The result is a set of chemical streams - a syngas that gets burned to produce power, CO₂, and some other streams that typically are turned into fertilizer or its components.

There are only a few large IGCC facilities for electricity in the US: Edwardsport (Duke, IN), Polk (TECO, FL), and Kemper (Southern, MS). There are a number of smaller ones that use biomass.

-----Original Message-----

From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Friday, April 07, 2017 11:41 AM
To: Eames, Frederick R.
Subject: Coal technology

Can you send me the types of coal technology that Roxann will be briefed to discuss?

Sent from my iPhone