



## Application Note: Power Generation - COAL

According to the International Energy Agency, coal is the world's second source of primary energy, namely for power generation. Over 40% of the world's electricity is produced from coal. Unfortunately, pulverized coal plants are the most carbon-intensive source of power generation. Efforts to reduce CO<sub>2</sub> emissions from coal plants involve the transition from subcritical to supercritical (and ultra-supercritical) technology and the development of carbon capture and storage technologies. Progress on both is slow, however opportunistic for industrial equipment manufacturers.

### HMI's for Coal OEMs

Most modern original equipment manufacturers (OEMs) use in coal-powered plants integrate an HMI into their machines to enable local operator control and to view production statistics including error conditions and alarms. HMIs in coal-fired power generation plants can be found in the following OEM devices:

- Coal pulverizing equipment
- Coal feeder equipment
- Boilers or furnaces
- Turbines
- Cooling system including pumps
- Generators
- Steam/water condensers
- Exhaust and waste scrubbers
- Ash management systems



### Using Beijer HMIs in Coal-burning Power Applications

Beijer Electronics' rugged iX HMIs are designed to operate in the harsh and environmentally challenging conditions that can be found in most coal-burning power plants. They support a myriad of controls applications. The breadth of Beijer's iX HMIs allows them to be sized and integrated into the spaces and controls requirements specified by the OEMs.

### Environmental Considerations

- High vibrations – extended and extreme shock and shaking
- Extreme heat and cold – as low as -30° C and as high as 70° C
- Direct sun – display readability and UV durability
- Dust – coal dust and ash
- Water – rain, snow, fog, humidity, hose/wash-down
- Hazardous – gases and vapors (UL Class I Division 2, ATEX Zone 2 and IECEx Zone 2)

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### Controls Applications

- Speed – motors, turbines, fans, engines, conveyors
- Flows – valves, meters, regulators
- Electrical – voltages and frequencies
- Temperature, pressures and fluid levels – water, coolant, fuel, lubricants
- Performance indicators – warnings for abnormal conditions
- Emissions – monitoring, measuring and recording
- Time settings – operating time, preventative maintenance

### Configuration, Sizing & Integration

HMI displays must be sized for the application. HMI displays range in size from 3'-5" on the low-end, 7"-12" in the mid-range, and 15"-24" on the high-end. For most coal-burning power control and management systems, the biggest need is in the mid-range sizes. HMIs understand the controls intelligence in the equipment. Some machinery use standard controls protocols like Modbus, whereas others use proprietary ones. The HMI must support both serial and Ethernet-based data communication protocol. Beijer's iX HMIs are designed to give OEM manufacturers maximum flexibility.



### Why Rugged HMIs from Beijer Electronics?

Beijer's iX HMIs are advanced operator terminals that provide remote access and control. The iX HMIs can be configured to log events and activities. These logs can be pushed or pulled into standard formats for analysis, trending and long-term storage. The alarm viewer provides real-time awareness of abnormal conditions. Operators can view system and component manuals, videos and web pages for quick and accurate access to pertinent information. The operator interface terminals provide the control, data repository, and drill-down capabilities for administrators and technicians, whether they are physically next to the OEM devices or connected remotely. Beijer's [rugged iX operator terminals](#) address most of the requirements needed by many OEM devices used in coal-burning power plants.

### References

- International Energy Agency, <http://www.iea.org/topics/coal/>
- US Energy Information Administration, <http://www.eia.gov/>
- World Coal Association, <http://www.worldcoal.org/>

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