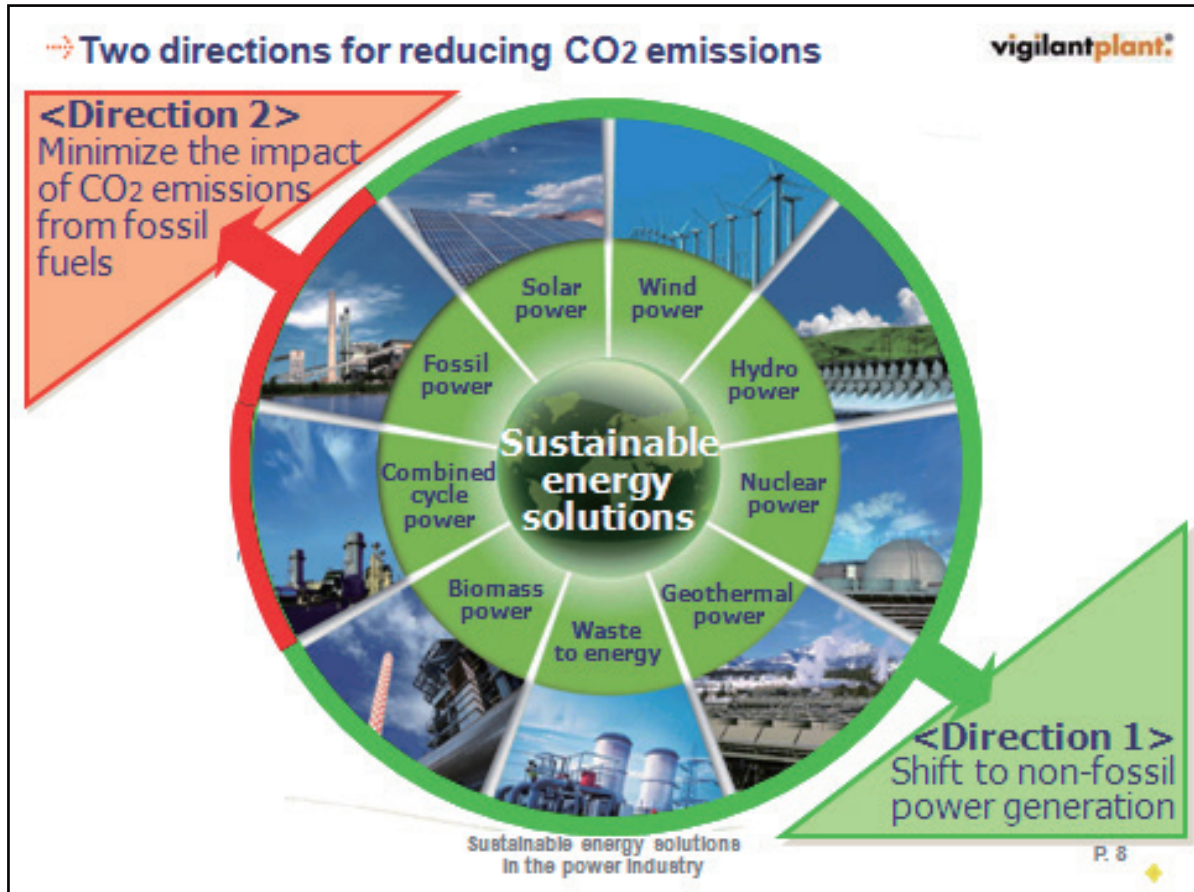


## Carbon Dioxide Emissions Reduced in Power Plants

### Features

- ◆ Contributing to carbon dioxide reductions in the control domains of various power plants.
- ◆ Promoting renewable energy > Direction 1
- ◆ Realizing highly efficient, environmentally friendly operations of thermal power plants which inherently emit large amounts of carbon dioxide > Direction 2

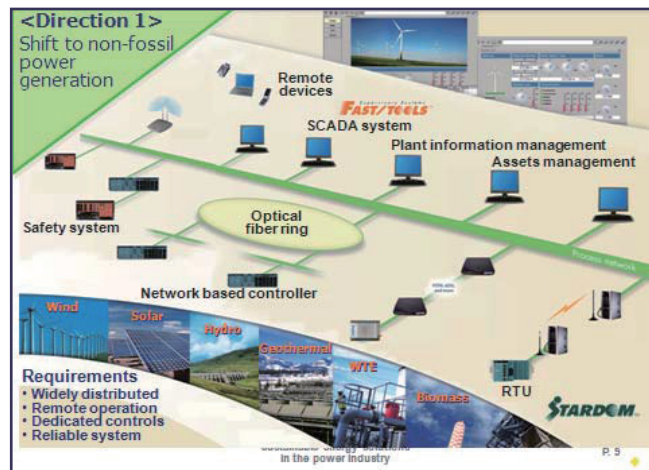
### Basic Concept or Summary



As shown in the diagram above, carbon dioxide emissions can only be reduced through commitments to renewable energy or improvements in efficiency of operations at thermal power plants and they both must be carried out on a global scale. Yokogawa offers controls that contribute to achieving reductions in both these directions.

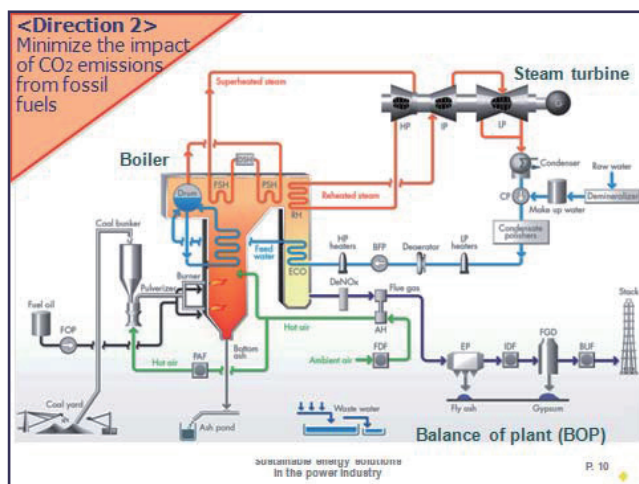
**Direction 1** ➤ Enabling control of ever-diversifying and advancing renewable energy production to help popularize use of renewable energy

- Solutions:
- Innovative web-based SCADA system
  - Multi-sensing digital technologies



**Direction 2** ➤ Modernizing instrumentation to increase operation efficiency of thermal power plants which inherently emits large amounts of carbon dioxide

- Solutions:
- Control systems that improves plant operation efficiency
  - Optimization of combustion control with the latest combustion gas analyzer



### Example of improvements

In the case of a coal-fired thermal power plant with an output of 300,000 kilowatts:

- Efficiency improvement: Approx. 0.3 to 1%
- Exhaust gas reduction: Approx. 3 to 10 kilotons of carbon dioxide per year
- Economic gains: Approx. US\$0.3 to 1.1 million per year

### Effects or Remarks

- ◆ Plant operations are clearly visualized and controls more rapid yet accurate, thus enabling more efficient operations and ultimately contributing toward reducing carbon dioxide emissions while also contributing toward maximizing users' profits.
- ◆ Adequate plant efficiency is realized without large scale revamp, such as modifying boilers or turbines, simply by converting, to an advanced system, the controls that make up the nervous system of a power plant.
- ◆ Optimum control technologies suitable for the application, such as geothermal, hydraulic, and biomass plants, are provided.

### Installation in Practice or Schedule

Contact us for details.

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