

HEAT

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& new York Times April 13, 2008 by Abby Schultz

Sizing Up the Utilities, if Carbon Caps Take Hold By ABBY SCHULTZ

Published: April 13, 2008 The following description is not from Schultz. It was added to add understanding of cooling.

Cooling towers, as their name suggests, are huge tower-like structures that are used to cool industrial fluids or water using the **principle of evaporation**; through the use of fans or other natural drafts. The most well known or recognizable types of cooling towers are probably the **rounded hourglass cooling towers that are used by nuclear power plants**. These are among the largest types of cooling towers that are used. Cooling towers have a wide array of use in the industrial sector and are expensive industrial equipment. A **cooling tower is designed mainly as either a: cross flow, counter flow, closed loop or open loop system**. The **hourglass shape of some towers is very efficient as these types of towers do not use fans to move air across heated water or other liquid**. **In this system, the warm water or liquid transfers its heat to the air at the bottom of the cooling tower**. The warm air then rises and draws more cool air into the bottom of the tower to replace it. When the cool outside air rushes over the warm water at the bottom of the tower, it also starts to rise and the cycle is continuously repeated. **Question: This cooling tower cools by evaporation(changing state from a liquid to a gas) 100,000 gallons of water per minute. How much heat in calories/min are extracted in this cooling tower? Hint: 3.785 liters = 1 gallon. Latent heat of vaporization for water is 540 calories/gram. Answer: 2×10^{11} cal/min.**

