

Reading Questions for Class 2 (May 2)

Introduction, Coal Use

Chemical Engineering 733

1. Compare the types of electric power generation (i.e., demand) in the United States by region (for example, Northeast, Northwest, etc.) versus population.
2. What is the trend in coal consumption since 1990 in the world and in the United States, China, Germany, England, and South Korea? Look at the following [website](#).
3. What is the current percentage of electric power generation in the United States from coal, natural gas, oil, nuclear, hydroelectric, biomass, solar, wind, and geothermal sources?
4. How does electric power generation vary between the top 20 electric power use countries? Discuss the differences.
5. Describe the main features of a pulverized coal-fired utility, including the cycle used for power generation. Why don't utilities use more advanced cycles or combined cycles?
6. Describe how coal is classified according to rank in the United States, including how the appropriate ASTM analyses are performed. What are the pluses and minuses of this system?
7. Where are the main coal fields in the United States located? Where in the United States is the highest potential for biomass use for electric power generation?
8. What are some of the problems with switching from coal to biomass combustion for electric power production?
9. Describe what the Argonne Premium Coal Samples are, how they are used, and what other coal sample banks are available. Why are these coal banks valuable?

Possible sources:

- Chapter 2 of text (Smith et al.)
- DOE Annual Energy Review (<http://www.eia.doe.gov/aer>)
- [Biomass chart](#) (see biomass section for this class)
- https://www.gem.wiki/Existing_U.S._Coal_Plants
- <https://www.iea.org/>