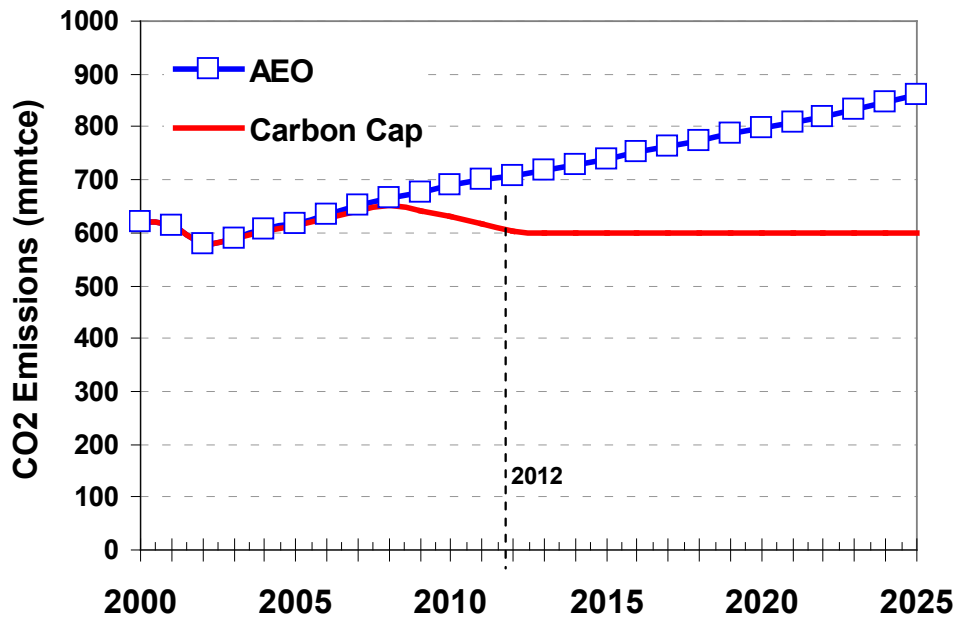


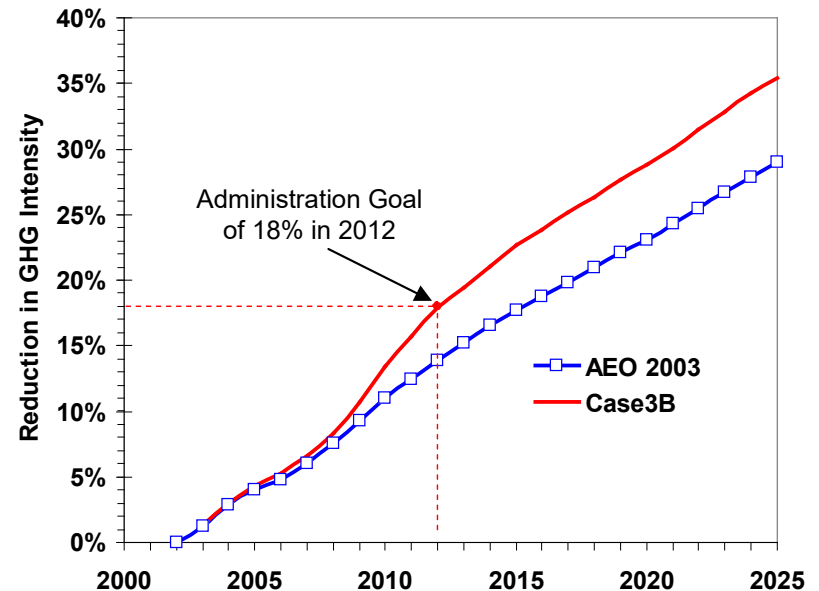
NEMS Scenario

A carbon constraint is applied to the electricity sector for technologies with carbon sequestration to be built. The NEMS scenario chosen for this study includes the Clear Skies Act. The carbon cap is applied through a cap-&-trade market-based system.

**Carbon Cap & Emissions
from the Electricity Sector**



GHG Intensity Created by Carbon Cap



Discussion of the process to setup NEMS cases for the Decision Tree

The first step in setting up the NEMS cases is to calculate capital costs and heatrates that will give the desired increase in plant cost-of-electricity (COE) for each of the eight branches of the Decision Tree. From the definition of levelized COE, the following equation for Capital Cost was derived (to simplify this estimate, depreciation and taxes are ignored):

$$\text{Capital_Cost}_{IGCC+S} = 8760 \cdot CF \cdot AF_2 \left[\frac{\%COE \cdot COE_1}{100} \right] - 8760 \cdot CF \cdot AF_2 \left[\frac{NPV_{fixed_O\&M2} + NPV_{variable_O\&M2} + CF_2 \cdot W_2 \cdot (a \cdot H_1) \cdot C_{coal} \cdot (8760/10^6)}{8760 \cdot W_2 \cdot CF \cdot AF_2} \right]$$

where

the subscript 1 is for IGCC

the subscript 2 is for IGCC+S

CF is the capacity factor

AF is the annualizing factor: $AF = \left(\frac{(1+i)^n - 1}{i(1+i)^n} \right)$

The AF converts a NPV into a series of equal annual costs or payments as a function of the interest rate and term.

W is the plant output in kW

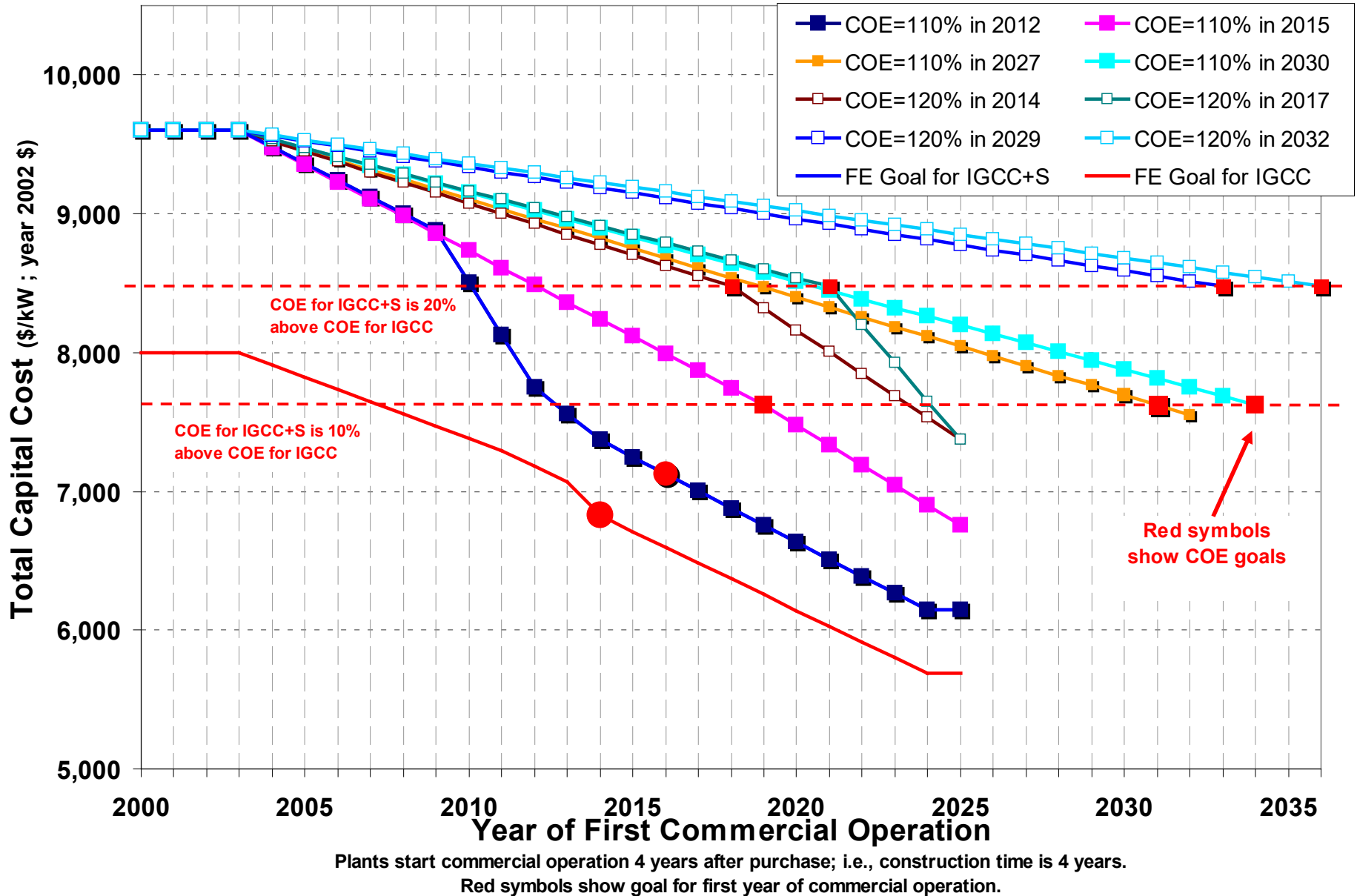
H is the heatrate

C_{coal} is the cost of coal in \$/mmBtu

Delayed Heatrate for Input to NEMS

Adv. Power Plant with Carbon Sequestration

for Risk Analysis by NAS Committee on Sequestration



Delayed Overnight Capital Cost for Input to NEMS

Adv. Power Plant with Carbon Sequestration

for Risk Analysis by NAS Committee on Sequestration

