



Cap and Trade among Five Western States and Minnesota

1. The assumptions we adopted in our simulation model are summarized as follows:

Case I: (A) five western states only; (B) five western states plus Minnesota

- the simulation target year is 2020
- all sectors are included in the emission accounting and mitigation effort
- all GHG emissions are considered
- all gross emissions (excluding sinks) are considered
- all emissions are consumption-based
- all permits are grandfathered
- offsets are not included
- no safety valve (permit price limit) is included
- marginal cost curves embody direct mitigation costs only
- marginal cost curves do not include various transactions costs
- marginal cost curves do not distinguish between producer vs. consumer allocation of permits
- marginal cost curves of Arizona and New Mexico are developed based on mitigation costs and related implementation mechanisms of individual policy options presented in CCS reports of the respective State Climate Change Action Plans
- marginal cost curves of California, Oregon, Washington, and Minnesota are developed by a parametric shift method using New Mexico's marginal cost curve as a reference; the parametric shift rule assumes a direct relationship between the slope of the marginal cost and the carbon intensity of a state.
- emission caps for the five western states are 15% below 2005 levels by year 2020
- though Minnesota has state GHG mitigation goals to reach 15% below the 2005 emission level by 2015, 30% by 2025, and 80% by 2050, we assume a same emission cap for Minnesota in 2020 as the five western states in the simulations

Case II: (A) five western states only; (B) five western states plus Minnesota

- same assumptions as for Case I, except:
- assumes half the cost-saving mitigation level for each state, i.e., the marginal cost curves are shifted upward so that the zero marginal cost level occurs at half the emission reduction level of Case I; this represents the worst-case condition, or upper-bound cost estimate, for each state to join the cap and trade mechanism

2. The model yields the following general results:

- GHG emission reductions for each state before and after permit trading
- Cost of GHG emission reductions for each state before and after trading
- Number of permits traded (bought and sold) by each state
- Equilibrium permit price
- Cost savings for each state of joining the Cap and Trade mechanism