

The power of markets to increase ambition

New evidence supports efforts to realize the promise of Parisⁱ

Summary:

Carbon pricing policies are a promising tool to combat climate change, as they can lower the costs of achieving a given target emissions level. These cost savings can translate into deeper cuts in climate pollution, and potentially lower political barriers to more ambitious goal-setting.

New EDF modeling results have found that reinvesting the cost savings from a global emissions trading system over the period 2020-2035 would nearly double the emissions reductions under current national Paris Agreement pledges (“NDCs”), at no added cost.

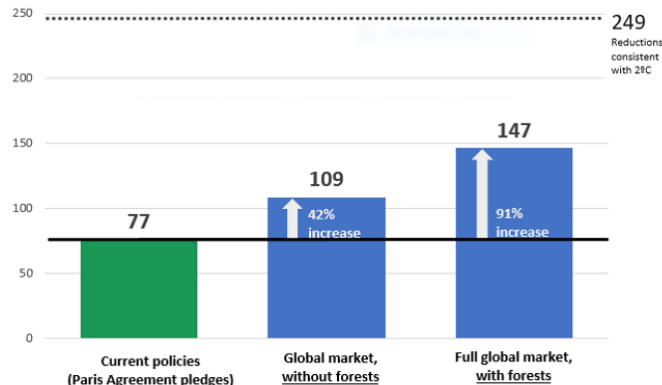
Specifically, EDF’s latest economic analysis indicates that:

- Employing global emissions trading to meet Paris Agreement pledges could reduce total mitigation cost by up to 79%.
- Reinvesting these cost savings into greater emissions reductions would nearly double the cumulative emissions reductions from 2020-2035 relative to current NDCs.
- Including forest credits, such as REDD+, enabled large ambition gains in international trading simulations (38 billion

tons of added reductions, out of 70 billion tons of total ambition gains).

- Even cases of partial regional coverage saw sizable ambition increases at no added cost.

Total emissions reductions from 2020-2035 in billion tonnes CO₂e



Emissions reductions from market scenarios relative to current policies, with and without forests.

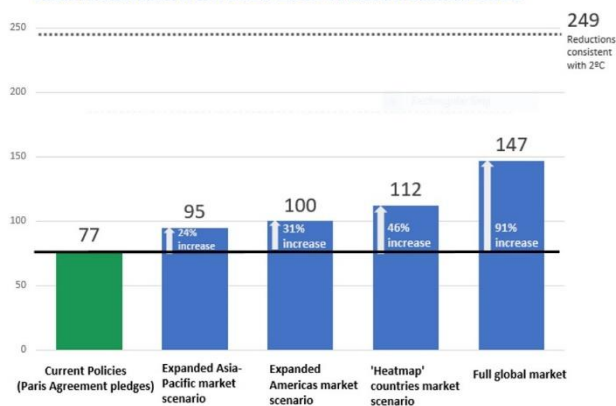
Although the expanded use of carbon markets can make a significant dent in the “ambition gap” even without increasing total costs, EDF’s analysis makes clear that keeping the rise in average global temperatures below 2°C by the end of the century will require significantly more mitigation, and hence additional investment.

Methodology:

EDF employed a partial equilibrium model of carbon markets to conduct a quantitative analysis of the cost savings under various scenarios for domestic and international emissions trading—as well as the corresponding escalation in reductions that would result if those cost savings were translated into greater ambition.ⁱⁱ Key assumptions are:

- Mitigation potentials include energy (including transport) and industry sectors, as well as avoided tropical deforestation, and the six major greenhouse gases (carbon dioxide, methane, nitrous oxide, SF₆, HFC and PFC).

Total reductions from 2020-2035 in billion tonnes CO₂e



Emissions reductions under various scenarios for market coverage, holding total cost constant.

- Nations achieve their NDC emissions reductions targets based on an annual trajectory that establishes an absolute limit on emissions; similarly, international aviation meets its international mitigation commitments under ICAO.
- Trading occurs based on a least-cost approach across participating nations and sectors based on marginal abatement cost curves.
- Full accounting transparency is in place for all trades of emissions reductions such that all traded units represent real mitigation and there is no double counting of reductions towards more than one international commitment.
- Banking (carry forward) of emissions units (based on emissions below the annualized target trajectory of NDCs) is permitted and occurs to the point where banked units appreciate at the rate of interest (plus a risk premium in the case of policy uncertainty).

As a sensitivity scenario, EDF also modeled the carbon market with a “risk premium” that gradually declines over time, which reflects how uncertainty over future policies is likely to discourage banking emissions reductions for use in future periods compared to the case with full market certainty.

As it may not be reasonable to expect full global participation in international carbon markets, EDF considered three cases for partial market development in addition to a full global market, building from a “heat map” that ranked countries by their societal readiness and strategic value in implementing carbon market pricing.^{iiiiiv}

The three scenarios considered were:

- (1) an Asia-Pacific market scenario;
- (2) an Americas market scenario; and
- (3) a scenario with all top-ranking “heat map” jurisdictions.

EDF compared the cost savings, and commensurate increases in ambition, for each scenario to the amount of ambition in current Paris pledges, as well as to the gains from a full global market. We also ran scenarios with and without the inclusion of REDD+ credits in trading schemes.

ⁱ Analysis conducted by Pedro Piris-Cabezas (ppiris@edf.org), Ruben Lubowski (rlubowski@edf.org), and Gabriela Leslie, Environmental Defense Fund, 20 March 2018

ⁱⁱ Piris-Cabezas et al. “Carbon prices under carbon market scenarios consistent with the Paris Agreement: Implications for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA).” EDF, 2018. Web. https://www.edf.org/sites/default/files/documents/CORSIA%20Carbon%20Markets%20Scenarios_0.pdf

Results:

International trading greatly increases emissions reductions at no additional cost

EDF’s model found that reinvesting the cost savings from a global emissions trading system over the period 2020-2035 would generate nearly double the amount of emissions reductions, at the same total cost as current NDCs. Global climate ambition increased from 77 GtCO_{2e} in the non-trading base case to 109 GtCO_{2e} without REDD+, or to 147 GtCO_{2e} with REDD+. The high-bound amounts to a 91% increase in climate ambition compared to current NDCs. This helps the world move from roughly 30% to 60% of the necessary reductions along a 2-degree consistent trajectory over 2020-2035. Moreover, if market actors are able to anticipate future increases in ambition and bank reductions, this could help the world reach a 2-degree consistent path sooner and avoid foreclosing the possibility of better climatic options.

Even partial coverage of carbon markets could lead to more ambitious climate targets, at no added cost

For instance, a regional carbon market in the Asia-Pacific region yielded a 24% increase in climate ambition. A regional market across the Americas - which might evolve from the Western Climate Initiative and Carbon Pricing of the Americas declaration - yielded a 31% increase in climate ambition. Lastly, a market across 25 countries EDF identified as being best placed to implement carbon pricing (based on a previous analysis) yielded a 46% increase in climate ambition.

Linking markets increases ambition

Across all scenarios, international linking led to the lion’s share of the gains from global markets, with a much smaller share coming from increased use of *domestic* carbon markets to meet national targets. This suggests that carbon pricing policies that encourage international cooperation—such as carbon markets—may be able to capture significantly more cost savings, and thus increased ambition, than carbon pricing policies that are less prone to linkage.^v

ⁱⁱⁱ G. Leslie and R. Lubowski. (2018). “Strategic assessment of priority jurisdictions to advance carbon pricing: A carbon markets heat map” Environmental Defense Fund. Washington, DC. Manuscript.

^{iv} Notably, the heat map analysis ranks countries based on their readiness and importance in terms of emissions (both directly and via links to other important countries), rather than in terms of their ability to maximize gains from trade in a market system.

^v For more information, see:

https://unfccc.int/sites/default/files/resource/236_Talanoa%20submission%20carbon%20markets%20potential%20EDF%20April%202023.pdf