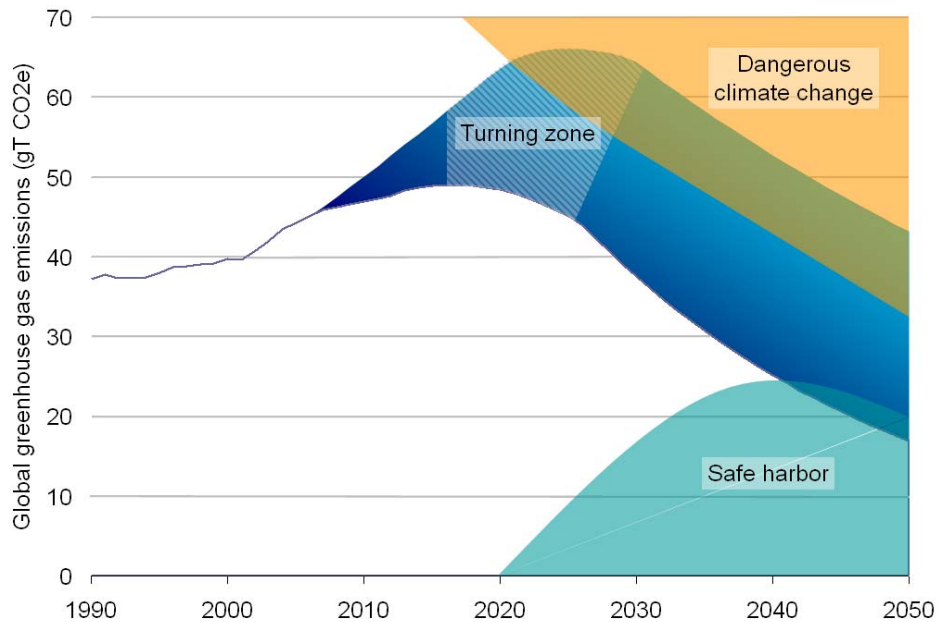


Turn toward climate safety

The science is compelling. We are heading in the wrong direction, and we are running out of time. The critical period is from now until 2020, when global emissions must begin to decline. The sooner the turn, the greater is the chance that we can avoid the most dangerous consequences.¹



Start turning now

We need to start putting the tools in place now to achieve this “turn toward safety.” The longer we wait, the more dangerous, difficult and expensive it will be. The United States must lead this effort and put a strong cap on its emissions. Others, most notably the European Union, have already taken on the challenge. But they and others need to strengthen and expand their efforts after the United States has acted.

The magnetic force of markets

The best and most efficient way to make the turn is for major emitters to harness the power of innovation and markets, making investments in clean energy sources more profitable than the dirty alternatives. A market that rewards entrepreneurs for finding better, cheaper and faster ways of cutting emissions acts like a magnetic field. It draws private capital toward low-carbon, high-efficiency economic activity. Businesses in large emerging economies, where most clean energy investment will take place, do not want to be left out of this opportunity.

A global opportunity

Businesses, entrepreneurs and innovators will lead the way toward lower emissions once the economic signals are clear. Not every nation is in a position to embrace carbon markets immediately, but all major emitters can act now to put the institutions and guideposts in place to steer their economies toward a low-carbon future and the world toward climate safety.

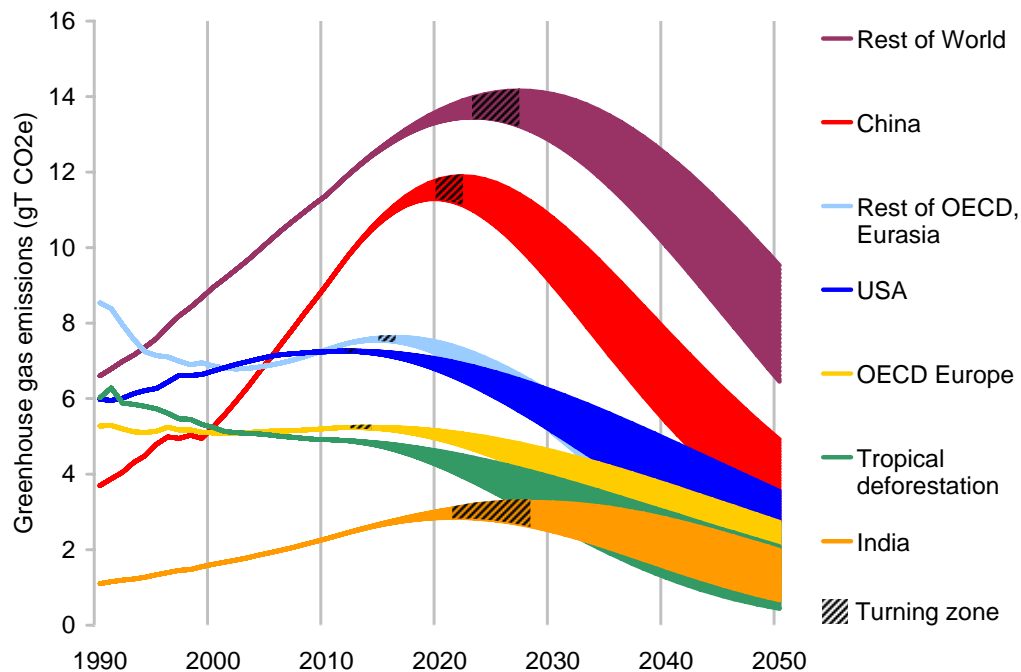
This paper sets forth the actions needed to start the turn toward safety.

Seven key elements

The science presents a world of opportunity for businesses and a challenge for policy makers. The principal building blocks that need to be put in place for the turn toward safety are:

1. **pass a strong U.S. cap-and-trade system:** emissions must peak before 2012 and decline at a rate that approaches 4 percent per year by 2020 or shortly thereafter;
2. **expand and tighten the European emissions trading system** to remain on a declining path and achieve reductions of 4 percent or more per year as quickly as possible;
3. **cap remaining OECD, Russian and Eurasian emissions** and ensure that emissions peak no later than 2015 and soon decline at an increasingly steep rate;
4. **decrease emissions from deforestation** globally to at least 20 percent below present levels by 2020;
5. **adopt concrete plans for large emerging economies** to peak emissions by 2020 or shortly thereafter and start on a rapid downward slope;
6. **enable other countries to create domestic carbon markets** and provide access to the global market through docking stations;
7. **offer financial aid to the poorest countries** to adapt to the most difficult consequences of climate change as they commit to clean development paths.

Together, these seven elements, which need to be in place by 2015 at the latest, can provide the platform for a transition to global climate stability.



This graph shows when the emissions of various nations and regions need to peak to achieve the turn toward climate safety.¹

Funding the turn

Financing currently available for climate mitigation amounts to roughly \$50 billion annually.² About \$5 to \$10 billion come from international government funds, both bilaterally and via multilateral channels. The rest comes from private investments, \$10 billion of which comes directly through the carbon market. Early estimates of the cost of reducing global emissions in developing countries range from \$100 to \$600 billion per year by 2020.³ Government funding may increase but cannot make up the difference. The private sector can.

Total global investment is around \$20 trillion. Foreign direct investment in developing countries alone is over \$600 billion.⁴ Much of the financing of the turn toward safety can simply come from funds we are currently prepared to spend on polluting fossil fuels. We now spend \$5 trillion annually on them, \$200 billion alone on fossil fuel subsidies.⁵ The kind of steep downward trajectory in emissions that is necessary will be extremely effective in redirecting large funds toward clean technologies.

It is crucial here to recognize the limits of current carbon markets. Capital flows to developing countries now happen primarily via Clean Development Mechanism (CDM) projects. But these project-by-project offsets do not allow for true scalability and cannot provide the many billions required to fund the transition to a low-carbon, high-efficiency economy.

The power of innovation and clear economic signals

Reducing emissions steeply soon is a tall order, but it can be done. It has been done. In the 1990s, the United States instituted a national cap on sulfur dioxide emissions in hopes of curbing acid rain. The program exceeded all expectations and essentially solved the U.S. acid rain problem within a decade at a fraction of the expected costs.

The history of markets and technological innovation demonstrates powerfully that the introduction of new technologies is often explosive rather than linear. Growth in technologies usually follows an S-shaped curve: slow start, rapid acceleration, and then tailing off at the end once the new technologies are ubiquitous. When innovations catch hold and are propelled by market forces, they spread more widely, quickly and cheaply than anyone beforehand was able to predict.

We would fully expect climate change to follow this pattern. To send the unmistakable signal needed to drive investment and innovation requires hard caps on absolute emissions. The entire system has the name “cap and trade.” It should really be called “rewards for innovation.”

Docking stations and CLEAR: financing the low-carbon transition

We need to find ways for all major emitters to participate in the global transition, recognizing that different countries may require different mechanisms and time scales.

Docking stations — provisions in a global treaty or domestic law that connect nations to carbon markets — provide this flexibility.⁶ They can be designed to allow countries to join as and when they are ready. Reducing Emissions from Deforestation and forest Degradation (REDD) is one example of a docking station. Small Island Developing States are exploring their own.

Another template for docking stations is called CLEAR — short for “Carbon Limits + Early Action = Rewards.” CLEAR enables developing countries that so choose to limit emissions on an accelerated basis. At the same time, it generates additional upfront investments through the carbon market.

CLEAR can be a powerful mechanism in emerging economies to jumpstart innovation and drive the turn toward safety. It highlights the power of market incentives and the importance of capping emissions early.

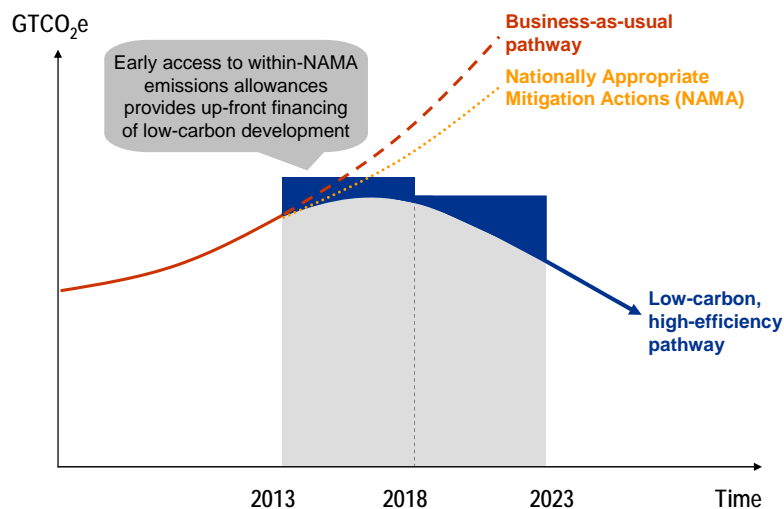
CLEAR mechanism

CLEAR is designed to hasten the turn toward safety by generating upfront capital flows for transformational change in emerging economies, within a framework that is consistent with the goal of limiting warming to 2°C.

The CLEAR approach offers a collaboration between developed countries and emerging economies. Funding comes through three channels, all of them enabled by and linked to a commitment to cap absolute emissions in major sectors of a country's economy:

1. Economies that adopt Nationally Appropriate Mitigation Actions (NAMAs) placing binding absolute emission caps on key sectors could gain early access to emissions allowances and the funding those allowances can deliver.
2. The supply of CLEAR allowances could be linked to more stringent emissions reductions in industrialized countries — e.g. the European proposal of reducing emissions 30 instead of 20 percent below 1990 by 2020.
3. Some portion of CLEAR tons in the initial years may represent a “premium budget,” which draws on a small amount of atmospheric capacity up front in order to drive and finance the long-term downward trajectory that is so essential. This approach must be limited and accompanied by tight safeguards to ensure that any such tons are being used to finance the most cost-effective investments possible.

In all three cases the rationale is the same: a relatively small allotment of tons from a “positive” cap helps finance the transition from business-as-usual to a peak-and-decline course.



Another important consideration is the impact on the global carbon market. While CLEAR can support a gradual expansion of carbon market benefits to developing countries, the supply of CLEAR tons must be managed to maintain investment incentives in compliance carbon markets. This dynamic requires a careful balance. More stringent emissions reductions in existing compliance markets can help, by assuring sufficient demand for CLEAR tons.

In the end, relatively small physical quantities can generate large financial flows. For example, 0.4 gT CO_{2e}/yr of allowances can generate roughly \$20 billion per year at \$20/ton and a typical leverage ratio of 40:60. In any given country, a mere 40 mT CO_{2e} can generate \$2 billion, a sum in line with incremental financing requirements in some key emerging economies. CLEAR is a powerful tool for generating large sums fast.

Fast forward to the future

We know the turn toward safety must come soon. The clock is ticking.

We know that with clear economic signals we can redirect much of the capital we were preparing to spend on carbon-intensive infrastructure to financing the turn toward safety.

And we know that within the next decade all major emitting countries must get on a downward trajectory in carbon emissions.

The task before us now is to get to a global deal that makes this happen — without delay.

For more information, please contact:
international@edf.org | +1-202-387-3500

Version 091103, http://www.edf.org/documents/10483_Turn_Toward_Safety.pdf

¹ Graph based on IEA and other emissions data; EDF analysis of avoiding warming in excess of 2°C above pre-industrial temperatures, assuming various probabilities and climate sensitivities.

² Figures from New Energy Finance (2009), UNFCCC (2008) and World Bank's *State and Trend of the Carbon Market* (2009).

³ The lower bound of \$100 billion comes from Project Catalyst (2009) and European Commission's *Stepping up international climate finance* (2009); the upper bound comes from IEA's *Energy Technology Perspectives* (2009).

⁴ UNCTAD estimates Foreign Direct Investment to developing economies in 2008 to be \$620 billion.

⁵ Fossil fuel subsidy figure from UNEP's *Reforming Energy Subsidies* (2008).

⁶ See http://www.edf.org/documents/10484_Docking_Stations.pdf