CLIMATE CHANGE AND THE ECONOMY

Myths versus Realities

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Climate Change and the Economy: Myths versus Realities

At the end of this year, representatives of the 192 nations that are signatories to the United Nations Framework Convention on Climate Change (UNFCCC) will meet in Copenhagen, Denmark, to forge a successor agreement to the Kyoto Protocol which expires in 2012. According to the scientists of the Intergovernmental Panel on Climate Change (IPCC), if this new global deal is to succeed in limiting climate damage, developed nations will need to agree to begin sharply reducing their greenhouse gas emissions over the next decade, and large, fast-growing developing nations will need to begin significantly curtailing their emissions growth.

A number of influential voices in the world community have, however, begun to question these efforts. With a world sunk in a deep recession, they say, now is not the time to divert scarce resources to reducing greenhouse gas emissions. Climate change is a long-term threat, while the recession is a near-term reality. Tackling climate change will be expensive, cost jobs, hurt national competitiveness, and generally make bad economic times worse. We should wait until the economy is stronger, the threat from climate change is clearer, and new low-carbon technologies are less expensive. Right now we can deal with either fixing the economy or addressing climate change—not both.

This paper will argue that the choice between the economy and the climate is a false one; a myth. The reality is that the transition to a low-carbon economy, if done right, has the

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potential to stimulate economic growth, create jobs, and bring benefits to consumers. The ‘costs’ of this transition, are in fact investments in new, 21st century infrastructure that will pay off for generations to come—just as the ‘costs’ of investments in electrification, highways, and the internet paid off with very high returns for the societies that made them in the 20th century.

Clouding both international and domestic debates are a series of myths about what it will take to shift to a low-carbon economy; the costs, impacts, distributional consequences and policies. In this paper we summarize a broad array of studies from scientists, economists, and other experts from around the world, as well as research by McKinsey, to counter ten of these myths and provide some evidence on what reality might look like.

The view that emerges is that fears of economic damage due to efforts to address climate change are to a large extent unfounded, and the potential benefits are underappreciated. This does not mean that shifting course in the timeframe required will be easy. Nor will countries avoid making difficult trade-offs between addressing climate change and other priorities. But it does mean that, with the right policies, market-based incentives, financing mechanisms and technologies, it should be possible for most countries to combine goals for climate security with goals for economic, energy, and national security.
Myth 1
We can wait

Reality
We have a decade or less to act; waiting will significantly increase risks and costs

The science tells us that if global average temperatures rise by more than 2°C above pre-industrial levels, we risk widespread damage to the climate and human society. Potential effects include the flooding of coastal cities, large-scale crop failures, loss of fresh water supplies to billions of people, the spread of disease, and mass extinctions of species. Many of the effects of climate change will play out over the decades to come, but as the IPCC reported, there is “high confidence” in the scientific community that we are already seeing the impact of climate change on ecosystems throughout the world today. Even below 2°C we will experience significant changes to the climate that could cost hundreds of billions of dollars to adapt to. But below 2°C there is a good chance we can adapt. The European Union has thus set as its policy that global warming must be contained to below 2°C.

In approximate terms, what determines temperature change is the stock of greenhouse gases in the atmosphere. That stock is measured in parts per million (ppm) of carbon

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Impact of delaying action for 10 years
Global GHG emissions, GtCO₂ per year

Future global power generation capacity
GW

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* Technical levers <$90/tCO₂e
Source: McKinsey Global GHG Abatement Cost Curve v2.0; Houghton; IEA; OECD; EPA; den Elzen; van Vuuren; Meinshausen
dioxide equivalents (CO₂e). Researchers estimate that in order to have an 80 percent chance of limiting warming to 2°C the atmospheric stock of CO₂e must be stabilized at 400 ppm, while 450 ppm would give a 40 percent chance. A recent study by McKinsey & Company of the global potential to mitigate greenhouse gas emissions shows that if the world starts sharply reducing emissions beginning in 2010, we can just make it onto the 400-450 ppm path.

Delaying action by 10 years to 2020 forces a difficult choice. We can accept a 550 ppm path but that implies a 50/50 chance that warming will exceed 3°C; a level that scientists generally agree carries unacceptable risks. Or we can face dramatically higher costs of abatement. The stock and flow math of the atmosphere means that the added emissions during 2010-2020 must be made up for with sharper reductions post-2020 and more radical reductions generally mean higher costs. In addition, China, India, and other developing countries will be adding massive amounts of new infrastructure during this period. Seventy-seven percent of the world’s power capacity in 2030 is yet to be built— if that infrastructure is not built low-carbon, the world will either be ‘locked in’ to a high-carbon economy for decades to come, or face the higher costs of retrofitting existing infrastructure rather than building it low-carbon the first time.

McKinsey’s analysis shows that, with delayed action to 2020, getting to 450 ppm might not even be technically possible, and if it is, it will be significantly more costly than starting in 2010. If we start cutting in 2010 we can achieve the 450 ppm path with actions that all cost less than $90 per tonne of CO₂e abated (and whose average cost is less than $10 per tonne). If we wait until 2020, the volume of cuts will need to be much larger, and their costs could reach as high as $150-300 per tonne. The only factor that could reduce these costs would be some as-yet-unknown technology breakthrough. Thus waiting 10 years would present the world with a choice between much higher risks of climate change, greatly increased costs, or making a bet on major technology breakthroughs post 2020.
Myth 2
We should fix the economy first

Reality
Fixing the economy requires reducing fossil fuel dependence; otherwise we sow the seeds of the next crisis

The proximate cause of the global financial crisis may have been the collapse in the sub-prime mortgage market in the U.S., but the structural cause was the huge imbalances in the global economy that accumulated over the previous decade. In essence the U.S. ran large deficits with the rest of the world, in particular with Asia and the Middle East. Dollars flowing out of America were then recycled back as investments in U.S. Treasuries and other assets, keeping U.S. interest rates artificially low and blowing a series of asset bubbles in the stock, debt, and housing markets, which eventually collapsed.

A major contributor to U.S. deficits and the recycling of dollars has been America’s growing dependence on imported oil. As the New York Times columnist Thomas Friedman has put it, borrowing money from China to buy oil from the Middle East which is then burned is not a sustainable model for growth.
Oil imports further contributed to the crisis when prices spiked from $35 a barrel in 2005 to more than $140 a barrel in 2008 before collapsing back down to $35 more recently. Not only did this spike directly damage economic growth at a fragile point in the economic cycle, but also significantly complicated efforts by central bankers to manage the fallout of the credit crisis. In the first half of 2008, fear of inflation kept central banks from moving on interest rates as aggressively as they otherwise might have.

If the U.S. does not reduce its dependence on imported fossil fuels, there is a risk that the pattern of structural deficits will reappear after the current crisis is over, creating the risk of another crisis in the future. Although some believe that increased domestic drilling is the answer, the math does not add up; the U.S. has only 2.4 percent of the world’s proven reserves but consumes 24 percent of its oil. Others point to actions such as increasing auto mileage standards, encouraging the adoption of hybrid or plug-in electric vehicles, developing sustainable second-generation biofuels, and substituting renewables for oil-fired power, as solutions. Here, the math does add up but implies major changes to the energy system that powers the U.S. economy. Without such changes, however, it will be difficult for the U.S. and the world economy to enjoy a financially sustainable model of growth.
Myth 3
Reducing emissions will cost too much

Reality
The ‘costs’ are in reality investments that are manageable, and in many cases highly profitable

Moving to a low-carbon economy is largely about replacing high-emissions infrastructure with low-emissions infrastructure, e.g., substituting renewables and carbon capture and storage for conventional coal generation; energy-efficient industrial plants, buildings, and appliances for less efficient ones; hybrids, electric vehicles, sustainable biofuels, and super-efficient internal combustion engine vehicles for today’s vehicles.

The world’s stock of infrastructure has a natural lifecycle. A power plant lasts on average 38 years, an industrial plant 24 years, a building 15 years, and vehicles 15 years. There is thus a continuous flow of investment in the economy to replace existing infrastructure as it turns over in its lifecycle and to build new infrastructure as the economy grows. Assuming that the global economy recovers in the next 2 to 3 years, it is predicted that the world will spend about $16 trillion on fixed asset investments in 2020, rising to over $24 trillion by 2030. Solving climate change thus involves redirecting these massive flows of investment from high-carbon choices to low-carbon choices over the coming decades.

Global GHG abatement cost curve
Abatement costs versus ‘business as usual’, 2030
$ per tonne of CO₂e

Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below $90 per tCO₂e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.

Source: McKinsey Global GHG Abatement Cost Curve v2.0
The key question is whether low-carbon choices cost more, and if so, by how much? In a recent study, McKinsey examined more than 200 such choices in detail across 21 regions of the world and 10 major industry sectors. The team then measured how much CO₂e the low-carbon choices could abate versus a ‘business as usual’ scenario, and the incremental costs of those choices per tonne abated. The resulting ‘cost curve’ shows the actions ordered from least-cost to most-cost, with the width of the bars representing tonnes of potential CO₂e abatement and the height the incremental cost.

The bars on the left have a ‘negative’ cost, that is the low-carbon choices actually cost less than high-carbon ones. This is typically due to energy cost savings. For example the energy savings from a high-efficiency heating and cooling system will more than pay for its incremental cost. The bars on the right with ‘positive’ costs are where the low-carbon choices cost more than high-carbon ones. For example, most renewables currently cost more than fossil fuel power generation.

Overall, the study found that the world can get onto a path to 450 ppm with incremental investments of approximately $800 billion per year by 2020 and approximately $1,200 billion by 2030. While these numbers sound large, they represent only a 5 to 6 percent increase in the business as usual investment flows during those years. Given that these investments are in long-life assets, they would in reality be financed and their costs paid over time. The total incremental costs of going low-carbon would thus be $300-525 billion a year by 2030 or equivalent to less than half of 1 percent of global GDP projected for that year.

There are two reasons why the costs are less than might be expected. First, about a third of the actions required are on the left of the curve and save money. A separate study by the McKinsey Global Institute found that the average return on investment for such energy-saving actions was 17 percent – an attractive return for generally low-risk investments. Second, low-carbon technologies have made great strides over the past decade and even with relatively conservative assumptions on future learning curves, are becoming increasingly competitive with costs from traditional technologies.
Myth 4
Reducing emissions will reduce growth and cost jobs

Reality
Clean energy investments will likely stimulate growth, create jobs, and spur carbon productivity

While most estimates of the total cost of tackling climate change come in at up to 1 percent of GDP, this does not mean that GDP will actually fall by up to 1 percent or that economic growth will be slowed. When economists measure the costs of climate change in this way it is a useful method for comparing different scenarios (e.g., a low-carbon scenario versus a high-carbon one) but it does not translate directly into the kind of headline GDP numbers that one reads about in the newspaper.

How action on climate change would actually translate into headline GDP growth is somewhat more complicated but important. The key is how the incremental costs of low-carbon choices are paid for. To see this, try a thought experiment. Imagine that a law was passed limiting new car purchases to low-emissions vehicles and high-emissions vehicles would be phased out over time with an emissions tax or other policies. And imagine that a low-emissions vehicle costs on average $1,000 more than a traditional vehicle. The ‘cost’ of the policy would be $1,000 times the number of vehicles sold per year. But the fact that the policy has a cost does not mean that GDP goes down. In fact, the GDP of the auto sector would likely go up, as auto company revenue would go up by approximately $1,000 per car. Auto employment would also likely go up, at least temporarily, as the companies re-tooled for the new cars.

However, if the $1,000 came straight out of consumer budgets causing them to spend less on other things, the boost to the auto sector would be offset by declines in spending elsewhere in the economy. In GDP terms this would likely cancel out. But most consumers borrow to finance their vehicle purchases—this makes sense as autos are assets with a relatively long life. The most likely case is that consumers would include the incremental $1,000 in their borrowing. This means that auto sector revenue would receive a boost with little negative impact elsewhere in the economy. On balance, GDP would go up—the economy would grow faster. We are not necessarily advocating such a policy, rather illustrating that even where low-carbon investments have incremental costs, they can still stimulate economic growth.

The same logic holds true in the industrial sector. If an electric utility builds a wind farm rather than investing in the same capacity from coal, the incremental cost would be folded into the borrowing utilities typically do to finance their new plants. The incremental cost would be viewed as a boost in investment in the GDP accounts and GDP would go up. In many ways this should not be surprising. Shifting to a low-carbon economy requires a major, temporary boost in infrastructure investment spending. If this incremental
investment is financed, GDP and growth go up. History bears this logic out as temporary periods of increased investment spending, e.g., the build-out of the railroads, electrical grid, highways, and the internet, tended to stimulate GDP growth. The key is that the incremental borrowing required does not put a strain on the economy or increase interest rates. In the case of tackling climate change, as noted in the previous myth, the incremental capital required is on the order of 5 to 6 percent of investment flows.

It is this same logic that has led to discussions in the U.S. and other countries about the potential for a ‘green recovery.’ Many countries are planning to borrow to boost infrastructure investment as a way to help recover from the current crisis and re-start growth. Historical evidence suggests that each dollar invested in such infrastructure-led stimulus can boost GDP by $1.59. Under green recovery plans, some of that investment would be devoted to low-carbon infrastructure as a way of simultaneously pursuing climate and economic recovery goals.

Studies of specific countries also show the potential for low-carbon investments to be pro-growth. For example, the Centro Mario Molina working with the Mexican government and McKinsey recently conducted a study of potential low-carbon pathways for Mexico. The study concluded that Mexico could achieve significant cuts in 2030 emissions with a 5 percent boost in investment spending, which in turn would stimulate GDP growth by up to 1 percent per year.

Other studies have shown the potential for low-carbon investments to create greater numbers of jobs than high-carbon equivalents. For example a University of California, Berkeley study shows that solar power creates 7 to 11 times more jobs per megawatt hour over the lifetime of the plant than coal or gas. Likewise, a recent study of energy-efficiency policies in California showed that these created a net increase of some 1.5 million jobs during the period from 1977 to 2007 as consumers converted energy savings into demand for other goods and services. Analysis by Global Insight puts the net job creation from low-carbon investments in the U.S. at more than 3 million by 2028; enough
to halve the anticipated unemployment rate in that year. As with any major technology transition, there will be job losses as some sectors and companies win and some lose but the net impact on employment is likely to be highly positive as new growth industries are created.

That it is possible for an economy to grow and create jobs at the same time as carbon emissions shrink may sound counter-intuitive, but in fact should not be surprising. One way to measure economic growth and emissions together is, ‘carbon productivity’, which is the GDP output per tonne of CO\textsubscript{2}e emitted. This measure is similar to labor productivity, which is the GDP output per hour worked. Just as an economy can grow faster than its labor supply by increasing labor productivity, an economy can grow faster than its carbon emissions by increasing carbon productivity. The world currently produces $740 in GDP per tonne of CO\textsubscript{2}e emitted. If the global economy is to continue to grow at 3 percent while emissions are cut in half versus 1990 levels (an amount required to get on the 450 ppm path), then carbon productivity must rise to $7,300—a 10-times increase—by 2050. This is a substantial challenge but similar in kind to one the world has met before. During the Industrial Revolution, innovations in technology and social organization enabled U.S. labor productivity to jump 10 times from 1830 to 1955. By increasing carbon productivity we can cut carbon and grow the economy but to do so we will need a Clean Energy Revolution that happens at three times the speed of the Industrial Revolution.

![Carbon productivity increase required graph]

Source: Global Insight; IPCC; McKinsey analysis
Myth 5
Reducing emissions will lead to higher energy costs for consumers

Reality
Increased energy efficiency and use of renewables can stabilize energy prices and reduce total energy costs

"Energy prices will go up," is one of the most common arguments made by those concerned about the economic impact of addressing climate change. But just as estimates of the overall impact are modest, so too are estimates of the impact on households. In a meta-analysis of five peer-reviewed studies, the Environmental Defense Fund concluded that the impact of capping U.S. emissions would amount to less than 1 percent of household budgets over the next two decades and that household energy bills would rise by no more than a few dollars per month. For gasoline prices, the median estimated price increase was 13 percent over the coming decades, but to put this in context U.S. consumers have seen gas prices jump more than 50 percent three times in the past two decades due to the volatility of oil prices. Thus the impact of climate policies on consumers at the pump would be small compared to the impact of events in the oil market.
Longer-term, moving to a low-carbon economy has the potential to stabilize and ultimately lower energy prices. As shown in the exhibit, we estimate that climate policies, including an expansion in sustainable second- and third-generation biofuels, could reduce crude oil demand by more than 40 percent versus business as usual in 2030. This would relax the pressure on an oil production system that until the economic downturn was straining under increasing world demand. Less demand would lower prices and reduce volatility by freeing up buffer capacity. Although lower oil prices may also create a temporary ‘rebound’ effect, delaying the uptake of low carbon choices.

Technological progress and learning curves also have the potential to drive the costs of some low-carbon power sources below those of traditional high-carbon sources. In electricity, wind power is already cheaper than gas in some regions. Solar power is rapidly becoming cheaper and may fall below gas and possibly even coal power prices by 2020 if current learning rates continue or accelerate.
Myth 6
Reducing emissions will hurt trade and competitiveness

Reality
The impacts on trade are not as large as often described, with relatively few industries affected

Among the most vociferous opponents of action on climate are energy-intensive industries that trade internationally and who perceive emissions limits or carbon pricing schemes as giving an unfair advantage to competitors in countries who face no such burden. For the industries and companies directly affected these concerns are understandable, but the breadth and potential impact of the trade and competitiveness issue is often overstated. The claim that whole swathes of industry will go bankrupt or relocate to other countries is simply not borne out by the data. In the U.S., for example, only 1.6 percent GDP and 1.7 percent of employment is generated from carbon intensive exports, with most of this in chemicals, and the rest in four other energy-intensive basic materials industries. Furthermore, a large proportion of trade in these products is with other developed countries such as the EU and Canada who would likely apply similar carbon restrictions.22

Other studies show that energy costs are a small factor in the location decisions of most companies, again excepting for the few energy-intensive industries mentioned. There is little evidence from studies of existing schemes such as the EU’s Emissions Trading

<table>
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<th>Carbon-intensive exports’ share of U.S. GDP</th>
<th>100% = $13.8 trillion</th>
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<tbody>
<tr>
<td>Other manufacturing exports</td>
<td>92.2</td>
</tr>
<tr>
<td>Carbon-intensive manufacturing exports</td>
<td>6.2</td>
</tr>
<tr>
<td>Chemicals and chemical products</td>
<td>1.1</td>
</tr>
<tr>
<td>Iron and steel products</td>
<td>0.1</td>
</tr>
<tr>
<td>Non-metallic mineral products (incl. cement)</td>
<td>0.1</td>
</tr>
<tr>
<td>Non-ferrous metals (incl. aluminium)</td>
<td>0.1</td>
</tr>
<tr>
<td>Pulp and paper products</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>1.6</td>
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</tbody>
</table>

Source: Global Insight
System, the Kyoto Protocol, or state level regulation in the U.S., of significant leakage issues where production leaves one country or region for another in pursuit of lower costs from environmental regulation.

This is not to say that trade and leakage are not important issues but rather to say that they must be put in perspective—they are likely to affect a handful of industries that make up a small part of most developed country economies. The issues are complex, and may require some action to avoid leakage in the affected industries and assist them in transitioning to a new low-carbon regime, but they should not distract from the larger issues of moving to a low-carbon economy.
Myth 7
Tackling climate change requires radical new technologies

Reality
Increased technological innovation will accelerate progress and lower costs but we have the technologies we need to start today

Another commonly held myth is that, because carbon abatement is perceived to have become a pressing concern only relatively recently, technological innovation needs time to catch up and solve the problem. The belief is that there is little point wasting money on expensive abatement options when in a few years’ time much cheaper solutions will be available.

There is no doubt that technological innovation will play an important role. Indeed, the McKinsey cost curve shows 9 gigatonnes of abatement anticipated in 2030 that is reliant on technologies that still need further development such as carbon capture and storage. Many low-carbon technologies are still at an early stage in their learning curves and will likely deliver higher performance and lower cost in the future. Likewise, researchers,

### Abatement costs for selected clean technologies

<table>
<thead>
<tr>
<th>Clean Technology</th>
<th>Abatement in 2030 MtCO₂e</th>
<th>Cost in 2030 $/tCO₂e</th>
<th>Cost in 2020 $/tCO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>2,890</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td>Solar</td>
<td>2,305</td>
<td>24</td>
<td>51</td>
</tr>
<tr>
<td>Coal CCS new built</td>
<td>1,240</td>
<td>56</td>
<td>57</td>
</tr>
<tr>
<td>Coal CCS retrofit</td>
<td>700</td>
<td>69</td>
<td>83</td>
</tr>
<tr>
<td>Switchgrass</td>
<td>415</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>Plug-in hybrids</td>
<td>345</td>
<td>-8</td>
<td>92</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>345</td>
<td>-5</td>
<td>6</td>
</tr>
<tr>
<td>Geothermal</td>
<td>245</td>
<td>-11</td>
<td>-9</td>
</tr>
<tr>
<td>Electric vehicles</td>
<td>55</td>
<td>62</td>
<td>131</td>
</tr>
<tr>
<td>Total</td>
<td>8,540</td>
<td>30</td>
<td>32</td>
</tr>
</tbody>
</table>

Source: McKinsey Global GHG Abatement Cost Curve v2.0; McKinsey analysis
company labs and entrepreneurs are pursuing new generations of technology that could provide low-carbon breakthroughs.

However, the argument that we should wait for technology breakthroughs is wrong for two reasons. First, we have most of the technologies we need to get started on a 450 ppm path today. The cost curve shows that more than 75 percent of the abatement required for 2030 can be generated from technologies that are in use and available today. These range from low-tech solutions, such as installing more building insulation, to medium-tech solutions such as the widespread diffusion of existing designs for high-efficiency diesel engines or scaling up the latest generation of wind turbines.

Second, innovation rates depend on the incentives and potential market sizes for low-carbon technologies. Delay in action on climate will keep market sizes small, create uncertainty, and reduce the incentives for innovation. Clear climate targets, the development of global standards, and a consistent regulatory framework will expand markets, attract talent, and reduce risk, thus accelerating innovation.
Myth 8

Only developed countries need to (or should) act now; developing countries can wait

Reality

We won’t solve the problem unless developed and developing act together—now

In order to get onto a 450ppm pathway, we need to reduce annual global emissions by 16 to 18 gigatonnes versus ‘business as usual’ by 2020. Even if we deploy all known technical opportunities in the developed world that cost up to $90 per tonne of carbon emission, this would deliver only 5 gigatonnes of abatement. Behavioral change has the potential to deliver a further 2 to 4 gigatonnes in developed economies and remains largely unexploited. Offsets (i.e., abatement projects funded by developed countries but realized in developing ones) could be used to purchase abatement in the developing world to deliver the 25 percent reduction against 1990 levels identified by the IPCC as the lower end of the range for developed countries. However, adding these opportunities together provides us with only half the total global abatement needed. The rest will need to come from the developing world, or we will not achieve a 450 ppm pathway.

| Abatement scenario with 25% target for developed world |
| GtCO₂e, 2020 |
|---|---|---|---|
| Required abatement for 450 ppm pathway | 17 | 9 Gt abatement required to reach 25% reduction target (against 1990 levels) in developed world |
| Developed world technical potential | 5 | 12 Gt of abatement required in developing world to reach 450ppm |
| Offsets: paid for by developed world, realized in developing world | 4 | |
| Remaining gap to 450ppm pathway | 8 | |

Source: McKinsey Global GHG Abatement Cost Curve v2.0; McKinsey analysis
Understandably, the priorities for developing countries are to grow their economies and help their citizens emerge from poverty, not to spend money they don’t have solving a problem often seen as created by the developed world. One of the most challenging aspects of the global deal is the fact that the abatement math simply does not add up without significant participation by developing countries, yet developing countries have the fewest resources and the least historical responsibility for the issue.

Even if the developed world delivers 100 percent of its potential abatement, the global deal will still need to provide incentives and support for developing countries to deliver more than 90 percent of their potential abatement if a 450 ppm pathway is to be achieved. Such support is likely to include very significant financial flows running from the developed to the developing world as well as help with technology and adaptation. The magnitude of support required is likely to be unprecedented. We estimate that the incremental costs of developing world abatement could potentially be in the order of $50-80 billion per annum by 2020.
Myth 9
Saving forests is primarily about preserving biodiversity

Reality
Biodiversity is important, but forests are also fundamental to protecting the climate

Forests have received a lot of attention for their role as storehouses of the world’s biodiversity. What is less broadly understood is that they also play a critical role in addressing climate change. When trees are still standing they act as sponges, absorbing CO₂ and thus slowing the growth of carbon stocks in the atmosphere. But when trees are cut down and burned or decay, they release greenhouse gases into the atmosphere. Thus deforestation both adds to emissions in the near term and reduces the earth’s ability to absorb CO₂ over the long term.

By 2020, avoided deforestation has the potential to account for 33 percent of the global abatement identified in the McKinsey cost curve. But capturing the forestry opportunity...
will prove a challenge. In order to get onto the 450 ppm pathway we will need to avoid the deforestation of 170 million hectares, equivalent to twice the land area of Venezuela, and plant new forests on 330 million hectares of marginal land—almost the size of India. Of this potential, almost 90 percent is located in developing countries, including some of the poorest places on Earth.

If we are not able to address forestry on this scale then we will face two unattractive choices. Either we will miss our climate goals with potentially disastrous consequences or we will have to find other, significantly more expensive sources of emissions reductions. Abatement from forests is generally inexpensive with around 8 gigatonnes of abatement potentially available for under $45 per tonne and with an average cost of $3 per tonne. If that abatement is not achieved in forests then other sources will need to be found to the right of the cost curve, costing more than $90 per tonne. By working aggressively to preserve and rebuild forests, the world will increase its chances of meeting climate goals, greatly reduce the costs of meeting those goals, and preserve the great species diversity that forests contain.
Myth 10
Markets and regulation are in opposition

Reality
Markets and regulation can play complementary roles

Those advocating action on climate change tend to break into two camps: those pressing for market-based solutions, namely cap and trade schemes, and those who prefer regulatory approaches. The McKinsey cost curve work, and the practical experiences of a number of countries, show that it is not an either/or proposition. Rather both approaches are needed in a complementary package.

Setting a price on carbon and other greenhouse gas emissions is necessary to provide consumers with incentives to make low-carbon choices, as well as to encourage managers to favor low-carbon decisions in their investments and product, service, and business model designs. The two ways to do this are through a cap-and-trade scheme or a carbon tax, with the former being viewed as more politically acceptable in many countries.

But while a carbon price is necessary, it is not sufficient. Market failures pervade the energy markets. The fact that the ‘negative’ side of the cost curve exists, i.e., that there are high-return energy efficiency opportunities, is a sign of such market failures. Examples

<table>
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<th>Abatement potential by type of mechanism</th>
<th>GtCO₂e, 2030</th>
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Source: McKinsey Global GHG Abatement Cost Curve v2.0; McKinsey analysis
include builders and landlords who don’t have incentives to build to high efficiency standards because they don’t pay the energy bills, and the tenants who do pay are not in the buildings long enough to capture the benefits; or consumers who demand a faster payback from energy efficient products (e.g., high mileage cars, low energy light bulbs) than from other investments; or problems where consumers and managers lack sufficient information to make low-carbon choices even if they want to; or where coordination among industry players would allow standards to be set, thus enabling an acceleration of investment.

Fortunately, a handful of policies have proven effective in reducing market failures and kick-starting low-carbon investments. In the power sector, both minimum renewable portfolio standards and feed-in tariffs have proven effective in increasing renewables use (though feed-in tariffs have been criticized for being expensive). Energy efficiency standards for electrical goods such as Japan’s Top-Runner program have yielded impressive results. Likewise, California’s building codes have achieved significant tonnes of carbon abated as have vehicle mileage standards around the world. Urban planning, particularly around transport, can make a difference. And many countries continue to have energy subsidies, in effect paying people to waste energy and increase their emissions. Unwinding these, while politically difficult, can deliver instant results.

The key message is that there is no policy silver bullet. Price signals are essential for creating widespread incentives but a portfolio of other policies is necessary to address widespread market failures. Fortunately there is a growing body of evidence on which policies and which designs are most effective, enabling policymakers to select best practices from around the world, and create an integrated market and regulatory approach.

Political and business leaders today are working to repair the world’s financial markets and manage the impact of the global economic slowdown. This is an urgent priority, but not one that is in opposition to the goal of protecting the planet and human society from the dangerous effects of climate change. The investments required to address climate change have the potential to stimulate growth and jobs in the near term, while laying the foundation for a cleaner, more efficient, and more stable economy in the long-run. Tackling climate change is possible; the costs are manageable, we have the technologies, and the policies that work are known. Getting the 192 nations that will meet in Copenhagen to reach a solution that is effective, efficient, and equitable will be one of the greatest challenges of our age; but we have no choice. The final myth is that there is still an option called ‘business as usual’. There is not—that is the reality.
Footnotes


8  McKinsey & Company, 2009, op. cit. Both the width and height of the bars are estimates, based on scenarios that depend inter alia on assumptions regarding energy costs, discount rates and the speed of induced learning for new low-carbon technologies.


This of course assumes they sell the same volume of cars. The volume of cars sold would likely decline somewhat due higher prices, but if demand for cars is relatively inelastic (i.e. consumers need them to commute to work, etc. and have few substitutes) and there are incentives to remove the existing stock of high emissions cars from the road, then consumers are likely to cut back on other purchases with greater demand elasticity.

Even though GDP accounting might show this as roughly netting out, economists would still view this as a social welfare loss as, left to their own devices, consumers would rather have spent the money on something else.

There would of course be some consumers who could not finance the incremental $1,000, thus reducing the volume of cars sold, but for illustration purposes we’ll assume this to be small.


Centro Mario Molina (forthcoming) “Low-Carbon Growth: A Potential Path for Mexico”.


