



## THE BIGGEST CAUSE OF CLIMATE CHANGE: COAL-FIRED POWER PLANTS

As global concerns rise regarding energy security, natural resource degradation, and the catastrophic threats of global warming – it's vital that we look seriously at how we address these issues. Rainforest Action Network actively works throughout our campaigns to protect old-growth forests, to confront our addiction to oil and fossil fuels, to develop social and environmental responsibility in global banking sector, and to stop climate change.

As part of our Global Finance Campaign, RAN is spearheading a “No New Coal” campaign – calling for a moratorium on the construction of dirty coal-fired power plants. This demand is also being made by people like Vice President Al Gore, Senators John Edwards and John Kerry, Dr. James Hansen (chief climate scientist at NASA's Goddard Institute) – and a growing list of respected scientists, politicians, NGO's and everyday citizens. Our dependence on fossil fuels such as coal places an unacceptable burden on public health, the environment, and our climate.

*“There should be a moratorium on building any more coal-fired power plants.”*

Dr. James Hansen, top NASA climatologist

Instead, our priorities must lie in developing responsible energy

solutions that prioritize investments in energy efficiency and renewable energy sources such as solar and wind power. RAN is taking this message to Wall Street – and demanding that banks stop funding new coal development, and enact comprehensive financial policies that address climate change.

While some people point to the abundance and superficially low market price of coal, the fact is that coal comes with high costs that we can no longer afford. The entire coal fuel cycle has human,

There are over  
150 new coal-burning  
power plants currently  
on the drawing board.  
Let's keep them there.

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environmental, and economic ramifications that make it a dirty technology that should be thrown into the dustbin of history. From the destruction of entire mountaintops in Appalachia for mining to the hundreds of millions of tons carbon dioxide, mercury, and other toxic pollutants emitted from power plants – coal destroys ecosystems, communities, water, clean air, and our climate at every step. And as the urgency of action to slow global warming steps up, CO2 intensive industries like coal will face increasingly stricter regulations and costs – making coal not just environmentally and socially reprehensible, but economically irresponsible as well.

**SOME BASIC FACTS ON COAL**

The realities of coal are very connected to economic and environmental justice issues. While slick TV ads hype the notion of “clean coal” – the fact is that every aspect of coal’s lifecycle is dirty. Almost invariably, the destructive impacts from coal are tied to communities that are traditionally poor and marginalized. While the corporations responsible for the use of coal earn soaring profits, the people actually working and living near coal mines, refineries, and power plants are often some of the poorest in the nation, and subject to the worst health and environmental impacts. For them, there is no such thing as “clean coal”.

The US holds large reserves of coal, some of the largest in the world. While the coal industry often markets the rosy notion that we enough coal “to last 250 years or more” – what that notion doesn’t consider is the economic, social, environmental, and technological impacts in mining that coal. Many experts believe we are nearing a period of “Peak Coal” (akin to Peak Oil) – where the easiest-to-mine coal has already been removed (already at huge social and environmental costs), and what is left will be much harder and costlier to extract. Some of that coal may be buried too deep to be economically viable,

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or it may be buried under homes, schools, and national parks, making the costs of coal even higher than they already are.

Most US coal comes from Wyoming’s Powder River Basin and Appalachian Region (West Virginia and Kentucky primarily). Coal is typically mined either in traditional “underground” mining, or more commonly in the US via “surface” mining where explosives such as Ammonium Nitrate Fuel/Oil (AFNO) are used to remove upper layers of earth to expose buried coal. Rather than remove coal from the earth, this method removes the Earth from the coal. In the US, surface mining accounts for 2/3 of all coal mined – as this method is more profitable for corporations and eliminates thousands of jobs.

However, surface mining is incredibly destructive. To reach the coal seams in Appalachia, over one million acres of mountain tops have been blown off and leveled in a practice appropriately called Mountain Top Removal.



Explosives like AFNO and dynamite loosen the tops of mountains, while giant cranes typically dump the debris into neighboring valleys. This buries thousands of miles of streams and rivers - polluting waterways, and creating massive flooding problems downstream. Many underground aquifers have become so contaminated that entire communities in Appalachia have no access to water. Mountain Top Removal creates toxic coal slurries and lakes containing billions of gallons of sludge. Entire mountain ranges and biologically-rich ecosystems are destroyed in this process.

Companies practicing Mountain Top Removal include Arch Coal, Alpha Natural Resources, Foundation Coal Holdings, and Massey

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Energy. Massey in particular has been mired in controversy, most recently in May 2007 when the Federal Government sued them for thousands of mining violation in Appalachia, totaling \$2.4 billion in fines. The picture above is from a Massey mine in West Virginia. You can see the barren mountain, as well as the coal-sludge lake in the bottom corner.

Coal mining has always been a very dangerous occupation, historically one of the most dangerous industries in the world. Widely shared stories of the dangers of mining to gun-battles trying to prevent workers from unionizing are very real. Generations of families have worked in coal mines, and countless suffer from chronic lung disease, cancer, and other illnesses. US mines employed nearly 700,000 people in the 1920's, but now employ only 80,000 people, despite coal production being nearly double what it was then. At one time, entire communities in coal regions were created by the opportunities for employment – now many of those towns are highly impoverished with severe unemployment rates as mine companies have destroyed the area and moved elsewhere.



Transporting coal is also a huge and dirty endeavor. Modern coal power plants use millions of tons of coal daily, and the bulk of the cost of using coal is in transportation. Depending on the location, transportation can account for up to 80% of the final cost of coal. Coal is largely moved from mines to power plants via rail or barge. A typical coal train can be over 100 rail cars - over a mile long carrying hundreds of tons of coal! Large power plants will use entire train loads in a single day. Nearly 50% of all rail traffic in the US today is

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just for transporting coal, using massive amounts of energy and fossil fuels in the process. Not only does coal transport create noise, but these trains and barges can leave coal dust along thousands of miles of track and river – a trail of pollution along its entire journey.

The primary usage of coal in the US (over 90%) is to fuel some 600 existing coal-fired power plants. Coal-fired plants produce approximately half of our net electricity production in the US, but are responsible for 80% of the greenhouse gas emission from the utility sector. In addition, dirty coal is starting to be pursued for uses including coal-to-liquid technologies (to create fuels such as diesel), as well as for fueling ethanol refineries.

Coal power plants are incredibly polluting, contributing to acid rain, global warming, and air pollution. Although there have been some advances in trying to limit traditional air pollutants from smokestacks such as sulfur dioxide and nitrous oxide, little has been done to control carbon dioxide, the leading cause of global warming. In the US, coal is the largest single source of global warming pollution, emitting 1.94 billion tons of CO<sub>2</sub> in 2004 alone<sup>i</sup>, nearly 40% of total US CO<sub>2</sub> emissions. In terms of greenhouse gases, constructing just one new typical coal fired power plant is like adding one million cars on the road. With over 140 proposed plants in the US alone, pollution and greenhouse gas emissions will skyrocket. Coal clearly has no place in energy policy that responsibly addresses climate change.



In addition to CO<sub>2</sub>, coal also contains uranium, thorium and other radioactive isotopes. Coal-fired power plants are also the single

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largest source of mercury in the US, accounting for 40% of industrial emissions<sup>ii</sup>. Mercury is a toxin, mutagen, and carcinogen linked to birth defects, breast cancer, lung- and nervous system damage. According to the American Lung Association, pollution from power plants causes **24,000 premature deaths annually**, and hundreds of thousands of asthma attacks, heart attacks, and hospital visits.<sup>iii</sup>

A large coal-fired plant can burn over 500 tons of coal every single day. Typically, plants are located in poor, rural areas, creating huge environmental justice issues. Yet utility companies are a popular investment vehicle for banks and other large investors. With increasing de-regulation, so-called “Merchant Generators” often produce electricity that is sold out-of-state, so the people suffering most from the impacts of coal are often unseen. Banks, investment firms, and private-equity groups see these merchant generators as highly profitable – as the true social and environmental of coal are largely externalized and unaccounted for. The profits are privatized, but the costs are born by the public.

## WHAT’S HAPPENING WITH COAL TODAY?

Sadly, we are in the middle of a new so-called “Coal Rush”. Due in part to the deregulation of the electricity and utility sectors, there is boom in proposed new coal development. According to the Department of Energy’s National Energy Technology Laboratory, over 140 new coal-fired power plants are currently proposed in the United States alone. None of the proposed

Estimated new CO2 emissions if all 150 US plants are built:  
**624 Million tons of CO2/year**

This is larger than the annual greenhouse gas emissions of 95% of the world’s countries including:  
 Canada, United Kingdom, South Korea, Mexico, Brazil, Australia, France, Italy, Saudi Arabia, New Zealand, Poland, Spain, Ukraine

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plants on the DOE list would be built with the technology to capture and store CO2 emissions – reinforcing the hypocrisy of “Clean Coal” claims by the industry.

Coal is planned to provide 57% of new electricity capacity by 2030.<sup>iv</sup> Sadly, clean, renewable energies like solar and wind are currently forecast as only comprising 9% of that expected capacity. Given that coal-fired power plants comprise just less than half of electricity production in 2005, we are currently on a trajectory of actually increasing our reliance on destructive, dirty coal. The estimated lifetime of a coal power plant is 50-60 years, so if these new plants are built, we lock ourselves into a lifetime of dirty coal.

This is coming at a time when top scientists are warning that we have less than one decade to stabilize and REDUCE our greenhouse gas emissions if we are to avoid the most catastrophic impacts of climate change. We need to act now in order to stop the next generation of dirty power plants from being built.

## WHO IS BUILDING THESE NEW COAL PLANTS?

There are hundreds of companies involved in electricity generation, and it’s a rapidly growing and profitable industry. The National Energy Technology Laboratory tracks over 140 coal plant proposals in the US alone, and the list below reflects the 20 companies sponsoring the largest new coal power plant development. Most of these companies have substantial involvement in existing coal-fired power plants in addition to these proposed new projects. Some responsible companies are recognizing that clean energy is way of the future, but these companies only seem to care about the short-term bottom line.

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American Electric Power is already the single largest emitter of greenhouse gasses in the country, and on a path to keep that disgraceful title. But Dynegy is giving them a run for their money. And companies like Peabody Energy are also heavily involved in extraction – coal from Peabody’s mines supply about 10% of total US electricity production.

Owner	Locations	# Plants	Est. CO2 <sup>v</sup>	Est. Cost
Dynegy / LS Power	IL, IA, TX, AR, VA, NJ, CO, GA	9	65.1 million tons	\$11.6 billion
American Electric Power	OK, VA, OH, WV, AR	5	21.8 million tons	\$6.4 billion
Peabody Energy	NM, IL, KY	3	21.5 million tons	\$4.8 billion
MidAmerican Energy	IA, WI, UT, WY	4	21.3 million tons	\$3.3 billion
NRG	DE, NY, LA, TX	4	17.7 million tons	\$5.2 billion
Composite Power	WA	1	16.3 million tons	\$3.9 billion
Clean Coal Power Resources	IL	1	15.6 million tons	\$2.8 billion
TXU	TX	3	15.1 million tons	\$3.7 billion
Sithe Global	NV, NM	2	14.6 million tons	\$3.5 billion
EnviroPower	IL, IN, KY, PA	4	13.8 million tons	\$3.0 billion
Florida Power & Light	FL	3	13.4 million tons	\$3.2 billion
Sempra Generation	NV, TX	2	13.3 million tons	\$2.8 billion
Santee Copper	SC	2	12.2 million tons	\$2.4 billion
Erora Group	IL, KY	2	11.5 million tons	\$2.1 billion
Great Plains Energy	KS, MO	2	11.1 million tons	\$2.1 billion
Southern Company	MS, FL	2	10.9 million tons	\$3.8 billion
Sierra Pacific	NV	1	9.7 million tons	\$3.2 billion
Illinois Energy Group	IL	1	9.7 million tons	\$1.7 billion
Duke Energy	IN, NC	2	9.3 million tons	\$2.8 billion
Dominion	VA, OH	2	7.8 million tons	\$1.9 billion
<b>TOTAL</b>			<b>331 million tons</b>	<b>\$74.2 billion</b>

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**THE OPPOSITION IS GROWING....**

Just in the first few months of 2007, there have already been substantial victories stopping some of these projects, and the momentum is growing. In Texas, TXU faced massive national and grassroots opposition to their coal plans, and scrapped 8 of 11 proposed plants. In North Carolina, Duke Energy was denied permits to build an 850 megawatt plant citing the fact that efficiency and renewable energies would better serve the community. And just in May of 2007, FPL was denied permits to build a massive coal plant in Glades County, Florida.

Regulatory boards and public utilities commissions have started denying coal plant applications across the country, calling for prioritizing clean energy options. Construction and permitting costs are sky-rocketing for companies proposing new coal due to legal hurdles and grassroots opposition. Many companies are realizing that investments in energy efficiency and renewable energy make more economic sense, as well as environmental sense.

There are dozens of campaigns happening across the country to stop these new coal power plants and end mountain-top removal. With massive grassroots opposition from community, environmental, and health groups and vocal supporters like Al Gore, Presidential candidate James Edwards, and top NASA scientist James Hansen, we have the momentum right now to truly put the “final nail in coal’s coffin.” RAN believes that one of the most effective routes we can take to stop dirty coal development by going to its source: funding. While supporting grassroots campaigns and struggles around specific coal development, RAN is pursuing a national strategy that pulls the rug out from under coal – by going to straight to Wall Street financiers.

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**WHO IS FUNDING THESE NEW PLANTS?**

Conservative estimates for the cost to build these ~150 plants start at **\$144 billion** dollars, not counting the costs for mining, transportation, materials, or the unaccounted costs of pollution. If you look at the total number of new coal plants that are planned around the world, these new plants will emit 30% more CO2 than all previous human uses of coal. In a world that is trying to stop climate change, continuing usage of coal cannot be part of the equation.

In the recent authoritative report by Sir Nichols Stern on the economics of climate change – the “externalized” costs (meaning the hidden costs of health, environmental, and climate damage born by the public) of one ton of CO2 emissions are calculated at \$85.<sup>vi</sup> This means these 150 new plants will negatively impact not just our environment – but the economy as well – to the tune of \$50 billion per year. Instead of the “polluter pays”, the public pays.

There is a lot of money being spent to continue our reliance on a technology that we know is unsustainable, heavily polluting, and utterly destructive. We have better options. This is money that should be invested in a clean energy future: on energy efficiency and renewable energies like wind and solar. We believe that we all share a responsibility in addressing climate change.



Governments must act to regulate greenhouse gas emissions, corporate polluters must reduce those emissions, and we expect Wall

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Street to aggressively finance the transition to a low carbon economy. It’s time that Wall Street is held accountable for their role in funding climate change.

Many banks don’t publicly share details on where they invest their (and often times OUR) money. However, RAN has identified the following banks as the primary financial supporters of coal. Some of these banks RAN has worked with in past years to develop better environmental and human-rights policies – but meaningful policies and action addressing climate change are still lacking. Our goal is to hold banks accountable for their financial support of climate-killing industries like coal. Together, we can push Wall Street to drive a rapid transition away from deadly fossil fuels, and to end investments in new coal. It’s time to build a vibrant, healthy, and equitable low-carbon economic future.

**What coal companies have Wall Street banks profited from recently?**

**Bank of America:** Alpha Natural Resources, Arch Coal, Consol Energy, Florida Power & Light, Foundation Coal Holdings, Massey Energy, Peabody Energy

**Citigroup:** Alpha Natural Resources, Arch Coal, American Electric Power, China Coal Energy Company, Consol Energy (CNX), Dominion Resources, Duke Energy, Dynegy, Florida Power & Light, Foundation Coal Holdings, Massey Energy, Mid-American Energy, NRG Energy, Peabody Energy, Southern Company, TXU, Xcel Energy



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**Credit Suisse:** Duke Energy, Dynegy, MidAmerican Energy, Peabody Energy, TXU

**Goldman Sachs:** American Electric Power, Duke Energy, Energy Capital Partners, Massey Energy, Sierra Pacific Resources, Southern Company, TXU, Xcel Energy

**JP Morgan Chase:** Consol Energy (CNX), Dynegy, Great River Energy, MidAmerican Energy, Peabody Energy, TXU

**Lehman Brothers:** Alpha Natural Resources, American Electric Power, Dynegy, Florida Power & Light, Peabody Energy, Sierra Pacific Resources, Southern Company, TXU, Xcel Energy

**Merrill Lynch:** Alpha Natural Resources, LS Power (Dynegy), Sierra Pacific Resources, TXU

**Morgan Stanley:** Alpha Natural Resources, Dynegy, Duke Energy, Florida Power & Light, Peabody Energy, Southern Company, TXU, Xcel Energy

**Wells Fargo:** Alpha Natural Resources, Consol Energy (CNX), MidAmerican Energy, Peabody Energy, Xcel Energy

**We have a simple demand to Wall Street. Stop financing new coal development, and adopt comprehensive climate change policies that address all investments and operations.**

### **WHAT ARE THE SOLUTIONS?**

Smart, responsible energy policy lies in prioritizing renewable energies and energy efficiency. The cleanest power plant is the one that isn't built – and we can meet our energy needs much more

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cheaply through investments in energy efficiency measures, and clean renewable sources like wind, solar, and geothermal energy. The future of coal is clearly an environmental disaster, but it is also an economic disaster. Respected scientist Amory Lovins estimates that by the time you mine, transport, burn, and deliver the electricity derived from coal, only about 3% of the original energy of coal is used to light our homes – which is a waste on every level.

We can no longer ignore the costs of climate change to the global economy and the social and ecological devastation it brings. We will ultimately be footing the bill for energy companies that rely on carbon-intensive industries and banks that profit from it. The costs of continuing to rely on dirty coal are only going to rise, while the costs of clean renewable energy will only continue to go down.

If invested in energy efficiency measures, the \$144 billion being spent on new coal could reduce US electricity demand by about 19 percent in 2025, making the need for new coal power plants irrelevant. The McKinsey Global Institute shows how we could cut energy consumption by half using existing clean-energy technology<sup>vii</sup>. The Swiss Federal Institute of Technology estimates that the US can reduce its per-capita electricity usage by 80% through energy efficiency<sup>viii</sup>. The International Energy Agency estimates we can cut global CO2 emissions by 470 million tons simply by switching to compact fluorescent light bulbs –meeting over half of the Kyoto protocol goals!<sup>ix</sup>



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If this money were invested in wind energy, the United States could develop 110 gigawatts of the best wind energy locations in the western US, which could produce electricity at an overall cost comparable to coal.<sup>x</sup> According to the Apollo Alliance, development of only 10% of the wind potential in the 10 windiest cities would provide enough capacity to reduce total U.S. carbon emissions by a third. And a recent study by Photon Consulting predicts that by 2010, the market cost for solar energy will rival that of coal for most residential customers— making clean energy not just the smart choice environmentally, but economically as well.

**It's time for Wall Street to be accountable for their role in funding climate change. It's time to invest in a green future.**

**Help us stop new coal development.**

**Visit [www.DirtyMoney.org](http://www.DirtyMoney.org) to find out more.**

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i <http://www.eia.doe.gov/oiaf/1605/ggrpt/carbon.html>

ii <http://www.nescaum.org/documents/rpt031104mercury.pdf>

iii State of the Air 2007 report, pg. 53 <http://lungusa.kintera.org/sota07pdf>

iv [http://www.eia.doe.gov/oiaf/aeo/pdf/trend\\_3.pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/trend_3.pdf)

v CO2 emissions rates of 6.5 Mt CO2 emissions/Gw from new power plants are conservatively derived from analysis done by Platts, the energy information division of McGraw-Hill, for the Christian Science Monitor. [www.csmonitor.com/2007/0322/p01s04-wogi.html](http://www.csmonitor.com/2007/0322/p01s04-wogi.html) This is judged to be a conservative emission rate factor given that corresponding emission rates for TXU's 11 coal power plant build out was 8.66 Mt CO2 emissions/Gw

vi The Stern Report, commissioned by the British government, is available at [http://www.hm-treasury.gov.uk/independent\\_reviews/stern\\_review\\_economics\\_climate\\_change/sternreview\\_index.cfm](http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm)

vii Energy Use Can Be Cut by Efficiency, Survey Says, Steve Lohr, NY Times 11/29/06

viii Smarter Living: The 2000 watt society [http://www.novatlantia.ch/pdf/leichterleben\\_eng.pdf](http://www.novatlantia.ch/pdf/leichterleben_eng.pdf)

ix <http://www.un.org/apps/news/story.asp?NewsID=22053&Cr=global&Cr1=warming>

x Global Warming Pollution Would Increase With 150 Proposed Coal Plants 7/20/06 OS PIRG <http://www.ospirg.org/OR.asp?id2=25594>

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