SHARING SOLUTIONS: TRANSATLANTIC COOPERATION FOR A LOW-CARBON ECONOMY

HEINRICH BÖLL STIFTUNG
The Green Political Foundation

THE CLIMATE NETWORK
Transatlantic Solutions for a Low Carbon Economy

SHARING SOLUTIONS: TRANSATLANTIC COOPERATION FOR A LOW CARBON ECONOMY

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About the project

Both Europe and the United States can point to regional success stories in the area of low-carbon growth. On both sides of the Atlantic however, certain regions remain economically and politically bound to carbon-intensive electricity production and manufacturing . This has the effect of slowing down ambitious legislation that could ease both the economic and the climate crisis, and lay solid foundations for future sustainable growth.

There is no quick fix to this divide. But as the authors of this publication show, ways exist to overcome this stalemate over the long term. By maximizing policy exchange and mutual learning, Europe and the United States can implement regional approaches, which generate local jobs and build the kind of political support needed to eventually move us ahead, both nationally and internationally.

For more than four years, the Heinrich Böll Foundation (HBF) has been contributing to this effort, driven by the conviction that both Europe and the U. S. bear a historical responsibility, as well as the capability, to lead the fight against global climate change. During the last two years in particular, the HBF has sponsored the *Climate Network: Transatlantic Solutions for a Low-Carbon Economy,* to seek ways to forge a close and effective partnership to move toward this goal, and to achieve economic benefits for both sides. With this perspective, HBF offices in Washington, Prague and Brussels, with the generous support of the European Commission, have engaged with stakeholders from both sides of the Atlantic to build a transatlantic network of experts and decision-makers for policy dialogue and mutual learning.

With the election of Barack Obama, there were high hopes that the traditionally close transatlantic partnership would be able to advance climate and energy policy internationally. The foundation of the European-American Energy Council in 2009 testified to the ambitious intentions on both sides. But after the International Climate Conferences in Copenhagen and Mexico, the prevailing economic and budget crisis, and the heated partisan divide in Washington that is in fact a fundamental struggle over the role of government in society, the U.S. is unlikely to see any national climate and/or energy legislation emerging any time soon. The Environmental Protection Agency, charged with regulating stationary sources, is a lonely ray of hope, but it is limited by steep budget cuts.

Meanwhile, Europeans see their own leadership role diminishing under the economic pressure of the crisis of the euro and by record unemployment rates of 20% or more in Greece, Portugal and Spain, as well as to the growing resistance from manufacturing regions in parts of central and eastern Europe, which have thwarted attempts to agree on steeper emission reductions. The

once-ambitious target of a 20% emissions cut by 2020 will no longer suffice to limit global warming to 2°C. It remains to be seen if initiatives such as the Energy-Efficiency Plan and the 2050 Roadmap for a Low-Carbon Economy can revitalize Europe's leadership role for a progressive climate policy in spite of ongoing economic and financial woes.

While 2011, with its record heat waves, floods and storms, which have also struck the U.S., dramatically manifests the urgency of the climate crisis, expectations for the upcoming UNFCC negotiations in Durban have been continuously scaled down on both sides of the Atlantic. However, since inaction is not an option, for neither the economic nor the climate crisis, there is no choice but to pursue parallel alternative and more pragmatic routes. One option that the HBF has identified is to engage more closely with key stakeholders at the regional/state level, where current frontrunners—but laggards too—are located. Only by developing sound economic strategies for low carbon growth in the industrial regions will Europe and the U.S. be able to substantially cut emissions.

In the U.S., resistance against ambitious federal policies comes primarily from regions which tend to be predominantly rural, depend on coal for electricity production, and have a strong agricultural or manufacturing base. States such as Indiana, North Dakota, and Wyoming produce more than 80% of their power from coal. States such as North Carolina, Louisiana and Texas rely heavily on revenues from the oil and gas industries. Most of these states have built their competitive advantage around a cheap supply of power. Therefore, fears prevail that curbing carbon emissions and promoting renewable energies will make energy more expensive, harm the economy and threaten jobs. Most objections are non-partisan in nature, and linked to the daily worries of middle-class Americans who see their traditionally strong regional economies weaken and their jobs at risk. Particularly strong concerns exist in the Southeast and Midwest regions of the U.S. where, even before the economic crisis hit, more than 1.2 million jobs were lost in the past decade.

But climate protection and economic recovery can go hand-in-hand. Investments in renewable energy make economic sense, as they generate well-paying local jobs that cannot be outsourced. Various studies, such as one conducted for the RES Alliance in 2009, have shown that a national renewable energy standard of 25% could create 2.36 million new jobs by 2025: more than half in manufacturing, one fourth in construction and trades, and one tenth in engineering and technical services. These jobs are more than simple academic projections. With the right set of policies, they can become reality in the U.S., as is shown by the case of Germany, where the so-called *clean contracts*—known there as "feed-in tariffs"—have spurred investment in renewable energies for the past twenty years. The country can now point to emissions reductions of 28% since 1990, more than 370,000 new jobs, and slow but stable growth despite the economic crisis.

In Germany, the economic success of renewable energy and energy efficiency has helped overcome the partisan divide, and has turned climate protection into a political mainstream goal. While thirty years ago, only the Green Party advocated ambitious climate policies; today, all five major parties have adopted similar objectives in their party programs.

While the Greens are now advocating an ambitious 100% renewables target by 2040, the ruling conservative-liberal coalition government has settled for a less ambitious target of 80% renewables by 2050—a fantasy, by American standards. The extent to which the multi-partisan character of German energy policy is rooted in broad public support for renewables was shown recently after the devastating nuclear accident in Fukushima. While foreign media described demonstrations of 60,000 people only two days after the incident as a manifestation of German *angst*, they were in fact the natural reaction of people who have practical experience with alternatives to nuclear energy. Small investors, midsize company owners and employees from the field of renewable energy were no longer willing to accept nuclear risks simply to ensure increasing profit margins for the four major German utility companies, or their externalization of environmental damage.

The result is a governmental decision to entirely phase out nuclear energy by 2022, and to replace the current share of 20% of nuclear energy with renewable energy and energy efficiency, in order to maintain the overall emissions-reduction target of minus 40%. But Germany is well positioned to manage this energy transition, as is shown by the examples of two German states, Schleswig-Holstein, a rural state in the north where more than 40% of power consumed is produced from renewables—primarily wind—and North Rhine-Westphalia in the west, a major industrial hub and a leading supplier for the renewables industry, again, particularly the wind industry.

In Schleswig-Holstein, three nuclear power plants are to go offline, and will require the installation of 9 GW of wind-turbine capacity to replace them, as well as major new power lines to carry the renewable electricity to high-use states. While in the U.S., such major projects often lack local acceptance, this German state can point to broad public support, due to the fact that many residents are renewable energy producers themselves. Thanks to the investment security of the German feed-in tariffs, local residents and farmers have founded cooperative businesses that own and run entire "citizens' windparks", so-called *Bürgerwindparks*. The community investments generate local wealth, jobs and hence public support for renewable energy. The business model is so successful that there have already been initial attempts by residents to build and run transmission lines, thus lifting one of the major barriers to the extension of renewable energy.

Building on the example of Schleswig-Holstein, the HBF partnered with the National Farmers' Union (NFU) to investigate how lessons learned in the state could be transferred to states in the rural U.S. Midwest. Together with Dirk Ketelsen, a German energy farmer, and Neil Veilleux, a Midwest Renewable Energy Fellow, the HBF and the NFU discussed renewable energy opportunities with farmers in Minnesota, South Dakota and Wisconsin. The result was a study (*Harvesting Renewable Energy in the Midwest*) that was presented in the United States Congress, and which demonstrates how U.S. farmers could become energy producers, similar to those in Schleswig-Holstein.

Industry stronghold North Rhine-Westphalia (NRW) shows that climate protection makes economic sense, even in regions which in the past have built their wealth around coal, steel and low-power prices. With 18 million inhabitants Germanys most populous state, and not only producers of one third of the country's power and emissions, but is also a major supplier of the renewable

energy industry. In 2007 for example, every second gear box used in wind turbines worldwide originated in NRW. Companies with traditional expertise in manufacturing have diversified their portfolios and have become internationally renowned suppliers, employing 10,000 people in the wind sector alone, making such parts as gears, couplings, brakes, rotor blades and wind towers, just to name a few. NRW has come to understand this development as a strategy for economic growth and is likely to adopt legislation that will mandate a reduction of emissions, which would of 25% by 2020 and in turn spur further investments in renewable energy.

Inspired by the example of North Rhine-Westphalia, HBF partnered with the BlueGreen Alliance, a major alliance for good and green jobs composed of ten American labor unions and four environmental organizations. Together, the HBF and the BGA organized the Midwest Green Jobs Tour, which in 2010 brought Midwest Green Jobs Fellow Christine Wörlen to Indiana, Minnesota, Michigan and Ohio to discuss lessons learned in Germany and to identify local strategies for spurring similar investments in the above industrial states. The study (*Clean Energy Jobs for the U.S. Midwest*) was also presented to the U.S. Congress. Building on the Midwest partnership, the HBF brought a delegation of high ranking BGA delegates to Berlin, Schleswig-Holstein and North Rhine-Westphalia for first-hand dialogue with German experts and decision-makers.

But Germany's states are not alone in showcasing the future of the energy system. There are positive examples in central and eastern Europe as well, in spite of energy inefficiencies in industry and high dependence—compared to western Europe—on coal-fired power generation. Under the *Green Investment Scheme* in the Czech Republic, some 150,000 households have benefited from and contributed to the energy shift, while making a good investment over the medium to long term. In his paper, Petr Holub elaborates on how the state and society could together harvest the relatively low-hanging fruit of increasing energy efficiency in buildings, which still produce about 40% of overall carbon emissions in the EU.

Support programs financed from emissions trading and stricter EU energy efficiency legislation for new buildings (EPBD) create and save many local jobs in the construction industry, and provide a buffer against ever-increasing energy costs and security threats.

However, as another contribution from the region in this publication shows, the political elites in central and eastern Europe still need to be convinced by experts, the public and parts of the business community that this is the way forward.

As we have seen in the course of our public events, most notably during the Prague Green Growth Conference in October 2010, the direct exchange between experts and practitioners on these progressive policies across the Atlantic is much needed and called for. This conference, the first of its kind in the region, focused entirely on the economic aspects of a low-carbon energy system, and on examples of good practice, such as public-private-sector cooperation. It brought together experts, representatives of government and interest groups and of the general public of various backgrounds.

At the level of policy, dialogue and mutual learning engaging state and regional stakeholders across the Atlantic helps to develop sound strategies for regional low-carbon growth. While the strong partisan divide in the U.S. should be an issue of deep concern, social and political alliances exist that have a promising potential to move the U.S. toward more progressive climate and energy policies. The above-mentioned BlueGreen Alliance and National Farmers' Union are only two organizations with broad reach into the rural and industrial parts of America for which low-carbon strategies have to be developed so urgently. Faith groups and veterans' organizations are other multipliers that can help bridge the partisan divide and advance public support for progressive climate policy. In turn, learning from these stakeholders can help deepen cooperation with

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similar partners in Europe, in particular in regions which are currently slowing down Europe's once-ambitious climate policy. During their U.S. Low-Carbon Economy Tour, central and eastern European participants of the Climate Network were able to learn first-hand from David Foster, the Executive Director of the BlueGreen Alliance, and from various NGOs how environmental experts and unions have formed new alliances for a low-carbon economy. The U.S. lags behind the EU in terms of greenhouse-gas reduction targets, but still can show many inspiring examples of building new alliances for change. In the last section of this publication, we examine some of them by presenting short papers by their members.

All in all, broader and deeper social and political alliances are needed in the U.S. and Europe alike, if we are to meet the challenge of the economic and climate crisis. Both are so profound and interlinked in nature that we cannot afford a partisan stalemate. Eventually, we will need to reach across the divide and work together.

It is with this in mind that we have chosen the authors for this publication: decision-makers, experts and activists from a broad range of political convictions and regions, all of whom have been valuable partners throughout this two-year program, and can share important lessons on how to build a functioning low-carbon economy.

The goal is to establish true transatlantic leadership on the way to a globally sustainable, low-carbon economy—for despite economic and political challenges, the transatlantic climate community remains strong and committed to moving ahead. The Heinrich Böll Foundation will continue to actively promote this process where it can. We would like to thank those—especially the authors of this publication—who contributed to the two-year Climate Network program for engaging with us in this important dialogue.

This publication is the final product of the project by the HBF's offices in Brussels, Prague and Washington, DC. Building on its key findings, it analyzes conditions for progressive climate and energy policy at the regional/state level. It discusses how regions with a strong coal, manufacturing or rural economy are affected by climate and energy policies, and how way policies should be designed to soften the impact of structural change toward a low-carbon economy. For more on our activities, articles, interviews, and videos from the public events, we also invite you to visit the website of The Climate Network http://www.boell.de/climate-transatlantic/

Keep up the good work!

REGIONAL PERSPERCTIVES

Regional perspectives on policies for climate mitigation and economic competitiveness

RENEWABLE ENERGY IN GERMANY: WHERE FIGHTING CLIMATE CHANGE SPURS ECONOMIC GROWTH

by Oliver Krischer
Member of the German Parliament, Alliance 90/The Greens

Today's energy policies are faced with formidable challenges, in Germany as well as in Europe as a whole, and worldwide. The negative impacts of climate change and the growing thirst for energy, increasing resource scarcity, and rising energy prices are all problems that must be solved not only simultaneously but also in a way that will ensure the well-being of future generations. Although these challenges are daunting, policy-makers would do well to view climate change as more than just a cost factor and, indeed, as an opportunity to open new markets. This article presents the renewable energy sector in Germany as an innovative market that has successfully managed to address the demands both of climate protection and of economic growth.

Over the past ten years, this sector has become a key pillar of the German economy: in 2010, a total of 370,000 people were employed in renewables. The fact that Germany weathered the global economic and financial crisis better than many other countries, and that it shows stable economic growth as well as dropping unemployment rates, can in part be attributed to this boom in the renewable-energy sector. The key condition for the upturn in the job market was a stable political framework that provided for the steady and reliable expansion of renewable energy.

The fact that Germany weathered the global economic and financial crisis better than many others ... can in part be attributed to ... the renewable-energy sector.

In Germany, a multi-party consensus has existed for some years that renewable energy will be the future backbone of the country's energy infrastructure. This consensus served to minimize the risk for investors, who no longer worried that a change in government could reduce funding. They have thus been able to focus exclusively on the development of technologies and on making them more cost-efficient. This has allowed Germany to become a global leader in many fields. In the fall of 2010, when the German government extended the operating lives of the country's nuclear power plants, investment in renewable energy and highly efficient combined heat and power (CHP) plants initially dropped. However, following the catastrophe in Fukushima, the German government revoked these extensions and ordered the complete decommissioning of the country's nuclear power plants by 2022—which cleared the way for an even more vigorous expansion of renewables. The Green Party has called for a 100% switch to renewables by 2040. If implemented, that could mean jobs for 500,000 people in the renewables sector by 2020, while at the same time serving to meet Germany's ambitious climate-protection targets. However, the German federal government under conservative Chancellor Angela Merkel is still hesitating, and has not, even after Fukushima, raised its renewable-energy goals. This can be expected to impede climate protection as well as the opportunity to fully exploit the country's potential for reaching full employment.

The current status of the expansion of renewables and their effect on the job market

The benefits of renewable energy expansion are obvious: renewables represent a virtually unlimited source of energy and, unlike other energy carriers such as oil, gas and uranium, do not have to be imported. The prices of renewables are stable, and the entire value-added chain can take place within Germany. Since they constitute the single most powerful instrument for reducing

CO^2 emissions, renewables are also indispensable for meeting climate goals. For Germany, that means reducing greenhouse-gas emissions by between 80% and 95% by 2050. According to the Intergovernmental Panel on Climate Change (IPCC), a reduction of this order of magnitude will be necessary in industrialized nations, in order to limit global warming to 2°C.

The goals of Germany's energy policy

In the fall of 2010, Germany's conservative-liberal coalition government adopted an energy concept that requires that 35% of all electricity consumption be provided by renewables by 2020; that is to rise to 80% by 2050. The Green Party is convinced that these goals can be achieved much earlier, and is working to accelerate that process. For example, in the traffic and transport sector, a reduction of fossil-fuel use by one quarter is achievable by 2020, while full transition to renewables could be achieved by 2040. In the home heating sector, the current requirement for heat energy could be reduced by one fifth by 2020, and the share of renewables expanded to 25%.

The fixed rates provide plant operators ... investment security, and have resulted in a considerable increase of private investment in renewables in Germany.

The German Renewable Energy Act as a basis for growth

In Germany, the expansion of renewables led to a boom in the job market, something that was considered impossible just a few years ago. The growth of the renewable energy sector in Germany was largely made possible by the Renewable Energy Act (EEG), which forces network operators to provide grid access and guarantees feed-in tariffs, fixed over a period of twenty years. These tariffs vary by type of renewable technology, and, for wind energy also by type of site, and are intended to promote the profitable operation of the plants. The rates for newly installed plants are reduced annually by a set percentage, or "degression," which is intended to give plant manufacturers and operators the incentive to build and operate power plants more efficiently and at lower costs, so that they can eventually sustain themselves on the market without subsidies. The Act supports the generation of power from wind, solar, biomass, hydropower and geothermal sources.

The fixed rates provide plant operators with a high degree of planning and investment security, and have resulted in a considerable increase of private investment in renewables in Germany. More than 90% of such investment now comes from local municipalities, public services and associations, so that the Act can be credited with having initiated the country's renewables boom. In 2010, renewable energy in Germany already covered 17% of the country's total electricity consumption. To date, the German Act has been imitated by over forty countries.

Status and potential of the different energy carriers

Wind energy has seen the greatest progress, and provided 6.2% of Germany's electric power consumption in 2010. However, in recent years, an anti-wind-energy policy by conservative-liberal governments at the federal and state levels practically halved the pace of expansion or, in the southern German states, impeded the installation of wind systems in the first place. Now however, voters in several German states, particularly in the big states of Baden-Württemberg (in the south) and North Rhine-Westphalia, have voted out these conservative-liberal state governments in favor of coalitions of the Greens and the Social Democrats (SPD), and opposition to wind energy has crumbled. This means that nothing stands in the way of doubling the currently installed 27 GW by 2017. New offshore wind farms will also be built in the coming years. Last but not least, wind farms "Made in Germany" are a particularly successful export item; some German wind manufacturers export up to 80% of their production.

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The photovoltaic sector has also grown significantly in recent years. In the spring of 2011, photovoltaics contributed up to 13 GW of electricity during peak times, comparable to the performance of about thirteen nuclear power plants. Thus, Germany is not only making a big contribution to tackling climate change, it is also supporting a future-oriented local industry. Moreover, the cost of generating power with photovoltaics is dropping continually, and the price of one kilowatt-hour from the roofs of private households will soon be comparable to the cost of electricity provided from the main grid. In 2010, photovoltaics already provided 2% of Germany's overall electric power needs.

Bioenergy now has 500 MW of installed capacity, and meets 5.6% of Germany's electricity needs. Its future potential could be further expanded through the use of biomass waste. Bioenergy lends itself very well to the production of heating power, and already accounts for 10% of Germany's total heating power needs. By using biomass to fire CHP plants and moving toward more demand-oriented production, the yield of this form of energy could be further expanded. On the other hand, bioenergy often involves unecological practices, such as corn monocultures, which the Green Party vociferously opposes, despite its general support for bioenergy.

The macro-economic effects of renewable energy expansion

Critics of renewables often argue that they are not cost efficient in comparison to other energy carriers. In Germany, renewable energy plants are financed through a cost-allocation system, so that the costs are covered by the rate payers. In 2011, each German electricity customer, except energy-intensive industries, paid a 3.5 euro-cents per kilowatt-hour surcharge for renewable energy. As the total price of electricity averages 23 cents/kWh, the renewables' share constituted approximately 15%. For a family of four with an annual consumption of 4000 kWh, this meant an additional cost of €140 per year, or €11.66 per month. Considering the benefits that renewables have for the economy as a whole, this appears reasonable and justifiable. Given the so-called merit-order effect, renewables also lower the spot-market price of electricity, which indirectly offsets these extra costs.

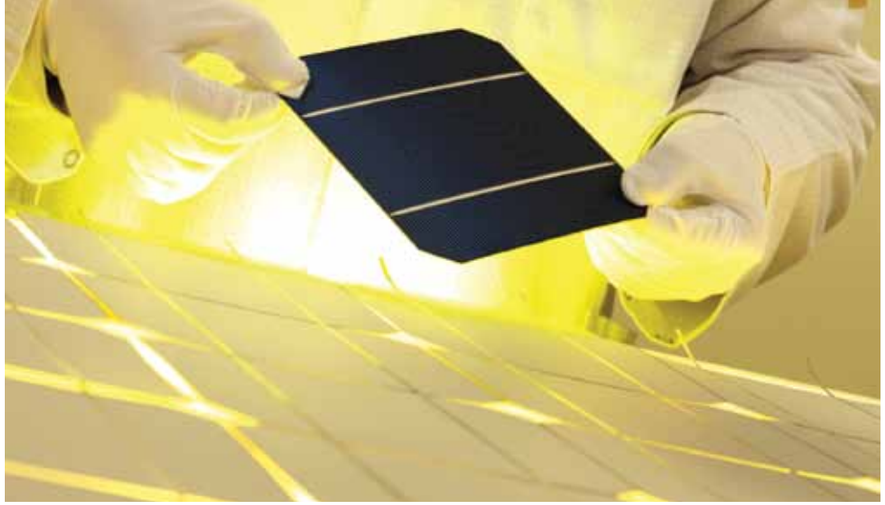
The positive effects of renewable energy do not end here. Overall investment in renewable energy reached an impressive €17.7 billion in 2009. In the same year, the use of renewables enabled the avoidance of fuel imports on the order of €6.4 billion. Researchers have further calculated that, also for 2009, the use of renewable energy prevented environmental damages estimated at €8 billion. All these effects should be included in a realistic economic evaluation of renewable energy.

The expansion of renewable energy has moreover been accompanied by a significant increase in the number of jobs in this sector—from 100,000 in 2000 to 370,000 in 2010. This makes the renewables sector Germany's number two jobs provider, second only to the automobile industry. And these jobs are future-proof, and range from manual laborers to highly-qualified engineers. After all, renewable energy plants have to be designed, built, brought into service, and operated.

The economic advantages of renewables can be expected to increase even more in coming years, as the prices of fossil fuels rise. Many indicators suggest that peak oil has been reached; the new oil reserves now being discovered are located in difficult-to-access regions or can only be operated under ecologically unacceptable conditions, such as the extraction of oil from tar sands in Alberta, Canada. At the same time however, the thirst for oil is growing, especially in emerging nations, which is pushing oil prices up. The same applies to natural gas and coal. The more expensive these resources become, the more cost-efficient the use of renewable energy will be.

Challenges

To ensure that the "renewables success story" continues, a firm and consistent energy policy is needed. In Germany, a series of technological challenges must also be tackled in order to accomplish the restructuring of the energy-supply system, including first and foremost the continued expansion of renewable energy; the expansion of power grids and of energy-storage systems; and the environmental retrofitting of buildings.



Accelerating the expansion of renewables
To ensure that German products continue to be in demand worldwide and that we maintain our technological lead, we must prove, using our own country as a showcase, the feasibility of covering all energy needs on the basis of renewables. A policy that continues to rely on coal and nuclear power plants in the medium term will impede the expansion of renewable energy sources, for these plants are not flexible enough to adapt to short-term fluctuations in the output of renewable sources, or in consumption patterns. This means that the exclusive focus on renewables must be prioritized for technological as well as environmental reasons.

Grid expansion
The expansion of renewable energy places enormous demands on the existing power grid and energy infrastructure, which are generally engineered to meet the demands of the nuclear-fossil base-load power plants. The expansion thus requires a comprehensive strategy for redesigning the entire system, to accommodate the fluctuating inputs of renewable energy. Moreover, renewable energy expansion will also need "smart" power grids able to harmonize power demand and supply. Unfortunately, this undertaking is still in its infancy; Germany is currently allocating a meager €60 million to the development of smart grids, compared with the billions of dollars invested for that purpose in the United States.

The expansion ... requires a comprehensive strategy for redesigning the entire system, to accommodate the fluctuating inputs of renewable energy.

The Green Party also calls for the integration of smart grids and super-grids. Smart grids, supported by information and communication technology, can optimize the generation, storage, and use of electricity locally, on site. For example, they can interconnect several renewable energy-based power plants with flexible users in ways that allow them to meet the total demand for energy with renewably produced electricity. Lastly, a successful renewable energy expansion should also provide for a backup plan in the case of outages in the production or feed-in of wind and solar-generated electricity. Already existing storage technologies, such as pump-storage systems, must be enhanced, and new storage technologies developed. In other words, solutions must be found to guarantee the full supply of electricity, even in the case of multi-day disruptions.

Building retrofitting
The SPD-Green coalition which ruled Germany around the turn of the millennium introduced the successful "CO^2 building retrofitting program," an important step, since nearly 80% of all buildings in Germany are in need of environmental retrofitting. In order for the country to achieve its climate goals, all of these buildings will have to be fully retrofitted within the next thirty or forty years; however, at the current pace, it will take a full century. That means that we must significantly accelerate the annual rate of retrofitting, boosting it from one to three percent. For this purpose, the Green Party advocates the creation of two funds of €2 billion each: one for environmental building retrofitting and the other for the retrofitting in disadvantaged urban districts. For each euro of public investment, more than €2.50 in private investment would be attracted. This investment boost of significantly more than €10 billion would translate into approximately 200,000 jobs, most of them in local skilled trades and manual labor.

Conclusion

The creation of a solid renewables infrastructure early on is an opportunity to be among tomorrow's renewable-energy technology leaders

Efforts to expand the use of renewable energy must recognize that economic added value, sustainability, and climate protection are inextricably intertwined. Such related areas as CHP, energy efficiency and retrofitting measures are equally important from an environmental point of view, and have enormous potential. The potential of renewables also depends on a country's geographic conditions and population density. Larger and less densely populated countries, such as Russia, the United States or Canada, could theoretically meet all their energy needs with renewables within a very short time. However, since these countries have seemingly infinite natural resources, they lack the immediate pressure to expand their renewables sectors. Germany, by contrast, as a densely populated and small country, has had strong incentives for developing renewables. However, since energy resources are not in fact infinite, as the above-mentioned peak-oil issue shows, all countries will eventually have to embark on a transition to renewables. Hence, the creation of a solid renewables infrastructure early on is an opportunity to be among tomorrow's renewable-energy technology leaders—a status Germany has already achieved. Unfortunately, this has not been fully recognized by Germany's current government, and, as in all areas, global competition is fierce and becoming fiercer. Nonetheless, Germany still has the opportunity, if it moves now, to maintain its technological leadership position in renewables. Environmental technologies have the potential to create future-proof jobs and to guarantee future generations a safe and secure energy supply.

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REGIONAL ACTION: A U.S. PERSPECTIVE

by Vicki Arroyo
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In the United States, action at the national level to tackle climate change has been excruciatingly slow. For the past two decades, there have been hopeful signs of progress followed by disappointing setbacks. A fundamental disconnect remains between what is needed to reduce emissions at the national—and ultimately, global—scale, and the political will to make those reductions.

While the U.S. argued for—and won—flexible mechanisms and other concessions during Kyoto Protocol negotiations, neither Democratic (Clinton, Obama) nor Republican (George W. Bush) Presidential Administrations ever submitted that protocol for ratification. And while climate legislation has been proposed for many years now, it has yet to be enacted.

President Obama called for Congress to pass a cap-and-trade bill in the early days of his presidency. And in fact, the Democratic controlled House of Representatives passed legislation in June 2009 that included standards and incentives to boost energy innovation, along with a cap-and-trade system to set a price on greenhouse gases (GHGs)[1]. That legislation awaited Senate action during the climate talks in December 2009, when President Obama took a leadership role in negotiating Kyoto's successor, the Copenhagen Accord. The U.S. target he articulated was based on the House legislation. But Obama turned his attention to fighting battles over healthcare and the economy as the 2010 mid-term elections approached, and the legislation died in the Senate.

Since then, it has become clear that no national cap-and-trade program is likely to be enacted in the foreseeable future. The reasons include the continuing recession, the increased Republican political clout in Washington, diverse regional interests, and the rising influence of climate deniers. Alternative policy approaches are being considered, however. Specifically, President Obama's 2011 State of the Union address called for a Clean Energy Standard that would require that a certain amount of electricity be generated by low-carbon sources. However, no legislation has been offered by the Administration, and no progress is likely before next year's election.

Previous efforts to establish a similar national renewable electricity standard (RES) have never cleared Congress. Even when Democrats controlled both Congress and the White House, regional differences weakened an RES bill to the point where some advocates openly questioned whether it represented any improvement on the status quo.[2] Senators from states with low energy prices and perceived inadequate renewable resources were the effort's chief opponents.[3] While the bill squeaked through the Senate Energy and Natural Resources Committee, it never reached the Senate floor.[4]

One of the challenges facing such legislation is the regional disparity in fossil energy production and use across the country. Indeed, regional energy differences are as important as party affiliation when it comes to energy and environmental debates in the U.S.—that has been true since the enactment of the Clean Air Act during the 1970s.[5] It's easier for states like California and Washington State, with their high percentage of renewable power, to meet the new requirements than states that produce or depend on fossil fuels, such as Louisiana, with its oil, and West Virginia and Ohio, with their coal mines. Yet support from these states is essential for national policymaking.

Not all the action on climate has been taking place in Washington, however. A number of states have promoted policies for clean energy investment and lower emissions, including renewable-portfolio standards, energy-efficiency standards, low carbon fuel standards, and even cap-and-trade measures.

Nonetheless, the U.S. is moving forward on greenhouse-gas (GHG) reduction—thanks to the Clean Air Act (CAA). That was made possible by a landmark 2007 Supreme Court decision, Massachusetts v. EPA, in which the court held that GHGs fit within the "capacious" definition of air pollutants,[6] and by a subsequent finding by EPA Administrator Lisa Jackson that such emissions "endanger" public health and welfare.[7] Since then, the EPA has been moving to promulgate standards.

The first regulations were aimed at vehicle emissions. Under the CAA, the state of California is given the special ability to set its own standards, which other states can follow.[8] Using this authority, California in 2002 enacted legislation providing for new vehicle emissions standards which—starting in 2009—required a 30% reduction in light-vehicle GHG emissions by 2016,[9] and several other states followed suit. While this often results in two separate automobile designs, the Obama Administration has decided to harmonize federal and California standards, resulting in one uniform national standard through 2016.[10]

What made such aggressive automobile standards possible, given the traditional regional rift between California and other states seeking aggressive standards on the one hand, and Michigan and other states where vehicles are made on the other, was not only the Supreme Court decision, but also the U.S. auto industry's troubles and declining political clout. With two major companies on the verge of bankruptcy, the Obama Administration bailed out the industry, in return for unprecedented cooperation on fuel economy standards. The auto-makers also moved toward more efficient vehicles, while consumers turned to such vehicles due to high fuel prices. These developments caused major policy breakthroughs.

The EPA is also developing rules to require reductions in emissions from stationary sources. Already, new EPA regulations for traditional pollutants, coupled with sagging electricity demand due both to the prolonged recession and to efficiency gains, are prompting the retirement of many old coal units. And the proposed regulations on both traditional pollutants and GHGs are coming under fire in Washington. Yet the agency is facing Congressional challenges to its authority and funding, and it is unclear whether it will be allowed to finalize and enforce all of the emissions reduction efforts currently underway.

Not all the action on climate has been taking place in Washington, however. A number of states have promoted policies for clean energy investment and lower emissions, including renewable-portfolio standards, energy-efficiency standards, low carbon fuel standards, and even cap-and-trade measures. The reasons include economic development and energy security, in addition to environmental concerns.

Twenty-seven states and Washington, DC, have enacted mandatory renewable energy standards (RESs), which require state-regulated power providers to produce or purchase a certain share of renewable energy.[11]

Four states have alternative energy standards which mandate similar requirements, except that such alternative "clean" energy measures as energy efficiency, coal gasification, demand-side management and energy storage also quality.[12] Two states include carbon capture and storage,[13] while one state includes nuclear power.[14] Six states have voluntary standards which encourage renewable energy development without mandating renewable energy purchases.[15]

Because renewable resources vary by state, the RES policy patchwork is diverse. Within their broader renewable standard, many states include additional mandates for specific types of renewable energy: Ten states require a set amount of solar, called a "carve out";[16] energy from certain biomass sources qualifies in seven state RESs;[17] and twenty-six states have set efficiency standards

requiring power generators to meet goals through reductions in load growth or a set share of energy saved.[18] In addition, thirty six states have developed Climate Action Plans;[19] twenty-two have explicit GHG reduction targets, either through executive orders or legislation,[20] and fifteen have completed, or are in the process of creating, adaptation plans to prepare for the impacts of climate change.[21]

A number of states have joined together to form regional partnerships. The Regional Greenhouse Gas Initiative, or RGGI, is the longest running multi-state GHG program, and the only operating GHG cap-and-trade program in the U.S.[22] RGGI began in 2005 with a memorandum of understanding (MOU) among seven northeastern states, and by 2007 included ten states.[23] The MOU and related state action established a market to regulate CO_2 emissions from power plants.[24] Starting in 2009, the RGGI established a glide path to achieve a 10% reduction in GHGs by 2018.[25] Power plants in the region are required to purchase tradable allowances at periodic auctions,[26] and 25% of the auction proceeds states receive must be allocated for consumer benefits or strategic energy investment, though many states invest more.[27] As of July 2011, the RGGI has held twelve auctions, generating more than $886.4 million, 80% of which has been reinvested by states for consumer benefits and energy efficiency.[28]

Despite the program's success, it is not without its detractors. In May of 2011, Governor Chris Christie of New Jersey announced his intention to withdraw from RGGI[29] by the end of the year, calling it "ineffective" and saying it disadvantaged New Jersey compared to non-RGGI states. New Hampshire Governor John Lynch vetoed a similar measure to withdraw from the RGGI in July 2011, citing its benefits to the state.[30]

A regional partnership in the West—the Western Climate Initiative (WCI) began in 2007.[31] While the partnership includes seven states and four Canadian provinces, only California and some Canadian provinces currently plan to participate in the cap-and-trade component. California also has set its own GHG reduction goals. The Global Warming Solutions Act directs California's Air Resources Board (CARB) to identify the best ways to meet the bill's target of reducing California's GHG emissions to 1990 levels by 2020.[32] CARB's plan includes an ambitious RES of 33%, its vehicle standards, energy efficiency standards for building and appliances, and low-carbon-fuel standards.[33] After a 2012 trial period, CARB will begin enforcement under its cap-and-trade mechanism in 2012.[34] This effort is expected to account for 20% of the required reductions, and to cover 85% of statewide emissions.[35] Other states and provinces in the WCI are continuing to work cooperate on a portfolio of other approaches to reduce energy use and emissions.

The Midwest Greenhouse Gas Accord, also launched in 2007, aimed to reduce GHGs to 20% below 2005 levels starting in 2012, through a regional cap-and-trade program and other complementary policy measures.[36] However, during the federal policy debate, the region's focus shifted to making design recommendations for the federal program in keeping with midwestern interests. The region has become less active following the 2010 elections, and the failure of national legislation.[37]

In spite of current political challenges at the state and regional levels, states from each of these regions continue to work together on programs to reduce their emissions and energy use. In addition, twelve eastern jurisdictions launched a Transportation and Climate Initiative in 2010 to reduce emissions from the transportation sector.[38]

Taken together, EPA rulemaking and state actions can not only achieve meaningful emissions reductions, but also demonstrate that progress is possible without causing economic harm. The RGGI's investment of auction proceeds is yielding jobs and other benefits. These examples provide lessons for national policymakers, who can adopt best practices when the time is again ripe for a serious national discussion of climate legislation—when the politically impossible becomes the politically inevitable.[39]

ENDNOTES

1. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009).
2. See Press Release, American Wind Energy Association, Renewable Electricity Standard Won't Create Jobs Unless Strengthened, http://archive.awea.org/newsroom/releases/Energy_Legislation_Needs_Stronger_071609.html; Andy Leonatti, Senate Democrats Preserve Renewable Energy Standard, *National Journal*, May 21, 2009, available *at* http://www.nationaljournal.com/member/daily/senate-democrats-preserve-renewable-energy-standard-20090521?mrefid=site_search (southern and midwestern senators' concerns over a national renewable energy standard).
3. See Ben Geman, Moderate Dems present challenge for renewables mandate backers, *E&E Daily*, Mar. 5, 2009, available at http://www.eenews.net/public/EEDaily/2009/03/05/1.
4. See Katie Howell, Frustration on Senate's Failure to Act on Energy Policy May Pave Way for 'Clean Energy Standard', *N.Y. Times*, Dec. 14, 2010, available at http://www.nytimes.com/gwire/2010/12/14/14greenwire-frustration-on-senates-failure-to-act-on-energ-90076.html.
5. Henry Lee, Vicki Arroyo, and Manik Roy. U.S. Domestic Climate Change Policy,1 *Climate Policy* 381 (2001).
6. Massachusetts v. EPA, 549 U.S. 497, 532 (2007).
7. Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act; Final Rule, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (to be codified at 40 C.F.R. ch. 1).
8. 42 U.S.C.A. § 7543 (West 1990).
9. *California Air Resources Board, Clean Car Standards*, http://www.arb.ca.gov/cc/ccms/ccms.htm.
10. Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25324 (May 7, 2010) (to be codified at 40 C.F.R. pt. 85, 86, 600). Also, the Obama Administration and California are working to develop new harmonized standards for 2017 through 2025. 2017 and Later Model Year Light Duty Vehicle GHG Emissions and CAFE Standards; Notice of Intent, 75 Fed. Reg. 62739 (Oct. 13, 2010) (to be codified at 49 C.F.R. pt. 531, 533).
11. See e.g. Pew Center on Global Climate Change, *Detailed Table of State Policies* (2011), http://www.pewclimate.org/docUploads/State-RPS-%20Detail.pdf; *North Carolina Solar Center & the Interstate Renewable Energy Council, Database of State Incentives for Renewables & Efficiency*, http://www.dsireusa.org/.
12. See Mich. Comp. LawS §§ 460.1001 to .1195 (2008); Ohio Rev. Code Ann. § 4928.64 (West 2009), 73 Pa. Cons. Stat. §§ 1648.1-.8 (2004), amended by 66 Pa. Cons. Stat. § 2814; W. Va. Code §§ 24-2F-1 to -12, amended by W. Va. Code § 24-2F-3 (2010).
13. See Mich. Comp. Laws § 460.1001 et seq. (2008); W. Va. Code §§ 24-2F-1 to -12, amended by W. Va. Code § 24-2F-3 (2010).
14. Ohio Rev. Code Ann. § 4928.64 (West 2009) (qualifying advanced nuclear energy, such as generation III technology).
15. See 2009 AK H.B. 306; N.D. Cent. Code Ann. § 49-02-28 (West 2007); S.D. Codified Laws §§ 49-34A-101 to -106 (West 2009); Okla. Stat. Ann. 17 §§ 801.1 to .7 (West 2010); Utah Code Ann. § 10-19-101 (West 2008); Va. Code Ann. § 56-585.2 (West 2010).
16. See note 11 supra.
17. Id. Qualifying biomass energy varies significantly by state. The Massachusetts standard is being actively updated given recent reports questioning the sustainability premises of traditional biomass fuels. Press Release, Massachusetts Department of Energy Resources, Patrick-Murray Administration Files Proposed Biomass Energy Regulations (May 3, 2011), available at *http://www.mass.gov/?pageID=eoeeapressrelease&L=5&L0=Home&L1=Grants+%26+Technical+Assistance&L2=Guidance+%26+Technical+Assistance&L3=Agencies+and+Divisions&L4=Department+of+Energy+Resources+(DOER)&sid=Eoeea&b=pressrelease&f=110503-pr-biomass-energy-regs&csid=Eoeea).*
18. American Council for an Energy-Efficient Economy, *State Energy Efficiency Resource Standard* (EERS) Activity 1 (2011), http://www.aceee.org/files/pdf/factsheet/State%20EERS%20Summary%20June%202011_2.pdf.

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19. Pew Center on Global Climate Change, *Climate Action Plans* 1 (2011), http://www.pewclimate.org/sites/default/modules/usmap/pdf.php?file=5900.
20. Pew Center on Global Climate Change, Greenhouse *Gas Emissions Targets* 1 (2011), http://www.pewclimate.org/sites/default/modules/usmap/pdf.php?file=5902.
21. Pew Center on Global Climate Change, *State Adaptation Plans* 1 (2011), http://www.pewclimate.org/sites/default/modules/usmap/pdf.php?file=7902.
22. Jonathan L. Ramseur, *Cong. Research Serv.*, RL33812, CLIMATE CHANGE: *Action by States to Address Greenhouse Gas Emissions* 4 (2008).
23. See *Memorandum of Understanding, Regional Greenhouse Gas Initiative* (2005), amended 2006, 2007, available at http://www.rggi.org/docs/mou_final_12_20_05.pdf.
24. Id.
25. Id.
26. *Regional Greenhouse Gas Initiative,* Fact Sheet: The Regional Greenhouse Gas Initiative (RGGI) (2010), http://www.rggi.org/docs/RGGI_Fact_Sheet.pdf.
27. *Memorandum of Understanding,* supra note 23, at 6.
28. See Press Release, Regional Greenhouse Gas Initiative, Regional Clean Energy Economy Boosted with $25.5 million in RGGI Auction Proceeds, June 11, 2011, http://www.rggi.org/docs/Auction_12_Release_Report.pdf.
29. Press Release, Governor Chris Christie, New Jersey's Future is Green, May 26, 2011, http://www.state.nj.us/governor/news/news/552011/approved/20110526a.html.
30. Jason McLure, NH Gov. Lynch vetoes plan to opt out of greenhouse initiative, Reuters, July 6, 2011, http://www.reuters.com/article/2011/07/06/us-greenhouse-new-hampshire-idUSTRE76567020110706.
31. Western Regional Climate Action Initiative, *Western Climate Action Initiative* (2007).
32. *Cal. Hlth. & S.* § 38500 et seq. (West 2006).
33. Hearing on AB32 Before the S. Select Comm. on Environment, Economy & Climate Change (Ca. 2011) (statement of Mary Nichols, Chairman, California Air Resources Board), available at http://www.arb.ca.gov/cc/testimony/testimony.pdf.
34. Id.
35. Id.
36. See Evan Lehmann, Midwest Regional Carbon Pact Faces Delays and Rising Partisanship, *ClimateWire,* Feb. 19, 2010, available at http://www.nytimes.com/cwire/2010/02/19/19climatewire-midwest-regional-carbon-pact-faces-delays-an-40140.html.
37. Darren Samuelsohn, Cap-and-trade policies losing steam, Politico, July 8, 2011, available at http://www.politico.com/news/stories/0711/58559.html#ixzz1RWr7owo9.
38. Georgetown Climate Center facilitates this initiative. For more information, *see* www.georgetownclimate.org.
39. This quote by Milton Friedman in another context is equally applicable to the climate crisis. "Only a crisis—actual or perceived—produces real change. When that crisis occurs, the actions that are taken depend on the ideas that are lying around. That, I believe, is our basic function: to develop alternatives to existing policies, to keep them alive and available until the politically impossible becomes politically inevitable."

UNEASY NEWCOMERS: CLIMATE, ENERGY AND THE "NEW EUROPE"

by Juraj Mesik
University Lecturer and Analyst

"The New Europe—a U.S. inside the EU?"

As far as ignorance and skepticism regarding climate change and sustainable energy is concerned, Europe has its own "United States:" The new EU member countries, famously flattered by the U.S. ex-Defense Secretary Donald Rumsfeld as "the New Europe" for their willingness—or rather: that of their governments—to join in the American invasion of Iraq in the spring of 2003, lag way behind their western European partners, both in their understanding of climate change and in their support for renewable energies. In other words: NOT only in America.

Obviously, we're talking about different size leagues here. Both the size of the U.S. economy and the level of U.S. energy inefficiency mean that the U.S. contribution to global greenhouse gas emission dwarfs that of the new EU member states. A few figures make the point: In 2009, the U.S. produced 18% of global CO_2 emissions, second only to China's—with her 1.3 billion people. Next came India and Russia with 5.2% each, and Japan with 3.6 %. Compared to those figures, the Visegrad Four (V4)—the Czech Republic, Slovakia, Poland and Hungary—provided only 1.52% of the global total in 2009 (the latest available figures), with Poland accounting for the bulk of it. That is just shy of the 1.68% share of Great Britain, which is in ninth place word-wide.

So, since Britain presumably "matters," the V4 block must matter, too. The question is how one chooses to matter —for as EU member states, the V4 have consistently put the brake on progressive EU climate policies, which makes them disproportionally important players, relative to their size and the size of their greenhouse gas emissions. Unfortunately, the educational levels and value systems of the east-central European political elites, still rooted in post-communist mentality and issues, does not correspond to their relative importance.

In another respect, the V4 outstrip the United States. Despite the obsolete heavy industries inherited from the communist past, they have undertaken quite extensive industrial modernization, leading to a decrease in their absolute as well as their per capita CO_2 emissions. In per capita CO_2 production, the USA has a permanent, insurmountable lead, with the average American accounting for 17.7 tons of CO_2 in 2009—virtually unchanged since 1990! The average Russian followed far behind, with 11.2 tons, still well ahead of his/her counterparts in Japan (8.6 tons), Germany (9.3 tons—down from 12 tons in 1990), Great Britain (8.35 tons), Italy (7.0 tons) or France (6.3 tons). Thus, France is able to assure a standard of living comparable—many would argue superior—to that of the U.S., with around one third of the CO_2 level, and even Germany, the world's second largest exporter after China, gets by with just half the American emissions. Clearly, something is rotten in the States—not in Denmark.

So back to the V4's emissions: In 2009, Czech per capita emissions were 9.33 tons, putting the country ahead of Poland (7.43 tons), Slovakia (6.54 tons) and Hungary (5.0 tons)—the last even lower than China's 5.8 tons per capita. These figures can to a certain degree explain Czech and Polish pressure inside the V4 as well as in the EU as a whole against more ambitious emissions-reduction goals. The main reason for their relatively high CO_2 emissions is the high degree of dependency of their electric power sectors on coal, which is, per unit of energy produced, an exceptionally strong CO_2 source. The worse Czech position compared to Poland is due both to its more energy-intensive economy and to the lower quality of the coal burned in Czech power plants. Their conversion to the use of high-quality Polish hard coal instead of low-energy lignite would be a logical, but unfortunately hypothetical, aspect of V4 climate cooperation. Such a move would easily

and quickly decrease Czech CO_2 emissions, but at the price of the layoffs of Czech miners—while preserving the jobs of their Polish colleagues.

Iron Curtain 2.1

Global warming is one side of the coin; the other is renewable resources. Probably nowhere is the gap between "New Europe" and "Old Europe" more obvious than when crossing the Slovak-Austrian border. Once an internal border inside the Austro-Hungarian Empire, later a stretch of Iron Curtain barbed wire, the border today is once again barrier-free. Bratislava and Vienna are just forty miles apart, making them one of the closest pairs of national capitals in the world; many Slovak political and business leaders make the trip almost daily—often to "their" Vienna airport. Yet they cross from one world to another, from the ignorant past to the sustainable future: The windy landscape is the same, but on the Austrian side, dozens of wind turbines rotate silently, while on the Slovak side, there is not one. Technologically, the divide is as visible as it was during the Cold War.

One reason is political: Slovakia, like Poland, has no relevant or authentic Green Party, while the Czech Greens, after a brief stint in government, are out of parliament again. The Hungarian Greens are in, but they are still parliamentary newcomers—and the only light in that country's dismal political sky, but powerless. Green civic initiatives played leading roles in the fall of communism in Hungary and Slovakia, and Slovak Greens even won seats in the first free parliament in 1990. But freshly liberated east-central Europe soon faced rising unemployment and the massive privatization of public properties, accompanied by unprecedented corruption and a wave of nationalism that eclipsed the long-term agendas and perspectives of the Greens. Another result was the split-up of Czechoslovakia, followed, in Slovakia, by years of struggle over the very survival of democracy. All this helped the lobbies old, entrenched nuclear and coal-based energy sources, and for heavy and chemical industry, to gain the upper hand. They managed to conserve and preserve old, communist-era energy systems and prevent any fundamental changes. The social insecurity of the citizens caused by high unemployment played an important part in stifling all attempts in the shift towards renewable sources such as wind or photovoltaics.

A startling recent exception occurred during the short period of Green participation in the Czech government, when the eco-party was able to push through a large solar power plant program based on an approach proven in Germany and elsewhere: guaranteed access to the national grid for solar power producers at a fixed—high—price. Solar farms started to grow fast, despite the less than ideal solar conditions in the Czech Republic—similar to those in Germany and elsewhere in northern Europe; here, the United States is much better off. Unfortunately, once the Greens were voted out, the old energy lobbies managed to create a backlash against the solar boom, arguing that it would increase the price of electricity to consumers, or destabilize the grid.

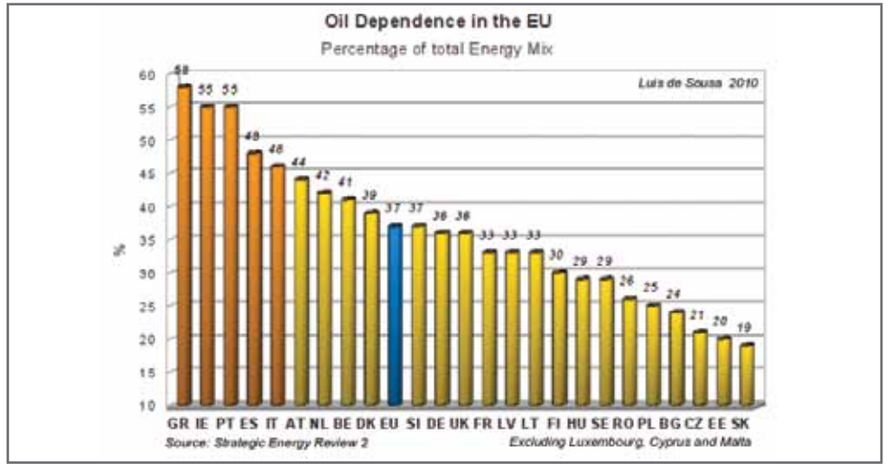
Transport: Europe's strategic advantage, America's strategic failure

While the United States has a huge edge over Europe in solar conditions, and is also well-placed with regard to wind energy, Europe has a number of significant advantages in the area of transportation, a huge producer of greenhouse gases. That makes Europe much more fuel efficient, diversified and resilient to the looming threat of "peak oil" and its consequences. Still, almost one third of the EU's primary energy consumption is swallowed by the transport sector, which accounts for 20% of the EU's greenhouse gas emissions.

One difference is that European urban planning ensures compact cities with high population densities. Unlike the American suburbs and urban sprawl, densely populated European cities can be—and are—served by well developed and diverse public transportation with comfortable and frequent connections. The short distances also make many things accessible for pedestrians and cyclists. In such countries as the Czech Republic or Slovakia, access to public transportation is in fact seen as a right. At least a few public buses run daily even to remote villages, so that people can live without cars even there—and can do so quite easily in towns and cities. In the post-peak oil future—not so remote as some may believe—trolleybuses, trams and trains powered by electric engines will sustain mobility for people and goods, even during times of disrupted oil supplies. Railways are present everywhere in Europe, including in the new EU member countries: while small towns and villages are served by slow trains, many larger cities are connected by high-speed electrically-powered rail systems.

All of which does not mean that east-central Europeans have avoided modern humankind's deadly love affair with the automobile—after all, one third of the world's cars are produced in the EU, most Europeans own cars, and roads in major European cities can be just as congested as in North America. Still, there are a few important differences. There are fewer cars per 1000 people in Europe than in the States, Europeans travel much less with their cars, and the cars they drive are smaller, lighter and much more fuel efficient. In the U.S. in 2008, standards for new vehicles were below 30 miles per gallon, while EU and Japanese standards were 50% higher—almost 45 miles per gallon. In 2008, there were 780 passenger cars per 1000 people in the USA—compared to 560 in Germany, 490 in France, 460 in the UK—and "only" 400 in the Czech Republic, 380 in Poland, 300 in Hungary and 260 in Slovakia. At the same time China had 130 cars per 1000 inhabitants, and India only twelve. Given the looming climate and oil crises, which country would be the best example for China and India to follow as they get richer—the United States, Germany… or Slovakia?

Finally, for those who still don't care about their fuel consumption, Europe has one more surprise: a hefty fuel tax, which strongly motivates people to reduce their travel and buy efficient cars. In May 2011, a liter of gasoline cost €1.65 in Germany, €1.63 in France and €1.49 in poorer Slovakia, while a liter of diesel cost €1.40, €1.43 and €1.37 respectively. At American gas stations, the bill was less than half of that—between $1.05 and $1.07, or 73 eurocents per liter. High fuel taxation has pushed European car manufacturers towards high fuel efficiency, which makes Europe less vulnerable to oil price fluctuations and, ultimately, to the expected post-peak-oil explosion. It will also give European governments some flexibility in easing pressure on consumers in case of extremely high oil price spikes in the future. The graph below illustrates how high exposure to oil in the total energy mix of a country can make it more vulnerable in times of economic crisis. Greece, Ireland and Portugal are three Eurozone countries caught in a debt crisis. They also happen to be the three EU countries with the highest oil dependencies in their energy mix—followed by Spain and Italy… A coincidence? Or maybe linked to the fact that the average price of oil has approximately doubled since 2005?



Graph: The EU: The greater the dependency on oil, the less stable the economy

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There is an important, yet largely neglected, lesson from the American transportation policy fiasco. It is worth remembering how vulnerable to oil pricing the United States became, due to, among other things, low taxation on petroleum products, unchecked urban sprawl, fuel-inefficient motor vehicles, a largely non-existent public transportation system, and an underdeveloped and obsolete railway network. Sticking to a coal-fueled energy sector and postponing the transformation of America's electric power grid towards renewable sources could easily lead to yet another strategic failure for the U.S.

Despite its shorter travel distances, its good railway and public transportation systems and its far more efficient cars, Central Europe has one huge and strategic disadvantage compared to the U.S. that may become a major liability: its extremely high dependence on auto production and export. After the fall of communism, east-central European countries were left with massive military industries, but no further need for weapons. The collapsing military industry provided a mass of skilled workers that was gradually shifted to a growing auto industry. In 2010, the Czech Republic produced 1,076,000 cars and commercial vehicles, Poland 869,000, Slovakia 557,000 and Hungary 168,000. The U.S.'s production at the same time was 7,761,000—only three times as many, with a population that was five times greater. If only personal cars are considered, the disproportion is even more staggering: in 2010, the V4 countries together produced 2,576,000 cars, almost as many as the U.S.'s 2,730,000. That was a five-to-one per capita difference; in the Czech Republic and Slovakia that jumps to twelve to one.

No surprise then that some Slovak politicians and the media have proclaimed their country the Detroit of east-central Europe—more than a little ironic for anyone familiar with Detroit's rapid decay in recent years. It is to be hoped that that irony is not lost on east-central European countries, for if their car industries are to survive and prosper in the post-peak-oil future, fuel efficiency and ceaseless technological innovation are a must. Stricter EU fuel efficiency directives may bring immediate pain, but once adopted, they also give the industry much better long-term perspectives.

Back to climate change—and to adaptation to what is to come

Back in 2008, the EU adopted a triple goal known as "20-20-20," meaning that by 2020, the Union wants to consume 20% less energy, use 20% more renewable energy, and decrease CO_2 emissions by 20%. After the financial crisis and prior to the botched Copenhagen Conference on climate change in late 2009, voices in European capitals began to call for more ambitious goals—a 30% decrease in CO_2 emissions. Initially, the idea was to use the 30% demand as a political tool to motivate the United States, China and other major polluters to join the fight against climate change, so that the EU was reluctant to adopt such a target unilaterally. Powerful fossil-fuel and heavy-industry lobbies were arguing that such an ambitious CO_2 goal would decrease their global competitiveness with Chinese products, and lead to the "de-industrialization" of Europe. Their arguments were rebutted by analyses that showed that on the contrary, moving towards a 30% reduction target would actually create jobs and strengthen European global competitiveness, while decreasing dependence on imported energy sources. "We need to start the transition towards a competitive low-carbon economy now," said EU Climate Commissioner Connie Hedegård. "The longer we wait, the higher the cost will be." And a BBC report noted that "As oil prices keep rising, Europe is paying more every year for its energy, and becoming more vulnerable to price shocks. So starting the transition now will pay off." Achieving the 20-20-30 target will save Europeans an annual €175 to €320 billion ($250 to $460 billion) for fossil-fuel imports—a not at all negligible sum, especially as it would otherwise end up in Russian or Saudi Arabian coffers. The number of jobs in renewable industries across the EU has doubled over the past five years, and implementation of the triple-20 strategy should boost the number of employees in the renewables and energy-efficiency industries to 1.5 million: another politically significant factor, especially in times of crisis.

National Archives. The picture illustrates "dust bowl" conditions in the U.S. Midwest during the 1930-1936 period. Just a few years of drought transformed rich agricultural land into a hell of deserts and dust storms. Today, the region is again one of the bread baskets of the United States. But for how long?

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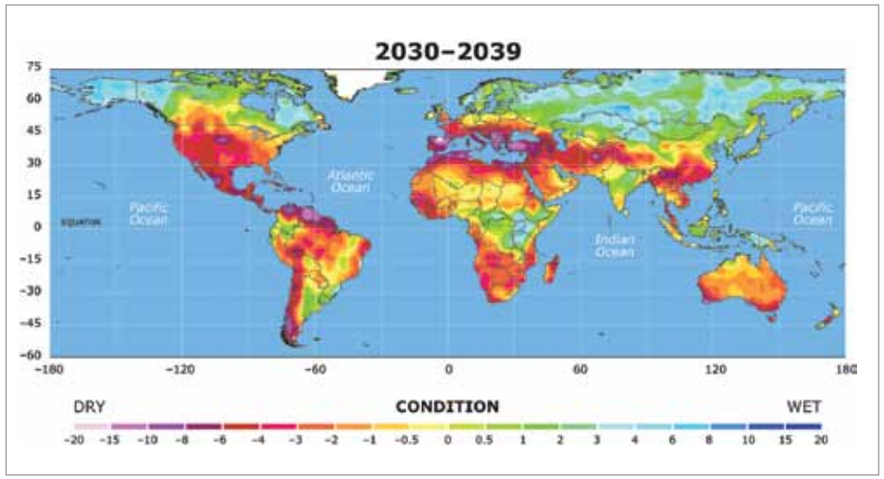
The 30% CO^2 reduction goal was approved by the European Parliament in late May 2011, an important step on the way to its adoption.

But even a 30% or more CO_2 reduction in Europe would, unfortunately, not stop global warming. Not only are the USA and China producing half the world's greenhouse gas emissions, they are both clearly determined to keep doing so. Moreover, even if all the countries in the world were to adopt and implement much stricter reduction goals than have ever been considered internationally, the earth's temperature would continue to rise, due to the sheer momentum of the CO_2 and CH4 that is already in the air. Much more warming is already in the pipeline: paleo-climatological studies tell us that the last time the earth's atmosphere had the 390 ppm of CO_2 it has today, sea levels were 25 meters (80 feet) higher than today's level. Already, summer Arctic ice albedo is decreasing rapidly, with ocean ice melting at an unprecedented pace, and CH4 emissions from melting permafrost in Siberia, Canada and Alaska growing unstoppably.

But does this mean that the EU and progressive forces in the United States should give up fighting for improved climate policies and reduced greenhouse gas emissions? Certainly not, they should push for maximum greenhouse-gas reductions and implement them unilaterally, if necessary. The EU's competitiveness is, historically and globally, a much less important factor than the chance to slow down and eventually stop global warming. Competitiveness is about money; global warming is about survival—at the minimal level, the survival of millions of human beings who might die in famines, on a more existential level, the survival of human civilization, and, given worst-case scenarios, the survival of our species. It is not at all irrelevant whether global

temperatures increase by, say, 4.5°C by the end of the twenty-first century, or by "only" 4.0°C. For and many species, a 0.5° difference may be the difference between survival and extinction, and for many people, between life and death. We only need to be very realistic, and understand that global temperatures will continue to rise regardless what we do—we cannot stop them, certainly not in the span of a human lifetime. But we can slow the speed of warming and reduce the maximum that will be reached.



The droughts of our children: The map shows estimates of the Palmer Drought Severity Index across the planet just two decades from now. Notice the severity of droughts in agricultural regions of the central U.S. and Mexico, Europe and the Mediterranean as well as in large parts of China. Readings of -4 or below are considered extreme droughts: during most of the dust bowl era, the PDSI in that region was at -3, with occasional drops to -6.

All available data indicates that we will live in a warmer world with greater and more frequent climate extremes. The decade of 2000-2010 was not only the warmest decade since measurements began, it also was a decade of many climate extremes. A few examples are the 2003 heat wave in western Europe and the 2010 heat wave in Russia; frequent major floods in central Europe—and much worse flooding elsewhere, as in Pakistan in 2010 and in Australia in early 2011; severe and extensive droughts and fires in the Amazon region—which supposedly happen once in 500 years—in 2005 and again in 2010. The Russian heat wave killed more than 50,000 people—twenty times more than the 9/11 attack in New York, yet the world hardly noticed. The world is still feeling the effects of the 2010 heat wave, when heat, drought and fires destroyed 40% of Russia's wheat harvest, leading to a wheat export ban and skyrocketing global food prices to hitherto unprecedented levels. Just six months after the Russian wheat export embargo and the resulting rapid rise in food prices, Arab regimes began to collapse one after another across northern Africa and the Middle East. Understanding the link requires no genius: all the Arab countries, from Morocco in the west to Oman in the east, import more than half of their food from abroad.

Obviously, climate change deniers ignorant of science or rooted in ideology, as is the case of the United States, will find their own explanation for all that is happening.

Given what is ahead for both Europe—including the "New" and largely unenlightened part of it—and the U.S., climate change adaptation is a must, in addition to climate change mitigation efforts. Unfortunately, both adaptation and mitigation measures around the world will be made much more difficult because of peak oil and its consequences. One more reason to start implementing as many adaptation measures as possible aimed at increasing food and energy security in agriculture, forestry, energy, transportation and all other sectors without further delay.

Sharing Solutions: Transatlantic Cooperation for a Low-Carbon Economy

"New Europe's" new opportunities

Over the past twenty years, the V4 countries have undertaken an extremely rapid modernization not often experienced in history. Many large, inefficient and polluting old industries have been closed down and replaced by modern ones—as shown above with respect to the auto industry—environmental standards have been introduced and enforced in many fields, energy efficiency in production has improved dramatically, material consumption has decreased; the list of achievements goes on and on. This has often come at a high social price, in the form of unemployment and social insecurity unheard of during the communist era. A high environmental price has also resulted from the rise in consumerism.

The blunt fact is that domestic political forces were not the dominant driving force behind the transformation achievements; rather, it was the powerful lure of EU membership and the necessity to adopt EU standards and norms as a prerequisite for accession. Once the V4 countries got into the club, they also got a say in how it was run: the price paid is that pushing through new progressive energy and environmental policies in the EU 27 is much more difficult than it was in the EU 12 or the EU 15 just a few years ago. On the other hand, the strong links that exist at many levels between politicians, bureaucrats and people inside the EU have also enabled a sharing of many ideas and a process of mutual learning. The new EU member countries' best hope is that the east-central Europeans will also start to learn from the progressive energy and climate ideas of their neighbors to the west—from the Germans and Austrians in particular.

The electric power sector provides an opportunity to learn a particularly good lesson. In May 2011, the German conservative government of Angela Merkel, in response to the public outcry after the Fukushima accident, reversed her policy of slowing down the planned phase-out of the German nuclear industry by two decades, and returned to the shut-down date of 2022. In addition, the seven oldest of Germany's eighteen reactors were immediately and permanently shut down. Polls show that the next German federal government will be formed by Greens and Social Democrats—a so-called red-green coalition, which will ensure that the shut-down will hold. The scenarios for replacing the power from the nukes—prepared long before the Fukushima accident—all assume that renewables, particularly wind farms and solar panels, not coal, will do the trick.

The real technical challenge will be to guarantee network stability and reliability under changing wind and solar conditions. The trade in electric power within the EU provides some buffering capacity, but real breakthrough strategies may come from developing new capacities for energy storage. One of the possible approaches could be close cooperation with Norway, with its huge hydropower potential. One possible strategy envisions using surplus German (and Danish) wind power during high-wind hours to pump water to high-altitude storage-dam lakes in Norway; Norway—and also the Alps, the Pyrenees and the Carpathians—could thus become Europe's "batteries."

The first argument against German plans expressed by current Central European leaders is that nuclear energy accounts for a far lesser share of Germany's power mix, hence it is easier for Germans to consider phasing it out. This is quite true: with 53.5% of nuclear electricity, Slovakia is the world's second most nuclear-dependent nation, surpassed only by France. Hungary, at 43%, ranks sixth, and even the Czech Republic's 34% nuclear share is much more than Germany's 26%. Nevertheless, if Germans overcome technical and economic challenges and succeed in replacing their reactors—and eventually lignite and hard coal plants—with renewable sources, the Czechs, Slovaks and Hungarians will follow, pushed by the ever growing economic and environmental costs of fossil fuels. Even today, mining in Slovak coal mines is heavily subsidized to the tune of €1800 per month for each job, so that if the government sent all 4000 miners home and paid them their average monthly salaries of €1100, it would still save 40% of the current cost of mining

coal—and cut CO_2 emissions considerably. Despite simple economic mathematics and the environmental imperative to stop subsidizing climate destruction, the Slovak government recently decided to continue subsidizing coal mining until 2018—as long as the EU permits it.

The European Union's funds provide significant financial resources that could be directed towards rebuilding the east-central European energy infrastructure, modernizing railroads, or providing thermal insulation for households. Some EU resources are in fact channeled in that direction, but too much is unfortunately wasted on unsustainable and often economically dubious projects, such as the construction of new highways.

Once the Germans start to make progress in their renewable energy conversion and more pump storage is built in Norway, the Visegrad countries will learn quickly. While both Poland and Hungary are lowland countries with good wind and solar potential, Slovakia, located between them, is a mountainous country with potential for developing energy storage dams. Thus Slovakia could become the "battery" of east-central Europe. The hydropower station in Slovakia with the largest installed capacity, 735 MW, is actually the Cierny Vah pump storage plant. It was put in operation in 1981 to compensate for the inability of nuclear power plants to decrease their electric-power output when demand is low; nukes, like renewables, which are dependent on the vagaries of the weather, need energy-storage technology.

There are many other opportunities, in fact necessities, to improve the energy cooperation and policies of the V4 countries. People in east-central Europe, as everywhere in the world, need to climate-proof their entire energy infrastructure. Heavy rains and floods predicted by climatologists will cause more landslides, which may damage power grids and pipelines. More frequent and intensive flooding will further accelerate sedimentation and filling of dams, thus reducing their water accumulation volumes and energy output. Heavy snows and extreme winds may become a threat to electric power transmission lines—already a common problem in the U.S. Extended droughts, on the other hand, may decrease the output of hydropower plants and reduce the availability of cooling water for nuclear plants, leading to forced reduction in output. On the other hand, droughts can increase the output of solar plants, enabling them to provide a back-up for the reduced output of hydropower, in such places as Slovakia.

East-central European countries also have to carefully analyze what the changes in weather patterns will mean for energy consumption. Heat waves for instance increase electricity demand for cooling households, as shown by American blackouts during extreme heat waves, when demand for power to air-condition poorly insulated houses exceeds production capacity. Extended and repeated droughts will also boost the need for irrigation in agriculture, and with it the demand for energy: irrigation is a major consumer of electric power in India and China.

Critically important is also the question of what changes in weather patterns will mean for the social situation of citizens in the V4 countries. For many, food and energy are the two largest expenditure items today. With climate change progressing, food could become more expensive, and the need for energy could increase seasonally, due to heat waves and cold spells, increasing the risk of energy poverty and even the loss of lives among people not able to cool or heat their homes at such times. There is firm epidemiological evidence that the 2003 heat wave in western Europe caused the premature death of over 40,000 people, mainly in France, and the reported loss of life due to the 2010 Russian heat wave is 56,000, although that figure may have been politically manipulated—i.e., underreported. And total deaths during the very cold winter of 2008-'09 in

England and Wales came to 11,000, a 49% increase over the previous year's average. Appropriate social policies might reduce such loss of life.

The European Union's funds provide significant financial resources that could be directed towards rebuilding the east-central European energy infrastructure, modernizing railroads, or providing thermal insulation for households. Such a program would also decrease the dependence of the V4 countries on imported gas, improve the trade balance with Russia and others, and significantly reduce CO_2 emissions. Some EU resources are in fact channeled in that direction, but too much is unfortunately wasted on unsustainable and often economically dubious projects, such as the construction of new highways.

STATE POLICIES AS DRIVER OF THE LOW CARBON ECONOMY

Case studies of state policies for climate mitigation and climate competitiveness

JOHANNES REMMEL

Minister of Environment State of North-Rhine Westfalia

Humankind is on the horns of a dilemma. The hunger for energy is expected to double the global demand for energy by the middle of the century whereas, on the other hand, the urgent need to limit climate change calls for greenhouse gas emissions to be halved over the same period. The industrial nations, the USA and Germany in particular, must accept the challenge and, rather than continuing to be part of the problem, must at long last become part of the solution.

Among the German states it is North Rhine-Westphalia, the country's most populous state with a population of 18 million, and both the hub of Germany's industry and the major industry and energy region in Europe, which has decisively taken the initiative.

It goes without saying, though, that ambitious climate protection goals pose a formidable challenge to North Rhine-Westphalia, too, given that

- North Rhine-Westphalia is home to Germany's largest energy suppliers;
- the state's industry is dominated by energy-intensive firms;
- some 30 percent of Germany's electricity is generated—and for a major part used—here in this state;
- from which it follows that one third of Germany's total greenhouse-gas emissions are released in North Rhine-Westphalia.

At the same time this means that

- North Rhine-Westphalia has the largest potential for reducing emissions in Germany, and
- North Rhine-Westphalia is in a position to make a major contribution towards realizing the German, European and international climate protection goals.

However, in order to achieve that objective, we need a re-orientation of the policy on climate protection and energy, both in our state and globally. In this context, our action is guided by the knowledge that ecology and economy, labor and the environment are not opposites.

North Rhine-Westphalia aims to become a trail-blazer in climate protection, energy saving technologies and renewable energy. To do so, we must be in the vanguard of sustainable innovations while preserving what has proven efficient and successful. We will step up the development of renewables, especially wind energy, in North Rhine-Westphalia. Technologies that are designed to make a sizable contribution towards attaining that objective include cogeneration, which is a most sustainable and eco-friendly, flexible-to-use technology with high energy conversion efficiencies, advanced energy storage systems, and innovative grids.

This, of course, requires tremendous efforts at all political and societal levels. We are, however, poised to live up to that challenge as North Rhine-Westphalia's economy ranks at the top in Germany, in Europe and in the world. There are many reasons for this: an excellently qualified labor force, a well-developed transport infrastructure, innovative and globally competitive industries, a highly dynamic environment and energy sector plus a unique and very closely knit university and research community.

And that commitment pays off for all of us, for it provides outstanding opportunities for business and researchers, enhances energy security, reduces dependence on expensive imports, increases added value in the region, and above all helps safeguard existing jobs and create new ones.

We are all called upon to jointly set the course for re-shaping our global energy system without delay, for if we fail to increase resources and energy efficiency, to step up the use of renewable energy, and hence to protect our climate and conserve our natural resources, this will inevitably lead to an international run on increasingly scarce fossil energy sources which may eventually pose a threat to world peace.

I am therefore very grateful to the Heinrich Böll Foundation for this publication, as it is a landmark contribution to analyzing a forward-looking climate and energy policy at both the regional and national levels. The publication sets the focus on investigating the extent to which highly industrialized and coal-centered regions on the one hand and rural regions on the other can realize their potential for creating new jobs, generating added value and improving energy security against the backdrop of the global challenges of implementing a sustainable energy and climate policy. The industrial countries, especially the United States of America and Germany, therefore must be at the leading edge of re-shaping the energy system.

The study provides information about how such policies and strategies must be devised with a view to bringing about a smooth and economically viable transition to a low-carbon economy. The publication puts forward a number of proposals as to how those countries and regions might benefit from energy efficiency and renewable energy and on how to provide an impetus for the urgently needed modernization of the national and regional economies. Furthermore, the study identifies economic impediments to a beneficial climate policy and comes up with solutions for removing those obstacles, including transatlantic approaches.

BEN BRANCEL

Secretary, Wisconsin Department of Agriculture, Trade and Consumer Protection

Energy issues will continue to be a focus of the nation's attention, as higher energy prices, volatility in oil prices, and national security concerns continue to affect our nation. Renewable energy production needs to be a part of any emerging energy policy to meet our energy challenges.

As a livestock farmer in central Wisconsin and now as Secretary of the Wisconsin Department of Agriculture, Trade and Consumer Protection, it is my belief that Wisconsin and the Midwest are uniquely positioned to participate in the renewable energy arena, given our diverse resources, which include productive agricultural soils, vast forest resources, nationally recognized research institutions, private sector involvement and innovation, active technical college programs and extension expertise.

Our nation's farmers are skilled at providing food for the people of our nation and those beyond our borders, and they are ready to provide the raw materials to supply our nation's energy needs as well. As the fifth generation to farm my family's land in Marquette County, WI, I have gotten to know many farmers from around the state. When a stable, assured bioenergy marketplace develops, our farmers will step up to supply the marketplace with high quality, reliable products, as we have for decades. Collaboration on all levels will be extremely important for developing a secure market for bioenergy feedstocks. Collaboration will yield efficiencies and process innovations, from planting and harvesting to collection and transportation, allowing for profitability across the entire biomass supply chain.

Bioenergy production can give farmers and foresters the opportunity to add new income sources, reduce energy costs, and diversify their crop systems. Livestock farms and food processing plants can produce renewable natural gas for conversion to electricity and heat, compressed natural gas for vehicles or for potential injection into the pipeline. Biomass grown on our family farms can provide farmers and rural areas with new income streams, diversify farm businesses and keep our valuable agricultural lands and farmers in farming. Bioenergy production by necessity will require building rural infrastructure and businesses to support the growth, harvest, collection, and transport of biomass and biofuels, thereby strengthening rural economies and providing employment opportunities to rural citizens.

When done thoughtfully and without large subsidy programs, state and federal policies can stimulate the growth of the bioenergy industry. Wisconsin has adopted renewable portfolio standards, invested in clean-energy job creation, led the advancement of research in cellulosic ethanol and biomass, and made great strides to increase energy efficiency in homes, businesses and government buildings. As a result, Wisconsin has seen a rapid expansion in alternative energy production and real growth in clean energy jobs. We can learn from our friends across the Atlantic who have already made significant changes in energy policy to drive these markets, stimulate growth and create jobs. I believe this transformation can occur in the United States as well, when policy makers come together to set a path toward energy independence and homegrown energy production, utilizing the assets that make our nation so unique.

ENERGYREGION.NRW: SUPPLIER FOR RENEWABLE ENERGY

by Dr. Frank-Michael Baumann
Executive Director, EnergyAgency.NRW

The German state of North Rhine-Westphalia (NRW) is Europe's most modern and significant energy region. For centuries, the land on the Rhine and Ruhr rivers has stood out worldwide for its unprecedented scale of consumption and supply of energy to businesses, providers and users of new energy technologies and energy services, for energy research and for energy technology development. The state produces some 30% of Germany's total electricity requirements, and consumes one third of all electricity used for industrial purposes in Germany. In 2009, approximately 250,000 people worked in the NRW energy economy. Many internationally active energy providers, gas pipeline companies, and power plant manufacturers have their head offices in North Rhine-Westphalia, as do energy-intensive production plants and market leaders and technology suppliers from the renewable energy sector.

The state's energy economy is oriented toward profitability, the stable supply and delivery of energy, and environmental compatibility. Thus, to ensure climate protection and create new jobs in the state, the focus is now on renewable energy. According to a study conducted by the Institute of the Renewable Energy Industry (IWR), the approx. 3,400 companies in NRW's renewable energy sector employed some 24,100 workers in 2009; by 2020, that is expected to increase to 40,000. The overall sales volume of NRW-based companies active in facility and system design for the production of renewable energy reached nearly €7 billion. North Rhine-Westphalia is thus well situated as a location for industry and energy production.

The clusters EnergyRegion.NRW and EnergyResearch.NRW

In the energy sector in particular, continued business progress depends to a large extent on the collaboration of all actors involved—in government, business, research, and finance. These collaborative efforts have given rise to two clusters, EnergyResearch.NRW and EnergyRegion.NRW (www.exzellenz.nrw.de).

EnergyRegion.NRW constitutes the platform for the cooperation of businesses, researchers, and municipal actors along the industrial value-added chains. The goal is to maintain our leading position as the number one energy state, and to provide more international visibility to NRW as an excellent site for businesses active in the energy industry. The cluster comprises eight different networks focusing on the following competency areas: biomass, fuel cells and hydrogen, energy-efficient and solar construction, geothermal energy, fuels and drive units of the future, power-plant technologies, photovoltaics, and wind energy.

EnergyRegion.NRW consolidates and networks North Rhine-Westphalian businesses and research institutes active in these areas, with the goal of promoting innovation processes in the state, establishing cooperative efforts and strategic alliances, and accelerating market launches of innovative products nationally and internationally. In addition, the cluster pursues the enhancement of existing core capacities, and the identification and adoption of new trends and developments.

The state government has assigned the management of this cluster to EnergyAgency.NRW, the networks and partners of which constitute the basis for the cluster's activities. The cluster is managed by professionals who approach and integrate key actors in business and research. EnergyRegion.NRW is closely interlinked with EnergyResearch.NRW, a cluster that is likewise managed by EnergyAgency.NRW.

EnergyResearch.NRW is a point of contact for all energy research issues in the state, and promotes the coordinated collaboration between research and scientific institutions and business. The work of the cluster thus contributes to accelerating the application of the state of knowledge.

The management of EnergyResearch.NRW aligns itself with North Rhine-Westphalia's research and policy priorities. As such, it has established three main focus points: centralized energy production; decentralized energy production; and the biological production of energy carriers. These are interconnected through important cross-cutting technologies such as grid technologies and storage systems, as well as energy-efficiency and acceptance measures.

Status and perspectives of selected renewable energies in NRW

Quick facts

North Rhine-Westphalia's share in the production of renewables is approximately 10% for electricity and heat respectively. This is much lower than the state's share in the country's overall conventional power generation (30%), or its contribution to Germany's gross national product (20%).

The development of renewables across Germany has increased enormously, with the share of renewables in final energy consumption having increased by a factor of five over the past ten years. In NRW however, this share has been much lower, due mainly to the state's large production capacities of conventional energy. At the national level, the share of renewables in final energy consumption (electricity, heat, and transportation) was 10%, whereas in NRW, it was only 4%.

Wind energy

In 2010, the growth of the international wind energy market slowed down. In NRW, approximately 2800 wind farms were estimated to be in operation in 2010, with an installed capacity of some 2900 MW.

Until 2004, NRW was the leading wind farm state in Germany. Today, it ranks fifth overall, behind the east German states of Brandenburg and Saxony-Anhalt and also behind Lower Saxony and Schleswig-Holstein, two coastal states with high installed capacities.

According to a study commissioned by the Federal Ministry of the Environment, North Rhine-Westphalia is one of two significant wind energy hubs in Germany. The state's expertise in mechanical engineering, electrical engineering, and material sciences in connection with wind power technologies are considered to be the world's best. NRW would thus do well to secure and further develop this position, particularly since the growing demand for wind farms, both domestically and internationally, can guarantee future-proof jobs in wind energy and ancillary industries.

Geothermal energy

A further example of the successful application of existing know-how to future energies is the geothermal energy sector. North Rhine-Westphalia is well on its way to transitioning from being the cradle of Germany's coal-mining industry to the country's number one producer of geothermal energy.

Even today, the state's Rhine-Ruhr metropolitan region holds a key position in the geothermal energy sector, with numerous market-leading companies and some 4000 to 5000 jobs in the sector. This is no coincidence, as North Rhine-Westphalia has always been the hub of German mining technology. The state can be credited with having established high standards in plant manufacturing, drilling technology, the construction industry, and the energy economy. Also, many companies active in these fields are gradually adapting their existing technologies and know-how to the development of geothermal energy.

Some 70% of the state's surfaces are suitable [for geothermal energy], and the state has one of the highest utilization rates for its heat pumps.

Major companies in this sector, such as RWE Innogy, DMT GmbH & Co. KG, HOCHTIEF AG, Daldrup & Söhne AG, and evonik, are already cooperating with universities to develop standards

for the manufacturing and development of this new technology. In addition, the International Geothermal Association has recently moved its office to Bochum for a period of five years. In this way, new incentives for business and job creation have been introduced that benefit both economic growth and climate protection.

The natural conditions for using NRW's near-surface geothermal energy are also very good. Some 70% of the state's surfaces are suitable, and the state has one of the highest utilization rates for its heat pumps. Currently, nearly one new structure in five in NRW is equipped with a geothermal heat pump, compared to only 2% ten years ago.

Moreover, the state's decommissioned mines still contain large quantities of hot mine water that can be exploited to heat buildings by means of geothermal technology. Pilot projects to this end have already been realized in several cities of the Rhine-Ruhr metropolitan region, and other projects are in planning.

The energy region NRW can be expected to continually increase and intensify its use of geothermal energy, in particular that of heat pump technology.

Funding

As part of the state funding program "progres.nrw," some €700 million were spent by NRW and the European Union (EFRE program) between 1988 and the end of 2007 on the development, demonstration, and market launch of innovative energy technologies and energy consulting, spread out over 60,000 projects. The program has attracted further investment on the order of €3.8 billion. This has allowed funding for nearly 7400 projects with €43 million in 2008 and 2009, and to inject €13.3 million into 3600 projects from the program sector market launch alone in 2010.

Outlook

According to the agreement of the current coalition government of 2010, NRW's C02 emissions are to be reduced by 25% by 2020. Renewables will play a significant role in reaching this goal. The share of wind energy in the state's total electricity production is to reach 15% by 2020 (20 TWh, compared to 4 TWh in 2009). Some 2% of the state's overall surface area is to be allocated for this purpose.

Consistent with goals of the European Union, North Rhine-Westphalia also gives priority to renewable energy over all other energy carriers. To this end, the state's implementation of the EU Directive on the promotion of the use of energy from renewable sources included a verification of the extent to which each of the state's provisions, regulations, and support programs qualified as a "non-discriminatory" measure in the expansion of renewable energy.

In the fields of energy-efficient and solar construction and building retrofitting, NRW also has a solid knowledge and consulting infrastructure. To achieve the state's climate protection goals, however, this infrastructure must be expanded and oriented more toward renewables. The residential building projects "Fifty Solar Housing Projects in NRW" and "One Hundred Climate-Protection Housing Projects in NRW" of EnergyAgency.NRW are widely recognized as successful pilot projects for the market launch of renewables. However, these too can and must be further improved.

NRW also has considerable repowering potential; according to some estimates, up to 1600 MW could be added by replacing old facilities, especially wind mills. However, repowering of the wind farms, most of which were built between 1998 and 2003, is unlikely until 2015 to 2020.

The ambitious climate protection and renewables expansion targets can only be reached if a reliable funding structure, supported by both the German federal government and the EU, is

maintained. Most of the subsidies are allocated to the technological development and innovation of renewables, and, to a lesser degree, to the operation of the plants. The main priority is to create a comprehensive renewables infrastructure through the establishment of testing facilities, scientific institutes, and competency networks, thereby allowing NRW to optimally participate in the rising renewable energy economy.

Climate protection and jobs through wind power in NRW

According to the Intergovernmental Panel on Climate Change (IPCC), global greenhouse gas emissions must be reduced by at least 50%-85% compared to 2000 levels by mid-century, in order to stay within the 2°C limit. However, to accomplish this, enormous efforts will be required from all political and social levels.

The North Rhine-Westphalian government has set itself the goal of reducing the total of greenhouse gases emissions in the state by at least 25% by 2020, and by 80% by 2050, compared to 1990 levels. These figures indicate that NRW has the largest emissions reduction potential in Germann goals.

The state government also plans to adopt a climate protection law for North Rhine-Westphalia, to serve as a key instrument of its climate and energy policy. It will stipulate climate protection goals and provide a legally binding framework for the development, implementation, and verification of climate-protection measures.

Among the climate protection measures of the current state government, renewable energy expansion clearly has a central place, alongside energy savings and energy efficiency.

Half the gears used in wind turbines worldwide came from North Rhine-Westphalia.

To NRW, as a bastion of mechanical engineering and plant manufacturing, renewable energy expansion is an important means for the transition to a sustainable industrialized society. "Made in NRW" products from the renewables sector have served to export climate protection worldwide, all the while sustainably securing jobs and creating new ones within the state. According to the German Wind Energy Association, some 10,000 people are already earning their living manufacturing wind turbines in the Rhine-Ruhr region alone; nationwide, that number is estimated at 100,000.

This wind-energy hub is driven and supported by an extensive supplier industry as well as a wide range of teaching and research establishments, all of which benefit from the state's above-mentioned expertise in mechanical engineering, materials science, electrical engineering, and the energy economy. North Rhine-Westphalia has the highest density worldwide of gear manufacturers for wind turbines, including Winergy (in Voerde), Bosch-Rexroth (in Witten), Renk (in Rheine) and Eickhoff (in Bochum), to name but a few. In 2007, half the gears used in wind turbines worldwide came from North Rhine-Westphalia.

For this, NRW has an extensive infrastructure of businesses specialized in the production and maintenance of gears, couplings, bearings, cast iron parts, rotor blade components, brakes, measuring and control technology, wind-turbine towers, screws and tools, and foundations. Here, the supplier companies include KTR (in Rheine), the Schaeffler Group (in Wuppertal), Rothe Erde/ThyssenKrupp (in Dortmund and Lippstadt), Hanning & Kahl (in Bad Oeynhausen), August Friedberg (in Gelsenkirchen) and Plarad-Maschinenfabrik Wagner (in Much). One new player is ZF Service GmbH, based in Holzwickede, which provides a gear-testing facility and service for the maintenance of wind turbine gears. Two relatively young manufacturers of wind turbines, Eviag and Kenersys, are also located in NRW.

NRW is also recognized in the field of wind energy research, especially with regard to mechanical and electrical engineering, having established over thirty institutes and laboratories at some fifteen universities, as well as three facilities in non-university settings.

Overall, North Rhine-Westphalia is an excellent wind-energy location, and the state is working to advance wind energy as the main pillar of its range of renewables. This effort has led to numerous patent applications, which have in turn strengthened NRW as an innovative location.

The share of wind energy in the state's total electricity consumption, currently at 3%, is to be increased to 15% by 2020. That is a very ambitious goal for a highly industrialized state with a population of 18 million—but it is nevertheless realistic.

Conclusion

The expansion of wind and geothermal energy are the only ways in which North Rhine-Westphalia can utilize its expertise as an energy-technology provider to support the transition to renewables. However, this transition will also require suitable grids and storage technologies, for our existing systems are not sufficiently equipped for the requirements of the future, either in terms of capacity or of load management.

As a long-time center of machine ... manufacturers, North Rhine-Westphalia can be expected to be ... among the top players in the race to protect the climate.

New grid concepts are needed which can transmit large quantities of renewable energy, integrate the decentralized feed-in of power from various sources, including renewable and cogeneration systems, and incorporate decentralized storage technologies.

A power supply based largely on renewables will require a modern, high-performance power grid. A major network study commissioned by the German energy agency *DENA* estimated that an additional 1500 to 3600 kilometers of power lines will be required nationwide. The study emphasized that the expansion and improvement of Germany's power grid must include a solid north-south artery as well as an overlay network that can send electricity from offshore wind parks in the northern and eastern parts of the country to the high-use centers in west-central and southern Germany—including NRW.

The realization of this grid expansion will require not only large-scale technological projects but also major efforts and campaigns to address economic and environmental issues. For example, it is vital to win the acceptance of residents living near planned wind farms, so as to secure the implementation of projects within reasonable time frames.

As a long-time center of machine and plant manufacturers, North Rhine-Westphalia can be expected to be, in the medium and long term, among the top players in the race to protect the climate. NRW-based companies provide technological solutions along the entire value-added chain, from energy transformation to energy-efficient components and energy-efficient production processes.

Ambitious climate-protection targets will also strengthen the local economies in smaller communities. Especially in rural towns, decentralized renewable-energy expansion will lead to higher employment rates, higher incomes, and more tax revenues.

Finally, a study conducted by the German Institute for Economic Research (DIW) in Berlin has shown that a restructuring of the energy system now would result in a gross domestic product in 2030 approximately 3% higher than that which could be expected without an expansion of

renewable energy. This finding underscores the underlying premise of the work of EnergyAgency.NRW: that economic growth and sustainability are not mutually exclusive.

For more information, visit: www.energieagentur.nrw.de
http://www.energieagentur.nrw.de/infopool/page.asp?InfoID=4639

Sharing Solutions: Transatlantic Cooperation for a Low-Carbon Economy

POWER GRID EXPANSION BY THE CITIZENS

by Robert Habeck
Chairman of the Parliamentary Group, Alliance 90/The Greens, the State of Schleswig-Holstein

Schleswig-Holstein, Germany's northernmost state, can currently produce 40% of its energy needs from renewable energy. While this proportion appears significant, it is less so considering that the state has few energy-intensive industries. Hence, the question is actually whether renewables can keep their promise of achieving the energy turn-around to a system with no coal or nuclear power.

The best point of reference for the state's power output is when all three nuclear power plants were on line. In 2000, the reference year, Schleswig-Holstein achieved total electric power generation of 33.8 TWh—that is the amount the state needs to achieve to retain its status as an energy exporter. Last year, the total surface of the state's potential wind farm areas, i.e., areas legally designated as potential sites for wind farms, was expanded to cover 1.5% of the state's overall surface. If all of those areas were to be utilized by 2020, with obsolete facilities replaced by new, the installed onshore capacity would reach 9 GW. Assuming 3000 annual full-load hours (AFLH) of operation, a facility with 9 GW of capacity can generate 27 TWh of energy.

More modern facilities achieve significantly more AFLH than the average of currently installed wind turbines. In the medium term, the generation of 3000 AFLH, is entirely feasible in windy Schleswig-Holstein. Offshore, estimates run around 4000 AFLH and a capacity of 3 GW.

Offshore wind farms would thus contribute an additional 12 TWh of power, but even this calculation, with a total of 39 TWh of wind energy, is a rather conservative estimate. A more efficient use of the potential wind farm areas could allow for the generation of 12 GW onshore alone. A decisive factor here is the optimal height of the wind turbines. In addition, the state could generate electricity from biomass and photovoltaics. However, in particular with regard to biomass, Germany has made some mistakes. The excessive promotion of monocultures, especially corn, has resulted in decreased public support for this type of renewable energy. *Vermaisung*—literally: "cornification"—has entered the German language as a negative buzzword that means environmental damage, ugly landscapes, competition with food crops, and increased leasing prices for farmland. According to Schleswig-Holstein's Agricultural Chamber, the state was operating 324 biogas plants in 2009. By the end of this year, there will be over 400; further facilities are planned and the total will exceed 600 within eighteen months or two years. In 2009, the state cultivated corn on some 184,000 hectares of land, approximately one half of which was used as an energy crop. Since Schleswig-Holstein has 660,000 ha of arable land in total, corn accounts for 28% of all crop cultivation, and energy-crop corn, 14%. Obviously, available land is limited, and a much more sustainable crop structure is required.

To better utilize waste heat, a biomass cogeneration system is vital

In order to point things in a new direction in these areas, the conditions for energy feed-in under Germany's Renewable Energies Act (EEG) are in urgent need of revision. It should no longer be permitted to combine the liquid manure bonus with the energy-crop (NaWaRo) bonus. The NaWaRo Bonus, which applies to the use of renewable resources in general, is also in urgent need of revision. The current version of the Renewable Energies Act promotes in particular the cultivation of corn, leading to significant increases in the prices for leasing agricultural land. A revised version of the EEG, to be introduced this summer/fall, will prescribe a minimum diversity of crop rotation, along with regulations to minimize negative environmental impacts and abolish excessive subsidies.

Biomass is too valuable, and its heat yield too low, to be used to generate electric power. To better utilize waste heat, a biomass cogeneration system is vital—and biomass power generation should only continue to be subsidized under the EEG under this condition. If the waste heat cannot be efficiently used on site, the biogas should be transported in biogas pipelines to CHP plants in locations that need heat energy. In contrast to wind and solar farms, biomass plants have controllable power outputs—an advantage that should be fully exploited. Electricity from biomass can and should be made appropriately available. Given this, the quantity of electricity generated from biomass can be expected to nearly double, to a capacity of 2 TWh.

In all, Schleswig-Holstein will have no problem whatsoever replacing nuclear energy. The total amount of renewable energy that can be generated on the basis of current legal provisions by 2020 at the latest is 42.5 TWh. The state's renewable portion will thus have exceeded the conventional power generation of the reference year 2000 by about 25%. Even without energy savings, Schleswig-Holstein is capable of generating three times as much power as it consumes. If energy consumption were then decreased by 20%—which is feasible with today's technical and economic standards and means—to 10 TWh, Schleswig-Holstein could generate more than 400% of its energy consumption from renewables. However, this theoretical level of consumption cannot be expected to be sustained over the long term, due to the introduction of such new, more energy-consuming technologies as electro-mobility, heat pumps, etc.

Schleswig-Holstein's onshore wind farms and many of its larger solar farms are citizens' wind parks—they belong to the people of a community.

The next step into the age of renewables will not so much face the problem of providing the installed capacity as of maintaining that capacity over the long term, and transmitting the generated power. The expansion of the power grid for example faces significant opposition from the public. Dealing with this challenge constructively could include learning from the "citizens' wind farm" model, and involving people in the planning process of grid expansion. Here, citizens are not only consulted or involved in debates but are integrally included as business partners.

Schleswig-Holstein's onshore wind farms and many of its larger solar farms are citizens' wind parks. This means that they belong to the people of a community. The capital for installing the facilities is raised on the basis of democratic principles. While citizens' wind parks can have various legal forms, they are generally incorporated as a "GmbH & Co. KG," i.e., a limited-liability partnership. The first step in launching the company consists of determining the overall capital requirement. Then, the authorized signatories are designated, a group that is gradually expanded as the company evolves. The capital requirements for citizens' wind parks are typically raised with the "round model." For example, if the capital requirement is €2 million, all citizens of a community receive the offer to participate in the investment. Share certificates are offered; however, only one per round, so that all citizens receive equal treatment, and no one person can buy all the shares. The number of people seeking to buy further shares usually diminishes with every round, yet rounds are repeated until all the shares are sold. The result is a very high level of acceptance of wind and solar power plants, a strong regional identification with the project, and considerable value creation within the municipality. The money remains in the state, rather than benefiting big business. For this reason, the citizens of Schleswig-Holstein identify strongly with renewable energy as "their energy." Given the success of this model for power generation, plans are now underway to apply it to the transmission of power. The construction of a 380-kilovolt transmission

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line along the west coast from Niebüll to Brunsbüttel is to begin as early as 2015; of course, legal battles would mean scrapping that target date.

The German Federal Government has adopted a grid expansion acceleration bill, under which the routes of any new high-voltage lines of supra-regional significance would be subject to a uniform federal spatial planning procedure, with project approval by the Federal Grid Agency, rather than states. Comprehensive participation by the various stakeholders would be achieved by means of a specialized federal advisory board on planning and an official project approval procedure. New lines carrying 110 kilovolt or less would generally be laid underground. Cities or municipalities affected by new high-voltage overhead lines would receive compensation payments of on the order of €40,000 euros per kilometer of line, since, unlike in the case of such other infrastructure projects as highways or railways, the communities located along a transmission corridor draw no specific benefit from them. The government bill also provides for early citizens' participation, albeit more in the form of information and consultation events. Citizens are not given a real right of veto, and much less the possibility to acquire capital shares. Yet without such components, the project can hardly be considered innovative.

To build this transmission network as a citizens' grid based on the citizens' wind farm model would be a completely new investment concept.

The most important power superline is the above-mentioned west coast line from Niebüll to Brunsbüttel, the construction of which will cost an estimated €200 million. It is to ensure that the immense quantities of wind energy produced in Schleswig-Holstein can reach German's interior faster, in this case via the transmission station in Brunsbüttel.

To build this transmission network as a citizens' grid based on the citizens' wind farm model would be a completely new investment concept. The investments would have to be handled by means of private investment fund subscriptions and shares. The regional banks, which have had good experiences with investments from citizens' wind farms, are in fact open to this project. The rate of return would be secured through the transmission charges, and should, based on the experience of power corporations, be around 4%. By applying the citizens' model, the people directly affected by the project would become participants, the power lines would become "our" lines, and renewable energy would quickly replace nuclear energy. However, what's best is that the energy turn-around would also lead to the democratization of the energy infrastructure, to less centralism, and to the creation of value-added chains for the people.

GETTING TO ENERGY EFFICIENT BUILDINGS

by Petr Holub
Independant Consultant

Energy efficiency is good. It increases energy security—internationally, since it means less fuel imports, and hence less dependence on supplier countries, and domestically, since efficient houses are less vulnerable to interruption in fuel or heat supplies. It also increases competitiveness through reduced energy bills. Industry and households realize savings that mean more disposable funds for investment or higher added-value services. For example, world energy price increases are good news in Denmark, since the country's energy intensity is about half the European average, which translates into higher competitiveness when energy prices go up.

Energy efficiency also means green jobs, for engineers and craftsmen, for example. And it means local and regional jobs, because you can't send your house to Asia to be modernized cheaply; you have to do it on site. It supports companies of all size, small, medium and also large corporations. In the Czech Republic, the Kyoto Protocol-funded Green Investment Scheme, under which some 150,000 households have received support for energy-efficient modernization of their buildings, or for the installation of renewable-energy systems, has been appraised by both the National Economic Council and the European Commission as a very good economic development measure.

And obviously, energy efficiency helps the environment, through reduced use of fossil fuels and therefore less local and global pollution. That would be the main argument for energy efficiency in western Europe, but not in the Czech Republic.

Finally, energy efficiency helps people. New or renovated energy-efficient housing ensures greater comfort and better health standards. Cold walls and drafty rooms are a thing of the past; fresh but warm air comes in through the mechanical ventilation from the heat recovery unit. Modern triple-glass windows provide better winter insulation than brick walls did twenty years ago. Efficient houses also help low-income families who would otherwise have trouble paying for fuel.

Why then don't all buildings yet have such a maximum standard of efficiency?

It's happening, but slowly

East-central Europe did not experience the 1973 oil shock, which, for example, set Denmark on its path towards energy efficiency and renewables. The Czechs were protected by supplies from the Soviet Union, and any increase in prices was absorbed somehow in the five-year economic plans. We lived in a fairy-tale world of endless cheap and plentiful energy on the one hand, and ever rising energy consumption on the other—in this respect, similar to the situation in western Europe or North America.

The result was a kind of mental inertia, which also affected the decision-makers. Another, much stronger type of inertia is that of a new economic force, the big players on the energy market. It is still true that more energy units sold equals higher profits, which these big players don't want to lose. That is understandable.

What is wrong is that elected decision-makers often defend the interests of the big players, which are often contradictory to the interests of people, such as household owners, small and medium-sized businesses and the like. A corrupt network of politicians, energy companies and the political parties they fund comes into play here.

The Czech Energy Utility (CEZ), two-thirds owned by the Czech government, is a vertically integrated monopoly created in 2003. Since then, there has been speculation that part of its profits are kicked back to finance political parties, both the right and of the left—marketing contracts in pre-election campaigns, overpriced orders from companies with unknown shareholders, or low interest loans through allied banks. Studies and an investigation by the European Commission showing that the CEZ is abusing its dominant market position to make unjustified profits.

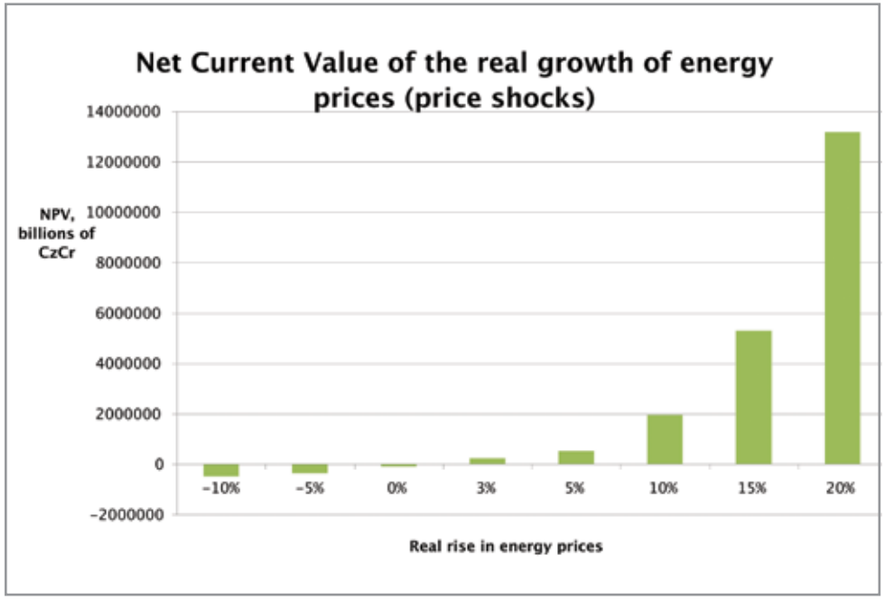
Municipal politicians often have conflicts of interests, as they sit on boards of partly or wholly municipally-owned district heating companies, which means that they have an interest both in higher profits for these companies, but should also have an interest in energy efficiency for consumers—a potential conflict. Also, there is a public lack of awareness about climate change, and climate skepticism among the nation's leaders. This is a radically different situation from western Europe.

Huge opportunities lie ahead of us

The biggest incentive for energy efficiency is rising energy prices, which have been running at an annual rate of 6% in nominal and 3.5% in real terms for the past decade in all sectors—electricity, gas and heat. If that continues, the prices will double in nominal terms by 2020. But if Vladimir Putin, with his Russian gas, or Pavel Tykač, who owns large lignite mines in northwestern Bohemia, decide to raise the prices more rapidly, they could soar. The payback time for major energy-efficient modernizations of residential buildings is about twenty to twenty-five years today, but will be eight to ten years by the end of the decade.

During that time, certain technologies will move from the R&D phase into market maturity. Germany and Austria, the Czech Republic's neighbors, are showing the way. We are seeing construction and insulation materials, solar collectors, heat-recovery units and triple-glazed windows actually installed in buildings and providing very energy-efficient houses.

The green construction sector is starting to unite for its own interests, a new development in the Czech Republic. Only since 2010 have green business associations actually begun to effectively



lobby for their interests in the political arena, with such groups as the Czech Green Building Council, the Passive House Centre or a working group at the Chamber of Commerce. Slowly but surely, they are developing a political position.

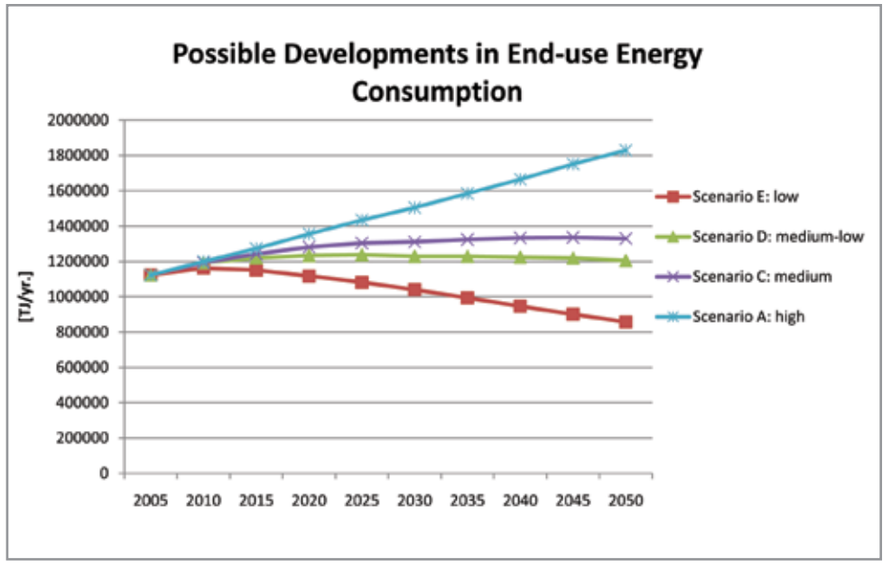
There is great disappointment with current political parties' financing practices, and with corruption scandals. People understand that the rich get richer and the poor stay poor. Translated, that means that the CEZ and the district-heating utilities are no longer very well-loved.

The legislative framework now comes from the European Union. After the first attempt to introduce legislation on efficiency in buildings in 2002 (Directive 2002/91/EC), we last year received the Energy Performance of Buildings Directive (2010/31/EU), to be followed by a new Energy Efficiency Plan, that will in turn be translated into a broader Energy Efficiency Directive, scheduled for adoption in the first half of 2012, during the Danish presidency of the EU. And last but not least, we also have the Renewable Energy Directive (2009/28/EC).

This is all very helpful here in the Czech Republic. The EU has actually been the most progressive political driver for sustainable energy in east-central Europe, aside from the brief engagement of Green Party in the Czech government between 2007 and 2010.

In short, change is coming, or at least starting. The energy system is facing a transformation of the same magnitude as the shift from huge computing machines and landlines to the Internet, tablets and smart-phones.

What could we do in practice? A case study for the Czech Republic



Possible Developments in End-use Energy Consumption

The chart above shows possible developments in end-use energy consumption. The growth shown by the blue line is scary—but possible, if we make wrong decisions. The red line, on the other hand, shows the trend if we make some smart decisions now. Since buildings contribute about 35% to the total figure, saving 60% of the energy in the entire building stock, which is not science fiction, would be significant.

One of the most obvious tools for utilizing this potential is to increase requirements for the minimum energy performance of new or renovated buildings. Here, we can follow the Energy Performance of Buildings Directive, which calls for nearly zero-energy buildings by the end of the decade. The green business community is actually agreeable to even more progressive incremental steps in that direction provided they are announced at an early date, so that business will have time to prepare. It is also important that requirements for renovations be framed so as not to hinder the renovation rate on one hand, but to avoid a lock-in effect due to unutilized savings potentials until the next renovation on the other. Thus, the requirement should be pegged not to the scope of renovation, but to the energy quality of renovated elements.

The second tool would be financial instruments. According to Czech economist Miroslav Zámečník, a member of the National Economic Council and former representative at the World Bank, economic benefits from such energy savings expressed as cumulative net present value could reach CZK 223 billion, or almost €1 billion, based on conservative assumptions, such as a low twenty-five year building lifespan until the next major renovation, and a 3% real-energy-price growth; this is shown on the second chart, above. What is striking is the exponential curve showing dependence of net present value on annual real-energy-price growth. Higher energy performance standards of buildings clearly provide residents insurance against any potential energy-price shocks.

The state should create a framework to fulfill this potential and temporarily support investors in building new efficient buildings, and owners in deep renovation of the existing stock. This is needed until the payback time of such measures falls below approx. ten years, which is expected around 2020. Though this looks like market distortion, the real reason is actually compensation for the direct or indirect, open or hidden subsidies that go to conventional energy producers today.

There are two good examples of such programs in the Czech Republic. In 2008, the government allocated €450 million from the EU Structural Funds for the thermal modernization of public buildings. The Ministry of the Environment decided to set the eligibility criteria for energy performance quite high, so as not to support "business as usual", and to ensure that the subsidies be used so as to shift the market towards better practice. There was massive negative feedback from all sides—that the criteria are too strict, and and nobody could economically or even technically comply with them. Nonetheless, the first call for projects produced requests for eight times more funds than had been allocated. This showed that, while the inertia in people's minds is strong, it is not impossible to institute change. Now, more than 1500 schools, hospitals and city halls have been renovated under the program.

The other example is the Czech Green Investment Scheme financed by revenues from emission credits sales under the Kyoto Protocol. The Czech Republic has received some €800 million to date, and the figure will soon pass the €1 billion mark. Although there have been some administrative problems, the program has proved to be a huge success. About 80,000 applications representing some 150,000 households—many applications were for apartment buildings—applied for support for energy-efficiency measures or renewable-energy installation.

Both programs cumulatively created or sustained up to 30,000 jobs, and will lead to a C02 emissions reduction of 1.5 to 2 million tons annually, approx. 1.5% of total Czech emissions.

Now, new funds from the EU Emissions Trading System can be used with such financial instruments as low-interest loans from a revolving fund and deductions on property or income taxes, so as to make the investment more attractive to building owners, and achieve a higher share of induced private investment.

Finally, education and training for architects, project designers and construction and installation companies will be needed to ensure that all the houses are built or renovated according to both high-efficiency and high- quality standards, and administrative procedures need to be adjusted to this new system.

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Policy recommendations

It is possible, it is not radical, and it is profitable—we are starting to move. These policy recommendations call for a shift towards higher energy efficiency in Czech buildings, which will surely be of relevance in a broader context. We together, and especially decision-makers, need to take the following steps:

- Generate the political will for a real and sound implementation of the shift toward climate-friendly policies: Make politicians think in the long term, and to backcast from set future targets, as opposed to merely forecasting trends, and focus on what is best for the nation.
- Challenged to be transparent and profit from bold energy visions, rather than merely doing the bidding of the rich and powerful: In the case of the Czech Republic, an effective anti-corruption law, recently supported, too, by the American Chamber of Commerce, should be adopted.
- Make energy prices fair: Internalize externalities, and have polluters pay for what they do. Keep or introduce prices for carbon and nuclear-based risks.
- Implement the Energy Performance of Buildings Directive in all its points: Incremental steps towards higher energy performance standards of buildings, enlarging the number of building types requiring energy performance certificates, training specialists and businesses, and providing information to the public.
- Introduce temporary financial instruments to foster the transformation: Be innovative and ensure high-leverage effect, inducing maximum private investment for each euro of public funds. Within the EU, the Emissions Trading System is the most obvious source of funding.
- Ask foreign partners for scholarships and internship opportunities in the energy-efficiency economy and in technological innovation: Let international green business companies create dedicated local capacity, focused on public advocacy for their mission in the Czech Republic.
- Foster implementation of energy-efficiency measures in sectors other than buildings, such as the industry and transport sectors. Focus on the production and distribution side of electric power and district heating systems.

NEW ALLIANCES IN THE U.S. AS GAME CHANGERS

LABOR-ENVIRONMENTAL PARTNERSHIPS PIVOTAL TO WINNING JOBS OF 21ST CENTURY, ADDRESSING THE CLIMATE CRISIS

by David Foster
Executive Director, BlueGreen Alliance

More than sixty years ago, at a U.S. Steel zinc smelter in the Mon Valley community of Donora, Pennsylvania, a temperature inversion trapped the toxic fumes, killing twenty residents and injuring another 6000 so that they required medical treatment. The Donora Disaster was a seminal event for both the modern environmental movement and for the United Steelworkers (USW), the largest industrial union in North America.

The workers at the U.S. Steel facility were represented by the USW. Their families and relatives lived in the community. As a result, the USW embraced environmental issues as a core concern of the union in the first decade of its existence, funding the labor movement's first Pollution Conference in the 1950s, and working to support the nation's landmark Clean Air Act, which was born out of public concern over Donora. This commitment to the interconnectedness of labor and environmental issues continued for the next fifty years, and resulted, on June 7, 2006, in the formation of a strategic alliance between North America's largest private-sector manufacturing union and the Sierra Club, the nation's oldest and largest grassroots environmental organization. The BlueGreen Alliance's core mission was to advance the job-creating investments required to solve such major environmental challenges as global warming. In its initial resolution, the USW and the Sierra Club declared that "the United States needs to lead the world in constructing a global economy that meets the historic challenge of providing for the social needs of a population of six billion human beings in an environmentally and economically sustainable fashion."

Although the jobs-vs.-environment debate flared up periodically in the United States, the Clean Air Act of 1970 and its subsequent amendments illustrate the fallacy that a clean environment and good jobs are diametrically opposed. Over the past forty years, the environmental protection provisions in the Clean Air Act have coincided with a stronger, more competitive economy in the United States. Since its implementation, U.S. Gross Domestic Product has grown by 204 percent and private sector employment has grown by 86 percent. The Act's stipulations led to new jobs through increased research and development, technology investments, and, most importantly, through energy efficiency upgrades that also reduced pollution.

The common understanding that good jobs and a clean environment are intrinsically linked in an advanced global economy—that we can and must have both, or risk the destruction of the planet—drives the common purpose of the partners of the BlueGreen Alliance.

Since its founding in 2006, the BlueGreen Alliance has grown to a partnership that includes ten major U.S. labor unions—the USW, the Communications Workers of America (CWA), the Service Employees' International Union (SEIU), the Laborers' International Union of North America (LIUNA), the Utility Workers Union of America (UWUA), the American Federation of Teachers (AFT), the Amalgamated Transit Union (ATU), the Sheet Metal Workers' International Association (SMWIA), the United Auto Workers (UAW) and the United Food and Commercial Workers

(UFCW)—and four of the most influential environmental organizations in the U.S.—Sierra Club, the Natural Resources Defense Council (NRDC), the Union of Concerned Scientists (UCS) and the National Wildlife Federation (NWF).

This strategic alliance brings together more than 14 million members and supporters, creating a powerful advocacy platform for good jobs, addressing global climate change, reducing U.S. dependence on foreign oil and leaving a stronger economy and better planet for future generations.

Evaluating Existing Partnerships

In evaluating any labor-environmental partnership, it is important to look at whether the efforts of both movements are being strengthened, and whether the broader goals of social justice are being advanced. Currently, the BlueGreen Alliance is filling a critical need in strengthening each movement's defense of the other's core principles in a time of serious political assault. In addition, the BlueGreen Alliance has provided the labor and environmental movements with a forward-looking, positive agenda for social change.

During the last year, this strategic alliance has been on the front lines in mobilizing the environmental movement in defense of American unions' right to engage in collective bargaining and in organizing the labor movement in support of basic environmental laws, including preservation of the Environmental Protection Agency's key authority to issue new rules regulating greenhouse-gas emissions.

In addition, with official U.S. unemployment still above 9 % and real unemployment over 16 %, the BlueGreen Alliance is bringing people together from across the country to demand good jobs in the twenty-first century economy. We believe that our century will be driven by the transition from the fossil-fuel economy of the past to the clean-energy economy of the future. By investing in and building a twenty-first century infrastructure that supports that transition, we will stabilize existing industries by creating new markets for their products and services, while expanding employment opportunities in construction, manufacturing, education and other sectors. In addition, new industries will be created in the fields of renewable energy, energy efficiency, transportation, recycling and green chemistry, and in the development of a smarter electrical grid and a broadband Internet.

To popularize this vision, the BlueGreen Alliance recently launched Jobs21!—Good Jobs in the Twenty-First Century. With this campaign, we are going door to door and community to community, building a movement to demand government action for the policies, incentives and public-private partnerships to create seven million jobs in clean energy and green technologies.

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In order to strengthen the movement, we have also joined forces with the Apollo Alliance, merging our two organizations to create a single national advocacy organization for clean energy jobs. The newly combined organization will be known as the BlueGreen Alliance, while continuing and expanding the reach of the Apollo Alliance policy projects.

Working Together to Overcome Challenges

One challenge to a strategic partnership like the BlueGreen Alliance is achieving consensus on divisive issues. This is an area where even longstanding organizations and partnerships struggle. The BlueGreen Alliance has succeeded by focusing on the major issues that are core to each movement's success, while recognizing that it is not necessary to agree on all issues or resolve every policy difference. In some cases, we simply and respectfully agree to disagree.

For example, the U.S. Environmental Protection Agency is in the process of setting standards for the regulation of greenhouse gases under the Clean Air Act. This authority is under sharp attack from some members of Congress, who charge that the regulations will be too costly to the U.S. economy. The BlueGreen Alliance issued a statement in support of moving forward with the regulations—coupled with complementary policies on industrial energy efficiency and international competitiveness that will, in combination, reduce emissions while supporting job creation and retention Thus, thoughtful discussion and careful policy design brought BGA's labor and environmental partners together on a core issue of importance to both movements.

Although finding a path forward may not be as easy for the BlueGreen Alliance as it is for more homogeneous organizations, the end result—demonstrating to policymakers, the media, and the broader public that unusual partners support a single solution—is much more compelling.

Growing the Movement

The BlueGreen Alliance is neither a partnership of convenience, nor one of accident. Rather, it represents the convergence of two important social movements at a time when the economic forces of globalization need—for the benefit of all humankind—to be regulated and given a structure that will make the clean-energy economy of the future fairer than the fossil-fuel economy it is replacing.

The transition to the clean-energy economy requires both a broad social movement linking the solutions to the global climate and jobs crises, and also educational and outreach programs to solve the problems of individual unemployed workers and struggling manufacturers. The BlueGreen Alliance and the BlueGreen Alliance Foundation are working on all fronts to fill these needs. Our annual Good Jobs, Green Jobs National Conference brings together advocates, policy makers, and business and community leaders for a robust debate on the best strategies. The GreenPOWER training program teaches both employed and unemployed workers green skills to increase efficiency and reduce waste in the manufacturing process. Our Clean Energy Manufacturing Center introduces small manufacturers to the wind and solar energy supply chains. The community-to-community efforts of the Jobs21! campaign enlist union members and environmentalists to take action in support of our clean-energy future. And our advocacy programs in Washington, DC, and state capitals around the country push for new policy solutions. The clean-energy economy represents humankind's best hope for a sustainable future.

RENEWABLE ENERGY OPPORTUNITIES FOR AMERICAN AGRICULTURE

by Roger Johnson
President, National Farmers Union

Introduction

National Farmers Union's members strongly believe that renewable energy has the potential to revitalize rural economies and repopulate rural communities. A significant amount of progress has been made in deploying wind, solar and biomass facilities for electricity consumption in recent years, due in large part to government tax breaks and other incentives. However, because of ongoing economic sluggishness and government austerity measures, renewable energy incentives are threatened. This lack of a clear long-term energy policy forces renewable energy advocates to defend the few incentives that we do have for renewable energy. The agricultural sector is economically unique, in that it does not react to normal market forces in the same way that other sectors react. Commodity prices and input costs are largely out of the control of farmers and ranchers. Germany has passed aggressive renewable energy policies that favor local ownership and long term solutions. German farmers are currently reaping rewards from renewable energy and the extra revenue stream it provides. In fact, there is now a large and growing number of German "energy farmers" whose principle source of income is derived from the renewable energy they produce. The U.S. federal government, as well as various state governments, should be looking at success stories from across the pond for inspiration.

Evaluation of current situation

The United States has tremendous natural resources potential in wind, biomass and sun. Under the right policy conditions, these resources can effectively be utilized by farmers and ranchers to power the country. Renewable energy production could also provide an additional source of stable revenue to farmers, who are often at the mercy of volatile commodity prices. Thanks to state renewable portfolio standards, farm bill energy programs and various federal tax credits, farmers are beginning to realize these opportunities. Widespread uncertainty stemming from the current unstable policy environment is putting the brakes on a largely untapped market.

Lack of Long-Term Incentives

How is it that Germany has more commercially deployed wind-power and solar PV facilities than the U.S., when we have such abundant wind and solar resources? One answer is that there is no long-term signal from Washington. Many incentives, such as tax credits for biofuels, wind and solar projects, are renewed on a yearly basis, and are therefore subject to investment uncertainty. There is also no unified energy policy at the national level. What we are left with is a patchwork of state policies and incentives for promoting renewable energy. While many states have passed Renewable Portfolio Standards (RPS), renewable energy development continues to be held back by regulatory issues, such as overly strict siting laws for wind towers and an extremely complicated and burdensome process for accessing the grid. This complex system makes investment in and development of renewable energy projects difficult.

Transmission System

Another major hurdle is the U.S. transmission system. The transmission regulatory system is not designed to accommodate small, distributed power generation. Instead, it is set up to favor large generating plants fueled by coal, natural gas, etc. Under this system, renewable energy projects compete with those traditional sources of energy for access to the grid. Besides having to compete on cost with traditional fossil fuels, there is currently a glaring lack of transmission lines which are needed to get power from windy regions to load centers. This is because our country's strongest resources in wind come from states with low populations, and often transmission lines to carry power from rural areas to load centers in more highly populated areas are insufficient. As a result, it is difficult to justify developing wind projects in a place like South Dakota, with a population of roughly 800,000 people.

Budget Issues

The recent global economic recession has left federal and state budgets vulnerable to austerity measures. Funding for renewable energy, including programs in the Farm Bill, is being targeted for substantial cuts or removal. With the current gridlock in Congress and a tough budget situation, renewable energy advocates are finding themselves in a defensive position, instead of being able to pursue broader policy options to encourage development.

Economic Factors

There are also several economic factors that have stunted the development of renewable energy. For instance, natural gas prices are at a historic low. The discovery of vast new shale gas fields and cost-effective means of extraction have increased natural gas production, and driven down costs. Renewable energy now has to compete with cheap natural gas for access to the grid. This, together with the reduced demand for electricity during the recent recession, has decreased overall demand for new energy production, and further limited development.

Recommendations on how to address challenges and overcome barriers

U.S. Energy Policy

The NFU strongly supports a clear, long-term signal from the federal government indicating its commitment to developing renewable energy sources. This is crucial for the nation's energy security and the economic vitality of our rural communities. A sustained commitment from the government would incentivize the private sector to invest in projects and finance development. A long-term plan will necessarily include a requirement for utilities to generate power from renewable sources, and also integrate power from distributed sources. There are numerous policy mechanisms to allow renewable energy producers easier access to the grid. A Renewable Electricity Standard (RES) would require utilities to generate a certain percentage of electricity from renewable sources. To maximize the benefit to local communities, there should be strong provisions which encourage the development of community-owned projects. Community ownership boosts local buy-in, and keeps revenues in local communities, increasing the economic multiplier effect.

Another policy option is a feed-in tariff (FiT). Germany successfully implemented an FiT in 1990, and has since reaped considerable benefits. The success of the FiT in Germany has been based on three provisions of the measure. The first is guaranteed access to the grid, which encourages development, because the developer knows that there will be a market for the power produced. The second is a fixed price per kilowatt hour (kWh); and the third is a long-term contract in the neighborhood of twenty years. The fixed price and the long-term contract provide terms sufficient to pay for capitalization costs.

Increased Education

In order for us to more fully realize the potential of renewable energy, there must be a concerted grassroots effort to educate the public. Widespread misinformation and a general lack of knowledge prevent many farmers and rural communities from participating in these opportunities. Engaging the public and more clearly articulating the connection between rural economic development and renewable energy will increase investment and participation in such projects.

The NFU is currently reaching out to farmers, ranchers and rural residents to educate them about renewable energy. Recently, in cooperation with the Heinrich Böll Foundation, the NFU organized and implemented the 2011 Midwest Renewable Energy Tour across South Dakota, Minnesota and Wisconsin. The tour provided information to farmers and policymakers on the benefits of renewable energy, its role in rural economic growth and the opportunity for an extra revenue stream for farmers, as well as attendant environmental benefits. The tour featured a dialogue with a German farmer and provided firsthand knowledge from a number of renewable energy experts.

Conclusion

Simply adopting the same policies that Germany has in the U.S. would not produce identical results. But we can learn from others' successes to provide a stronger rural economy, to reduce our dependence on fossil fuels and to begin dealing with our shared responsibility to leave a more stable, more sustainable world for our grandchildren. It's past time to get serious.

FAITH GROUPS AND CLIMATE CHANGE

by Barbara Rossing
Professor of New Testament, Lutheran School of Theology at Chicago

Introduction

Religious communities offer enormous potential for mobilizing transatlantic partnerships and commitment on climate and energy issues. This is because climate change is not simply a "scientific or political issue—it is a moral issue" as Rabbi David Saperstein notes.[1] In both Germany and the U.S., churches provide moral leadership and advocacy on behalf of the poor and of future generations, encouraging a just transition from a fossil-fuel based economy to renewable energy. Most of all, faith communities can offer a vision of hope.

Evaluation of Current Situation

Religious communities' concern for the environment springs from foundational Biblical and Qur'an teaching regarding the sacredness of God's creation and humanity's responsibility to care for it. Most religious denominations have approved official policy documents supporting "care for creation" and stewardship of the earth. More specifically, German and U.S. faith communities have also adopted statements calling for strong action to combat the threat of global climate change, advocating ambitious carbon-emission reduction targets.

The 2.5 million-member Episcopal Church USA, for example, adopted the Genesis Covenant in 2006, which calls for a 50% reduction in carbon emissions on the part of all Episcopal institutions within ten years. "Science has revealed that global warming is real, caused by human activities and is a threat not only to God's good creation, but to all of humanity," Presiding Bishop Katherine Jefferts Schori said in testimony before the U.S. Senate Environment and Public Works Committee in 2007. An oceanographer as well as a priest, Jefferts Schori has called for U.S. legislation targeting a 15-20% carbon reduction by the year 2020, and an 80% reduction by 2050.

Undergirding Jefferts Schori's and other religious leaders' commitment to climate justice is concern for the effects of climate change on the world's poorest and most vulnerable communities. Together with religious-based development organizations such as *Brot für die Welt* in Germany and the Church World Service in the USA, the Jewish World Service and others, faith communities bring attention to the fundamental injustice of climate change, pointing out that people who have done the least to cause global warming are the first to suffer its effects. Redressing environmental racism and listening to the voices of indigenous communities are also priorities among faith communities.

At the local level, churches, synagogues, temples and mosques promote green themes in many areas of life. Carbon fasting during Lent, a Muslim community's "Green Deen," and a Jewish celebration of Shabbat Noach, are ways some congregations are building environmental awareness into their liturgical seasons. Congregational "green teams" plant community gardens, host energy fairs, weatherize buildings, and promote climate education. Some national denominations have made energy efficiency a condition for receiving loans for new congregational buildings.

U.S. churches can learn from the German experience about how economic incentives and partnerships motivate the shift to renewable energy generation. Interfaith Power and Light is an organization with chapters in most states to help religious communities make the transition to renewables, and to advocate climate justice. In New Jersey, the interfaith organization GreenFaith has partnered with a solar energy installer and leveraged favorable tax incentives to help twenty-three local congregations install solar panels. The Limestone Presbyterian Church in Wilmington, Delaware, notes that its membership increased after the church put solar panels on its roof. In Washington State, a Lutheran Church in Woodinville partnered with a federal government program to host an electric vehicle charging station.

Young people bring wonderful energy to the creation-care movement. The German Protestant *Kirchentag* (Church gathering), attended by 100,000 people every two years, brings together scientists, public leaders, and church groups to strategize about climate and energy issues. Wheaton College, an evangelical college in Illinois, organized a university-wide effort on global climate change in 2006, after Wheaton's president had taken the courageous step as one of the original signatories to the Evangelical Climate Initiative "Climate Change: An Evangelical Call to Action."[2] Two Lutheran colleges, Luther College in Decorah, Iowa and St. Olaf College in Northfield, Minnesota, have purchased utility-scale wind turbines. Luther College has also made major investments in energy efficiency, and is a charter signatory of the American College and University Presidents' Climate Commitment. Such steps save the college money on cooling and heating, and also educate students about the religious/ethical grounds for environmental sustainability and institutional transformation.

Challenges and Barriers

Challenges and barriers to addressing climate and energy issues among U.S. communities of faith are largely the same as among the general American public. Religious congregations tend to mirror the increasingly-polarized American public on climate and energy issues.

For a very few conservative Christians, opposition to addressing climate change may be theological. Some argue that God's mandate to humans to have "dominion" over the earth (Genesis 1:26) means God put fossil fuels in the ground for us to use up, while others suggest that climate change—if it exists at all—may be a sign of biblical end-times. Some American evangelicals fear that embracing the science of climate change also means accepting the science of evolution. The most extreme and well-funded critics dismiss religious climate concern by labeling environmentalism itself as a "religion" antithetical to Christianity. This is a charge of *Washington Post* columnist George Will, as well as the recent book and DVD *Resisting the Green Dragon*, by conservative Presbyterian, E. Calvin Beisner.

But for the most part, religious opposition to climate action comes from the same source as conservative opposition generally in the U.S.: a resistance to governmental regulation of any kind, including regulation of greenhouse-gas pollution, and opposition to any interference with free-market *laissez-faire* capitalism. Denial of climate change among religious people tends to include criticism of the science as well as economic concern about job losses and the costs of transitioning to a low-carbon economy. Many fear that addressing climate change will put the U.S. at a competitive disadvantage with developing nations.

Recommendations for Addressing Challenges

People of faith care deeply about hunger and global poverty. Many Christians have had their eyes opened to global hunger through mission trips and people-to-people exchanges. Their concern can be mobilized by focusing on the devastating health effects climate change will have on subsistence farmers in the developing world, as well as on the urban poor and communities of color. Since poverty is also one of the issues many deniers try to raise, it is important to address it head-on.

Energy conservation, revitalizing of local communities, and the prospect of green jobs may be the most effective way to persuade some communities to cut carbon emissions. In Kansas for example, the non-profit Climate and Energy Project found that it is "much more effective not to use the word "climate change" at all, but instead to focus on traditional values of thrift and care for creation."[3] By working with pastors and civic leaders, director Nancy Jackson persuaded local communities to compete with one another to achieve energy savings. The Heinrich Böll Foundation's model of offering renewable energy tours and partnering with farmers and others could be carried into faith communities, especially in the Midwest and conservative regions where church attendance is high.

It can be helpful for members of faith communities to meet climate scientists who are themselves active members of faith communities. At the 2011 *Kirchentag* in Dresden, Germany, I met scientists from the Potsdam Institute and many others who work on climate change out of a strong faith commitment. A number of evangelical Christians working on climate change trace their own "climate conversion" to the experience of meeting Sir John Houghton, IPCC scientific assessment co-chair from the 1980s until 2002.

Financial partnerships are needed. Many faith communities are unable to afford the initial investment costs for geothermal or solar systems, nor even for weatherization or retrofitting their building. More partnerships that help churches partner with corporations to take advantage of tax incentives could empower many more to shift to renewables. Stronger feed-in tariff legislation is one way churches could advocate a financial model to support renewables. Here, too, the German experience could be helpful.

"If the world is to mount any kind of defense against global warming, we Christians must play a much stronger role. Not just because physics and chemistry demand it—but faith as well, as we rise to the greatest challenge to both Creation and social justice the planet has ever faced."[4]

Conclusion

Many Americans—especially conservative Americans—root their moral reasoning in religion. Faith communities can play a crucial moral role in opening up the vital space between the two poles of denial and despair on climate and energy issues. Stories of community transformation that are practical and hope-filled can bring people together around shared goals and concrete action, in order to protect the climate for future generations.

Environmentalist Bill McKibben—founder of 350.org and a United Methodist Sunday school teacher—makes the case for the important role of faith communities:

ENDNOTES

1. News release May 2007, "An Interfaith Declaration on the Moral Responsibility of the U.S. Government to Address Global Warming."
2. The Wheaton College story is chronicled in the volume edited by Lindy Scott, *Christians, the Care of Creation, and Global Climate Change* (Eugene, OR: Pickwick Publications, 2008).
3. Leslie Kaufman, "In Kansas, Climate Skeptics Embrace Green Energy," *New York Times* October 18, 2010.
4. Bill McKibben endorsement for Nick Spencer, Robert White, and Virginia Vroblesky, *Christianity, Climate Change, and Sustainable Living* (Hendrickson Publishers, 2009).

VETERANS STILL WANT TO PROTECT THEIR COUNTRY

by Stacy Bare
Director of Operations, Veteran Green Jobs

I am a veteran of the United States Army. In 1996, when I was seventeen, my father signed my enlistment contract. I served in Iraq before and during the initial stages of the surge in 2006 and 2007. Every time I fill up my car at the gas tank, I ask myself why I went to war.

Every cause, politician, or movement in America generally loves to have a token veteran spokesperson. We bring an aura of patriotism and righteousness to any situation. If you say you support the troops, if you roll out a service member, even better if they're disabled, to support your position, you're telling America: if you don't support me, you hate America, you're not a patriot. I was asked by a Presidential campaign in 2007 if I would be willing to stand behind the candidate. They were not interested in what I had to say, only that I looked like a soldier, that I could say I was a veteran and I supported Candidate X.

We are a much sought-after demographic, but we are often cautious about getting involved in any cause. Many of us are too busy fighting for our own survival, for the benefits we were promised, but have to struggle to actually access.

Many of us are confused by why we went to war. In 2001 and again in 2003, the reasons we went to war were presented as open-and-shut cases, no questions asked. We went to avenge a brutal attack on America and to prevent further attacks against American interests. We went to build democracy and promote human rights and ensure that weapons of mass destruction would not be used against innocent civilians. These were just wars.

In 2004, on a break from overseas service, I remember endless conversations with people who accused me of supporting a war machine, killing children, and defiling the environment in the name of some corporate profit, or for cheap oil. I sat and listened to people who did not understand national service while they drank soy lattes, wore organic cotton, and droned on about responsible farming and climate change. I was pissed off. They did not understand why I served; they did not respect my service and they still filled their hybrid cars up with oil, flew on airplanes, and indulged in mass produced potato chips. The environmental movement was the left. The left was not patriotic; they were anti-troop, and anti-war.

In 2006, my views on the war were more nuanced, or perhaps just more confused. I was inhaling fumes that were a mixture of feces, fuel, and trash in Baghdad Province. I drove my HumVee over a field, altering the drainage of centuries-old farmland and catalyzing the salinization and desertification of the soil, in effect ruining a food resource of the very people I was now here to help. We had abandoned the search or even the pretext of WMDs several months earlier.

In 2006, I also learned about the Carter Doctrine. In 1980, when I was not quite eighteen months old, the Democratic president had proclaimed that the 1979 invasion of Afghanistan by Soviet troops posed "a grave threat to the free movement of Middle East oil." From that day on, the United States would use military force if necessary to defend its national interests in the Persian Gulf. Our national interest was clear: oil.

Looking back on President Carter's statements it is safe to draw a conclusion about the cause and effect of that national policy for our current wars in Afghanistan, Iraq, and Libya. We can also justifiably question as to why the Carter doctrine did not also include a provision about using whatever force might be necessary to shift our national interests away from the Persian Gulf's control on oil to a diverse array of homegrown, renewable energy resources. We fought and died for the Carter doctrine. At least I think we did and what do we have to show for it?

Is our country—our land—safer? Not just metaphorically: Are the soil, the water, the coastline, the tundra and the forests that we fought to protect, safer because we went to war? I would argue it is not. I would argue that after ten years of war, our land, our freedoms, and our nation are less secure now than when we went to war in 2001, but I am not all veterans, I am not all service members, and I recognize that many veterans, perhaps most veterans would disagree with me.

So what do we do about it?

On the one hand, if the environmental movement can find a way to not only convince veterans that the environment and renewable energy are worth fighting for, but also connect with veterans, veterans could become the leaders of the movement. Who else has first-hand and front-line experience of just how destructive resource wars are? Who else can speak more honestly about the damage done?

But we are confused.

Why *did* we go to war? Was it for oil? Was it to defend our nation? We want our service to be respected. We want our actions to be justified. We want to believe we served a higher cause that we were protecting freedom, that we were not duped. We want to believe that the self-righteous on the left are wrong. We want to believe in a higher cause and that our friends' deaths and mutilations meant something.

The thing is, we are too busy fighting for our own survival, fighting to receive the basic care and benefits promised us, to worry about climate change or renewable energy. But imagine, imagine if veterans and the military were convinced to dedicate the energy and resources, teamwork, dedication, and strength of service displayed on the front lines to help America become a renewable-energy superpower! What would that look like?

First, the environmental community needs to support veterans in the issues that matter most to them.

Second, the traditional level of distrust between environmentalists and the military community would need to be overcome.

Third, the contributions the military is currently making to the environmental movement—energy efficiency in base construction, the promotion of algae press fuels for jet fighters, innovative land management, and innovations in solar and wave technologies—need to be highlighted and celebrated.

Fourth, we need an accurate history of our quest for oil and destructive resources that is not partisan, and recognizes where and how fossil fuels have historically benefited our country. After all, many of us are the children of miners, leathernecks, factory workers, power-plant operators, truckers, and farmers.

Fifth, a new framework for environmental action needs to be created and promoted that shows the issue not in terms of placement on a political spectrum. Instead, environmental action needs to be shown as one of the highest of patriotic duties that our nation can embark in. The environmental movement needs to give veterans a second opportunity for service in clean and renewable energy.

So how do we go about it? Where do we start?

Get outside. Take a veteran with you. Don't start with activism. Just help us see the land you love. The land we protected on your behalf. Let us touch the trees, dig in the soil, stand on top of the mountains, sit in the waterways and oceans, and run through the prairies you want to defend. We love our country, that's why we served. Serve alongside us and we'll go back to war with you, organic cotton T-shirts and all.

Sharing Solutions: Transatlantic Cooperation for a Low-Carbon Economy

AUTHORS

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Vicki Arroyo is Executive Director of the Climate Center of Georgetown University Law Center. She was the Pew Center's Vice President for Domestic Policy, and has taught environmental policy and climate change at Catholic University, George Mason University and Tulane Law School. She served at the U.S. EPA's Office of Air and Radiation and the Office of Research and Development, where she reviewed Clean Air Act standards. From 1988 to 1991, she created and directed the Louisiana Department of Environmental Quality's policy office, and was the Governor's environmental advisor. She serves on California's Economics and Allocation Advisory Committee, the National Center for Atmospheric Research external advisory committee, an NAS Transportation Research Board Committee, a National Science Foundation advisory committee, and the editorial boards of the Climate Policy journal and the Georgetown International Environmental Law Review. She holds a BS in biology and philosophy from Emory University, an MA in Public Administration from Harvard and a JD from Georgetown.

Stacy Bare

As a captain in the US Army, Stacy Bare fought to defend the land, air, and water of the United States. He is continuing to serve his country and fighting to preserve and keep secure clean water, clean air, and wild places. As a climber and surfer, he turned to nature and the wilderness to cope with what he had learned and seen in combat. A recipient of the Bronze Star Award for his time in Baghdad from 2006 to 2007, he has also served abroad in Bosnia, Germany, Angola, and Georgia. Prior to his current position with the Sierra Club as the National Military Family and Veterans' Representative, he helped to found both Veterans' Green Jobs and Veterans' Expeditions. Protecting and expanding access to the outdoors and wild places for all is his solution to most of the world's problems.

Ben Brancel

Ben Brancel is Secretary of the Department of Agriculture, Trade and Consumer Protection (DATCP) of the State of Wisconsin; appointed in January 2011, he also held the job from 1997 to 2001. Brancel is the fifth generation to be raised on his family's farm; previously a dairy farm, it now raises beef cattle. He holds a BA in animal science from the University of Wisconsin (UW). Brancel served in the Wisconsin Assembly for eleven years, where he served as co-chair of the Joint Finance Committee; he was elected Speaker in 1997. He was appointed Wisconsin state director of the U.S. Department of Agriculture Farm Services Agency in 2001. As state relations liaison for UW, he helped support the Wisconsin Agricultural Research Stations. As Secretary for DATCP, Brancel sees the opportunity for bioenergy to help diversify Wisconsin's changing agricultural landscape and provide additional income for farmers and agribusiness, while helping the state generate homegrown power, heat and fuel.

Robert Habeck

Robert Habeck is a Member of Parliament in the state of Schleswig-Holstein and Chairman for the parliamentary group of Alliance 90/The Greens. From 2004 to 2009, Robert was the Chairman of the Party. In addition to a political career, he and his wife, Andrea Paluch, made their debut as freelance authors in 2001, cooperating together on numerous books. He has a degree in Germanic studies and Philosophy and wrote his doctorate in 2000 on "the Nature of Literature". Robert was born 1969 in Lübeck, is married with four children.

Petr Holub

Petr Holub is an expert consultant on energy and environment. His advisory supports public authorities, environmental organizations, the Green Party and private companies in the fields of renewable energy and energy efficiency. Until April 2010, he served as Director of the Department for Sustainable Energy and Transport at the Ministry of Environment of the Czech Republic. Previously, he worked as an advisor to the Minister of Environment. His responsibilities at the Ministry included the development of criteria for the "Green Investment Plan", a program focused on supporting energy efficiency and renewable energy in residential buildings. Moreover, he was involved in the "Operational Program Environment", a support area for sustainable energy on the municipal level. He led a working group which identified administrative barriers to the development of renewable-energy sources and proposed instruments to overcome them. He also developed and supervised an information campaign on renewable energy for public authorities. Before entering the Ministry, Holub worked as Head of the energy program of Friends of the Earth, Czech Republic, an influential environmental group, from 2003 to 2007.

Roger Johnson

Roger Johnson is President of the National Farmers' Union; he was elected in 2009. Prior to leading the family farm organization, Johnson, a third-generation family farmer from Turtle Lake, ND, served as North Dakota Agriculture Commissioner, a position to which he was first elected in 1996. From 2007 to 2008, he served as president of the National Association of State Departments of Agriculture (NASDA). Johnson graduated from North Dakota State University with a degree in agricultural economics. Johnson and his wife, Anita, have three children and three grandchildren.

Oliver Krischer

Oliver Krischer is a member of the German Bundestag for the Green Party; he was elected in 2009 from Düren, North Rhine-Westphalia (NRW). Born in 1969, Krischer joined the Green Party in 1989. In 1997, after completing his studies in biology at the RWTH Aachen University, he joined the Greens' legislative staff, first in the Bundestag, and, in 2002, in the NRW state parliament, where he served as a senior adviser for energy and agriculture. As a Bundestag member, Krischer is the spokesperson for the Green Group for the fields of energy and resource efficiency. He is a member of the Committee for Environment, Conservation and Reactor Safety, and an associate member of the Committee for Economics and Technology. Krischer lives in Düren with his wife and two children.

Juraj Mesík

Juraj Mesík served from 1989 to 1990 as a Member of Parliament in the Czechoslovak Federal Assembly in Prague, and as chairman of the Green Party. From 1990 to 1992, he was Director of the Department of Social Context within the Ministry of Environment of Czech Republic. From 1993 to 2002, Mr. Mesik has been the Director of "Environmental Partnership for Central Europe (EPCE)" in Slovakia (currently Ekopolis Foundation), later as a Senior Community Foundations Specialist for the World Bank in Washington D.C. During his years at the World Bank, he worked on introducing community foundations to a number of countries around the world. Juraj Mesik is also the author of numerous commentaries and analytical articles published in opinion-making dailies.

Dr. Frank Michael-Baumann

Frank Michael-Baumann is a physicist who graduated from the Ruhr University of Bochum, North Rhine-Westphalia (NRW). Until 1990, he worked there at the Institute for Experimental Physics. From 1990 to 1995, he worked at the DMT Institute for Process Control Systems and Electrical Installations, and then helped found the company ee energy engineers GmbH. From 1996 to 2006, he was managing director of the NRW State Initiative on Future Energies, and since 2007 has been managing director of the EnergyAgency.NRW. He is also the Clustermanager of EnergyRegion.NRW and EnergyResearch.NRW, spokesperson of the Future Energies Study Group at the Future Energies Forum, a member of the expert group on renewable energies of the German Engineers' Association (VDI), Chair of the expert advisory board of the Center of Innovative Energy Systems (ZIES) at the University of Applied Sciences in Düsseldorf, and a member of the Advisory Board of Energy Research Metropolitan Ruhr.

David Foster

David Foster is the Executive Director of the BlueGreen Alliance, the national partnership between labor unions and environmental organizations dedicated to expanding jobs in the green economy. The Alliance unites ten major labor unions and four of America's most influential environmental organizations. From 1989 to 2006, Foster served as Director of United Steelworkers District 11, in the northwestern U.S., which represents 43,000 miners, steel, aluminum, tire, oil and gas workers, and health-care employees. From 1990 to 2006, Foster served on the USW's International (U.S. and Canada) Executive Board, with responsibilities for negotiating with many of the country's largest steel, iron ore and aluminum companies. For the past twenty years, he has been among the labor movement's leading environmental advocates, and chaired the USW Executive Board's task force on environmental policy. He has vigorously worked to bridge the divide between workers and environmentalists in the Northwest and throughout the U.S.

Johannes Remmel

Born in Siegen in 1962, Johannes Remmel has been the Minister for Climate Protection, Environment, Agriculture, Conservation and Consumer Affairs of the German state of North Rhine-Westphalia since July, 2010. He joined the Green Party in 1983, and over the following years served in several political and parliamentary functions at the local and state levels. Since 1995, Remmel has been a member of the North Rhine-Westphalian (NRW) state parliament, during which time, he served at various times as the Green Group's spokesperson for tourism, financial affairs and the environment; from 2000 to 2010 he also served as the Group's floor leader. From 1997 until 2000, he chaired the parliament's fact-finding commission on transport demand management, "The Future of Mobility."

Barbara Rossing

Barbara R. Rossing is an ordained Lutheran pastor and Professor of New Testament at the Lutheran School of Theology in Chicago. She holds a D.Div. from Harvard, an M. Div. from Yale, and a BA in geology from Carleton College. She is the author of The Rapture Exposed: The Message of Hope in the Book of Revelation (2004), featured on several U.S. TV magazines. She lectures and publishes widely on biblical and environmental themes, including the January 2007 Trinity Wall Street Institute in New York, and was a member of World Council of Churches and Lutheran World Federation delegations to the UN Climate Change Conferences in Copenhagen and Cancun. Rossing has served as chaplain at Harvard Divinity School, pastor at the Holden Village retreat center in Washington State, and ranger at Mesa Verde National Park, Colorado. She is an avid hiker, and is currently writing a book on ecology and apocalypse.

CLIMATE NETWORK TEAM

Brussels Office

Silvia Brugger

Silvia Brugger coordinates the Climate and Energy Policy Program at the Brussels-based European Union office of the Heinrich-Böll-Stiftung. Prior to that she worked within the European Union office's Global Dialogue Program where she concentrated on a project on gender-based violence in Latin America. Silvia has dealt intensely with political and economic transformation processes in developing and transition countries during her work at the Centre for Applied Policy Research in Munich as well as within her thesis where she conducted case studies of Venezuela and Brazil. Silvia has spent a year at the University of Chile in Santiago and holds a Master of Arts in Political Science, International Law and Intercultural Communication from the University of Munich.

Annett Waltersdorf

Annett Waltersdorf joined the European Union Office of the Heinrich Böll Foundation in June 2007. For two years, she was in charge of the office's visitors program, organizing capacity building projects, expert meetings and study programs for visiting groups sent by the headquarters in Berlin, or by one of the twenty-eight foreign offices of the Foundation. From January 2010 until May 2011, she coordinated the climate and energy projects of the office. Annett holds a Bachelor of Arts Degree in European Studies from the University of Chemnitz, Germany, where she focused on the east-central Europe.

Prague Office

Erik Siegl

Erik Siegl is Programme Coordinator at the Prague office of the Heinrich-Böll-Foundation with responsibilities for the Energy and Foreign Policy activities. As part of his working experience, Erik worked as diplomat with the Czech Embassy to the Federal Republic of Germany and in the Human Rights area. He holds a Master of Arts in History and Ethnology from the Charles University in Prague and studied also International Politics in Geneva and Marburg, Germany.

Washington D.C. Office

Arne Jungjohann

Arne Jungjohann is the Director for the Environment and Global Dialogue Program of the Heinrich Böll Foundation in Washington, DC. The focus of his work is identifying solutions towards a low-carbon economy, transatlantic cooperation on key domestic energy and climate policies such as cap-and-trade and feed-in tariffs. In the Global Dialogue Program, he engages in international negotiations to contribute to a fair, ambitious and binding global climate treaty. Before joining the HBF in 2007, he worked as a senior advisor to the German Greens in the Bundestag, gaining extensive experience on environmental, energy and climate legislation. Among other things, he worked on the implementation of the EU's emissions trading scheme, Germany's nuclear phase-out and the Renewable Energy Act. He holds an MS in Political Science from the Free University of Berlin. Arne is the speaker of the local chapter of the German Green Party in Washington DC, and has a passion for soccer.

Joan Kloepfer

Joan Kloepfer has served as Finance Manager of the Foundation's Washington, DC, office since 1998. Joan holds an M.A. in Soviet Studies and International Economics from the Johns Hopkins University School of Advanced International Studies and a B.A. in German Studies from Oberlin College.

Till Kötter

Till Kötter is an advisor for capacity building at the climate change program of the German International Cooperation Society (GIZ) in Beijing. Prior to this, he was the project coordinator of The Climate Network, with a focus on policy measures for the promotion of renewable energy. In this context, he worked closely with farmers, labor unions, and faith and veterans' groups to build bipartisan alliances for progressive renewable policies. In 2010 and 2011, Till organized the Renewable Energy Tours, which engaged local stakeholders in Indiana, Minnesota, Michigan, Ohio, South Dakota and Wisconsin on Germany's feed-in tariffs success story (a.k.a. "clean contracts"), the country's major driver for the growth of renewable energy, rural development and the creation of more than 300,000 green jobs. He holds an MA in International Affairs from the Paris Institute of Political Studies (*Sciences Po*), and was an exchange student at the University of Florida.

Lindsay Parker

Lindsay Parker is the project manager for the Climate Network, a two-year program run by the Heinrich Böll Foundation offices in Brussels, Prague and Washington, DC, that seeks to share economic and political strategies to promote renewable energies between the U.S. Midwest and German states. Previously, she worked at a leading German NGO, Germanwatch, as a co-author of the Climate Change Performance Index 2011, released at the 2010 UNFCCC Climate Change Conference. She worked at the German Environmental Ministry on the foundation of the International Renewable Energy Agency (IRENA). She also researched solar energy policy for Texas Representative Lon Burnam (D), working to draft a bill to promote solar power. Lindsay holds an MA in Public Policy with a focus on energy and climate policy from the Hertie School of Governance in Berlin. She received a double major in German and Political Science from the University of Texas in Austin.

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World Resources Institute
World Future Council
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