

POLICY LEADERS
EXPLORE ENERGY
AND GREEN
TECHNOLOGY

European Union: Energy



Global Leader Series **2010**



THE CENTER *for*
INTERNATIONAL
UNDERSTANDING
The University of North Carolina

The Center for International Understanding in collaboration with The German Marshall Fund.



Europe is over 4,000 miles away from North Carolina. A study of European energy policy revealed many shared challenges that reach across the miles and unite us in our quest for thoughtful solutions.

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- ① Brussels, Belgium
- ② Hamburg, Germany
- ③ Rostock, Germany
- ④ Paris, France

Foreword

In November of 2010, a delegation of North Carolinians involved in energy policy participated in a program to learn about successful energy models in the European Union (EU). Although the weather was mostly cold, rainy and windy, that didn't deter the group from shedding light on energy policies and practices in several countries, some of which may be helpful as North Carolina continues to develop and advance its own energy policies. This delegation, led by the University of North Carolina's Center for International Understanding, landed in Brussels, Belgium, went next to Hamburg and Rostock, Germany, and finally to Paris, France.

The goals of this program were as follows:

- To broaden the vision and expand the conversation of what is possible from an energy policy perspective and in practical application.
- To gather information about the progress and challenges of sustainable energy policies in the European Union.
- To engage with experts about models to expand renewable energy and promote energy efficiency.
- To understand the role of economic policies and incentives in promoting energy goals.
- To gather information about France's nuclear policies, including the



North Carolina delegates from the Renewable Energy and Green Jobs Program at the European Union Parliament in Brussels, November 2010.

management of nuclear waste and the public acceptance of nuclear energy.

We met these goals and much more. We learned from experts in the EU and we learned from one another. One of the dynamic outcomes of a program like this is building the relationships among a group of policymakers – building a common bond so we may work more effectively together for a better North Carolina.

Any study of energy policy is complex, and a brief visit to three countries cannot explore all the ramifications of various options. This report provides a review of our delegation's experience and insights from meeting with the various experts on our program. We give special thanks to our sponsors:

Z. Smith Reynolds Foundation, Center for European Studies at UNC-Chapel Hill, The Foundation for the Carolinas, UNC-CH Institute for the Environment, The William and Flora Hewlett Foundation, The Blanche and Julian Robertson Family Foundation, and the Winston-Salem Foundation.



Exploring The Renewable Energy House in Brussels.

The North Carolina Context

A new energy economy is beginning to develop in North Carolina. With advancements in technologies and a diminishing role for fossil fuels, it is important to note that concern about cost and affordability has been and still is an important driver of energy policy in our state. Note also the growing realization that costs are measured in different ways, and that overall efficiencies and economies must be captured throughout our systems and practices involving generation, distribution and use of energy. Our regulatory oversight on energy issues has always been a source of pride. This, too, is adjusting in accordance with changes in the industry, in science and in markets.

Senate Bill 3 (SB3), ratified in 2007, has been an important force behind the growth of this new energy economy. This bill established the first Renewable Energy and Energy Efficiency Portfolio Standard (REPS) in the Southeast and amended North Carolina law regarding certification and financing of baseload electric generating facilities. This REPS requires electric power suppliers in North Carolina to meet an increasing amount of customers' energy needs via a combination of renewable energy resources (such as solar, wind, hydro-power, geothermal and biomass) and reduced energy consumption through the implementation of new energy

efficiency measures. The schedule for compliance re: percentage of energy sales from new renewables for Investor Owned Utilities is as follows:

Calendar Year	REPS Replacement
2012	3% of 2011 N.C. retail sales
2015	6% of 2014 N.C. retail sales
2018	10% of 2017 N.C. retail sales
2021 and thereafter	12.5% of 2020 N.C. retail sales

Costs to consumers will be limited under this Act as follows:

- Impacts on residential consumers per account must not exceed \$10 per year 2008-2011; up to \$34 per year 2015 and beyond
- Impact on commercial customers per account must not exceed \$50 per year from 2008-2011; \$150 per year thereafter

Other key points of SB3 include allowance for ongoing review of construction costs for new power plants and recovery of costs in a general rate case. There is also a tax credit provision that provides credit for donating funds to a nonprofit organization to enable the nonprofit to acquire renewable energy property.

Average Retail Price of Electricity (Residential)	Cost per kilowatt hour
North Carolina – Dec. 2010	9.51 cents
U.S. – Dec. 2010	11.04 cents
Belgium – Jan. 2011	26 cents
France – Jan. 2011	18 cents
Germany – Jan. 2011	33 cents

Source: EIA, www.eia.doe.gov; Europe's Energy Portal, www.energy.eu
 Note: Euro cents were converted to U.S. currency using rate as of 11.15.2010

November 6-15, 2010 Program Agenda

Day 1

Arrival and Orientation

Arrive in Brussels, Belgium

Welcome reception and briefing on EU 2020 goals

Presentation by Burson-Marsteller

Day 2

European Union Perspectives

Discussion at German Marshall Fund Office with EU Directorate General on Energy and EU Directorate General on Climate Action

Presentation and Tour of the European Renewable Energy Council's

Renewable Energy House

Presentation and Tour of the European Union Parliament Building

Discussion and reception with EU governmental representatives and non-governmental organization experts on EU energy and environmental policies

Day 3

Non-Governmental Perspectives

Presentation with European Climate Foundation: Roadmap 2050

Depart to Hamburg, Germany

Day 4

Governmental Policies

Meeting with Hamburg Chamber of Commerce

Overview of German federal policies with Germany's Agency for Renewable Energies

Welcome by the State Ministry of Urban Development and Environment

Overview and Discussion on 2010 Hamburg Climate Action Policy

Overview and meeting with Hamburg Energie

Presentation on urban development at IBA Hamburg and tour of IBA's Energy Mountain

Day 5

Site Visits in Rostock, Mecklenburg-Vorpommern

Tour and discussion at Liebherr, a manufacturer of marine cargo handling equipment

Tour and discussion with Nordex, manufacturer of windmill turbines, blades and nacelles

Panel presentation on renewable energy with:

- Wind-energy-network
- Environmental-network
- Institute for Renewable Energy Systems (IRES), University of Applied Sciences Stralsund

Reception and presentations at Rostock Chamber of Commerce, hosted by Mecklenburg-Vorpommern's State Minister of Economics, Labor, and Tourism and the Mayor of Rostock

Day 6

Business Representatives

Meeting at Hamburg Chamber of Commerce

Overview of Renewable Energy Cluster

Discussion session with Director of GE Marketing

Presentation by Nordex operations in Hamburg

Depart for Paris, France

Discussions with representatives of the French Ministry of Environment and Energy at la Defense

Day 7

Debriefing & Reflection

Small group debriefing

Day 8

French Nuclear Industry Perspective

Small Group Debriefing

Discussion on France's nuclear power operations and nuclear waste reprocessing with AREVA

Day 9

French Utility and Additional Perspectives

Presentation and discussion with Electricité de France (EDF)

Presentation and discussion on the Nuclear/Renewable Energy efforts by AREVA

Debriefing session

Return to North Carolina

The European Union



European Union Member State flags line the entrance to the Parliament building in Brussels

Where strategies for jobs and growth include energy goals



It was important for our Energy and Green Jobs Study delegation to understand the context in which energy and environment laws and regulations are made in the EU as we prepared for more intense study in Germany and France. The European Economic Community (EEC) was set up in 1957 to establish a common market and to facilitate trade between its six western European Member States. Today the EEC has grown into the European Union (EU), a supranational governing body comprised of 27 Member States. The official seats for most EU institutions, including the European Commission, Council

of the European Union and the European Council, are located in Brussels, Belgium.

Member States cede sovereignty to the EU in a number of policy areas, most significantly the monetary policy for those States sharing the common currency of the Euro. In other policy areas, including energy and environment, the EU issues directives which Member States must implement, with the flexibility to use the policy instrument of their choice.

The EU set strong policy examples for the world around bringing broadband to the European countries to create a more competitive economy for the EU. They have done it again with their efforts to create policies and incentives for renewable energy production.

Major drivers of EU energy policy are energy security, competitiveness (a single open EU market) and climate change. Many European countries have limited fossil fuel resources and thus decreasing reliance on fossil fuels not only reduces greenhouse gas emissions, but also bolsters internal energy independence. In the winter of 2009, the natural gas supply to Europe was interrupted for three weeks due to a dispute between Russia and Ukraine. This event is still top of mind for many Europeans and energy security was often mentioned as a key justification for energy policy in all the countries we visited.

The EU Emissions Trading System

According to the European Renewable Energy Council, Europe's demand for energy is increasing in an environment of high and unstable energy prices. Greenhouse gas emissions are rising and the energy sector is one of the main emitters of greenhouse gases.

As a signatory of the Kyoto Protocol, in 2005 the European Union implemented its first policy aimed at meeting Kyoto targets – the EU Emissions Trading System (ETS). The ETS, the largest in the world, establishes an absolute cap on carbon emissions and a market

mechanism for trading emissions permits between individual emitters. Depending on its resources and industrial profile, each Member State has its own binding emissions cap. The richest states must reduce the most, while the poorest are allowed limited increases. The states are then responsible for dividing up emissions permits between covered industries. The EU ETS is the first international emissions trading system and now covers 30 countries. It was designed in three phases to allow the law to be revised and improved periodically, using practical experience to learn how to create the most effective

By the year 2020, the EU must:

- Reduce greenhouse gas emissions to 20% below 1990 levels
- Increase the share of renewables in energy consumption to 20%
- Improve energy efficiency by 20%



The European Union Parliament in session in Brussels, November 2010.

system. Today, the carbon price stands around 15 Euros per ton.

EU 2020

In 2007, the EU significantly broadened its commitment to a sustainable energy

future when it launched a comprehensive set of integrated climate change and energy policy directives known as EU 2020.

By the year 2020, the EU must:

- Reduce greenhouse gas emissions to 20% below 1990 levels
- Increase the share of renewables in energy consumption to 20%
- Improve energy efficiency by 20%

Member States have the option of selecting the policy tools and method of power generation best suited to their economy and natural resources as long as they can meet their stated goals. The Emissions Trading System discussed above is one of the many policy tools that will help Member States achieve these targets. Others are implemented at the individual State or even local level. As our delegation saw, the policies, resources and direction vary from Member State to Member State.

In 2009, EU leaders announced an objective to reduce greenhouse gas emissions by at least 80% below 1990 levels by 2050 as well as increase the abundant renewable energy potential of the Member States. All sectors of energy production are included in this goal.

Roadmap 2050

The Roadmap 2050 Project is an initiative of the European Climate Foundation (ECF) and has been developed by a consortium of experts funded by the ECF. ECF is the largest philanthropic program in Europe focused on influencing public policies aimed at reducing greenhouse gas emissions. This non-government organization receives all of its funding from private sources. The mission of Roadmap 2050 is to provide a practical, independent and objective analysis of pathways to achieve a low-carbon economy in Europe, in line with the energy security, environmental and economic goals of the European Union. “Backcasting” – defining the desired future and then working backwards to identify the most effective policies to get there – was used to figure out how to achieve these goals, which include all sectors of energy, not just electricity. (Source: Roadmap 2050)

Observations from the EU

- The EU is clear on its overall energy policy and we were struck by the level of planning and analysis. Overall we were impressed with their ability to develop an overarching policy framework, like EU 2020, that extends across sovereign states and over a long planning horizon. This has facilitated both dialogue and action among the Member States.
- The drivers of energy policy in the EU are energy security, competitiveness and climate change. Price and resource costs appear to be

The Renewable Energy House

“The Renewable Energy House, located in Brussels, groups together all major actors in the field of renewable energy in Europe, thereby representing one of the fastest growing economic sectors with an annual turnover of more than 35 billion Euros, employing more than 350,000 people and supplying 8.5% of Europe’s current energy demand.”

Source: Renewable Energy House Brochure



secondary to these goals, although the debate about costs is beginning to become more important as the economies lag and the renewable markets change. One reason that electricity prices are not as important to residential and commercial users is that there is little use of electricity for heating in Europe.

- While the specific plans must be approved by the EU, each Member State has flexibility in meeting the prescribed EU 2020 targets and develops its own implementation strategies and mix of generation sources.
- Transmission constraints and cross-border interconnection capacity are an important issue for the EU and will require additional investment in infrastructure.
- The scale of the EU 2020 policies

and those developed by the individual Member States can be credited with achieving significant cost reductions and improved efficiencies for all renewable energy technologies. We are learning from their advances in technology and benefitting from the resulting cost reductions.

- It is difficult to perform exact comparisons between EU energy policy and U.S. energy policy as there are many structural, cultural and governmental differences. The learnings come from exposure to ideas, understanding the costs and benefits of actual experience and building alliances for the future.

Germany



Revitalization efforts on the river Elbe in Hamburg

The World's First Major Renewable Energy Economy

After leaving Brussels, the delegation moved on to the next country in our program — Germany. Germany has been highly dependent on fossil fuel imports with three-fourths of the supply coming from outside the country. Now, there is change going on in this country that is clearly visible. Windmills blend into the landscape on many hillsides and solar panels can be seen on rooftops. Germany was the first nation to achieve sufficient market penetration in solar and became home to a “solar valley” of green companies.

Concerns about climate change fueled

the initial movement to develop renewable energy as well as an interest in creating a native industry. The 2010 renewable portfolio in this country includes more than 10% from renewable sources and is growing. According to renewableenergyworld.com, that figure is predicted to increase to 33 percent by 2020 as they move ahead of other European countries in renewable energy development. Germany's Working Group on Renewable Energies declares that over 300,000 citizens work in the renewables industry – one of the fastest growing in Europe. This country is secure in its commitment to and command of the new energy economy with a supportive political and legal framework.

A 2001 law required that all nuclear plants close within a period of 32 years. This policy is currently being revisited under Chancellor Angela Merkel, who decided to



Delegates meet at the Hamburg Chamber of Commerce.



Delegates compare energy policies in Germany to those in North Carolina

extend the life spans of her country's nuclear plants as cost-effective bridging technologies while renewables develop and expand.

In 2000, Germany passed the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz- EEG), which has been a defining piece of legislation for Germany and a catalyst for the growth of renewable energies. This law was created with three main stakeholders in mind: the renewables

producer, the grid operator and the consumer. The core elements of the EEG are:

- the guarantee of connection, purchase and transmission for renewable power.
- investment security – a consistent fee for this electricity paid by the grid operators, generally for a 20-year period, for commissioned installations. This payment is geared around the costs.

What is a feed-in tariff?

The feed-in tariff is a policy tool that encourages renewable energy development by guaranteeing a fixed tariff for electricity generated from renewable sources which are fed into the public electricity grid. The specific tariff, or rate paid to the producer, is dependent on the technology used, and linked to the cost of developing that specific renewable resource.

- the nationwide equalization of the electricity purchased and the corresponding fees paid.

Grid operators are required to feed in electricity produced from renewables first and purchase it at a minimum price within their supply area. There is also a new requirement that grid operators extend the existing grid and enhance it.

The EEG differentiates between renewable technologies in that the various energy sources are guaranteed a fixed price depending on the generation cost. Incentives to invest in development and generation of renewables are provided to each energy producer. It is interesting to note that while utilities play a very important role, there are many farmers and small businesses involved in producing the renewable energy.

Several of the speakers we heard from in Germany believe that the financial certainty has been highly effective. While the specific tariffs are under re-evaluation, the feed-in tariff is believed to have created viable competition and jobs while avoiding picking the winning technology.

This piece of legislation has been a model for other countries, with over 19 EU Member States using feed-in systems to promote renewable energy sources in the electricity market. Worldwide, about 44 nations have introduced feed-in tariff systems.



FACTS ABOUT THE EEG

Source: EEG-The Renewable Energy Sources Act: German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

The Renewable Energy Sources Act: A Success Story

The EEG is a success story as regards launching renewable energies onto the market.

The EEG:

- is the driving force for a new industry
- accelerates the expansion of renewable energies
- acts as a unique job machine
- provides effective climate protection
- creates innovations for the economy and society

Renewable energy proportion of total electricity consumption

1990:	3.4%	2004:	9.3%
2000:	6.3%	2006:	12.0%

“ The EEG introduced a fundamental change in energy supply: every citizen can now become an energy producer. The grid system operators are committed to accepting this electricity, and to paying fixed fees for it. After just a few years this has created an independent, successful and thriving industry which is carried by the vision of a few business entrepreneurs, the know-how of numerous small and medium-sized enterprises, and the enthusiasm of solar energy initiatives, environmental groups and agenda groups.”

Sigmar Gabriel, *German Federal Minister for the Environment, Nature Conservation and Nuclear Safety*



Transforming the City of Hamburg



Hamburg Chamber of Commerce

Our headquarters in Germany was Hamburg – named as the European Green Capital 2011. This bustling city, situated on

the banks of the river Elbe, has a population of about 1.8 million and faces numerous metropolitan challenges. However, Germany's second largest city combines comprehensive approaches, policy commitment and the necessary funding to resolve these challenges. On the whole, it has an integrated and participative planning strategy and a strong commitment toward a “green” vision. The quality of local ambient air is very good, and there are well defined targets, excellent results, future plans and structured monitoring with respect to climate change.

It should be mentioned that Hamburg has set its own ambitious climate protection goals such as reducing its CO₂ emissions by 40% by 2020 and by 80% by the year 2050. CO₂ emissions per person have been reduced by

about 15% when compared to 1990, with annual energy savings of some 46,000 MWh, a major achievement for a big city. Hamburg also stimulates competition and market processes by awarding an eco-label, certifying buildings and promoting energy efficiency as part of the sale of land plots.



Starting in 2010, the European Commission created an award for the European Green Capital of the Year. This award recognizes the important role that local authorities play in improving the environment and promotes these efforts. Stockholm was the 2010 winner and Hamburg the 2011 winner. The award is given to a city that:

- Has a consistent record of achieving high environmental standards;
- Is committed to ongoing and ambitious goals for further environmental standards;
- Is committed to ongoing and ambitious goals for further environmental improvement and sustainable development;
- Can act as a role model to inspire other cities and promote best practices to all other European cities.



Founded in 2009, Hamburg Energie, one of numerous utilities in the area, is a municipal utility serving the citizens of

Hamburg and the surrounding area. Its generation sources do not include any coal or nuclear power and profits are invested in new power plants with an aim of owning production of 50% of its total output. Current generation sources include wind and solar. Generation projects in progress include deep geothermal, biogas and a combined heat and power plant. Hamburg Energie's marketing strategy is to initiate a social movement for more renewables.

Source: Hamburg Energie

The delegation visited Energy Mountain, where wind, solar, biomass, geothermal and methane gas all contribute to the production of energy.

Wind Energy – A Powerful Force in Germany's Renewables Economy

Wind energy has come of age in Germany. According to the German Wind Energy Association (BWE), 21,164 wind turbines with a total capacity of 25,777 MW were installed in Germany by the end of 2009. 38.0 TWh of wind electricity were generated and this was 7% of Germany's net electricity consumption. Almost 100,000 people are employed in this sector. BWE predicts that by the year 2020 nearly 47% of Germany's electricity could be powered by wind and almost 10,000 MW of capacity could be installed in the North and Baltic seas. The above-mentioned Renewable Energy Sources Act (EEG) is given much of the credit for this growth.

Onshore wind construction in Germany continues but has slowed over the past few years. However several states in the country have issued new targets and plan to add significant new wind capacity. Repowering, i.e. replacing the first generation turbines with more efficient technologically advanced ones, will allow Germany to gain even more capacity from wind. It is believed that repowering could eventually double the amount of onshore wind capacity. Repowering is generally only economical when the wind turbines are 15 or more years old. By late 2015 over 6,000 MW will reach that milestone.





Delegates tour Nordex facility in Rostock, Germany, a sister city of Raleigh



Alpha Ventus Goes Online: At a height of 150 meters (492 feet), each turbine is as tall as Cologne Cathedral and, at 1,000 tons, as heavy as 25 fully loaded semi-trailer trucks. Source: Spiegel online: www.spiegel.de/international

Offshore Wind is on its Way

Offshore wind park development is happening in Germany. The first one of these deep-water wind farms, Alpha Ventus, went on line in late April, 2010. Most of these parks will be erected between 20 and 60 km from the coast in waters 20-40 meters deep. An amendment to the German Renewable Sources Act introduced tariffs for offshore wind that will make it more economically viable. According to the BWE, the initial rate is 13 euro cents per kilowatt hour. If a wind farm is commissioned before January 1, 2016, a

“sprinter bonus” of 2 cents per kilowatt hour will also be paid, resulting in a rate of 15 euro cents per kilowatt hour for the first twelve years.

To the Baltic Sea – Where Wind Power is a Force in Economic Development

Mecklenburg-Vorpommern (MV) is a state in Northern Germany, centrally located between Berlin and Hamburg, two major cities in central Europe. It is an attractive area, bordering the Baltic Sea and tourism is one of its main industries. On the way from Hamburg to Rostock, MV (a

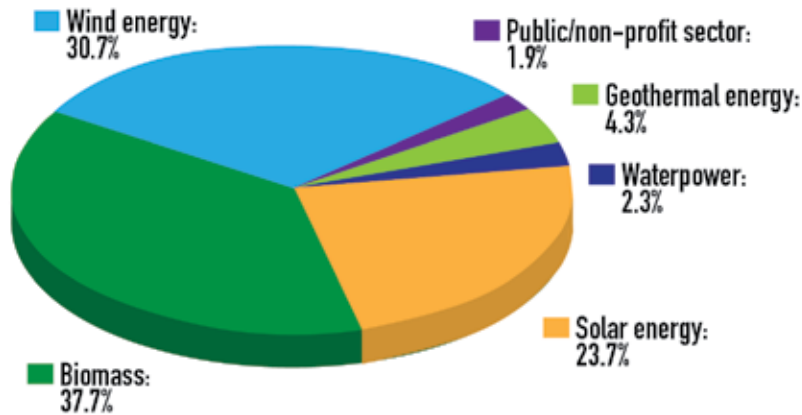
sister city of Raleigh, N.C.), one can’t help but notice many stately wind turbines dotting the rural countryside. They blend in nicely with farms, homes and shopping venues. But for the leaders of Mecklenburg-Vorpommern, wind is a real economic development success story. This was once an area with little economic future. Now, around 40 companies with more than 1,200 employees constitute the backbone of the wind energy sector here.

World leaders such as the wind-turbine manufacturer Nordex Energy GmbH in MV develop new wind technologies that are used around the world. A visit to the Nordex wind rotor blade production facility highlights the impact such an industry can have. This plant is a huge industrial facility and a major employer of skilled technicians. There, they make wind turbine rotor blades. The rotor blade is responsible for the yield of a wind turbine generator and is therefore a key component.

The production companies here are surrounded by regional supply businesses, engineering firms and other companies that play a key role in supporting the manufacturers and create additional skilled jobs. It was also apparent in this region that business, government, university and non-profit organizations were all engaged in the economic development mission of the area.

Proximity to the Baltic Sea port allows both future expansion and unlimited export capacity. There is also great potential off the Baltic Sea coast

Distribution of the approx. 339,500 jobs in the renewable energy sector in Germany 2009



Figures for 2008 and 2009 are provisional estimate: deviations in totals are due to rounding.

www.unendlich-viel-energie.de/english

Source: Agentur für Erneuerbare Energien

of Mecklenburg-Vorpommern, where offshore wind parks are developing. “Baltic 1”, a 21 turbine wind farm with 48 MW of capacity, will come online in 2011. The Baltic 2 Wind Farm has been authorized and will feature 80 wind turbines. These offshore wind parks will provide another big boost to the economy of this area

market certainty, transparent pricing and a reasonable return for investors.

- A concerted effort to move the renewables sector from the research and development stage to become a real industry has paid off for Germany. Jobs have continuously grown in the renewable energy sector, counting 340,000 jobs in 2009 and an expected 500,000 jobs by 2020.

- The supportive government policies and incentives for “clusters”, where businesses related to the renewables sector are located, have been beneficial to the development of this sector. Clusters may include associated businesses, such as suppliers, insurance providers, engineering, research and more.
- Wind parks are always dependent on having adequate wind resources and supportive local conditions, but when present, wind energy can offer a state and its citizens jobs and opportunities along with the environmental benefits.
- Germany is beginning to develop offshore wind and this could provide another pathway for future job opportunities there, as well as additional renewable energy resources.

Observations from Germany

- The 2000 Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz–EEG) has been a defining piece of legislation for Germany and has been a catalyst for the growth of renewable energies.
- A pivotal feature of the EEG was the creation of a market-based policy called a “feed-in tariff”. Political acceptance for the feed-in tariff enabled a policy that encouraged investment in wind, solar and other renewable technologies by providing



Cityscape, Hamburg

France



Paris City Hall

Nuclear Energy is the Backbone of the French Electrical Power System

The group's final destination was France. A stark contrast to Germany, France is the most significant nuclear energy producer in the EU. Nuclear provides over 75% of France's electricity supply, with 58 installed nuclear plants operated by Electricité de France (EDF). EDF is a limited liability corporation, with the majority of shares owned by the French government. AREVA is the reactor supplier for EDF as well as the operator of the fuel cycle.

A popular French riposte to the question of why they have so much nuclear energy is “no oil, no gas, no coal, no choice.”

Source: PBS Frontline “Why the French like Nuclear Energy”

France is rich in many things, but natural energy resources is not one of them. Most of its natural gas and oil must be imported. Domestic coal mining ceased in 2004. This lack of domestic resources focused France's policymakers on a goal of energy independence. Early on, nuclear was considered to be one of the key building blocks of this policy.

In 1974, following the first Arab oil crisis, the French government made a decision to rapidly expand the country's nuclear capacity. While domestic energy resources were not plentiful, France had enormous engineering expertise. Nuclear energy, with its relatively low fuel cost, helped this country minimize imports and achieve energy security.

Given its strong commitment to nuclear, France has the lowest CO2 per capita emissions of any of the EU countries. Several French energy officials we met with noted that they don't understand why nuclear is not widely accepted as a low-carbon option in the U.S. They strongly consider nuclear a relevant solution for a secure, affordable and low-carbon baseload energy supply that is beneficial to regional industry and employment. Our



French nuclear policy stimulates discussion

this include the creation of a national interest-free eco-loan, RFPs to build at least one solar plant in each region by 2011, and the creation of a green bonus for motor vehicles.

Observations from France

- Nuclear is a success story for France, providing over 75% of France's electricity supply. While public support is not guaranteed and polls show divided opinion, nuclear has been widely accepted in France as a source of electricity production. French officials maintain that nuclear power, coupled with renewable power, is the best way forward for meeting the goals of carbon constraint and alleviation of global warming.
- France's nuclear program has created the lowest CO2 emissions per capita in the EU.
- Electricité de France (EDF) is a

limited liability corporation and the world's largest utility company. Its primary owner is the French government, with its ownership of more than 80% of the shares. It is much more heavily capitalized than any U.S. utility company.

- As in Germany, the role of energy security was integral to French energy policies.
- The French nuclear fleet is more standardized than anywhere else in the world. All 58 reactors are PWRs (Pressurized Water Reactors). The first EPR, which is an advanced Pressured Water Reactor, is under construction.
- Used fuel recycling is practiced in France and clearly provides jobs and fuel economies. According to the World Nuclear Association, about 17% of France's electricity comes from recycled used nuclear fuel. It is also possible that this policy is an

important component in the French acceptance of nuclear.

- France has been very aggressive in developing nuclear technology. Reactors, fuel products and services are marketed worldwide and this sector is seen as a driving force for economic development both at home and abroad.
- France is using new nuclear-build to maintain its competitive position as the leader of the global nuclear energy industry. Many of these plants are being built on their borders and are likely to be used, in part, to supply baseload power to other countries. These plants also offer an opportunity to train the next generation of the nuclear workforce.



Delegates hear presentations from representatives of the French Ministry of Environment and Energy

North Carolina Delegates meet in Paris



INSIGHTS of Interest to North Carolina



Wind turbine in northern Germany

An overarching and systematic energy policy is an important driver for economic development

The Center for International Understanding's Energy and Green Jobs study program to the European Union taught us many things. One of the most important is that we are off to a good start in North Carolina in building a more robust renewable energy generation mix. The establishment of a Renewable Energy and Energy Efficiency Portfolio Standard (REPS), renewable energy tax credits and N.C. Green Power clearly demonstrate North Carolina's commitment to adding more renewables to our generation portfolio. The N.C. Energy Policy Council is actively engaged in assessing current and future energy policies. The N.C. Building Code Council recently voted to adopt higher efficiency standards in new homes

and buildings. Our utilities have developed efficiency programs that complement the State's efforts.

It is difficult to determine exact comparisons between the European Union and our national or state energy policies. Distinct national cultures impact business practices. The governmental structures are different. Environmental regulations are different. The economic and philosophical drivers of EU energy policies are not exactly the same as in the U.S. For example, electricity can be bought and sold across borders in an open, competitive market in the EU. There, grid operators are required to connect renewable energy plants to the grid with priority. But there are enough similarities that we feel confident in sharing the following insights that we hope will be helpful to North Carolina policymakers and citizens.

- **State Energy Policy**

The U.S. does not have a specific energy policy similar to EU 2020. This would be an important driver for influencing policy at the state level. In the absence of an overarching federal policy, however, the role of the states becomes even more important. North Carolina should continue to involve all stakeholders as it develops a systematic approach to energy policy. It is important to note that cost and affordability will continue to be important to our citizens.

- **Renewables in N.C.**

Independent analysis shows that North Carolina has renewable resources. We should continue to develop policies that allow us to take advantage of these resources in a cost-effective manner and recognize the force this could be for economic development and jobs. What has happened in Germany may be an indicator of the potential impact of this sector.

- **Renewables and Nuclear**

As we study energy policy, we can learn from the common bond that nuclear and renewable energy have in France. It does not have to be an “either-or” situation and in a rising demand environment, could be considered complementary.

- **Stable Regulatory Environment**

We were struck by the uniformity of views among speakers regarding the proposition that all technologies will benefit from stable regulatory treatment, guaranteed demand, reliable and transparent price points and a skilled workforce.

- **Energy Policy Council**

We recommend that state policymakers closely consider the study being conducted by the N.C. Energy Policy Council and a group of partners to review implementation of North Carolina’s REPS to date and to highlight additional economic

development opportunities through energy, including those in renewable energy and energy efficiency.

- **Increased Windpower**

We recommend increasing efforts to develop onshore and offshore wind power in the state where it makes economic sense. We should follow the development and experience with offshore wind in the EU as we consider this option.

We recommend that the North Carolina Department of Commerce form a high-level working group to investigate and make policy recommendations on how our state can take full advantage of opportunities in the field of offshore wind. Several national studies, including one by the National Renewable Energy Laboratory in June of 2010, find North Carolina has one of the most significant offshore wind resources on the eastern seaboard. This singular wind resource, as well as favorable policy measures already in place, create an opportunity for North Carolina to be a national leader in this emerging renewable energy field.

- **Green Jobs**

Jobs can be created in the renewable energy sector with the right mix of competition and public and private support. Nonprofits with an interest in sustainability could be a valuable resource as well. As the renewable

energy sector develops, attention should be paid to creating “clusters” where related businesses are intentionally organized and located together and contribute to job growth and development of the sector.

- **Transmission Challenges**

Transmission and infrastructure challenges loom large and should be part of the discussion.

EU Member States have many challenges similar to the U.S. and North Carolina, including the need to build new transmission and upgrade the electric grid. The transmission challenges facing the EU are continental and massive, compared to North Carolina’s consideration of expanding east-west transmission and adding the ability to bring offshore wind power onto shore and transmitting it to major load centers.

- **Continue the Dialogue**

Continuation of this dialogue with stakeholders from all viewpoints will be integral to good policy decisions. Members of this delegation represent a variety of professional experience, resources and perspectives, as well as years of hands-on learning about the actual effects of energy policy. This delegation will be pleased to serve as a resource to policymakers.

Global Leaders Program: Energy and Green Jobs European Union 2010

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Resources in North Carolina

The Center for International
Understanding
ciu.northcarolina.edu

The German Marshall Fund
www.gmfus.org

NC Utilities Commission
www.ncuc.commerce.state.nc.us

NC State Energy Office
www.energync.net

U.S. Department of Energy
www.energy.gov

U.S. Energy Information
Administration
www.eia.doe.gov

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www.advancedenergy.org

NC Green Power
www.ncgreenpower.org

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www.epri.com

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Environmental Defense Fund
www.edf.org

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NC Conservation Network
www.ncconservationnetwork.org

Duke Energy
www.duke-energy.com

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www.progress-energy.com

NC's Electric Cooperatives
www.ncelectriccooperatives.com

Coastal Wind - Energy for North
Carolina's Future
www.climate.unc.edu/coastal-wind

Resources in Europe

Wind Energy Network
wind-energy-network.de

EDF – Electricité de France
france.edf.com

European Climate Foundation
europeanclimate.org

European Renewable Energy Council
erec.org

Europe's Energy Portal
www.energy.eu

Hamburg Chamber of Commerce
www.german-business-portal.info

Mecklenburg-Vorpommern
www.mecklenburg-vorpommern.edu

German Wind Energy Association
BWE
www.wind-energie.de

Nordex
www.nordex-online.com

A special thanks to our presenters from whom information was pulled for this report

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- Stephen Boucher, EU Climate Policies Program Director, European Climate Foundation

- Samuel Flückiger, Energy Strategy Centre Associate, European Climate Foundations
- Ulrich Brehmer, Head of Innovation & Environment, Hamburg Chamber of Commerce
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- Jörg Mayer, Managing Director, Germany's Agency for Renewable Energies
- Dr. Benno Hain, Department Leader, German Federal Environmental Agency
- Dr. Ulrich Brammert, Manager, Hamburg Energie
- Kai Dietrich, Presenter and Guide, IBA Hamburg
- Angela Stehlmann, Ministry of Economics, Tourism and Labor, State of Mecklenburg-Vorpommern
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- Roland Methling, Mayor, Rostock, Germany

- Jürgen Siedel, Minister for Economics, Labor and Tourism, State of Mecklenburg-Vorpommern
- Udo Michallik, Secretary of Education, Science and Culture, State of Mecklenburg-Vorpommern
- Rolf Paarman, Managing Director, Rostock Chamber of Commerce
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- Dr. Michael McMahon, Country Director, AREVA, France
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