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Report:

Acceptance of renewable energies in the USA

Abstract

This report deals with the acceptance of renewable energies in the USA and takes a deeper look into the approval of offshore wind energy projects. The report is based on 23 interviews with US citizens who are experts for renewable energies and/or work in the field of energy policy. The interviews were led in April / May 2008 during a McCloy fellowship on environmental affairs granted by the American Council on Germany.

With the share of renewables ever growing both in Europe and the US, what do people in the US think about renewable energies, what do they know about them and are they supportive or against renewables? In general the public considers renewable energies to be “good” and sustainable. They can have a positive effect on climate change and enable the US to be more independent from foreign oil. But this position is changing when the people’s direct surroundings are affected (NIMBY-effect). What is more, people are not sure that renewables can replace fossil fuels in generating electricity, yet. Most experts notice only a limited understanding about energy terms, renewables and climate change by the public, also, there is much misinformation. However, renewables are not only seen as an important solution for reducing global warming, but also is their economic benefit - new jobs in the energy business, a supplementary income for farmers and rural state governments – seen ever more widely.

A closer look to a planned offshore wind farm on Horseshoe Shoal in Nantucket sound in Massachusetts shows the same. The acceptance reaches up to 70% depending on the degree to which the people are directly concerned. In this case most opposition comes from wealthy landowners who feared their view would be destroyed by the offshore wind farm. This case as well as other studies shows that early involvement of the public and explaining the regional advantages a renewable energy plant would bring can minimize the opposition and create acceptance. There are big regional differences in the acceptance of renewables; citizens of states who are more familiar to energy production in general as well as to solar or wind energy plants are considered to be more supportive.

Experts say that in order to increase the use of renewables the USA have to work on several levels. They demand the federal production tax credit to be prolonged and turned into an instrument with a long-term perspective, in order to give investors more security. On the state level, action is needed, too. Experts hold different views on national goals and/or instruments such as a national Renewable Portfolio Standard (RPS). They fear as some state governments think they do not have enough renewable energy resources, these would block any ambitious national goal. Another problem mentioned is the grid disparity, i.e. the fact that renewable energy is generated in other regions than those that have the highest demand. While the grid serves the current electricity structures well, it needs to be rebuilt in order to serve renewable structure that will differ from fossil fuel structures.

Amazingly nearly all experts hesitated when asked what share of renewables they envisioned for the years 2030 or 2050. Obviously, there is a different mentality in the US and in Europe, with the US expanding renewables without a certain goal, and European countries first setting goals and then trying to get there.

None of the experts made clear statements as to whether there are differences in age, gender, or ethnic background when it comes to the acceptance of various energy forms. They agreed, however, that it would be worth while knowing target groups better and increasing educational efforts in order to reduce misinformation. Most important was how every expert called for more (federal) leadership. It became very clear how today many experts are frustrated about the current federal energy policy and hope that after the presidential election severe changes will take place.

Introduction

Do US citizens accept renewable energies? Why are they pro or against using them? And if they are pro, do they actually act in favor of them? Do they buy green power if possible, do they use renewable energies when they build, buy or renovate houses? And what about NIMBY¹-attitudes when it comes to siting for renewables?

Thanks to the American Council on Germany², who granted me a four-week McCloy fellowship on environmental affairs, I was able to look into some of the questions above in more detail. As for the question of siting I concentrated on wind energy with a focus on offshore installations, because considering the Cape Wind-controversy which has even made it to European newspapers, I expected this to be in the focus of public debate rather than onshore wind energy.

During my travels I spoke with 23 experts on renewable energies and/or energy policy throughout the USA, who are based in Babylon (NY), Berkeley (CA), Boston (MA), Boulder (CO), Cheyenne (WY), Davis (CA), Easthampton (NY), Golden (CO), Montpelier (VT), Newark (DE), Trenton (NJ), and Washington (DC). I interviewed 17 of these experts and discussed my topic with the others. Additionally, I had three group discussions with up to 20 people attending.

Some figures

“Good wind areas, which cover 6% of the contiguous U.S. land area, have the potential to supply more than one and a half times the current electricity consumption of the United States.”³

In 2007, the USA for the first time overtook Germany as world champion in additionally built wind energy capacity, which amounted to 5,249 MW. They expanded their nation's total wind power generating capacity by 45% in one single year⁴. Germany is still leading in the total of wind energy capacity installed. However, the United States hope to take the lead in the near future. This may well be the case considering that a wind capacity of 1,400 MW was installed in the US in the first quarter of 2008 alone, which is rather amazing considering that legislation on the future of the production tax credit is pending.

In 2006⁵ 2.4% of the nation's electricity generation (=96,423,000 MWh) stemmed from “other renewables”, including wood, black liquor, other wood waste, municipal solid waste, landfill gas, sludge waste, tires, agriculture byproducts, other biomass, geothermal, solar thermal, photovoltaic energy and wind. According to information provided by the EIA⁶, the share of wind power totaled 0.66%⁷ of the national energy consumption. From 2006 to 2007, the energy provided by wind power plants rose by over 20%.

According to the American Wind Energy Association (AWEA) the United States can expect to generate 16,818 MW of electricity by wind power in 2008 which is equivalent to powering more than 1.5 million American homes. AWEA estimates that at the end of 2008 a wind energy capacity of 48,000 MW will be reached which can supply over 4.5 million houses - which is up to 1% of the US electricity supply⁸. There is a strong demand for wind power across the country, so that wind turbines have already been sold out till the end of this year. The American Wind Energy Association (AWEA) illustrated that fourteen new manufacturing facilities opened or

¹ „not in my backyard“

² www.acgusa.org

³ DOE, Energy Efficiency and Renewable Energy, Wind and Hydropower program, see http://www1.eere.energy.gov/windandhydro/wind_potential.html

⁴ Comp. http://www.awea.org/newsroom/releases/AWEA_Market_Release_Q4_011708.html, accessed 2008-08-14

⁵ Comp. <http://www.eia.doe.gov/cneaf/electricity/epa/epat1p1.html>, accessed 2008-06-28

⁶ Energy Information Administration

⁷ Comp. http://www.eia.doe.gov/cneaf/electricity/epm/epmxf1_1_a.xls, accessed 2008-06-28

⁸ Comp. http://www.awea.org/newsroom/releases/AWEA_Market_Release_Q4_011708.html, accessed 2008-08-14

were announced to open in 2007. This implies that in the US wind energy businesses will expand and accordingly create new jobs and business opportunities through the country.

When referring to renewable energies in the US, people usually speak about vehicle fuels and electricity. Generating heat and cold as another energy-consuming service is rarely addressed. Boston-based energy advocate Wilson Rickerson and co-authors have summed up what figures they found for renewable heat in the US in a report published by the Heinrich-Boell-Foundation.⁹

As the interviews this report is based upon concentrated on (offshore) wind energy, we will only speak about electric power from here on.

General attitudes

"Americans solve problems. We don't run from them."¹⁰

I visited the USA roughly half a year before the presidential election in November 2008. Maybe because of this I found most people I spoke to volunteering information on who they voted or will vote for as their new president. In shops I noticed more stickers, magnets etc. ridiculing the US president than I had seen during former visits. I encountered a general feeling of shame and/or helplessness about the US' position on global issues such as climate change. However, climate change and/or environmental protection did not play a major role in the election campaigns during my stay.

There was a feature in Newsweek in April 2008 comparing candidates' attitudes towards the environment, which however did not go into much depth, but only gave brief overviews on their position on some key issues. Some weeks after my stay ended, the US Senate debated climate change policy. While the Senate did not move forward on legislation, 54 Senators stated that they do believe climate change must be urgently addressed.

Whenever I told people that I was gathering information on acceptance of renewable energies, they would usually react by giving me their opinion on US biofuel policy – subsidizing corn farmers to gain environmentally doubtful ethanol – and/or the US' dependence on (foreign) oil, thus mirroring the general public debate during the weeks in which I traveled. Some recurred to state policies on renewables, only few told me how they contributed to saving energy and/or using (more) renewables.

What do US people think about renewable energies?

"I am all for wind power. I just wonder how much it costs if they build it where there's no wind."¹¹

According to the people I spoke with most US citizens are pro renewable energies. People suppose renewables are good and clean but on the other side very expensive, not proved enough and inefficient because of the need for government subsidies. Most citizens consider renewables to be rather utopian than real, asserting them as a vision and not as practical. Mostly, opposition to actually building plants and extending grids comes from county and state governments who often seem to be influenced by an established coal, oil, gas, and/or nuclear lobby. In West Virginia, for example, the state government is opposing wind farm siting on many occasions, claiming it destroyed the landscape. At the same time, the state government supports the so-called mountain top removal. In this process, coal resources are accessed from the top of the mountain, the rocks "cut off" to reach the coal are put into so-called "valley fills". To us, it seems this includes destroying the landscape at large, even though, "as mining is completed, the remainder of the material is used to return the ridge tops to the approximate

⁹ See http://www.boell.org/docs/TheMissingPiece_Online_Version.pdf, accessed 2008-06-28

¹⁰ John McCain, Republican presidential candidate, <http://www.johnmccain.com/Informing/Issues/65bd0fbe-737b-4851-a7e7-d9a37cb278db.htm>, accessed 2008-06-30

¹¹ Shop assistant in Columbus, Ohio

original contour.¹² In Germany, even though there was not mountain top removal so far, we had large strip mines for lignite in the area of Lausitz, Brandenburg, as well as in the Ruhrgebiet in Western Germany. After the strip mines were closed, the landscape was rebuilt. However, the area does not look the least like it looked before, not to speak of resettlements etc.

Back to renewables: Individual positions on renewable energy sometimes change as soon as somebody's direct surroundings are affected. Usually, only people's position towards an individual site may differ, not towards renewables as a whole. This phenomenon, known as NIMBY = Not in my backyard, is also known from any other infrastructure project throughout the world. While building wind farms may still not encounter too much opposition, building new transmission lines usually does.

However, as an example I was told about shows, citizens who were informed that a transmission line planned for should actually transmit wind power, did not oppose the project any longer. On the other hand, in Minnesota a citizen initiative joined by environmental NGOs such as the Sierra Club intensely opposes the newly planned South Dakota Big Stone II coal plant¹³. The project shall expand the power plant Big Stone built in 1975 which is supposed to emit mercury to the nearby state park. The initiative rather wants to see wind power to be developed in their state. As the company planning to erect the expansion wants to sell a relevant share of the power produced to Minnesotans, they are dependent on transmission lines through the neighboring state.

Nearly all experts explained that there is a public understanding about the importance of renewable energies. People see the effect of global warming and become aware of the role regenerative energy resources can play. Some citizens aspire that renewables can help in the matter of energy security in as much as they enable the US to become more independent from foreign oil. The wide consciousness for different forms of energy production is also predisposed through the media interest and in addition through Congress debates. Congressmen and – women recently discussed a lot about renewables and green collar jobs. Some experts think that by now the whole population is looking at environmental effects and has grown more interested in energy policy for the last five or ten years. Citizens are getting ever more aware of global climate change and how it will affect their children and grandchildren.

However, most people only have a limited knowledge about deregulation of energy markets as well as of generation, transmission and distribution of energy. Many people do not know where their energy comes from. They do not take care about this, they take (cheap) energy for granted. Many experts explained also that there is a lot of false information in people's mind. One expert said that the topic energy was like a mystical black box for US citizens.

People recognize the rising prices for gas and coal and are angry about this. But they do not believe that renewables are adequate to replace fossil fuels in generating energy.

Some of the interviewees pointed out regional differences for the acceptance of renewable energy technology. One expert illustrated an interesting effect: When an energy project is planned in areas which are less "green" concerning the public opinion, the people were more supportive to the project than those in "greener" areas. In Texas, for instance, where energy generation from gas and other fossil fuels plays and always played a major role, the population tends to feel less affected from a renewable energy plant than e.g. people in Massachusetts where many people are wealthier and drive hybrid cars. Furthermore experts spoke about the NIMBY problem - that means the national sentiment is very high for renewable energies but when people are directly affected by a project the support for it tends to decrease.

Everybody I talked to mentioned environmental reasons and consciousness for climate change as driving forces for extending the use of renewable energy. What is more, many mentioned that fossil fuels not only impact global warming and climate change but also people's health due to

¹² Compare <http://www.wvgs.wvnet.edu/www/mtrm/fa02mtrm.htm>, accessed 2008-06-28

¹³ Compare <http://beyondbigstone2.com/index.html>, accessed 2008-06-28

air pollution. The experts' views differ about the increased general awareness for climate change: some say more people were getting aware of climate change especially after the hurricane Katrina and connect this with renewable technologies; others say economic reasons, i.e. rising gas and oil prices, are also very significant for them. All in all, most experts agree that renewable energies are seen as an important solution for reducing global warming. Besides, they believe that the public feels responsible for protecting the climate.

Another major factor when it comes to public views on energy is the idea of energy independency. In this debate economic issues play a central role, because people have recognized that fossil fuels are running low and on the other hand green energy pledges many jobs. Furthermore the high gas prices and the dependency on foreign countries constrain the nation to think about alternatives and to approve of them.

In the US there is a growing consciousness that for farming communities' investments in renewable technology, i.e. in onshore wind plants, can be very lucrative and profitable.

The general public considers renewables to be a low pollution innovation and high technology; therefore they are associated positively. A few people even link a "cool-factor" to this new technology.

What does the US people think about offshore wind energy?

"It's not the view. It's the vision."¹⁴

In the US, onshore wind energy is not considered a new technology. The first wind farms were built in California e.g. on Altamont pass in the 1980s. Mistakes were made, and hardly any regulations had to be followed, be it concerning nature protection, be it concerning maintenance. A tax credit was applied to building the plants, not to actually generating power. In consequence, many problems arising from using the wind farm were not taken care of in due time. Among others, Altamont became famous for birds killed by the rotors. One reason for this was that the rotors were positioned exactly on the altitude of migrating birds' routes. According to the interviews led, no official research on issues of nature conservation had taken place before building the wind farm.

However, just like in Europe offshore wind power platforms are a new technology. In Germany, the process of actually starting to build the first offshore wind farm at Borkum West took longer than expected – partly because of intensive permission processes, partly because of problems of raising the money for it. The first test field "Alpha Ventus"¹⁵ will be commissioned in early 2009. The project is developed by the German Offshore Foundation¹⁶, members of which are producers of wind power plants, utilities, affected German states and the Federal Government. Considering the debates in Germany, it does not surprise that there are more intense debates about offshore wind power projects in the US than about onshore wind farms. What is more, especially in the Great Plains there are so many promising possible wind power sites far away from settlements (and, thus, from grids), that one expert actually called these sites "our offshore".

Beyond doubt the most famous controversy about an offshore wind farm is the one about the Cape Wind project on Horseshoe Shoal in Nantucket sound in Massachusetts. Williams and Whitcomb have thoroughly covered the confrontation between some of the richest people in the US and project developer Jim Gordon and his proponents in their book¹⁷. Depending on which survey one refers to, acceptance of CapeWind among citizens varied from below 50% to over

¹⁴ Website by Clean Power Now, citizens' initiative for CapeWind. See: <http://cleanpowernow.org/>, accessed on 2008-05-07.

¹⁵ See <http://www.alpha-ventus.de>, accessed 2008-08-19

¹⁶ see <http://213.133.101.147/offshore/version1/home.html>, accessed 2008-06-28

¹⁷ Williams, Wendy and Robert Whitcomb: "Capewind. Money, Celebrity, Class, Politics, and the Battle for Our Energy Future on Nantucket Sound", 2007

70% over time. Relevant markers that changed opinions were the oil spill in Buzzards Bay in April 2003 and the first nationwide coverage of the conflict in the New York Times magazine in June 2003.

There are, however, other projects which have been proposed in the meantime. The Earth and Marine program at the University of Delaware came up with surveys both on CapeWind and a proposed project at Delaware's Rehoboth Beach, one of the most popular places for retirees in Delaware. The first survey found that a vast majority of Delaware citizens were in favor of a hypothetical offshore wind farm 6 miles off their state coast, with only 4.2% opposing it¹⁸. These figures changed the smaller you drew a circle around the proposed site, however, the support still remained clearly above 50%. The same seems to be valid for beachgoers who have been interviewed for a current survey. Some say they would rather go to another (Delaware) beach than seeing the wind power plants. However, others say they would especially come to this beach if tours were offered to see the plants from a closer distance.

Most interesting, however, is the reaction to another question posed in this survey. The offshore wind power plants will be built about 6 miles offshore. Roughly at the same distance on land there is a coal plant which obviously most of the people surveyed did not know. Asked if they would visit the beach if there was a power plant at six miles distance on land, hardly anybody said they would not.

So, is it indeed all about the view, and maybe not so much about the vision, as proponents of CapeWind are saying?

Nimby or not, view or vision, most experts I talked to were convinced that today no industrial development – in this case: wind energy plants and grid extensions – can be made without early involvement of those affected by it. However, the question remains what early involvement means and what it includes. In my talks I found that besides sticking to the truth a major part of information should be visualizing the planned development. This includes the best and the worst case scenarios. Most opposition is created by the feeling of not being informed, of not being taken seriously. The other major factor is pointing out what advantage the development brings to those most affected. Now this is rather tricky, as history shows that so far nobody cared much about what a new plant does for the citizens around it. While renewable energies have the advantage to do something for the planet by helping to reduce climate change, this is not the benefit the citizens close to a plant can feel or see in their pocketbook. One major argument of the Alliance for Nantucket Sound, the opponents of CapeWind, was that developer Jim Gordon would get rich(er) by realizing the project while they would only have the spoilt view. The chief executive officer of this Alliance commented on the planned offshore plant that "This is like trying to put a wind farm in Yellowstone National Park, as far as we're concerned."¹⁹

Hence, the question is if the chance to benefit from a plant by being able to buy shares etc. will encourage local people to support a plant. A Master thesis currently written by an MIT student I talked to bases on this hypothesis. However, at the point of our talk he had not found clear proof for this.

When I asked the interviewees: "What do you think people know about offshore wind energy?" almost everybody answered they believed the general knowledge about this was very low. They said that the same effects can be seen with other renewable energy technologies, All in all people think renewable energies are a good and clean alternative to "dirty" technologies as e.g. oil, gas and coal. However, with offshore wind some experts quoted surveys and/or newspaper articles saying people were insecure of primarily visual impacts and secondly environmental impacts like bird kills. The bad example of Altamont described before is deep seated in people's

¹⁸ Comp. <http://www.ocean.udel.edu/Windpower/docs/FinalDNRECOpinionReport.pdf> , accessed on 2008-06-28

¹⁹ Comp. http://www.businessweek.com/print/magazine/content/08_27/b4091052403644.htm , accessed on 2008-08-14

minds. The average citizen has a positive association with wind energy but no deeper knowledge about the technology and/or its environmental impacts.

What is more, there are regional differences, too. There is hardly any public disagreement with (offshore) wind farms in Texas, California or the Mid West, One reason is that people there are familiar with onshore wind energy plants and there is wide open land and much space. The opposite is true for most of the East Coast, where wind energy farms are one industry competing for the – by US standards – little space. One expert claims that “If you go to Long Island and the East Coast the support is shrinking, here the people make clear that they will not see an offshore wind farm at their beach.”

Now it seems as if CapeWind won the fight against the opposition of the planned offshore wind farm on Cape Cod. The BusinessWeek article “The War Over Offshore Wind Is Almost Over”²⁰ from June 2008 explains that CapeWind may get the authorization to begin the construction of the wind farm in a few months.

What is done in the US to increase the use of renewables?

“Atomic Power, atomic power was given by the mighty hand of God”²¹

In order to support climate protection, action to increase the use of renewables is taken on several levels. However, during my talks I kept getting the impression that hardly anybody knew anything about what other levels or other entities at the same level had done or were doing at the time. This sometimes put me into the strange situation that I – the German only visiting for four weeks – was the one to have a better overview and to put people into contact.

Federal level

At the time of my visit a production tax credit was in place till the end of 2008. Congress only recently extended it until December, 31, 2009. The credit gives those who invest in renewables and guarantee operation and maintenance of their plants the chance to deduct taxes depending on the quantity of power produced (currently 2.0 US-cents / kWh from wind power²²). The production tax credit followed an earlier incentive that failed to be successful as it only rewarded building plants, not maintaining them. According to the people I talked to the major problem of the production tax credit is that there is no long-term-planning respectively reliability, thus blocking serious engagement of investors. One expert explained that the fact that the PTC is an on/ off-proposition without a long-term perspective is due to short-sightedness in Washington DC. In his opinion this makes it difficult for investors to plan a project for a 10 till 20 year period.

There have been and/or are initiatives to create incentives by Congressmen for a federal Feed-in-law, a federal Renewable Portfolio Standard (RPS), a Carbon Cap and Trade mechanism as well as Carbon taxes. Most people I spoke to hoped that one or more of these would come into force after the presidential elections. However, when it comes to an RPS, the major problem is how to make sure that advanced states can stay on their track without being blocked by the federal standard. What is more, some experts fear that as the coal, oil, and nuclear lobbies will try to interfere, and as especially governments of South Eastern states tend to believe their states are unable to use renewable energy, a federal RPS might be watered down so much that it won't help increasing the share of renewable energy at all.

Some state governments do not want a federal RPS because they think they do not have enough resources available, so that they must buy renewable energy from other states. Some interviewees think that with a national RPS there will be a lot of wind development in Wyoming,

²⁰ See: http://www.businessweek.com/print/magazine/content/08_27/b4091052403644.htm ,accessed on 2008-08-14

²¹ Buchanan Brothers: “Atomic Power”, 1946, RCA Victor, Fred Kirby, see http://www.authentichistory.com/1950s/atomicmusic/1946_Atomic_Power-Buchanan_Brothers.html

²² Comp.

http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=US13F&State=Federal%C2%A4tpageid=1

Montana, Colorado, Oklahoma and a lot of solar development in Arizona and New Mexico. The problem they pointed out is that these areas are not those where the energy generated is needed and that electricity transmission is regionally constrained.

Some experts seemed to be rather frustrated about federal policies, one said: "The federal administration has to do something more, whether there is a RPS or something else, before we approach the point where it is no more possible, the point when the Congress is paying more attention to carbon regulation and then just deal with carbon regulation."

Only some experts had seriously thought about a feed-in law for power. In Germany, this is one of the major instruments of promoting renewable energies. Whoever generates renewable energy is guaranteed to be able to sell it to the grid operator at a fixed price. The price depends on the form of renewable energy and the year in which the installation was built, with prices decreasing on an annual basis. One person mentioned that a feed-in law will not make sense in the US because electricity prices have a high disparity in different areas, with differences amounting to a ratio of up to 3:1. Another expert supposed while not thinking in detail about feed-in-systems that the grid in the United States was too difficult to be controlled and that it is impossible to force grid operators to buy electricity generated in a certain way.

One expert explained how federal taxes have played a synergistic and useful role in supporting renewable energies for the last 3 or 4 years.

Many interviewees pointed out that they see the highest benefit in carbon emission limits and, secondly, in a carbon cap and trade system and thus favor this instrument.

State level

As many as 26 states set renewable portfolio standards (RPS) that have to be met by energy suppliers. California, which for years has taken the lead among the US when it comes to renewable energy, has a RPS of 20% renewable energy (share of power generated) till 2010. Massachusetts also set eager standards, even though the former state governor²³ opposed the building of an offshore wind farm in Nantucket Sound south of Cape Cod. Today's governor, Deval Patrick, is quoted saying "I view this project as an important symbol of our commitment to clean energy. The Commonwealth has the opportunity to be the world's leader in clean energy and the economic development that will come from that leadership."

On the other hand, Wyoming, biggest supplier of energy in the US, has not set any standard but exclusively relies on energy being continually demanded. In Wyoming, nobody is in charge of a "sustainable energy policy", there is, however, an energy advisor to the state governor, who in effect in his brochure greeting visitors mentions the coal reserves the state has, but does not mention renewable energies.

Some states such as Kentucky and West Virginia are actively supporting the coal, oil, and nuclear economy. Together with states which fear that a national RPS will force them to import renewable energy they have been successfully blocking national policies for renewable energies.

Almost everybody I interviewed agreed upon the need for measures on the state level. However, the majority also demanded at least simultaneous action on the federal level. Most experts think a state RPS will be better than a federal one. One person argued it was better for the states to decide for themselves what will be their best way. Observing their individual progress will then have an effect on other states, and, if all states join in, this will be close to a national RPS. From the German perspective, this "volunteer" approach does not sound very promising, at least not, if no benchmarking or else are planned.

²³ Comp. Williams, Wendy and Robert Whitcomb, 2007

County and community level

County administrations are often the first to be contacted when it comes to siting new projects. However, those in charge often do not know much about renewable energies in the first place. This is why e.g. NREL tries to offer usable information to county representatives to enable them to take responsible decisions.

During my travels I heard quite a few stories about positive examples of communities that had chosen to concentrate on using renewable energies. However, I have not heard of any community which has set a goal to reach 100% renewable power by a given point in the future. I suppose that encouraging networking among communities in the US and maybe overseas might be a good idea to further increase bottom-up progress on renewable energy. In a ranking as of 2006/07²⁴, Oakland, CA was leading the list with a share of renewables of 17%, with other West Coast cities following suit.

More recently, some Congressional leaders e.g. from Iowa or North Dakota²⁵ have started supporting wind energy, because they recognized that wind energy plants can bring benefits for their farmers and furthermore tax revenues to rural governments. For the rural areas in the US wind energy is a “very significant boost”, the farmers get significant amounts of revenue if they lease their land, maybe \$5,000 per year per wind turbine depending on how much electricity is produced. Additionally the wind farms create maintenance jobs in these regions, so it allows the people to work at home and to not have to leave the area.

Citizens

There are some local initiatives, e.g. in Wyoming, that try to enhance communication between individuals who have been or might be approached by energy companies in search of e.g. wind sites. The major aim is to make negotiations about prices for renting land fairer and to thus raise acceptance for renewables. Many farmers throughout the US see leasing ground to energy companies as a good chance to make money from their grounds after retiring.

Most friends and acquaintances I spoke with have a more or less rudimentary understanding of what their contribution to climate change is. While it is true that most German citizens do not have any idea what their carbon footprint is, either, based on my obviously restricted insight into the US-society I would say that the general knowledge about energy consumption is more profound in Germany than in the US.

Goals, scenarios and preferred instruments

“If you don't know where you are going, any road will take you there.”²⁶

In Germany and Europe, the debate about increasing the share of renewables is almost always a debate about instruments. While I was in the US for my fellowship, a debate raged about whether a feed-in-system or a trading system was better for reaching the goal of a 20% share of renewables in 2020.

With this background, I wanted to find out which instruments my interview partners preferred, and what they thought about goals and scenarios in the first place. When asking these questions, I referred to what I knew about presidential candidates' ideas on this.

The Democrat candidate for president, Barack Obama, has goals referring to the renewables share of power in the future. He “will establish a 25 percent federal Renewable Portfolio Standard (RPS) to require that 25 percent of electricity consumed in the U.S. is derived from

²⁴ http://www.sustainlane.us/articles/city_renewable_energy.jsp

²⁵ Comp. http://www.plentymag.com/features/2008/01/randy_swisher_qa.php, accessed 2008-08-19

²⁶ Lewis Carroll: “Alice's Adventures in Wonderland”., 1865

clean, sustainable energy sources, like solar, wind and geothermal by 2025.”²⁷ This goal is part of his environmental policy including measures to increase energy efficiency as well as a cap and trade system for carbon emissions with a 100%-allowance auction. In Germany, after grandfathering the rights in the first run, we now auction off 10% of the allowances, expecting a revenue of around 400 million Euros, which will be reinvested in climate protection. I do not know in what way Obama’s campaign was influenced by the great success Al Gore had with his movie and his support for the Climate Alliance. However, a majority of people by now seems to believe that it is a good idea for the US to turn towards sustainable energy sources.

While John McCain, the Republican candidate, agrees that climate change has to be addressed, and is in favor of a cap and trade system, too, he seems to think that rather nuclear power than renewables is the solution: “Over time, we must shift our entire energy economy toward a sustainable mix of new and cleaner power sources. This will include some we use already, such as wind, solar, biofuels, and other sources yet to be invented. It will include a variety of new automotive and fuel technologies, clean-burning coal and nuclear energy, and a new system of incentives, under a cap-and-trade policy, to put the power of the market on the side of environmental protection.”²⁸ According to his “Lexington project”, he wants to “rationalize the current patchwork of temporary tax credits that provide commercial feasibility. John McCain believes in an even-handed system of tax credits that will remain in place until the market transforms sufficiently to the point where renewable energy no longer merits the taxpayers’ dollars.”²⁹ Neither does McCain announce a goal for a certain share of renewable energies in the future, nor does he seem to support incentives to increase their share.

The US Department of Energy only recently published a scenario that explains which obstacles have to be overcome to reach a 20% share of wind power by 2030: “The report considers some associated challenges, estimates the impacts and considers specific needs and outcomes in the areas of technology, manufacturing and employment, transmission and grid integration, markets, siting strategies, and potential environmental effects associated with a 20% Wind Scenario.”³⁰

Amazingly, almost everybody I talked to was rather uncomfortable with giving me an estimate of which share renewables could have in the years 2030 or 2050. Most experts were not very familiar with scenarios, and my asking them to “envision” their preferred renewable future took many of them by surprise. This was ever more the case the closer my interview partners were linked to the administration. While some said they could imagine a renewable share between 50 and 100% in 2050, most just did not see themselves fit to answer the question. Those interviewees’ who actually answered the question varied quite a bit in their estimates. Some said there can be a share of 20, 25 or 30% of renewables by 2030 and a share of 50, 70, 80 or nearly 100% by 2050.

I debated this result with quite a few people, who could not come up with a good explanation for it, either. One reason for this reaction may be that Americans tend to consider everything coming from the federal government to be an – illegal – invasion into their lives. Hence, a national goal or “vision” might be too “socialist” for the US. On the other hand, once there is a common “mission” such as “We can do it”, Americans tend to support it no matter what. So, if goals are not yet positively connoted, it might be an idea to change that in order to know where to go.

Accordingly, almost everyone assured me that a relevant share of renewable energy will only become reality if big changes take place soon. While political changes are a prerequisite, besides, innovations for the industries to reduce their carbon emissions, personal motivation and

²⁷ <http://www.barackobama.com/issues/pdf/EnvironmentFactSheet.pdf>, accessed 2008-06-29

²⁸ <http://www.ihf.com/articles/2008/06/18/america/17textmccain.php?page=2>, accessed 2008-06-29

²⁹ <http://www.johnmccain.com/Informing/Issues/read.aspx?guid=17671aa4-2fe8-4008-859f-0ef1468e96f4#3>, accessed 2008-06-29

³⁰ <http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf>, accessed 2008-06-29

more public awareness for climate change are needed. A development in storing renewable energy and concerning the grid are crucial musts.

Experts said that subsidies for traditional fossil fuels should end, so that there is more investment in alternative energy production. Many interviewees agreed that one difficulty will be to overcome the existent giant lobbies, as e.g. the clean coal lobby.

Some people I talked to told me that a lot of regional renewable potential is not used today. One expert claimed that with putting solar plants in the South West, onshore windfarms in the Great Plains and Far West and offshore plants at the East Coast, these regions could easily produce 100 % of their needed electricity with renewables by 2030. Some agreed that it is really necessary to start up the offshore energy production especially at the East Coast and at the Great Lakes; then it would be possible to reach the federal standard of 20% electricity from renewable energies by 2020. One expert said: "This 20% goal is a tall order but doable." Another big step is to reduce the carbon emissions by up to 80% by 2050.

As for preferred instruments, most of my interview partners discussed states' Renewable Portfolio Standards, often questioning if a federal RPS would help increasing the share of renewables at all. The danger of such an RPS being watered down especially by South Eastern states was seen by many. The second instrument often named was a cap and trade system to reduce carbon dioxide emissions. Auctioning off allowances was mostly welcomed however, some feared that grandfathering rights and setting the cap too high could be a problem in the US.

The idea of a feed-in law following the German example, as has only just been drafted by Congressman Jay Inslee, was mostly unknown among the people I talked to. When I explained the concept, many considered it worth while thinking about it, but did not feel very strongly about it. The major problem with such a law seems to be the sheer size of the United States, making regional solutions necessary.

Does energy consumption behavior and acceptance of various forms of energy vary considering age, gender, or ethnic background?

Most experts I spoke with had little if any knowledge concerning this question. However, most of them agreed that knowing the target groups' needs better would help in aiming both energy policy and offers by energy providers better than is usually the case today.

One expert pointed out that there are differences in the way how women and men deal with questions of energy use. While both groups basically want to see their needs for cheap and stable power supply met – no matter what energy source is feeding the grid – this expert sees that while hi-fi and computer equipment is usually a men's domain, decisions on buying household appliances are usually taken by women. Using their expertise may help in developing energy-saving appliances that actually meet people's needs.

Interestingly enough, the only person raising the question of environmental justice without being asked for it was the only Afro-American expert I spoke with. Just like in Germany, energy policy seems to be a domain of white males, who usually are not too aware of what views other shares of the population hold on energy supply.

In my interviews, there were several more or less educated guesses about how age influences the acceptance of renewables. However, hardly any of them were founded. One survey among inhabitants of a state where offshore wind energy plants are being planned, showed a higher acceptance among younger and older people than among middle-aged people. However, it remains unclear if this tendency will be repeated in future surveys.

Even though I did not ask for it, most experts volunteered information on how Democrats were more supportive of renewables than Republicans. The same was suggested for coastal states vs. inland states. However, it seems that even among Republican voters support for sustainable energy is surprisingly wide spread.

One expert made clear that he sees a relevant impact of the education levels of people. He explained that there is a lot of misinformation in people's minds about energy generation as a whole and about alternative energy sources. The interviewee made clear that he experienced how people with a higher education are less likely to fall for "dumb" information from the internet or papers. However, this education problem can be overshadowed by motivation and interest in such energy topics. Furthermore he described that people can fall for misinformation even if they have the ability to research it due to lack of time or inclination. To him it seemed surprising that installations like solar panels were not so often to be found on rich people's houses but rather on working class people's houses, assuming they have a higher motivation to promote renewables than richer people do.

Another expert declared that she has not seen relevant differences in age, gender or background but that there is large regional discrepancy in awareness for energy issues and the acceptance of renewable energy sources. There is a great awareness for changes in energy policy and for preventing climate change in California and in the North East. On the other hand, in the Southwest, the Midwest, Upper Midwest and the Northern Plains there is less acceptance.

One expert described how during the long time since the Cape Wind project has started at the East Coast he recognized an interesting income effect. For him it seems as if the rich people – this means 250.000 \$ in average income a year - are supportive for the project, but the really rich people – millionaires – are mostly opposed to the project. Accordingly, he called them "NIMBY-individuals".

What action is needed?

During my travels, one expert told me a very impressive story about house owners she had interviewed not long before. She had picked the couple who had only recently moved into a house equipped with solar cells. When she asked them how content they were with their PV system, they swore they did not have one. In the end they went out on the street, only to not see a PV system. Only after they went a few yards down the road, they finally saw the PV system on the roof, which could not be detected from the angle in front of the house. This story proves very impressively how visualizing is a "must" when it comes to convincing people to use clean energy. A net metre running backwards, installed visibly in the kitchen, would have helped this couple quite a bit to understand where their energy came from.

Nearly all experts I talked to agreed that mass education and extended public participation are needed to encourage energy efficiency and consumption of renewables (rather than fossil fuels). At the same time, many people I spoke to strongly supported not laying the burden on the individual. They rather saw working on lobbies and policymakers as the most promising way to a sustainable energy policy.

Asked for the two major challenges for renewables in the next ten years, experts mentioned:

- Leadership
- Overcoming existing structures that are in favor of coal, oil and nuclear energy
- Grid extension
- Education and information

Interestingly, need for research (and funding research) was hardly mentioned, even though I spoke to quite a few scientists at universities and institutes. Research on acceptance seems mostly to be carried out by individuals in several states, such as Delaware, Colorado, and California. Other than technical research, it is obviously mostly dependent on public funding.

Call for leadership

"If we could put a man in the moon ..."

Most of the experts I met made a call for leadership by the federal government. While two said that a call to the nation as Franklin D. Roosevelt's "We can do it" in the Second World War was necessary, others simply stated: "If we could put a man in the moon, why shouldn't we be able to replace fossil fuels by renewables?" Basically, the belief that truly "United" States could do everything they wanted prevailed. People in the US are very good in this, if they understand why it takes them to reach a goal.

To me, this positive identification with a national goal is something I so far only encountered in US-citizens. I can only guess why that is the case among so great a share of the US population, but personally I know that the European and especially the German history prevents me from being proud of and believing in my country beyond limits.

However, it seems that right now the US is looking for the right way to go concerning energy policy. One person said in a frustrated way: "We have the know-how but a lack of leadership!" Another expert even claimed that if representatives of fossil industries should prove unwilling to join in the efforts to protect the climate in the long term, the federal administration might finally need to force them to. All in all most interviewees agreed unanimously that a long term and very aggressive policy intervention will be absolutely essential. Furthermore, one expert described that a mass movement was indispensable, which should then motivate the government to fight climate change very quickly. This governmental action should then focus on the whole nation. He pointed out that a public that supports renewables was needed to show the leaders the way, because sometimes the elected officials do not really lead but rely on the public opinion as recognized by them or their teams. Hence he considered public awareness to be essential.

AWEA³¹ suggests it is possible to provide as much as 20% of the nation's electricity by 2030 through wind. The biggest obstacle they see today lies in the lack of consistent and stable policy. Over the last ten years the wind production tax credit has been extended only for two years at a time. The AWEA executive director explains that this "on-again, off-again nature of the wind PTC" has also had a negative impact on European wind turbine manufacturers for expanding to the USA. Although the US has been the largest market for wind turbines in the world for the last three years "only one of the top 10 manufacturers in the world is a US-based company, because we have not nurtured this industry with any kind of stable policy." In addition, he mentioned that the public has the power to force their interests by saying: "We want to see this country embrace a renewable energy future. We want to see the renewable energy tax credit extended on a long-term basis." He suggests that this could be communicated e.g. in town meetings when members of the Congress are visiting their districts. AWEA suggests that if there will not be a long-term federal policy for renewables and no constraints on carbon emissions, either, the share renewables can bring will not approach its real potential³².

As stated above, leadership on energy policy is needed. Most people I spoke with said they did not see a coherent or reliable energy policy on the federal level. While in Germany that was the case, too, before 2000, today there is a framework set by the decision to phase out nuclear power as well as the outcomes of the chancellor's energy summits. This along with scenarios and goals set both by the European Union and the national government helps the administration a lot to work coherently. After the EU council set goals for the reduction of greenhouse gases, an increase in energy efficiency, and the share of renewables, the German administration developed an Integrated Energy and Climate Program (IEKP) that shall reduce German greenhouse gas emissions by 35% in 2020 as compared to 1990. This also shows how Germany takes the lead among the European Union.

³¹ Comp. http://www.plentymag.com/features/2008/01/andy_swisher_qa.php, accessed 2008-08-19

³² Comp. http://www.awea.org/pubs/documents/Outlook_2008.pdf, accessed 2008-08-14

Understanding the structure of the US federal administration when it comes to renewables was very difficult. There are units in several departments and agencies dealing with the issue. It seemed to me that dialogue and exchange among them let alone with states or other countries is very restricted. In Germany, moving the responsibility for renewable energies from the department for commerce to the department for the environment helped a great deal to connect the problem (climate change) to a possible solution (renewable energies). Governmental agreements such as made at the energy summit, but also the Integrated Energy and Climate Program passed by the Federal Cabinet in December 2007 help to relate energy policy to climate change policy – which in my opinion is very important to successfully prevent further climate change threats.

Grid extension and siting

As the debate about CapeWind at Horseshoe Shoal as well as many other local or regional debates show, a major question of expanding the use of wind energy is how and where wind sites are set. While the densely populated areas at the East Coast have little space for new installations and a huge need for energy, the lowly populated areas in the Great Plains have wind, space, but only few power lines and consumers. Hence, building wind sites will usually run into acceptance problems or problems when it comes to connecting the wind farms to the grids.

Acceptance problems, most experts I talked to agreed, can be solved at least partly by informing and integrating neighbors as early as possible. This will maybe cost a little more time and money before building, but will mostly ensure a smoother operation later. Sometimes, with offshore wind power, it might be useful to choose sites where views aren't disturbed. However, as the surveys in Delaware show, visible offshore wind farms might even attract additional visitor and thus revenues for the state and/or community.

When talking about these problems, we sometimes touched the question in what way the US individual "pursuit of happiness" obstructed increasing the share of renewables. While some experts agreed that the egoism with which some citizens pursued their individual happiness did not help solving future energy problems, everybody I talked to unanimously agreed that the major problems for renewables were the missing action by the federal government as well as the influence of conventional energy structures.

Education

Nearly everybody I talked to was convinced that more information and education on renewable energy was needed in the US. Considering the general knowledge I encountered outside my interviews, I clearly see the need for awareness raising campaigns. One expert suggested that these might follow the concept of the Alliance's for Climate Protection \$300 million campaign only recently launched.

During my travels I visited one official visitor centre on renewable energy. I was greeted by a very engaged retired engineer who volunteered in dealing with visitors. I watched a film about the institution the visitor centre was connected to, then was shown through the small exhibition that showed mainly technical exhibits on how renewable energy can or could be harvested. Seemingly, the exhibition did not follow a concept. While the institution itself was rather large and employed about 800 people, the visitor centre seemed to be "the black sheep" of the family. The centre had a rather small library that was mainly equipped with sample copies of other institutions' brochures. I could not see a concept of why a brochure was exhibited or why another one was not. The institution presented itself through printouts from its website. I had to wonder if the visitor centre had a budget at all, and if so, how high it was.

Following my interviews I do not believe that an effective campaign for renewables could or would be launched by official bodies in the US. Considering the efforts an NGO took to put together a small brochure on renewables, thinking of the little up-to-date information in the visitor centre described above, and considering the breach to be covered among individuals as well as officials, I doubt that small campaigns will help very much. This is even more the case as in my

interviews the need for awareness raising measures was usually seen in general, but not on the relevant level of my interview partners. I suppose the question what they could do to raise awareness would have mainly remained unanswered.

This leaves the question who could take such an initiative. Seeing the impact of Gore's activities in the US, I suggest to maybe link a renewables campaign to the Alliance's for Climate Protection activities. In my opinion, this would require united action not only by NGOs, but also funding by official bodies.

In Germany, while we have reached a certain general awareness about renewables, we are in the process of establishing more knowledge about and acceptance for different ways to qualify for jobs in the field of renewables. Our educational system makes this more difficult than it would possibly be in the US. However, I believe with the prospects of renewables in the US, and given that a future federal administration might pay more attention to the chances connected to renewables, it is a good idea to start awareness raising and education on the issue now before the US run into problems of not finding people fit to work in the field in the near future. This even more so as today's numbers of graduates knowing at least a little bit about the field are obviously already vastly outnumbered by the number of job openings awaiting them.

Overcoming fossil fuel structures

All experts I talked to saw the need to overcome fossil fuel structures in the US. This includes the dependence on oil, but also the industry and administration structures that are in place and grew over decades. This does not only refer to scandals such as the one involving Halliburton, but to structures as a whole. Williams and Whitcomb describe these structures very well in their book mentioned before³³. For Germany, Gammelin and Hamann describe similar structures, lobbyism, and influencing mechanisms in their book "Die Strippenzieher"³⁴.

These structures are usually rather invisible (except for the scandals), so that some people I talked to believed that it might be easier to use the structures than to spend / waste energy on making the structure visible but not gaining anything from that for climate protection. Hence, one expert was convinced that the most promising way to increase the share of renewables was to bring the industry to the attention of the stock exchange, thus encouraging investments in renewables. In his opinion, using existing structures and setting incentives the finance industry knows from fossil fuel structures might help to "spread the word".

When visiting Wyoming, I saw one wind farm that was built by a big US energy company, which so far only had invested in coal, natural gas, and nuclear energy. The on-site manager told me that the company was building two bigger projects in Texas at the same time. Maybe this is the best way to increase the share of renewables in the US – using existing structures and redirecting investments. However, as one expert told me, some big companies only engage in renewables as a fig leaf in his opinion. I doubt that there will be an easy answer to the challenge of restructuring the energy industry and every other industry connected to it. The debates in some forums about why even John McCain's energy policy is "un-American" because it endangers "the right to cheap gas" speak for themselves.

Conclusion

There is no doubt that the 2008 presidential election in the US is desperately awaited by the majority of the electorate. Most US citizens seem to feel uncomfortable with their current president and his administration. It seems that the way the world looks at the US these days and considers its environmental and climate change policy not worth while of an industrial country the size and importance of the US does not please many US citizens.

³³ Comp. Williams, Wendy and Robert Whitcomb, 2007

³⁴ Gammelin, Cerstin und Götz Hamann: „Die Strippenzieher. Manager, Minister, Medien - Wie Deutschland regiert wird“, Econ, 2005.

I must admit was astonished by how many people in the US actually seemed to be informed about how US climate change policy was seen globally. It seems that Al Gore's movie "An inconvenient truth" is gaining ground, as is the Climate Alliance's campaign.

It will be interesting to see what the next president will actually do for renewable energies, and in what way the fossil fuel lobbies will try to keep him from doing so. Besides, I hope there will also be funding for education and awareness raising, because I strongly believe that even in a country that has as much space as the US you need informed people for a healthy economic growth of a new industry. While the permission procedures for wind farms in Texas, for example, are as short and easy as they most probably were for oil rigs years ago, I fear that the growth of the wind energy industry there is not very sustainable.

I am looking forward to reactions to this report. Acceptance of renewable energy is a field worth dealing with, and I enjoyed having the chance to discuss it with US experts at length. The fact that the International Energy Agency (IEA) only just founded a task "Social Acceptance of Wind Energy"³⁵ speaks for itself.

I was glad to see that so many people in the US actually care about climate change and want to support activities slowing it down. Thank you very much for your time, your insights, and the efforts you took to connect me to even more experts worth while talking to.

The authors

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³⁵ Comp. www.socialacceptance.ch