

Transatlantic Urban Climate Dialogue

Briefing Books

Workshop # 1

Urban Redevelopment in the Ruhr Region and Integrated Local Energy Planning

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Table of Contents

- 1. Overview and Origins of the Transatlantic Urban Climate Dialogue1**
- 2. The Core of Community Energy Planning (CEP) Process.....2**
- 3. The Cases: CEP Results Four regions to Date and Future Challenges.....4**
 - A. Guelph.....4**
 - B. Northern Virginia7**
 - Northern Virginia/Arlington County..... 7
 - Northern Virginia/Loudoun County..... 11
 - C. Stuttgart 14**
 - D. Mannheim..... 16**
 - E. Hamburg 18**
 - F. North Rhine-Westphalia 20**
 - Overview of NRW Policies for:22
 - Energy Efficiency Home and Building Policies, Passive Housing.....22
 - Regional Land-Use, Regional Transportation and Regional Governance Polices, IBA
Emscher Park as a Scale Project..... 23
 - District Energy Systems (Waste-to-Energy and Industrial Heat Recapture)29
 - Renewable Energies, Especially Solar PV.....30
- 4. Background Information for Site Visits 32**
 - Innovation City Bottrop.....32
 - Hydrogen Competence Center H2Herten Ewald.....34
 - Energiepark Mont-Cenis Herne.....36
 - Wissenschaftspark Gelsenkirchen38
 - Zeche Zollverein Essen.....40
- 5. Questions to Facilitate Discussions 42**
- 6. Biographies for elected officials and speakers 42**
- 7. For further Reading 48**

1. Overview and Origins of the Transatlantic Urban Climate Dialogue

The Transatlantic Urban Climate Dialogue (TUCD) was designed to strengthen the transfer and application of sustainable energy and climate practices between metropolitan regions in Germany and North America. The reasons for the exchange of these practices are clear. Between 2010 and 2030, metropolitan areas in both countries will see significant increases in the amount of energy consumed. The OECD estimates that by 2030, cities in the U.S. will consume 87 percent of all energy. In Germany, it is projected that cities will consume nearly 75 percent of all energy by 2030. Germany has set ambitious targets to reduce greenhouse gas emissions by 2020 within the context of the Meseberg Declaration. However, questions linger about the country's ability to attain these goals – particularly within urban areas. Likewise in North America, consumption of conventional fossil fuels and emissions of greenhouse gases in the U.S. and Canada continue to rise, and current sectorial energy and climate paradigms are proving insufficient.

The U.S. and Canada continue to use substantially more energy relative to GDP than other major industrial countries of the world. It is rare to see cities in North America develop and implement actionable energy efficiency and greenhouse gas reduction programs with quantifiable benchmarks and targets. In general, the climate and energy plans of most U.S. states and Canadian provinces are voluntary and lack dedicated resources for the necessary large-scale transformation of the energy supply, building and transportation sectors.

The events of Copenhagen in 2009 confirmed that international progress on climate mitigation has stalled. The recent failure by the U.S. Congress to pass meaningful energy and climate legislation also points to long-term challenges in global and transatlantic climate relations. Despite these challenges, national governments in Germany, Canada and the United States can still cooperate positively and substantially on climate and energy through existing work within and between cities and metropolitan regions. Several metropolitan regions on both continents are working to develop sustainable energy and climate policies that are framed around energy efficiency, heat recovery, renewable energies, efficient energy distribution, and combined transportation and land-use development – a framework that is becoming known as Community Energy Planning (CEP).

The development of community energy plans in German and North American cities offer great potential for applied transatlantic policy learning and knowledge transfer. Historically, little has been done so far to fully explore and utilize this potential. The successful transfer of knowledge is handicapped by a lack of review and analysis of the experiences with community energy planning and implementation in Germany and North America. In particular, efforts to transfer and exchange energy and urban development practices have traditionally lacked problem-focused and goal-oriented contexts. Analysis of energy and other environmental innovations considered for import from abroad has lacked proper background about the national frameworks in which energy

policies have emerged, and comparable details regarding performance. Most critically, any prospective evaluation about what potentially could be usefully transferred and be applied between Germany, the United States and Canada must take into account the extensive political, legal, environmental, and institutional differences between both countries. Serious consideration must also be taken of substantial differences in public opinion related to energy and climate issues.

This lack of analysis and reasoned assessment of what can be adapted between uniquely German and North American contexts is especially pronounced at the metropolitan and municipal level, where the bulk of energy is consumed and where the need for practical solutions is greatest. As a result, international work in general and work to exchange lessons between Germany, the U.S. and Canada is often perceived as irrelevant or sometimes wasteful. As a result valuable initiatives such as the “Transatlantic Climate Bridge” and others, fail to deliver on their full potential.

The TUCD project seeks to strengthen the bi-directional transfer and implementation of community energy planning practices between Germany and North America by initiating a two-year dialogue of policymakers, practitioners, business leaders, academics and technical experts. The goal is to create a long-term exchange and application of best practices that will re-orient local energy and climate policies in North America and Germany, maximize economic development, innovation and social inclusion opportunities. The ultimate success of the proposal will be measured by communities on both sides of the Atlantic making clear and significant changes to their plans that both increase the effectiveness with which energy is used and reduce its impact on the environment.

The explicit purpose of each of the four workshops the project includes will be to highlight the development and performance of German, Canadian and U.S. community energy planning practices within unique thematic contexts (e.g. energy efficient buildings, building retrofits, district energy systems, or regional redevelopment) and to evaluate the transfer of innovative practices between Germany and selected North American metropolitan regions.

2. The Core of Community Energy Planning (CEP) Process

Several metropolitan regions on both continents are working to develop sustainable energy and climate policies that are framed around energy efficiency, heat recovery, renewable energies, efficient energy distribution, and combined transportation and land-use development – a framework that is becoming known as *Community Energy Planning (CEP)*.

CEP is a process to address energy security and environmental challenges. It is often part of a comprehensive energy and climate change management process

Successful community energy planning on both continents incorporates these attributes:

- World-class energy efficiency – especially in Homes and Buildings
- Planning that integrates land-use and efficient, clean transportation

- District Energy Systems that facilitate clean and renewable energy conversion and waste heat recovery
- Multi-fuel flexibility and renewable energies
- Integrated multi-utility approach to energy distribution.
- Large Scale development or redevelopment
- Community engagement informed by quantitative benchmarks and results

The benefit of CEP is that it promotes regional energy security, energy efficiency, renewable energy deployment, and environmental protection. In addition, community energy plans lay the foundation for a “green job” economy by promoting opportunities for sustainable construction and retrofits of homes and buildings, creating new demands for architects, engineers, construction workers, and building managers

Community energy plan implementation and the support for renewable energy and district energy systems lead to investment planning, land use planning, legal and contractual management, marketing, engineering, construction and operation of both combined heat and power (CHP) systems, district energy networks, and large-scale solar photovoltaic systems.

In the European Union, these CEP efforts are packaged as the “Trias Energetica.” The three elements of Trias Energetica are:

1. Reduce the demand for energy by avoiding waste and implementing energy-saving measures
2. Use sustainable sources of energy like wind, solar energy and water
3. Use fossil fuel as efficiently as possible and only if sustainable sources of energy are unavailable.

In California, a version of this classification has been referred to as the “Loading Order.” In Germany, cities such as Freiburg (Vauban), Stuttgart (Scharnhauser Park) Hamburg (Hafen City) and others, have pioneered the development of community energy plans that go beyond the already relatively high performance levels of the country as a whole. These cities applied and extended standards for energy efficiency in homes and buildings (new and existing), incentivized the development of passive or zero-energy homes, enhanced feed-in tariffs for solar, wind and other renewable energies, developed and expanded district energy systems, cogeneration, combined heat and power from multiple fuels, and integrated transportation, spatial and urban land-use planning policies. As a result of these and related efforts, between 1990 and 2007, Germany’s 25 percent energy efficiency gains outpaced economic growth and energy consumption per capita is no higher today than in 1990. During the same time, Germany increased production electricity from renewable sources from less than 3 percent to over 12 percent and has cut total emissions of greenhouse gases by 8 percent below 1990 base-year levels.

In North America, community energy planning also is starting to take hold, although within a less developed national energy and climate policy framework. In 2006, Guelph, Ontario, developed one of the first long-term comprehensive

community energy plans in North America. The plan was informed by German cities such as Mannheim. In 2009, Loudoun County, Virginia, developed one of the first comprehensive community energy plans in the U.S. The plan also was informed by the experiences of Stuttgart. In 2010, the strategy was recognized by the U.S. National Association of Counties as a national model for energy planning. However, the long-term value of these, and similar community plans will be judged by how well they were implemented, not how well they were written.

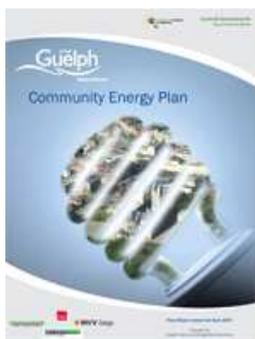
3. The Cases: CEP Results Four regions to Date and Future Challenges

A. Guelph



Guelph is a city of 118,000 people, located in Ontario, Canada, west of Toronto. It has committed itself to use less energy in 25 years than it does today, to consuming less energy per capita than comparable Canadian cities and to producing less greenhouse gas per capita than the current global average.

In order to achieve these goals, Guelph has established a *Community Energy Initiative* that has earned international attention. It is among only a handful of North American cities to undertake an energy management project of this scope. The Community Energy Initiative (formerly Community Energy Plan - CEP) is Guelph's commitment to use and manage energy differently, better, than it has in the past.



Guelph's leaders recognized the growing importance of effective management of energy and water to the economy and environment, and in 2004 formed a Consortium to proactively develop a community energy plan. The Consortium represents all facets of the community including the administration, academia, business, the gas and electric utilities, and other community groups. In 2006, the Consortium decided to formalize a long-term Community Energy Plan (CEP) which would guide the city's energy future for years to come.

In 2007, the Guelph City Council unanimously endorsed the vision, goals and general directions of a 25-year Community Energy Initiative that will put Guelph on the cutting edge for North America. Under the initiative's targets, Guelph could use less energy in 25 years than it does today – even with expected residential growth of 65,000 people – and cut its annual greenhouse emissions by nine tons per person. This will put Guelph among the top energy performers in the world, and make it one of the most competitive and attractive communities in which to invest.

Cross-departmental teams of City staff are working with Guelph Hydro and other partners and stakeholders to implement the directions in the initiative. They will provide regular reports on their progress to Council and partner agencies.

Guelph's population is expected to grow to 180,000, probably within its current boundaries, supported by significant commercial and industrial development. In rough numbers, the growth will add about 20,000 homes and somewhere between 400,000 and 500,000 square meters of non-residential construction, along with significant industrial growth.

Guelph's vision is supported by five goals that focus on the CEP's role in attracting quality investment, in ensuring reliable and affordable energy, in reducing environmental impacts, in enhancing Guelph's competitiveness, and in aligning public investment with the CEP. Each has recommended long-term measurements detailed in the plan. Successful delivery of these goals brings tangible financial and other benefits to residents, local business, the city administration, developers and builders, banks and investors, and the energy suppliers.

Guelph's climate, with over, 4352 heating degree days compared to only 180 cooling degree days, puts a high demand on space heating, and the plan addresses the heating alternatives in some detail. The CEP was developed using the following priorities:

- Maximize the energy and water efficiency for buildings, vehicles and industry
- Maximize use of heat generated in electricity generation and existing industrial processes
- Incorporate as many renewable energy sources as feasible
- Team with the existing electricity and gas networks to avoid wasteful duplication of assets.

Following these priorities, the CEP recommendations are:

- Use efficiency to create at minimum all the energy needed to support the growth of the residential sector

Ontario recently passed stringent new energy efficiency building codes that will be fully in force by 2012. The CEP is recommending that the city explore incentives and other approaches to immediately implement the full code. From 2012 onwards, the CEP is recommending a steady annual improvement in energy efficiency of about 1 percent per year.

- Use efficiency to create all the energy needed to support the growth of the commercial and institutional sectors
- Adopt an energy performance labeling scheme for buildings as a voluntary initiative for the city, teamed with Natural Resources Canada and a local mortgage bank, to act as a pilot for the whole of Canada to gain about 5 percent incremental delivered efficiency
- Add to Guelph's attractiveness for quality industrial investment by offering world class tailored energy services and achieve annual investment growth

rates higher than the underlying population growth, with no overall increase of the primary energy needed to serve the first fifteen years of growth.

- Meet Guelph's growing transport requirements while reducing the transportation energy use by 25 percent, using sensitive urban design, effective alternative transport options, and encouraging vehicle efficiencies.
- Incrementally create energy distribution architecture in Guelph that will allow the majority of the city to be served with fuel choices that optimize cost, availability, and environmental impact long into the future.

The CEP is recommending a stepwise development of district heating networks covering the higher density areas of the city to supply space heating and domestic hot water. These networks also provide an efficient and economic way to distribute heat from a variety of existing and new energy sources.

- Within fifteen years, at least a quarter of Guelph's total energy requirement will be competitively sourced from locally created renewable resources
- Target – At least 30 percent of Guelph's anticipated electricity requirements will be associated with Combined Heat and Power (cogeneration) by 2031.
- Guelph will reduce the magnitude of the summer grid electrical peak by at least 40 percent by 2031 to avoid the need for investment in new electrical infrastructure to serve the growth of the city

The cumulative effect of many of the preceding measures including efficiency, cogeneration, heat recovery and solar PV will moderate and reduce the peak.

- Guelph will systematically create an integrated energy metering, billing and management network across the entire city to allow cost-effective management of all energy forms
- Guelph will implement large area high-efficiency Scale Projects that accelerate progress towards a successful implementation of the CEP by creating early success and developing a deep pool of community expertise

Despite the anticipated growth of the population and increase in economic activity, the overall fuel use required by the city to deliver all its energy service will actually decrease from today's total of 8,475 GWh_e to 6,135 GWh_e in 2031. This represents a decrease of greenhouse gas emissions, currently at an estimated 1 tons per inhabitant, to about 7 tons. This is still some distance from the ambitious goal, but at a level that is clearly putting Guelph among the top energy performers in the world.

Interesting Links:

City of Guelph: <http://guelph.ca/>

Guelph CEP: <http://guelph.ca/living.cfm?smocid=2127>

B. Northern Virginia



In Northern Virginia, the Northern Virginia Regional Commission (NVRC) assists in the development and implementation of community energy planning programs. NVRC has helped develop, structure and facilitate the CEP process for localities such as Loudoun and Arlington Counties, and assists other jurisdictions in Northern Virginia with comprehensive energy planning.

Drawing from global best practices, especially from Germany, NVRC's CEPs are transforming energy planning at the local level. NVRC's work has led to consideration and adoption of policies that will encourage district energy systems, integrated transportation and efficient urban planning. In May 2011 the Northern Virginia Regional Commission approved the development of a Northern Virginia Regional Energy Strategy that will build on the CEPs developed for Arlington County and Loudoun County.

Next to Loudoun County and Arlington County, community energy planning has been kicked off in Fairfax County, Falls Church and in Alexandria, Virginia. Fairfax County set up a Private Sector Energy Task Force in 2011, whose goal is to identify opportunities to develop a transformational vision, supported by achievable strategies that will define the steps the Fairfax community can take to position itself as a leader in the area of energy efficiency, sustainability, and "green" technology. The city of Falls Church has also set up a Task Force that will recommend government and community energy consumption and greenhouse gas reduction targets and strategies, and produce a Community Energy Plan based on science, community priorities, recognized best practices, and available resources. This Community Energy Plan Task Force will work through a consensus building process to conclude its work and report to the City Council by June 30, 2012. Alexandria released an energy and climate action plan in 2011 for the years 2012 to 2020. The plan sets out principles, goals, targets and actions that explain how Alexandria can lead the new green economy, address the challenges of climate change, and continue its high quality of life while decreasing the city's carbon and ecological footprints.

Northern Virginia/Arlington County

Arlington is an urban county of approximately 26 square miles located directly across the Potomac River from Washington DC. The county's proximity to Washington DC, its public transportation network and its highly skilled labor force have attracted an increasingly varied residential and commercial mix. The county's current estimated population is 212,300, and forecasted to grow to

247,600 by 2040. Arlington's economy revolves around the US Government and the related service industries consulting to US Government.

In January 2010, then Arlington County Board Chairman Jay Fissette announced that the County would expand its efforts to reduce greenhouse gas (GHG) emissions by developing an Arlington Community Energy Plan (CEP). Arlington County has successfully reduced GHG emissions from government



operations through the AIRE (Arlington Initiative to Reduce Emissions) program. AIRE set a specific goal of lowering County government GHG emissions 10 percent from 2000 to 2012. The county now seeks to broaden that effort with meaningful community dialogue on cutting-edge GHG emissions reductions programs and energy generation, distribution, storage, and use in

the greater Arlington community.

A Community Energy and Sustainability (CES) Task Force was appointed by the Board on January 1, 2010. The 30-person Task Force comprises community leaders that represent many sectors. Together with input from the community and the Technical Working Group, the Task Force provided the County Board with a Task Force Report in March 2011. The report contains eighteen recommendations and strategies to help everyone in the County effectively manage energy use, distribution, generation, and storage between 2011 and 2050.

Benchmarked against global best practices, the plan has three overarching goals:

- Enhance Arlington's economic competitiveness and provide high-quality jobs
- Ensure reliable and affordable energy supplies
- Demonstrate the county's long-term commitment to reducing its greenhouse gas emissions as outlined through signing the "Cool Counties" Initiative.

Using energy-related greenhouse gas emissions per resident as a surrogate for energy productivity as a whole, a core sustainability goal of Arlington is to cut its per capita emissions to at least 3.0 tons (mt) from the current 13.4 tones over the next 40 years. The county has committed a deeper goal of 2.2 mt/capita if surrounding jurisdictions share in credible, aligned community energy planning. The preliminary recommendations to meet the goal in ways that are economically viable and improve energy supply quality fall into four categories:

- Governance of the CEP implementation
- Specific targets and policies regarding built environment
- Cross-cutting initiatives

The governance recommendations include organizational aspects at the county and local neighborhood level, and regular reporting of results including energy costs, investments and jobs created and environmental performance. In addition, the plan calls for, under crosscutting initiatives, the creation of “high-quality green jobs” to implement the recommendations of the CEP.

The efficiency targets have been established for both existing and new construction and evolve over time. Widespread adoption of efficient new construction and renovation will have a deep transforming effect on the local employment in the buildings sector for a wide range of functions from investment, through construction and operational management.

With homes and buildings consuming 75 percent of all energy, the efficiency and supply of the built environment are the major focus on the Arlington CEP. By energy type, the generation and use of electricity accounts for 64 percent of all the fuel consumed, followed by gasoline and diesel fuel at 21 percent and natural gas at 14 percent.

The Task Force recommends that from 2015, renovated residential buildings should operate at least 30 percent more efficiently on average compared to the 2007 baseline average. Non-residential buildings being renovated should operate at least 50 percent more efficiently than the 2007 baseline average. Moreover, from 2015, all new residential and non-residential buildings should operate at least 30 percent more efficiently than current code expectations. From 2025, ongoing new residential and non-residential building construction should operate 1 percent more efficiently every year through 2050. A further recommendation in the building sector is to emphasize that home and building operations must be effectively managed day-to-day to control energy costs.

The major impact of the use of electricity, mainly through losses in generation, transmission and distribution, strongly influences the Arlington CEP recommendations. Arlington has already recognized the challenge of transportation energy use, and through a decades-long multi-pronged approach including transit-oriented development, has achieved a lower portion of its total emissions than the US average.

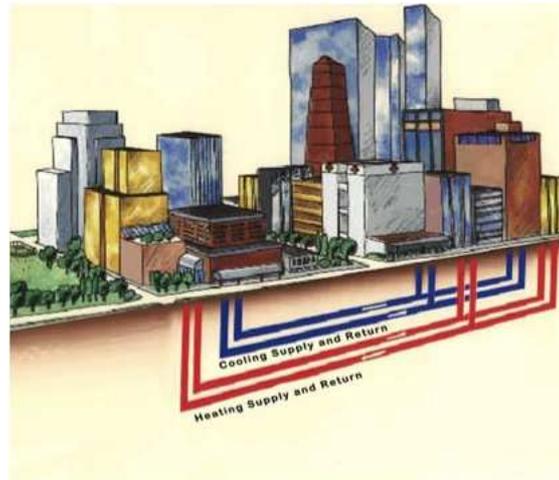
The Arlington CEP has assessed that district energy could be a viable option in much of the county. It is proposed in the Arlington CEP that high-density areas such as Crystal City and the Ballston Rosslyn Corridor have the potential to economically transition towards neighborhood-scale district energy systems starting as early as 2015. Specifically, the CES Task Force is calling for the development of Integrated Energy Master Plans (IEMP) for Crystal City, Columbia Pike, Rosslyn and East Falls Church.

In the case of Crystal City, the first steps are being taken under the leadership of Vornado in cooperation with the County and local utilities. The IEMP Scope of Work for Crystal City was finalized during the preparation of the CES Task Force Report in May 2010. The Task Force selected Crystal City as one of four high-priority potential Energy Scale Projects (ESP). Each ESP is expected to develop an IEMP over the coming months. The final recommendations of the IEMP, provided they are accepted by the Consortium, will be integrated into the overall planning process for Crystal City. One of the goals of the IEMP for Crystal City is that total energy usage should be substantially less than a comparable

development elsewhere in Virginia. The indicative target is that the energy use will be 60 percent less than current practice by 2040, with GHG levels being at least 70 percent less. The Crystal City plan can serve as a framework to create IEMP Scopes of Work for other comparable high-density areas.

The CEP also calls for about 150 MW of distributed cogeneration to both reduce the peak loads on the wider grid, to generate heat for the district energy system and to greatly reduce the GHG footprint. In lower-density neighborhoods, at least 50 percent of all domestic hot water needs and 20 percent of the space heating needs not supplied by district energy should be from clean and renewable sources by 2050.

To both reduce the summer peak, and to further reduce GHG emissions, the plan recommends installing a total of 160 MW of Solar PV capacities by about 2035. Like the widespread increases in efficiency, these strategies have the potential to promote transformational job growth in the district energy, and clean and renewable energy sectors.



The recommendations also called for the introduction of new administration and governance processes designed to sustain the vision. Specifically, the plan recommends that the County Administration create a “County Energy Team,” create and implement an “Energy Implementation Plan,” and ensure that the CEP recommendations are reflected in the County Plan and other county planning processes.

In May 2011 the County Board appointed a group of local energy and business leaders to an Advisory Group. Together, with the input from the community and the Technical Working Group, Advisory Group members will advise the County Manager on the creation of the Community Energy Implementation Work Plan and in finalizing the Community Energy Plan. The Advisory Group began quarterly meeting in June 2011.

After several meetings of the Task Force and the Technical Working Group, in May 2011 the Community Board considered the Task Force's Community Energy Strategy Report as a foundation for the subsequent implementation plan and in May an 18-month Implementation Plan effort was kicked off. The final CEP and Implementation Workplan will be completed by November 2012.

Interesting Links:

Arlington County CEP: <http://www.arlingtonva.us/departments/DES-CEP/CommunityEnergyPlan/CommunityEnergyPlanMain.aspx>

Arlington Environment Information: <http://www.arlingtonva.us/portals/topics/TopicsEnvironment.aspx>

Northern Virginia/Loudoun County

Loudoun County has a population of 312,311 and stretches across an area of 520 square miles. By 2040, local employment in Loudoun County is expected to grow to 305,000 jobs from 140,000 in 2007. Population is expected to grow to 458,000 over the same time. This will require adding 75,000 homes to the current 100,000 and adding 73 million square feet of nonresidential buildings to



the existing 69 million. All electricity for the County is generated outside of the County resulting in about 70 percent conversion and transmission inefficiencies. Loudoun County is home to a number of Data Centers, which continue to be major consumers of electricity, and are constantly seeking new ways to be both more energy efficient and to create lower emissions. Data Centers and the other technology businesses are expected to be a continuing strategic source of investment and employment in the County.

Transportation will remain a challenge for the County, with about 2.3 billion vehicle miles of travel causing congestion of the existing roads at peak traffic times. The 2007 local energy use in Loudoun County was distributed as 34 percent in homes, 38 percent in commercial and public buildings of all types, and about 28 percent in transportation. In total, the County uses 70,753,000 Million Btu of energy of all types.

Recognizing the potential challenges, opportunities of developments in the energy markets, Loudoun County took the lead in developing a comprehensive County Energy Strategy (CES) reaching to 2040 to achieve measurable reductions, using 2007 as the baseline year. In December 2009, the Loudoun County Board of Supervisors adopted the Country Energy Strategy. It represents Loudoun County's goals for the next 30 years and its recommendations are possible approaches for the county to achieve these goals.

Success will be measured in many ways summarized in the five key Goals of the CES:

- Loudoun County will be recognized as a location of choice for investment in part because of its innovative energy strategy.
- Loudoun County will strive to have consistently lower energy costs relative to surrounding areas.
- Loudoun County will have greenhouse gas emissions among the lowest in the country.
- Loudoun County will be recognized as a regional, state, and national role model of effective energy and climate management.
- All major investments will visibly contribute to meeting the CES goals.

The CES addresses three main areas of energy opportunity – homes and buildings, transportation and clean and renewable energy supplies.

The energy needs of the growth in both employment and housing for the County can be provided through efficiency of both new construction and existing

homes and buildings. This will be achieved by:

- Encouraging all new construction to meet Energy Star levels from 2011, or about 30 percent more efficient than current code.



- Encouraging all major retrofits to be at least 25 percent more efficient than the current County average.
- Incrementally increasing these targets every four years by about 4 percent.

To both educate the market and to raise the market transparency of the actual energy performance of homes and buildings, voluntary Energy Performance Labeling (EPL) is recommended. These recommendations result in 7 percent less total energy use in homes and buildings while serving a 70 percent increase in population and more than a 100 percent increase in jobs.

The CES recommends the following efficiency measures for the transportation sector:

- Reduction in outbound commuting through the successful growth of local employment.
- Development of mixed-use neighborhoods to encourage shorter commutes, walking and cycling.
- Development of transit-oriented mixed-use neighborhoods encouraging the use of mass-transit and local walking and cycling or short drives to the two new Metrorail stations.
- Encouragement of smaller vehicle use through urban design and parking strategies.
- While including some impacts from urban redesign and mass transit, the CES recognized that individual vehicles would remain the dominant form of transportation for the entire period to 2040.

These combinations of wider trends and local recommendations result in 18 percent less energy use in transportation, again serving the needs of a 70 percent higher population.

By generating a significant percentage of its electricity and heat locally, the County can greatly reduce the peak demands on the electric grid and the fuel waste inherent in distant electricity generation. The CES is recommending two major clean and renewable energy supply approaches. The first is to implement about 100 Megawatts of natural gas-fired Combined Heat and Power (CHP) by 2040. The use of medium-sized CHP would be encouraged in the following kinds of developments:

- In higher density developments, such as anticipated around the transit hubs, district energy could be used to distribute heating and cooling, avoiding the need for individual chillers and boilers in every home and building. This recommended approach was modeled on two typical projects and showed

good economics for homeowners, building occupants, developers, the district energy service provider and potentially the County.

- In single large developments of about 100,000 square feet or larger. These would include commercial or retail complexes, sport centers, large healthcare facilities, etc.

The second recommendation is to install about 25 Megawatts of solar electricity by 2016, rising to 100 Megawatts by 2040, aimed primarily at reducing the summer cooling peaks, and reducing the need for increased transmission capacity.

In much of the County, property densities are very low and will remain so. A wide and growing market of clean and renewable energy supply options is available, ranging from micro-CHP units to geothermal heating and cooling units. Loudoun County has a strong rural nature, with a substantial supply of agricultural and forestry waste. These have significant potential to be converted to various gas, liquid, or solid biofuels. Depending on the relative costs of energy and the need to further reduce greenhouse gases, about 10 percent of new construction could use biofuels for heating, and up to 20 percent of all natural gas could be substituted with biogas.

The CES lays out a framework of recommendations that touches on many different aspects of the County over the coming decades. Over time, the basic recommendations need to be incorporated in multiple County outreach meetings, planning, and reporting activities.

Loudoun County has already successfully implemented various projects to pursue its climate and energy goals. In March 2011 it completed a project that was financed through the Energy Efficiency & Conservation Block grant (EECBG). 42 LED lights were installed along the Main Road in Purcellville. This not only reduced greenhouse gases, it also reduced energy consumption by 2525 kW/h in the first two months. Another project that was financed through the EECBG was energy improvement retrofits of five county homes. This project created jobs, reduced greenhouse gases and energy consumption. In July 2011, a project was completed that installed 23 kW/h solar panels on the roof of a youth shelter.

In addition to these construction projects, several outreach projects were started in 2011 to increase energy awareness, reduce greenhouse gases and energy consumption and reduce energy costs. Through various projects, the county has achieved 5,200,072 kW/h of energy saving between 2004 and today. Moreover, the county has already succeeded in reducing its greenhouse gases.

Interesting Links:

Loudoun County: <http://www.loudoun.gov/Default.aspx?tabid=163>

CES von Loudoun County: <http://www.loudoun.gov/Default.aspx?tabid=2363>

Energy Star Programm: <http://www.energystar.gov/>

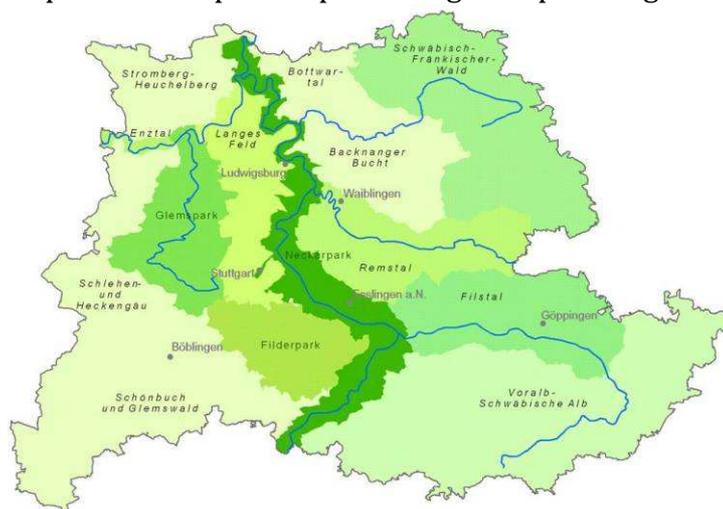
C. Stuttgart



The Stuttgart Region stretches over an area of 3.654 square kilometers and has a population of 2.7 million. The region has a high population density – it makes up 10 Percent of the *Land* Baden-Württemberg, but is home to about 25 Percent of the population of the *Land*. The regional representation of Stuttgart Region is the Verband Region Stuttgart, which was founded in 1994 and covers the region’s central planning policies including, for instance landscape planning and transport planning.

The annual budgets of the Verband Region Stuttgart come mostly from public funds. The Verband Region Stuttgart drew up a Regional Plan in 2009, which was finalized and accepted by the Ministry of Economics in 2010. The plan has a time-horizon of some 15 years. It formulates the goals, basic principles, and suggestions from which the planners at municipal level have to take as their guide. For instance, it contains the areas first in line for new housing or commercial and industrial development, routes and locations for infrastructure, and also the green belts and zones that are to be kept free of development. It calls for CO₂ reductions through energy saving, increases in energy efficiency and the increased use of renewable energy. The common factor running like a thread through all aspects of planning has the aim of developing the Region on a sustainable basis and to ensure it has a secure future.

Landscape planning is an important component part of regional planning. This is where the landscape and ecological specifications of the Regional Plan are prepared in technical terms. The Verband has drawn up an all-embracing concept called the “Greater Stuttgart Landscape Park”, showing where open areas are to be improved, redesigned, and linked up together. Since 2005, the Region has helped every step of the way in realizing the Landscape Park as a network of open spaces, ecologically valuable green areas and small parks combined with towns and landscapes.



The traffic and transport infrastructure is the nervous system of a metropolitan region like Greater Stuttgart. For the first time, the Region now has an integrated traffic and transport concept, which is at the same time coordinated with regional and landscape plans. The regional traffic and transport plan contains long-term strategies for roads, railways, and cycle paths, and a list of priorities for future investments.



The Verband Region Stuttgart is the organizing body behind the local suburban electric railway system and, since October 1999, for all regionally important rail traffic. This means that the Regional Assembly decides on extensions to the regional rail network,

vehicles, special offers and so on. The Verband “buys in” the transport services from the transport companies such as suburban electric services from Deutsche Bahn AG (German Railways). The Verband is working on the extension of the suburban electric railway network, has decided on improvements to the timetable and introduced a regional night-bus service at weekends.

One special large-scale project within Verband Region Stuttgart is Scharnhäuser Park. In 1994, the State of Baden-Württemberg sold to the City of Ostfildern (a town of 35,000 people located on the eastern edge of Stuttgart) 150 hectares (375 acres) of the U.S. 7th Army’s Nelling Barracks. To accommodate Ostfildern’s population growth

(around 2 percent per year), restrict sprawl development, and promote model energy efficiency programs and mixed-use diverse housing, the city coordinated a design competition for a master plan. The master plan proposed 3,500 dwellings of mixed market-priced and affordable apartments, along with 67 hectares of park and open space, 25 hectares for streets, and a light rail system around three distinct “districts.” In addition to the 3,500 units for the 10,000 residents, the plan also called for commercial space of approximately 480,700 square meters to host 1,200 jobs.



The core community energy planning dimensions of Scharnhäuser Park include:

- *Heat Recovery.* The plan included the deployment of a cogeneration unit for burning biomass to produce 1MW of electricity and 6MW of heat through a newly reconstructed district heating and cooling system that extends over 13 kilometers. The existing district heating and cooling system was to be

extended to all buildings of the project. Thermal cooling was provided via a lithium-bromide refrigerating machine, with a cooling capacity of 150kW.

- *Energy Efficient Buildings.* Energy efficiency targets for the planning process included low energy standards of 60kWh/m²a per year (or 25 percent below the 1995 German energy efficiency ordinance) for all buildings. A Youth Center was built that met the German passive housing standard for heat consumption, 32kWh/m²a.
- *Land Use and Transportation.* To reduce vehicle miles travelled, parking spaces were restricted to one per commercial unit. Eighty percent of all residents at the project would be no farther than 500 meters from any light rail station.
- *Renewable Energy.* A solar thermal power plant of approximately 200 square meters and a 70kW solar photovoltaic array were installed. It is estimated that the photovoltaic potential at Scharnhäuser Park could cover up to 40 percent of the electricity requirements for the entire project due to the high number of flat roofs and solar reflection.
- *Performance Measurements of Scharnhäuser Park.* Scharnhäuser Park has seen 30-38 percent efficiencies when compared to the national energy savings standards. In addition, the 6MW biomass plant (with two natural gas boilers of 5MW and 10MW thermal capacity), provide 80 percent of the project's heating and 50 percent of the electrical power. In 2004, 20,000 MWh/year were produced from biomass. By 2006, this increased to 24,000MWh/year of which 81 percent emanated from biomass. Five thousand residents were housed and 1,400 jobs were created via the €150 million invested in public infrastructure (schools, etc.) and €700 million private investment. By far the most important measurement is the fact that Scharnhäuser Park is successful economically, with premium real estate prices, and is seen locally as an attractive place to live, work, and play.

Interesting Link:

Verband Region Stuttgart: <http://www.region-stuttgart.org/vrs/main.jsp?navid=65>

D. Mannheim



Mannheim, a city of 308,000, is located in the Rhine-Neckar metropolitan region. Its recent policy for sustainable regional development includes bridging economic growth along with environmental protection. This necessitates that CO₂ emission levels be reduced in accordance with the Kyoto Protocol. In its climate concept 2020, the city council decided in 2009 to establish a straightforward, sustainable climate protection strategy. It developed a climate action plan that includes 60 different measures concerning energy and transportation that will be implemented by 2020.

The climate concept addresses areas where there is a large potential for energy savings, such as private households, industry and commerce. The goal is to achieve a 40 Percent CO₂ reduction by the year 2020 in comparison to 1990. The first success stories of the climate concept are the establishment of the “Klimaschutzleitstelle”, an agency that is concerned with climate issues within the administration of the city, and the creation of the Climate Agency Mannheim. Since 2009, the program „12 months – 12 climate projects“ has been in place. This campaign introduces a different climate project to the public each month.

And Mannheim has had energy saving policies in place for quite some time before 2009. The city rebuilt and put back into service its existing infrastructure, including a pre-existing district heating system and tramway system in the immediate postwar period. Homes and buildings are efficiently constructed and managed using building performance codes that are regularly updated.

A strategic decision was made in the 1980s to upgrade and extend the district heating system, and it now extends across wide areas of the city. The system serves the majority of both residential and commercial users with heating and domestic hot water. The city and its utility MVV Energie AG announced in 2008 that an additional 20,000 residential and commercial consumers would be added to the system in the next few years. District cooling is being added to serve the downtown business district and selected specific sites, including the new SAP Arena, a large sports venue.

A unique feature of Mannheim’s energy structure is the creation of an industrial enterprise zone on an island in the Rhine River and its surrounding areas. This zone has a tailored energy system that supplies industrial grade steam as a community utility, in addition to supplying district heating, natural gas, and electricity. As a result, investors with specific process steam needs have been attracted to this zone in efforts to avoid significant capital and operating costs.

In Mannheim, the thermal and electric networks facilitate the inclusion of multiple fuel and technology options. The bulk of the heat is sourced from a large-scale coal-fired cogeneration plant located very close to the city. The system is supplemented by natural gas, combustible municipal waste, recycled lumber from building demolition, and some solar sources. A good example of how a flexible multi-utility system such as Mannheim can incorporate new technologies is the way Mannheim is piloting a trial of 200 appliance-sized micro-cogeneration units that fit into individual homes and act as both electricity generators and heat sources. If successful, this could put thousands of electricity and heat generators into the overall community system, owned and operated by the city utility. Grants for micro-cogeneration units of up to 11kW (electrical) are provided from the Climate Protection Funds established by Mannheim’s utility MVV.



Being a predominantly seventeenth century city, the core of Mannheim is essentially designed along “new urbanism” principles, and is naturally oriented more to walking, biking, and mass transit.

The tramway system has been radically updated in the past fifteen years, and is served by frequent air-conditioned light rail infrastructure. This light rail also serves as a convenient alternative to high-speed heavy rail or cars. In parallel with upgrading mass transit, the city has discouraged car use in the downtown through conveniently located central parking near mass transit, along with designating large areas of the city that are off limits to cars.

The city utility, MVV Energie AG, is itself an example of community integration unfamiliar to the U.S. Energy services—electricity, gas, district heating, and district cooling—along with water and sewer, are run by a single municipal entity. Taking advantage of market liberalization laws, in the late 1980s, this entity has emerged from being a municipal department for energy and water supply to becoming a separate legal entity fully-owned by the City of Mannheim. In 1999, it was one of the first German regional and municipal utilities to be partially privatized and converted into a private corporation—MVV Energie AG. A majority of the stock (50.1 percent) is still owned by the city, while other utilities and free-float investors hold minority participations via the stock exchange.



Interesting Links:

City of Mannheim: <http://www.mannheim.de/en>

MVV Energy: <http://www.mvv-energie.de/cms/konzernportal/en/homepage.jsp>

E. Hamburg



Hamburg has a population of approximately 1.78 million or 4.3 million in the entire Hamburg metropolitan region. Hamburg is a city on the water, located by the river Alster, the river Elbe and other channels and canals. It is an impressively green city in comparison to most cities similar in size, with over 16.7 percent of the urban area consisting of forest, recreation and green spaces. The European Commission awarded Hamburg the title of “European Green Capital 2011” in Brussels, February 23, 2009. With Stockholm as European Green Capital 2010 and Hamburg 2011, the two cities were the first to ever receive an acclaimed award recognizing the two most environmentally friendly cities in

Europe.

In 2007, the Hamburg Senate (Hamburg’s governing body) developed a comprehensive climate protection program that has developed more and more projects. The city aims to reduce its carbon dioxide emissions by 40 percent in 2020 and 80 percent by 2050 – all based on 1990 levels. The climate protection

plan of the year 2010 features more than 450 projects covering virtually all areas of environmental policy.

The Hamburg-based Energy Agency (Hamea) is currently developing climate strategy model projects for households. The agency aims to strengthen a network of actors targeting support for climate protection measures in civil society. The energy company, founded in 2009, places Hamburg on the path to a sustainable energy future.

The renewable energy sector is an important aspect in Hamburg's climate policy efforts. Hamburg aims to massively expand renewable energies, offering over 600 companies in Hamburg in the industry the opportunity to enhance their competition through close networking and exchange.

In the transportation sector, Hamburg aims to advance its sustainable urban mobility – including the port, where containers are transported via automated “container taxis” between port terminals, which eliminates the use of trucks. Hamburg's entire city is easily accessible through the use of public transport. Studies reveal that the number of passengers has increased exponentially over the last five years. The city will continue the expansion of the public transportation system. A new light rail system will be available by 2014. Furthermore, environmentally friendly bicycle traffic is in focus: the establishment of city bike stations and overall expansion of the cycling network are two examples of more to come.

Hamburg's HafenCity is currently Europe's largest inner-city development project. It is a blueprint for European city-center development at the water's edge. HafenCity covers an area of 157 hectares. Based on a new concept for urban living, it will increase the size of Hamburg City by 40 percent. Between the historic Speicherstadt warehouse district and the River Elbe a new city with a cosmopolitan mix of homes, service businesses, culture, leisure, tourism and commerce is emerging.



Structures typical of a port will be retained. Around 27 ha of public parks, squares and promenades will be developed. HafenCity Hamburg GmbH, a 100 percent subsidiary of the Free and Hanseatic City of Hamburg, manages the development of the project. The time frame for development of the entire area extends to circa 2025. HafenCity is already rated as the model project for international waterfront development.

HafenCity will be a sustainable city. For instance, the former port and industrial areas will be decontaminated and restored. The city structure will be characterized by a fine-grained mix of uses. There will be short distances and the area can already be accessed by Metrobus, bicycle or by foot. There is a significant amount of foot and cycle paths by the waterfront and in addition

there will be a subway connection by fall 2012.

The energy needs will be met by district heating, solar energy and fuel cells. For new buildings there has been sustainable construction since 2007. The goal is that at least 30 percent of the buildings in central and eastern HafenCity fulfill standards required for the Gold HafenCity Ecolabel. This Ecolabel is awarded for sustainable construction.

Thanks to its sustainable infrastructure and building stock, HafenCity will make an important contribution to meeting climate protection targets in Hamburg both in the medium and long term. Hamburg's selection as "European Green Capital 2011" can also be attributed to systematic sustainable development in HafenCity.

Interesting Links:

City of Hamburg: <http://english.hamburg.de/>

HafenCity Hamburg: <http://www.hafencity.com/en/home.html>

F. North Rhine-Westphalia



North Rhine-Westphalia (NRW) is an industrial state that has a population of 18 million. It is located in the western part of Germany, at the center of Europe. NRW is the largest energy *Land* of the Federal Republic of Germany. It provides 94 percent of Germany's hard coal and 54 percent of its lignite coal. NRW's electricity consumption amounts to about a third of the entire German consumption and it generates 28 percent of Germany's electricity.

Since the dominant energy source is coal, the emissions of greenhouse gases are high. 2010 estimates show that NRW emitted a total 313.6 million tons of CO₂ equivalent – about a third of the entire German greenhouse gas emissions. This, however, constitutes a 9 percent reduction compared to 1990 emission levels in NRW. At a per capita level, 16.3 tons of CO₂ equivalent were emitted in NRW in 2006.



This gives the *Land* an important responsibility in achieving the federal government's and the European climate policy goals. The goal of the government in NRW is to make NRW a model for climate protection. In June 2011, it decided to reduce greenhouse gas emissions in North Rhine-Westphalia to at least 25 percent below 1990 levels by 2020 and to at least 80 percent below 1990 levels by 2050. In 1990, NRW's greenhouse gas emissions totaled 361.6 million tons of CO₂ equivalent – an 80 percent reduction would mean that by 2050 NRW's greenhouse gas emissions would be at 72.32 million tons of CO₂ equivalent per year – or lower. Taking into account population developments as calculated by the Federal Statistical Office, this would mean greenhouse gas emissions of about

4.7 tons of CO₂ equivalent by 2050. The government introduced climate legislation in June 2011 that will make these CO₂ mitigation goals binding.

Once the climate legislation is adopted, a climate action plan will be developed. It will contain specific measures that will enable NRW to reach its goals. At the latest in mid-2012 this climate action plan will come into force. But the government will initiate its first climate protection measures much earlier – at this time, it is working on an immediate program. Energy savings, increasing energy efficiency and strengthening renewable energy will be key policy tools in achieving the climate protection goals. Adaptation will also be an important component of the climate policy of North Rhine-Westphalia.

The NRW government has already introduced a 12-point-plan for renewable energy. It contains goals for the support of renewable energy production until 2020. One of these goals is that the renewable energy sector achieve a € 15 bn. business volume by 2020 and employ 40,000 workers.

The coalition government of NRW, consisting of the Social Democratic Party and the Green Party, has also specified ambitious climate and energy policy goals in its coalition agreement from 2010. The contract states, for instance:

“A sustainable land-use plan will set the following goals among other goals of the regional planning:

Climate policy is an aspect that should already be recognized on the planning level. All land-use plans should make sure that climate compatibility and energy efficiency strategies can be applied in the best possible way. This applies, for instance, to energy production, settlement planning and transportation planning.“

“The electricity production in North Rhine Westphalia should be converted in order to guarantee an increasing percentage of renewable energy in the energy mix. Renewable energy should be preferred over other energy sources.“

“The regional land-use plan should designate preferred areas for the use of wind energy. These areas should comprise 2 percent of the space available in NRW. Individual regional plans should be adapted accordingly.“

“In order to improve the degree of utilization of energy and for climate protection and environmental reasons the possibilities of combined heat and power and the use of industrial waste heat recovery should be exploited.“ NRW has several supporting instruments in place that will help achieve its climate goals. It has laws and framework conditions in place, has a program of subsidies to encourage energy efficiency and the use of renewable energy and it benefits from research in sustainability from the Wuppertal Institute. In 1990, the EnergyAgency.NRW was founded. It is charged with the task of developing training and education programs, with the organization of networks, cluster development and it offers consultancy in energy issues free of charge. The agency partners with many companies, institutions, universities and research facilities with the goal of forming a sustainable energy policy for NRW.

Interesting Links:

NRW Ministry for Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection:

http://www.umwelt.nrw.de/ministerium/info_english/index.php

EnergyAgency.NRW:

<http://www.energieagentur.nrw.de/infopool/page.asp?InfoID=4639>

Overview of NRW Policies for:

Energy Efficiency Home and Building Policies, Passive Housing

One of the goals in the 12-point-plan for renewable energy of the government is that 20 percent of the heating energy in new buildings should come from renewable energy. Another goal is that 20 percent of the renovations of buildings should include the conversion of heating and warm water supply with systems relying of renewable energy.

The federal level and the *Land* NRW both promote energy saving measures in residential buildings. The following measures are supported:

- Energy saving new developments (low-energy houses and passive houses)
- Heat insulation for existing buildings
- Energy saving heating and water heating
- Renewable energy: solar energy, biomass and
- Heat recovery
- Electricity production including feed in tariffs for renewable energy and energy from combined heat and power

The NRW department for climate protection, environment, agriculture, nature conservancy and consumer protection has concentrated its subsidies in the area of energy policy in NRW in the program “**progress.NRW**”. Part of this program is a guideline for the support of rational energy use, of renewable energy and energy savings. This guideline includes financial incentives for district heating and local heating. **Progress.NRW** aims at accelerating the speed by which already available technology that is based on renewable energy sources and rational energy use are introduced on the market. This rapid market introduction will be a significant part of protecting the climate and reducing CO₂ emissions. The aim is to apply the existing renewable energy and energy saving systems in a balanced way.

The program **progres.NRW** contains a broad amount of incentives and guidelines for the efficient use of energy and the application of renewable energy in NRW. It is, therefore, an important funding instrument for businesses, consumers and communities. About a third of all energy use in Germany comes from space heating and hot water generation in buildings. That is why energy efficient construction of new buildings and the retrofitting of existing buildings in order to make them energy efficient are important parts of climate policy.

Progress.NRW subsidizes the construction and acquisition of passive houses

with an amount of up to € 3,500. It also offers financial incentives for the construction and acquisition of so-called 3-liter-houses in solar buildings. These houses have a primary energy use equivalent to 3 liters of heating oil per square meter and year. The incentives reach up to € 2,800

Addressing the opportunities of retrofitting of already existing buildings, housing agencies of the cities and municipalities in NRW grant investors low-interest loans for heat insulation, for the replacement of old windows and for the modernization of heaters. In addition, heating systems are targeted by **progress.NRW**, which offers financial support for investments in the area of energy saving heating systems. The installation of solar panels, for instance, is subsidized with up to € 300 per square meter of the panels. The conversion to from old heating systems to heat pumps with combined heating and water-heating functions is subsidized with 26 percent of the expenditures. The program further incentivizes the construction of energy recovery ventilators that bring fresh filtered air and pull heat for reuse from outgoing air. A final aspect of retrofitting activities that make buildings more sustainable is the application of renewable energy. **Progress.NRW** supports public facilities that install solar PV systems with € 500 per Kilowatt Peak. The installation of hydropower facilities is subsidized as well. Investors receive up to € 1,000 per kW.

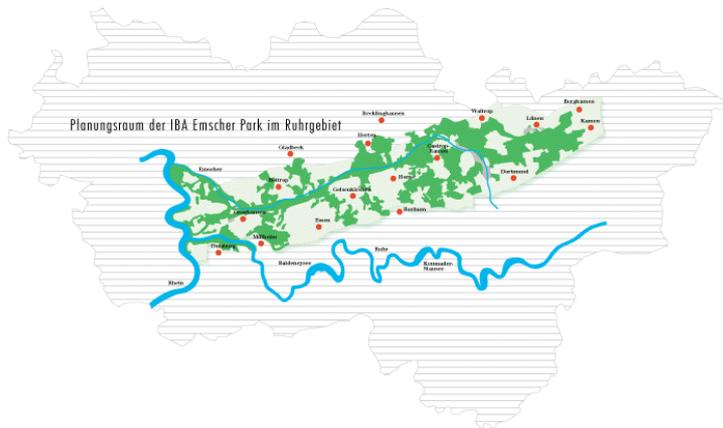
In order to create incentives for district and local heating, the *Land* offers financial support of up to € 1,500 or 20 percent of the expenditures. With this financial aid, NRW promotes the installation of transmission stations and private connections in buildings in order to connect them to district and local heating.

Regional Land-Use, Regional Transportation and Regional Governance Polices, IBA Emscher Park as a Scale Project

Part of regional land-use planning in NRW is comprehensive regional redevelopment.

NRW has a long industrial legacy. Containing urban sprawl and promoting livable urban spaces has been a top policy priority for over two decades. On average, 15 hectares of open space have been converted to housing settlements or traffic zones every day in the past decades. That is why the government has declared it a paramount political task to find effective mechanisms to limit land consumption. Municipalities play a very important role in this task because they are in charge of land-use planning.

IBA Emscher Park – a Scale Project



Since the turn of the 19th century, international buildings exhibitions (IBA) have been planned. Their goal was always to translate societal reform proposals into contemporary architecture. Inspired by the IBA Berlin, NRW chose ecological and economic renewal of the Ruhr as its main topic. In 1989 the IBA Emscher Park was founded as a future-oriented project of the *Land* North Rhine-Westphalia for the period of ten years. Its task was to the urban and ecological renewal of the northern Ruhr, which comprises 800 square kilometers. The idea was to spruce up the former “backyard of the Ruhr”.

In this process of structural change that was initiated through the IBA, the IBA cooperated with many partners, including local governments, businesses, trade unions, social initiatives and the citizens. Seventeen communities from the Emscher region became part of the IBA.

The Emscher region is the industrial heartland of Europe. During the ten years of the IBA, about 120 projects in six central working areas were developed and realized. About two thirds of the DM 4 Billion (ca. € 2.05) that were invested were public subsidies. The IBA included park area planning for 300 km². Some 350 km of sewage courses were rearranged. The result of the IBA was 17 technology centers, 3000 new apartments and 3000 existing apartments were renovated.

Funding for the project came from existing aid programs of the *Land* North Rhine-Westphalia, combined with structural development aid from national government and the European Community. Projects received financial support from a total of 56 state aid programs. These included the established programs for urban renewal, business and housing aid, as well as funds for training schemes, the Emscher-Lippe ecology program and the action plan for coalfields.

Guiding Themes of the IBA:

The Green Framework: The Emscher Landscape-Park

From the air the Emscher region has a lot to offer in the way of green areas. But, at the beginning of the IBA, anyone trying to find beauty spots on foot or by bicycle soon came across features typical of The Ruhr: industrial sites, sewers, roads and railway lines. For a long term strategy to change this situation, within

the framework of the IBA Emscher Park, the 17 Emscher towns from Duisburg to Bergkamen and the Kommunalverband Ruhrgebiet worked on a joint project: the Emscher landscape Park, which is an area of 300 sq. km within which regenerated and protected green areas have been connected in a chain structure.

This large project makes a historical link with the Tradition of the "regional green corridors". The individual north-south corridors of the region were expanded and linked to a new east-west corridor in order to form a complete park system of European significance. The creation of this landscaped park provided the main unifying theme of the Emscher Park Building Exhibition, the central core of a new infrastructure for the region. The



idea was to achieve lasting improvement in the living and working environment of more than 2 million regional inhabitants by connecting isolated open spaces, restoring the landscape and upgrading the ecological and aesthetic quality of the countryside. Projects in the Emscher Landscape Park range from large-area development of fallow land to the smallest "construction sites", installations of biotopes or the planting of trees - in total about 200 individual schemes.

Regeneration of the Emscher River System

For decades the river Emscher, which flows for 70 kilometers from east to west through the northern part of the Ruhrgebiet known as the Emscher region, had the unenviable reputation of being the open sewer of the region. But in future this river and its many tributaries will be seen as a symbol of the ecological regeneration of an industrial region. The Emscher System - about 550 km of waterways - became an open sewer around the turn of the century, when the population grew by hundreds of thousands in a matter of a few years and industry started generating increasingly large quantities of effluent. A specially created co-operative organization, "Emschergenossenschaft", of local authorities, mining and industrial companies in the region, was responsible for straightening the rivers, lining them with a concrete shell, enclosing them with dykes and creating artificial gradients.

The use of Underground pipes, as is customary in other urban areas, was not possible because of the danger of subsidence and resulting pipe fractures. At the time this was a considerable engineering feat and ensured to this day that sewage could be cleaned at relatively low cost. However, nowadays ecological measures are preferable. New opportunities arise because coal-mining operations have slowed down and the risk of subsidence has decreased. Sewerage is confined to Underground ducts and treatment has been decentralized. The concrete linings are no longer needed. Animals and plants have gained new habitats. The Emscher and its tributaries are increasingly important - as designing structures in a free landscape and as recreation and leisure areas for the towns' inhabitants. Today, the Emscher river and its

sustainable use and incorporation into regional-planning is further developed through the master plan "Emscher Future" (Emscher Zukunft). The Emscher basin serves as attractive local recreation site.

Working in the Park

For many decades, mines and iron and steel mills formed the cores of the towns. When they were shut down and disappeared, they left empty spaces in the town centers. New and different workplaces have been created on these sites. Within the scope of the IBA Emscher Park, 22 locations, totaling approximately 550 hectares, of modern commerce, service and science parks, under the motto "working in the park", have been created. These projects, implemented as public and private investment joint ventures, have a large proportion of open and green space in common, and high ecological and architectural standards. Located in park settings they are accessible to everyone. "Working in the park" projects are concerned exclusively with former industrial sites, each with their own development plan related to the particular sector involved. This is reflected in the detailed design of sites close to town centers. Special focus was placed on urban development and landscaping quality and, as far as possible, schemes for training and employing the long-term unemployed were integrated within these projects.

A Chain of Technology Centers

The sites were supported by special provisions for the formation and promotion of innovative industries and new businesses. Start-up centers were established and initially run using public funds. Their task was to attract advanced companies and thereby support new technology transfer to the region. One of the major projects within the IBA Emscher Park was the establishment of the Science Center (Wissenschaftspark) Gelsenkirchen, venue of the first workshop of the Transatlantic Urban Climate Dialogue project. The location used to be a steel mill and has been converted into a venue for conferences, fares, seminars and events that focus, among other things, on the future of energy.

Industrial Monuments

More than 150 years of industrialization left their mark on the region: gigantic mines, blast furnaces and winding towers, impressive relicts of a former era. Today, the buildings are architectural witnesses, explaining the history of the region. They can be seen from far away and serve as orientation points for people. To demolish them would mean depriving the region of important landmarks. The aim of IBA Emscher Park was to preserve these monumental witnesses of industrial culture. Historical pithead buildings are now being reused for housing, workplaces and leisure activities. Old halls are being filled with new life: art, culture, commerce or offices. An old tapping hall has been turned into a gigantic stage, mining halls have been turned into renowned galleries. The goal was to stimulate the cultural potential of the



region. Today, the Ruhr is one of the densest European cultural landscapes. Additionally it offers a unique backdrop of 200 years industrial history. Developing the region for tourism has been one of the most important tasks in the past years. Solutions for dealing with examples of an industrial past alternate between letting them crumble" and "preserving them". There have also been technological and economic challenges. Twentieth century industrial monuments, in particular, pose new preservation problems in relation to their sheer size and specific steel and iron aesthetics. Economic subsidies and maintenance costs for large plants are difficult to calculate. A selection process is unavoidable, in order to choose "typical" plants, those most meaningful for industrial history.

Housing Construction and Urban Development

The idyll of village life in the middle of the Ruhr: the many garden estates, the traditional workers housing of the region, are increasingly prized as homes and quality environments when compared with the many urban development failures of recent decades. Fortunately most of the housing areas could be saved. The participation of residents was at the heart of their reconstruction.

Some 25 housing projects within the International Building Exhibition Emscher Park played a central role in urban development, in recycling vacant sites, supplying new ideas for urban planners and architects, and developing residential and commercial parks in central locations. Altogether there are today approximately 2,500 new and 3,000 refurbished housing units. About 75 percent of new construction has been publicly funded. Special features of the new units were higher ecological, social, urban development and design standards. Modern, attractive architecture and more space for children were important goals. The involvement of national and international architects and planners in the various competitions and implementations stages was an important factor in ensuring that abstract ideas of quality were actually translated into on-site reality. Projects considered needs of single parents, the handicapped, senior citizens and children. Families with small incomes were also considered. They helped build their own homes in a "Build simply and by yourself" construction program. Their labor input was a form of "mortgage replacement" which helped them to save money.

The Emscher Park also left and created room for a very typical German institution: The so-called *Schrebergärten* (allotment gardens). These days, the allotment gardens mainly serve as places of leisure while in the past some families depended on the crops they grew in their own *Schrebergärten*. At the heart of every garden is the arbor with a maximum size of 24 sq. meters. In the past there were strict rules for the length of the lawn and the height of the hedges. The gardens often included the so-called *Gartenzwerge* (lawn gnomes). These days the rules are more relaxed, especially in the case of new initiatives and associations which draw young families.

Social Initiatives, Employment and Training

Developmental changes taking place, from Duisburg to Dortmund, required joint efforts within the region. Many Ruhr residents were working on IBA projects. They helped to establish new housing areas, develop ideas for the use of old buildings, they offered their knowledge of mining history and the iron and steel

mills, or they actively worked on co-designing their greenbelt recreation areas. These people were bearing the main load of regional development. Some of these initiatives have developed into employment and training bodies, which have been particularly influential in bringing young long-term unemployed citizens back into working life. These young people were employed on many IBA projects: refurbishing old mining halls, constructing bicycle paths or designing parks. Integrating the unemployed and developing new fields of work was the aim in all sectors of the IBA.

At the end of 1996 the region was called to "take the initiative". The goal was to support small, privately organized, city neighborhood projects where energy and commitment had been initially generated by the citizens themselves – regardless of their social, cultural or ecological field of activity. Such projects were also initiators for structural change. They made substantial contributions to improving infrastructure possibilities, local community activity networking and recycling of unused space and buildings. Often they also helped knit together construction investment and programs with training and re-employment schemes. A total of 16 such projects were included in the IBA Emscher Park. The support of initiatives took a concrete form: convincing concepts were financially supported by North Rhine-Westphalia.

For further large-scale projects in the *Land*, see the background information on sites, such as Mont Cenis and InnovationCity Bottrop below.

Regional Transportation

Having an attractive public transportation system is an important and environmentally friendly aspect of the transportation system in North Rhine-Westphalia. NRW belongs to the top countries in the European transportation market. Public transport has more than 2.1 billion customers each year in local rail-traffic and achieves 100 billion train-kilometers annually. The system consists of some 100 lines and more than 1,500 railcars. The S-Bahn (urban rail) covers 650 kilometers with its lines. Since 1996 the amount of trains on the timetable has been increased by more than 30 percent. There remain, however, areas where the train service urgently needs to be expanded, such as the Dortmund and Köln areas.

The region between the Rhine River and the River Ruhr is the largest European urban agglomeration. It needs a high-capacity quick public railway system for regional public transportation. The latest infrastructural project in this regard is the Rhein-Ruhr-Express (RRX). It will be the backbone of regional public transportation in North Rhine-Westphalia. The RRX has the capacity to transport more than 30,000 additional customers on a daily basis from all parts of the *Land* to the Rhein-Ruhr axis. This project is mainly subsidized by the federal government.

Public transportation includes not only rail traffic. It also takes place in the streets. Buses offer great advantages as shuttles to the central axes and for short distance trips outside of the urban agglomerations. Alternative forms of transport, such as on-call shared taxi services, on-call buses etc. can guarantee the mobility of people outside of these city centers. NRW therefore subsidizes public transportation and especially rail transportation with up to € 1.5 billion annually.

Interesting Link:

IBA Emscher Park: http://www.iba-emscherpark.de/pageID_2507086.html

Typically Ruhr Region: Allotment Gardens:

<http://www.metropol Ruhr.de/en/start/ruhr-metropolis/typically-ruhr-region.html>

District Energy Systems (Waste-to-Energy and Industrial Heat Recapture)

Combined heat and power is very important for the energy and heat supply in NRW and for its climate protection goals. The importance of this technology is recorded in the coalition agreement of the coalition government.

It states:

„Combined heat and power is the cheapest, most simple and most environmentally friendly means of integrating heat from renewable sources into urban energy supply structures in the medium run. It is a very versatile technology that ranges from micro-cogeneration to decentralized block heating stations to the use of district and community heating. The considerable development of decentralized, efficient and climate friendly combined heat and power will play a major role in achieving the climate protection goals.”

NRW is characterized by a special potential for combined heat and power (CHP). Especially in the densely populated agglomerations along the Rhine River and the Ruhr River, industrial buildings, residential buildings and office buildings are located right next to each other. This facilitates the transportation of heat to consumers.

One of the goals of the 12-point-plan for renewable energy of the government is, therefore, to equip public buildings with combined heat and power technology whereas 20 percent of the coverage should come from renewable energy.

According to the federal government, 25 percent of the electricity in Germany should be produced in CHP plants by 2020. NRW supports this goal and aims at doubling the percentage of electricity produced from CHP in the *Land* until 2020. In order to achieve this, CHP technologies will be further developed, district and community heating systems will be expanded and financial and investment mechanisms will be developed. Apart from financial incentives through the federal CHP Act, the subsidies in NRW will be expanded.

The *Land* already incentivizes the conversion of single and multi family houses to block heating stations that are based on CHP. For instance, the energy supplier Vaillant is planning on building 1000 block heating stations a year. Investors can apply for low interest loans with the NRWBank in order to switch to CHP-based block heating stations. In addition, the NRW Emscher Lippe Energie company subsidizes the construction of a heating system that runs



on natural gas condensing boiler

technology in all new construction with up to € 300. It subsidizes the construction of micro CHP plants or a gas-fired heat pump with up to € 600.

Another important aspect of the renewable energy strategy of the NRW government is biomass. In its 12-point-plan, the government has set the goal to mobilize additional biomass within its biomass strategy. This biomass could be generated for instance, from forestry or waste and could be used for the production of biofuels.

Solar PV, wind and hydro energy can only be used for electricity. Solar thermal energy and geothermal energy are mostly used for heating. The government therefore expects that biomass, which can be used for both heat and electricity generation, will play a pivotal role in the future as a renewable energy source that could replace the fossil fuels natural gas and crude oil. The energetic efficiency of electricity and fuel production from biomass is currently low in comparison to its use for heating. In addition, it produces high CO₂ abatement costs. However, for electricity production, biomass has the advantage that it is storable and suited for base load. Biomass has a high energetic potential and can already be used in many different areas in an economical way. Biomass is suited for all forms of energetic transformation (electricity and heat production, for instance in CHP plants, transformation into biogas that can be used for electricity and heat generation and transformation into fuels, for instance biodiesel).

The *progress.NRW* program offers incentives for the application of biomass in biogas plants for heating and CHP. It pays up to 15 percent of the expenses of such an investment.

Renewable Energies, Especially Solar PV

North Rhine-Westphalia has achieved its first climate policy success with a combination of energy savings and the application of solar energy in the project "50 Solar Housing Energy Estates in NRW". The aim of the project was, on the one hand, to greatly reduce energy requirements through appropriate solar construction methods and, on the other hand, to cover the remaining energy needs with solar energy for the most part. The ministries in NRW coordinated their subsidy programs for this project.

The campaign placed specific requirements on the construction of solar energy housing estates:

- Heat energy consumption: max. 15 kWh/m²a (passive house standard) or max. 35 kWh/m²a
- Production of hot water: The solar energy contribution is to be at least 60 percent of the energy requirements.
- The production of electricity by photovoltaics: At least 1 kWp per housing unit.

At least two of the three requirements had to be fulfilled in order to obtain the status of a "Solar energy housing estate". The holistic concept of the solar energy estates included not only energetic aspects. Social and ecological aspects were also taken into account. Today, 37 estates including approximately 3700 apartments have been completed. An additional 14 projects are currently being

constructed. With its 51 projects, NRW is at the European forefront regarding solar estates.

The goals of the NRW energy and climate strategy will now also be achieved in the new project “100 Climate Estates in NRW”. With this project, the goal will be pursued to further mitigate CO₂ emissions from heating. All technologies that are suited for CO₂ reductions will be applied in these estates. The major focus of this project is the abatement of greenhouse gas emissions. But the climate estates will not only be characterized by an innovative energy concept, but also by special urban development and social features.



The aim is to make environmentally friendly construction part of sustainable urban settlement development. For new buildings, there will be an integrated architectural concept, for instance through the use of uniform materials and colors. Moreover, playgrounds, leisure spaces and land for rainwater management will be part of a free and green spaces concept. Public transportation will be easily accessible from the new estates, as will be infrastructure facilities. Another aim of the project is to save space and therefore save resources in the construction of the buildings. The *progress.NRW* program subsidizes this project as a multiplier project that sets a positive example in climate policy.

Apart from solar energy, another important energy source in the climate strategy of the NRW government is wind energy. NRW is an excellent location for wind energy. The government has set the goal that the percentage of wind energy in the energy mix should increase from 3 percent today to 15 percent by the year 2020. In July 2011 the government issued a new executive order for the planning and approval of wind energy facilities (“Windenergieerlass”). This new order decreases barriers in planning new wind energy turbines.



Wind energy is already an important motor of innovation for the NRW economy. Some 2,800 wind energy plants produce almost 40 percent of the renewable electricity in NRW. The sector has 26,000 employees in Germany and it makes more than € 8 billion a year.

A central aspect of wind energy policy in NRW is „Repowering“. This means that old plants are replaced with new, more efficient plants. This will make it possible to significantly increase the electricity produced from wind energy. The new wind order will make Repowering possible by eliminating

restrictions on the height of the wind energy plants. According to the latest technology and know-how, the plants need to have a size of 150 meters – previously most plants were at most 100 meters high.

Interesting Links:

100 Climate Protection Housing Estates in NRW: <http://www.100-klimaschutzsiedlungen.de/page.asp?TopCatID=12248&RubrikID=12248>

50 Solar Energy Housing Estates in NRW:
<http://www.energieagentur.nrw.de/solarsiedlungen/page.asp?TopCatID=6197&RubrikID=6197>

4. Background Information for Site Visits

Innovation City Bottrop

The city of Bottrop won a contest initiated by the *Initiativkreis* Ruhr. It now officially holds the title „Innovation City Ruhr“. The city and the *Initiativkreis* developed a project for the time period of ten years. Through the project, a target area in the city will become a model for other cities through the application of innovative technology and projects. Key emphasis is the increase of energy efficiency and the application of new energy sources to reduce CO₂ emissions.

The target region for the InnovationCity includes several districts of Bottrop. Among them is the city center and districts in the Southern part of the city. A total of 67,000 people live in these areas.



The unique model city for climate protection in the Ruhr will be an international model and a showcase. In the medium and long-term perspective, the entire Ruhr will, according to the NRW government, become a low-energy use area. The first goal is to reduce energy consumption and CO₂ emissions. This will be accomplished through the use of innovative products and practices in all areas of every day life. This includes housing, leisure, commerce, services, industry and business as well as transportation.

The agency in charge of the model project is the *Initiativkreis* Ruhr, an association of 60 enterprises from the Ruhr. The *Land* North Rhine-Westphalia supports the project. The EU will likely provide additional financial support. The *Initiativkreis* expects that financial support and investments of some billion Euros will flow into the *InnovationCity* projects over then next ten years.

The model project *InnovationCity* Ruhr comprises four areas of action:

1. Energy efficiency and energy saving:

The energy use trough heating and electricity will be reduced significantly. The remaining necessary energy use will be utilized in a beneficial way. The idea is to achieve this through heat insulation of buildings, through the conversion to energy saving heating systems and the application of energy saving appliances. One of the first *InnovationCity* projects that touches upon energy efficiency and

energy saving is the *STEAG Fernwärme Förderprogramm*, a district heating project. In this project 100 homes are receiving grants of up to € 2,000 to encourage switching to the district heating system. NRW is supporting this project with a total of € 246,500. Another project is called „Intelligentes Zuhause“ (intelligent home). This project is supported by the local energy provider Emscher Lippe Energie GmbH. It aims at bringing more efficiency to electricity use and heating through the application of digital controls. With the support of such digital controls and software, appliances in buildings will only be operating when they are really needed. Fifty households are participating in this project.

2. Energy production that conserve the climate:

The application of renewable energy will be increased. At the same time, the use of finite energy sources, such as coal, oil and natural gas will be strongly reduced. In general, it will be an important goal to achieve a high degree of efficiency in energy production. This will be achieved through the production of electricity from wind, through electricity and heat generation from solar energy and biomass, and through the use of geothermal energy. Moreover, process heat, that so far has only been a waste product, will be used as well as cogeneration.

3. Mobility that is environment-friendly

The people and goods travel will be reduced. Traffic needs to be handled as environmentally friendly as possible. This can be achieved by making important destinations more easily accessible. This concept is called „Stadt der kurzen Wege“ (city of short distances). Moreover, it can be achieved through an increased application of vehicles with electronic, hydrogen or hybrid engines, through the improvement of public transportation, the support of pedestrian and bicycle traffic, mobility counseling and new logistical concepts.

4. Sustainable City Development

Despite all of these actions, not all of the effects of climate change can be avoided. City development must therefore be adapted to the consequences of climate change. This means, for instance, the protection from the negative consequences of heavy rains or periods of extreme heat. This can be achieved through flood detention, the leaching of rainwater as a measure of flood protection, securing and developing open spaces as fresh air aisles and the greening of the city.

These measures that have been planned for the *InnovationCity* will not only benefit the environment, but also the people and local businesses. The cost of energy will decrease and the modernizations of buildings result in value appreciations for buildings and apartments. The quality of life will improve and there will be better protection from the impacts of climate change.

The economy in Bottrop will benefit from a higher volume of orders and competitive advantages through low energy prices and innovative products, access to new markets and the positive marketing effects of the *InnovationCity*.

Bottrop will attract national and international attention through the project. The city will become more attractive as a business location and residential location and it will attract highly skilled workforce. There will likely be follow-up investments in different sectors.

Interesting Link:

Innovation City Bottrop: <http://www.bottrop.de/en/index.php>

Hydrogen Competence Center H2Herten Ewald

The Ruhr h2 Network is a registered association, which has set itself the task of promoting hydrogen and fuel cell technology in the Ruhr region. The network is an amalgamation of municipalities and other public institutions, companies, associations and natural persons. It presents the business-based and public activities of the hydrogen and fuel cell technology sector located in the region to a national and international public. Furthermore, the association is committed to obtaining broad support for these activities from industry and state institutions and publicizes this technology in public, particularly at educational institutions. The association pursues the aim of expanding the framework conditions for the area of expertise of hydrogen and fuel cell technology in the Ruhr metropolis and establishing the region as a key location in Europe for this sector of the economy. The intention of the association is to contribute to accelerating the market launch of hydrogen technologies and fuel cell applications taking into account the production of low-CO₂ and CO₂-neutral green hydrogen. The scientific, economic and political preconditions for these processes are to be promoted and optimized.



"Hydrogen infrastructure" designates all of the necessary components serving the purposes of the production and distribution of hydrogen. Hydrogen is produced on the one hand in the Ruhr hydrogen region by means of natural gas steam reformers (black hydrogen). On the other "carbon-neutral" hand, so-called green hydrogen is produced through the use of regenerative electricity in combination with electrolysis using wind generated electricity, the gasification of biomass, the reformation of biogases and hydrogen production by means of algae.

One of the largest reformer plants in Europe is located at Marl Chemical Park. Plants in which green hydrogen is produced are to be found in Bottrop (waste water treatment plant of the Emschergerossenschaft Lippeverband) and are currently being erected in Herten (electrolysis using wind generated electricity at the "H2 Herten User Centre" and Staged Reformation in the Blue Tower). The distribution of hydrogen is guaranteed throughout the Ruhr area. Hydrogen is supplied to large customers by means of a branched pipeline network which branches off from the northern edge of the Ruhr metropolis over a total length of 230 km. The supply of smaller end consumers is carried out by various methods. For example, at the Marl Chemical Park there is a hydrogen filling station for high-pressure cartridges which is the only one of its kind in the world and with which the majority of the regional vehicles are fuelled. Hydrogen filling stations can now be found in the region in Bottrop, Gladbeck and Herten.

"Steam reformation" is currently the most efficient and thus most economical method of producing hydrogen. This method is used for around 90 percent of

world production. In steam reformation hydrogen is produced in large plants from mixtures of fossil hydrocarbons, mainly natural gas. During the use of fossil energy carriers for the production of hydrogen, the same quantity of carbon dioxide is produced as during the combustion of fossil fuels. It is therefore not possible to achieve CO₂ reductions with this method. For this reason CO₂-neutral, green hydrogen is the future. The Ruhr metropolis has several pilot plants in which this green hydrogen production is demonstrated.

The Ruhr metropolis also benefits from a high density of research institutes at its educational centre. Research groups are working in the field of fuel cell and hydrogen technology at the university locations of Bochum, Dortmund, Essen and Duisburg, as well as the three universities of applied science in Dortmund, Bochum and Gelsenkirchen. These research capacities are complemented by the activities of internationally renowned research facilities such as the Fraunhofer, Leibniz or Max Planck institutes. In addition to basic research, this dense network also covers all associated topics from hydrogen distribution to developments of practical applications.

The Ruhr metropolis is continuously developing into an international center for hydrogen and fuel cell technology. Besides the research facilities, it is the numerous business activities in the region in particular which are rapidly accelerating technological process. The spectrum ranges from large international suppliers of industrial gases to innovative start-ups which are engaged in this sector. These market hydrogen technologies from development to sales: a value-added chain, which, in the long run, will ensure that hydrogen, develops into a technology suitable for end consumers. The sector-related location advantages, consisting of good infrastructure, ideal framework conditions for science and research, the existing corporate landscape and the ideal geographical location at the heart of Europe, make the Ruhr metropolis the ideal location for companies working in hydrogen and fuel cell technology. As a result, renowned national and international companies have moved to this region in the past few years.

In the Ruhr metropolis there are numerous hydrogen and fuel cell projects currently being planned and implemented, some of which are already directly linked to the daily lives of the people living between the rivers Rhine and Ruhr. The main points of focus in the region are: Green hydrogen, mobile applications – the region is testing fuel cell powered fleets of buses, light trucks and load-carrying bicycles – and stationary applications using hydrogen and fuel cell systems, for instance in heating technology and in combined heat and power plants. Further starting points for fuel cell systems are projects for the storage and generation of renewable energy. Hydrogen is used for storing surplus production in order to compensate for subsequent supply bottlenecks. Besides the recovery of energy in fuel cells, hydrogen is also used as a fuel in gas motor combined heat and power units.



A unique feature of the new "H₂ Herten User Centre" is its ability to perform electrolysis using wind generated electricity for its own decentralized power

supply. Electrolysis is used to generate hydrogen with the electricity produced by wind energy from the neighboring Hoppenbruch slag heap. With this green hydrogen the energy produced from the wind, is stored. If the wind is blowing only gently across the slag heap, the hydrogen is converted back into electricity by means of a hybrid fuel cell/combustion engine system.

Another means of producing green hydrogen is through digester gas. Digester gas, a by-product created in the process of wastewater treatment, is a source of renewable energy and thus ideal for the sustainable and CO₂-neutral production of green hydrogen. Wastewater treatment plants can therefore provide an important contribution to the development of the hydrogen infrastructure and in future ensure the urgently required decentralized provision of green hydrogen. Part of the digester gas from the wastewater treatment plant is treated until it reaches the quality of natural gas, and then converted to hydrogen in a further step. The natural biogas is used for fuelling natural gas vehicles and the hydrogen for the generation of electricity and heat for a nearby school centre.

This creates a completely decentralized hydrogen infrastructure from the starting material wastewater sludge to the end consumer. The hydrogen produced at the wastewater treatment plant is passed via a separate pipeline to a school centre. There, the schools are supplied with heat by a hydrogen combined heat and power unit. The electricity that is generated is fed into the grid of the utility company (ELE).

Interesting Link:

The Ruhr H2 Network: <http://www.h2-netzwerk-ruhr.de/Home.15.0.html?&L=1>

Energiepark Mont-Cenis Herne

The *Energiepark* (“energy park”) is an example of both land-use and integrated urban planning action. With the closure of the “Mont Cenis” pit in 1978, the district of Sodingen in Herne, with a population of 171,000, lost its functional and urban centre. The demolition of the pit facility created 25 ha of fallow land. At the end of the 1980s, the NRW Ministry of the Interior decided to establish a second further education academy in Herne. This provided the starting point for the “Mont-Cenis” project, which was initiated in 1990 as part of the international architectural exhibition “IBA Emscher Park”.

The overall goals of the project were to:

- Revitalize a pit wasteland via economic and ecological renewal
- Create of a new centre for the district
- Promote local restructuring via projects with superregional impact
- Apply and promote modern energy technologies

The measures that were implemented to achieve these goals:

- „Building-in-a-glass house“ concept (microclimatic envelope)
- Construction of the NRW State Ministry of the Interior’s higher education academy

- Integration of public amenities: district town hall, citizens' hall, library, catering
- Roof-integrated photovoltaic system to generate power and provide sun-protection
- Pit gas utilization via engine-based co-generator
- Battery tank with 1,2 MWh storage capacity as a buffer for regenerative electricity produced

A 1991 competition resulted in an urban development design which included a 172 x 172 m and 15 m high wood and glass solitaire. The structure is connected to the district via a broad stairway arrangement flanked by retail shops. A district park, a densely populated residential area and a nursery school complete the development project. The „Development Company Mont-Cenis“ realized the entire project, starting in 1994.



The higher education buildings, several municipal facilities and a public urban space are grouped within the outside glass house. The glass shell, which is supported by roughly planed spruce timber and timber framing jambs and girders, creates a weather-sheltered space with a mild climate, the so-called “micro-climatic envelope”. This meant that all the buildings situated underneath the roof could be constructed as simple steel or wood frame structures. The front area accommodates the buildings of a citizens' centre featuring a district town hall, a library and an assembly hall. These uses, in particular, link the new building to the district. There are also catering establishments, a casino and the academy's hotel, conference and administration buildings. The entire interior space is provided with natural light.

Integrated in the roof is the solar power station, a 10.000 m² photovoltaic facility, which simultaneously serves as a sunscreen. Approximately 550.000 kWh of the system's total output of 750.000 kWh can be fed into the grid. The rest covers the energy park's own demand.

The Herne department of works has built a pit gas engine-based co-generator and a battery tank on the adjoining plot. The engine-based co-generator uses the energy of the pit gas escaping from the mineshafts to generate electricity and short-distance district heating for the academy and residential buildings. The battery tank with an energy content of 1,2 MWh facilitates the buffering of solar electricity and its supply to the grid at times of high consumption. The facility has been in operation very profitably since 1997.

The generous, weather-sheltered urban space created under the microclimatic envelope furnishes the district with a new centre by providing for public uses and re-interpreting the site of the old centre of local life. In doing so, the project successfully integrated a large-scale photovoltaic system which, in combination with a battery tank, brings ecological as well as economical advantages.

Interesting Link:

Energy Park Mont Cenis: <http://www.werkstatt-stadt.de/en/projects/30/>

Wissenschaftspark Gelsenkirchen

Science Park Gelsenkirchen is located in the centre of The Ruhr, State of North Rhine-Westphalia – Europe's leading energy region in Gelsenkirchen, a town of 224,000. The conceptual and physical architecture of the park represents a change of direction and has the potential to attract young and innovative industries. The discovery and exploitation of rich coal resources in the 19th century had been the foundation for the growth of The Ruhr - an industrial region with a population of today five million people. In further developing its traditional energy competence, the Ruhr has become an international leader in research, development, production and dissemination of new and renewable energy technologies. Science Park Gelsenkirchen is both a symbol and a catalyst of this development.



A symbol because of its spectacular architecture and the use of latest energy technologies: The 210 kW solar power plant on the roof of the technology centre was the largest of its type at the time built in 1995. A catalyst because of the manifold activities carried out here to support the transition to clean energies. Science Park Gelsenkirchen has become a major venue for energy-

related events like conferences and trade fairs.

Owner of the technology centre in Science Park Gelsenkirchen was the "Wissenschaftspark und Technologiezentrum Rhein-Elbe Vermögensgesellschaft mbH", founded in 1991. The capital expenditure for the technology centre is about DM 75 mil. (ca. € 38 mil.). In 2002, the "Science Park Gelsenkirchen GmbH" emerged from the old owning corporation. 51 percent of the "Science Park Gelsenkirchen GmbH" are owned by the town of Gelsenkirchen, 24.5 percent of the corporate shares each are possessions of "LEG NRW" and "GEW mbH".

Science Park Gelsenkirchen's Project Group on New and Renewable Energies seeks to foster the growth of the clean energy sector with a broad range of activities and services, such as energy events, consultancy on energy technologies or capacity building. Science Park Gelsenkirchen is the point of entry for international visitors and expert delegations exploring the competencies of the energy region Ruhr. The



International Visitor Centre RuhrEnergy offers first hand information on companies, institutions and projects through its website, permanent exhibition and guided tours in the region.

The operating company of The Science Park – Wissenschaftspark Gelsenkirchen GmbH – is engaged in this process through its Project Group on Future Energies. Services offered range from conference organization, consultancy to marketing support for companies of the clean energy sector.

Science Park Gelsenkirchen has received the German Architecture Prize and the MIPIM-award for being one of the best European business centers (both in 1995). The long glass demarcate (300m) of the Science Park connects altogether nine three-storey gazebos, each at a size of about 270qm; an area, which is interdisciplinary assigned to technology- and service-oriented businesses. The technology-centre in the Science Park decrees at the time over 8,000qm of rentable office- and labor-space.

For events and presentations there are an additional 3,500qm including the glass demarcate. The Institute for Work and Technology, being a part of the Science-Centre North Rhine-Westphalia, occupies another 2,200qm office-space. Additionally under the management of the "Wissenschaftspark Betriebsgesellschaft" is the neighboring small business incubator with about 1,700qm. As a location traditionally being part of the power industry, the Science Park developed into a centre for future energies. Congresses, exhibitions, seminars and presentations of future energies take place regularly. Further occupants of the Science Park are service providers for the established development and research organizations.

Having one of the biggest solar power plants on its roof, the Science Park demonstrates that production of solar power is possible without having great room losses, and therefore is an expedient choice for our lines of latitude as well. For the construction of the solar plant in 1995, the European Union, the federal state of North Rhine-Westphalia and the RWE Energy AG invested about 6 mil. DM (€ ca. 3.1. mil). Theoretically, the imposing solar plant could cover the energy requirements of 40 four-person households per year and it is going to save about 4,500 tons of CO² during its lifetime. During the construction phase of the solar plant, regional companies were given priority, to protect local jobs in the future energies branch.

The Science Park developed into a platform for future energies in 1996, when the, at the time, largest existing on-roof solar power plant was launched. It was a pioneer project, which attracted longtime international attention. During the EXPO 2000, the Science Park Gelsenkirchen attracted attention as part of the "Solardreieck Emscher Park": Together with the next-door solar cell manufactory Shell AG/Pilkington in Gelsenkirchen-Rotthausen and Mont-Cenis, where the world-largest solar plant integrated into a roof is located, the visitor can get a inimitably topical overview over the actual state of photovoltaics in research, production and appliance.

With the goal of promoting the establishment of new industries in the center of the Ruhr Valley, the Science and Technology Park Gelsenkirchen offers innovative companies ideal working conditions and a suitable stimulating environment. The concept is based on four columns:

- Energy technologies - following up the tradition of glass and power industry in Gelsenkirchen, the Science Park was precociously strengthened as an internationally acknowledged research centre for solar technology
- Services - growth and development in the service branch (e.g. in senior businesses and management consultancy) in the Science Park are specifically supported by several projects and initiatives
- Information and communication technologies - from software development to call-center, all departments of these modern basic technologies for knowledge-based branches are represented in the Science Park

Interesting Link:

Science Park Gelsenkirchen: <http://www.wipage.de/en/>

Zeche Zollverein Essen

The Zollverein World Heritage Site – also known as “the world’s most beautiful coal mine” – is located in the north of the city of Essen. It is the most famous industrial monument and centre of the creative industry in the Ruhr area. Zollverein used to be a "forbidden city" to which only the workforce had access. Today it offers residents and visitors alike a rich spectrum of leisure activities. Young or old, whether you're looking for peace and quiet, relaxation or fun and games, there is something for everyone here on the 100-hectare site.

The Zollverein’s activities began when in 1847 the first shaft was sunk, and in 1986 the last coal was brought to the surface. In 1993 the coking plant was closed down, and in 2000 the buildings and equipment were officially listed. In 2001 Zollverein was inscribed into the list of UNESCO World Heritage Sites. In 1998 the not-for-profit foundation Zollverein was founded by the city of Essen and the *Bundesland* North Rhine-Westphalia. The goals of the foundation are the conservation of the world heritage and the support of culture and the development of the Zollverein as an international cultural and economic location. Since 2009, the foundation Zollverein owns parts of the former coalmine.

The watchword for the Zollverein today is: preservation through new usage. Zollverein offers a huge range of attractions. History, culture, creativity, events, gastronomy, leisure activities - all this presents Zollverein its around one million visitors per year.



Four of the five old shaft sites have been preserved along with the underground equipment, the central coking plant, the spoil tips, the transport sites and the colliers’ housing estates. In short the "Zollverein industrial mining complex“ is a perfect example of the coalmining and coal processing industry in the 19th and 20th century. Zollverein is the only mining site in the world where the complex processes involved in this branch of industry can be

seen and clearly understood. For this reason Zollverein is the symbol of industrial heritage in the Ruhr Area, the region in Germany most deeply affected by the social, economic, aesthetic and industrial upheavals during the age of coal and steel.

While still running, Zollverein was not simply the largest coalmining in the area, it was generally known as the "the most beautiful colliery in the world". Its design was architecturally rooted in the style of "Neue Sachlichkeit" (lit: new objectivity): strong symmetrical and geometric lines, individual cubic buildings in a correspondingly strict arrangement on the site. In this respect the site was a perfect reflection of the representational requirements of its owner, the United Steelworks Inc., Europe's largest coal and steel concern.

Zollverein eventually fell victim to the crisis in the coal and steel industries. Despite all the rationalization measures introduced to reduce costs, the largest colliery in the Ruhr Area was unable to compete with coalmines abroad. On the 23rd December 1986 the last shift was hauled to the surface after 135 years of mining operations. The last remaining colliery in Essen had closed forever. The coking plant followed on the 30th June 1993 and this raised the question what would happen next. In many places disused industrial sites had been forced to give way to other uses like trading estates or housing. Ruhrkohle Inc., the owner of Zollverein since 1969, applied for a demolition order. But efforts to preserve the site with its outstanding architecture, and economic and social significance in economic and social history for the whole region proved stronger. In December 1986 Zollverein was put under an official protection order by a ministerial decree from Düsseldorf, and listed as a monument in the city of Essen.

The idea was to preserve it by finding new opportunities in utilization. As early as 1987 ideas were put forward to use Zollverein as a cultural site and preserve it as a catalyst for structural transformation. The various halls were redeveloped to conform to listed monument standards, and new tenants moved in. Most of these were artists and other creative persons. More and more visitors were attracted to artistic events in the once "forbidden city", and to follow the "monument path" on foot. The coking plant was also thrown open to the general public for the first time in 1999, when it played host to an exhibition entitled "Sun, Moon and Stars", the final presentation of the Emscher Park International Building Exhibition (IBA).

The structural changes at Zollverein were sealed when the site was inscribed into the UNESCO World Cultural Heritage list in 2001. In order to qualify for the list, a monument not only has to be unique and authentic; it also has to be integrated into public life in a sensible manner. The master plan put forward by Rem Koolhaas in 2001/2002 is the logical consequence of this philosophy. The redevelopment of the halls in the outside areas has proceeded apace and the site is continuing to look for new users. The Coal Washing Plant, the largest surface building at Zollverein, was comprehensively redeveloped between 2003 and 2006 and is now a museum. The facade and the machines were overhauled and restored, and the building was equipped with modern technology and facilities.

The first new building on the World Cultural Heritage site for 50 years was opened in 2006. The Zollverein School is an architectural masterpiece designed by the Japanese architectural office SANAA. The grey cubic building is

simultaneously stately, light and airy. It contains 134 windows that seem to have been arranged at random, and provide visitors with interesting views of the site. The new "design city" at Shaft site 1/2/8 continues to grow. "design city N°1" offers offices and ateliers for people who are setting up their own business. This will be followed by "design city N°2". The Zollverein Park is taking shape as a recreational area for local residents and visitors to the World Cultural Heritage site alike. The old spoil tips, now greened over, provide a habitat for rare flora and fauna.

Around 1000 jobs have now been created at Zollverein, and it has become the creative centre of the Ruhr Area. Every year 7000 visitors pour into Zollverein to view the largest industrial monument in the region. And the number continues to grow. Zollverein has mastered the process of structural change. It is simultaneously aware of its historic industrial roots and its responsibility for the future.

Interesting Link:

Zeche Zollverein: http://www.zollverein.de/english/index.php?f_categoryId=3

5. Questions to Facilitate Discussions

What are common implementation obstacles vis-à-vis community energy planning?

What legal challenges are there for community energy planning?

What kind of financial mechanisms might be available?

What is the motor for the CEP policies?

How can the policies' performance be evaluated?

6. Biographies for elected officials and speakers

Angela Freimuth is a member of the *Landtag*, the state parliament of North Rhine-Westphalia. She holds a law degree and started working as a lawyer focusing on commercial law and fiscal law in 1998.

In 1987 she joined the FDP (the Liberals) and the „Junge Liberale“, a youth arm of the party. In 1994 Mrs. Freimuth became a member of the executive board of the NRW FDP. Since 2002 she has been the deputy chair of the NRW FDP executive board. In 1998 she became the chair of the regional chapter of the FDP in Westfalen-West. In 2003 Angelika Freimuth became a member of the federal board of the FDP. She is a member of the state and federal committee for domestic and legal affairs and of the federal committee for international affairs.

Since 2000, Mrs. Freimuth has been the spokesperson for budget and finance matters of the FDP parliamentary group in NRW and the spokesperson for the subcommittee on human resources. Since 2005 she has been the vice president of the *Landtag* and the president of the German-American parliamentary group. She is a member of the committee on culture and was spokesperson between 2005 and 2010. Since 2010 Freimuth has been a member of the committee for women, equality and emancipation. Moreover, she is a deputy committee

member of the economics committee and the committee for innovation, research and science.

Angelika Freimuth volunteered at the youth welfare committee („Jugendhilfeausschuss“) Lüdenscheid between 1989 and 1994. Between 1999 and 2002 she volunteered with the school board Lüdenscheid and since 2005, Freimuth has been a member of the policy advisory board Märkischer Kreis. In 2004, Mrs. Freimuth was the deputy chair of the board of trustees of the Wolfgang-Döring Stiftung. Angelika Freimuth is also active in other groups, such as the German child protection agency („Kinderschutzbund“).

Mr. Peter Garforth runs a specialist consultancy based in Toledo, Ohio, and Brussels, Belgium. He advises major U.S. and Canadian companies, communities, colleges and universities, property developers, and policymakers on developing competitive approaches that reduce the economic and environmental impact of energy use. He has held senior management roles around the world at Honeywell, Landis & Gyr (now Siemens) and, most recently, was Vice President of Strategy for Owens Corning, the largest U.S. manufacturer of insulation and other materials. Mr. Garforth has long been interested in energy productivity as a profitable business opportunity and has a considerable track record establishing successful businesses and programs in the U.S., Western and Eastern Europe, Indonesia, India, Brazil, and elsewhere. He was the co chairperson of the International Advisory Committee of the Alliance to Save Energy in Washington, D.C., a founding member of the European Business Council for a Sustainable Energy Future, a member of the Steering Committee on Energy Efficiency Financing of the Russian Federation, and Chairman of the International Institute for Energy Conservation. He is also past President of the Board of Trustees of Toledo Opera and Vice Chairman of Downtown Toledo Inc, a non-profit organization dedicated to the revitalization of Toledo's city center.

Andreas Gries

Network Manager Energy-efficient and Solar Building at EnergyAgency.NRW
Project Manager: “50 Solar Energy Housing Estates in NRW” and
“100 Climate Protection Estates in NRW”

Education

1986-1992: Technical University Braunschweig
Study of Mechanical Engineering, Dipl.-Ing., Specialization: Energy
Technology

Profession:

1992-1997: RWTÜV, Technical inspection organization
Expert on ventilation and air conditioning technology

1997-2006: NRW State Initiative on Future Energies
Project Manager Building and Housing

- 2007-2008: Energy Agency NRW
Project Manager Building and Housing
- since 2009: Cluster EnergyRegion.NRW
Network Manager Energy-efficient and Solar Building

Staatssekretär Dr. Günther Horzetzky

Has been under-secretary of state since July 16th, 2010 in the Department for Economics, Energy, Construction, Housing and Transportation of the *Land* North Rhine Westphalia.

Higher Education

1972-1976: Agricultural Sciences, Rheinischen Friedrich-Wilhelms-Universität in Bonn; Graduation 1976: Dipl.-Ing.agr.;

PhD Award 1979: Dr. agr.

Professional Life

1976-1979: Researcher, Department for Economic Sociology (Prof. Dr. Herbert Kötter), Agricultural Faculty of the Rheinische Friedrich-Wilhelms-Universität in Bonn

1980-1982: Head of Office for the Chair of the Trade Union Gardening, Agriculture and Forestry (GGLF) which was a member of the Confederation of German Trade Unions (DGB) in Kassel

1983-1988: Department head of the Headquarters of the GGLF and Secretary of the Board of Directors

1989: Deputy Chair of the GGLF

1989-1991: Head of the Parliamentary Liaison Office of the Federal Board of Directors of the DGB in Bonn

1991-2000: Secretary of the Federal Board of Directors of the DGB, Chair of the Düsseldorf Chapter

2001-2002: Abstractor for Social Affairs, German Embassy Washington, DC USA

November 2002- January 2006: Head of Division 3 (Social Affairs, Education, Research, Environment, Transportation, Consumer Protection, Agriculture) of the Chancellery, Berlin

2006-2008: Head of Division 1 (Policy Principles) of the Department of Labour and Social Affairs (BMAS), Berlin/Bonn

October 2008-November 2009: State Secretary, Department of Labour and Social Affairs (BMAS)

Rob Kerr is the Community Energy Plan Manager for the City of Guelph. Rob holds a bachelor's degree in physics and environmental studies and has over 25 years of experience working in field of energy management, with a unique mix of

private sector experience and a strong background in public service. Rob's career has evolved in parallel to a rapidly changing energy landscape- from straightforward energy conservation activities to leading edge approaches to energy, climate change and community sustainability. In addition to working for recognizable energy management providers such as Honeywell Ltd, Rob worked for energy-service subsidiaries of Toronto Hydro and Hydro Quebec. He has worked in energy related program delivery for both the provincial and federal governments. The majority of Rob's career has focused on local governments and community sustainability initiatives- whether it's as a service to clients from his private sector positions, as the Energy Management Coordinator for the City of Mississauga, or the Director of the Canadian office for the International Council for Local Environmental Initiatives. Rob has provided policy and program support to the Ontario and federal governments and has officially represented local government interests to international bodies such as the United Nations Framework Convention on Climate Change and its annual climate conferences starting in Kyoto in 1997. In April 2010, Rob joined the City of Guelph as the Community Energy Plan (CEP) Program Manager. Rob will represent the City of Guelph as a cornerstone partner in a community-wide effort to implement Guelph's CEP. Rob will play a key role in educating the public and keeping stakeholders informed of the goals, progress and successes of the plan.

Thomas Kiwitt

Chief Technology Officer, Verband Region Stuttgart (Regional planning commission)

Thomas Kiwitt is head of the department of regional planning in one of Germany's most densely populated and prosperous regions.

He leads the implementation of Stuttgart Regions spatial strategy for mitigation and adaptation, which comprises the enforcement of mandatory guidelines for spatial development, consultancy and support services for local authorities and research activities.

Since recently he coordinates a pilot project to improve sustainable transportation in the Stuttgart Region.

Within the European Network of Metropolitan Areas and Regions (METREX) he is a member of the working groups for major infrastructure and urban-rural cooperation.

He is a member of the German academy for spatial research and planning's study group for regional planning and the Baden-Württemberg committee.

He is a lecturer and member of the advisory board at the masters program for city planning at the University of Applied Sciences in Stuttgart.

Thomas Kiwitt holds "Dipl.-Ing." degree for spatial and environmental planning from the University of Kaiserslautern, Germany.

Prior to working for Stuttgart Region, he has worked for cities and regions in Germany as well as for the metropolitan administration of Jakarta, Indonesia.

Dr. Dale Medearis is a senior environmental planner for the Northern Virginia Regional Commission. He recently returned from an 8-month sabbatical at the Free University of Berlin's Environmental Policy Research Center to research and write about the transfer of local energy and climate policies from German cities to the U.S. He leads the NVRC's regional climate and energy programs and manages NVRC's international environmental partnerships through the European Network of Metropolitan Areas and Regions (METREX). Prior to working for NVRC, Medearis spent 20 years at the Office of International Affairs, U.S. Environmental Protection Agency, Washington, as the program manager for Western Europe and urban environmental programs. He was the Vice-chair of the OECD Territorial Development Committee and Chairman of the OECD Working Group on Urban Affairs. Medearis has been awarded fellowships to study urban and environmental planning in Europe from the German Academic Exchange Council, the FU Berlin, the Alexander Von Humboldt Foundation, the Fulbright Commission, the European Union, and the American Council on Germany. He has a Ph.D. in environmental design and planning from Virginia Tech University, an M.S. in Cartographic and Geographic Science from George Mason University, an MGA in Government from the University of Pennsylvania, and a BA in International Relations from the University of Redlands.

Prof. Dr. Miranda Schreurs is the director of the Environmental Policy Research Centre and Professor of Comparative Politics at the Freie Universität Berlin. Prior to this she was Associate Professor in the Department of Government and Politics, University of Maryland. Schreurs' work focuses on comparative environmental politics and policy in Europe, the US, and East Asia. She was born and raised in the United States and has also lived for extended periods in Japan and Germany and briefly in the Netherlands. Her PhD is from the University of Michigan and her MA and BA from the University of Washington. She has also spent time researching or teaching at Harvard University, Utrecht University, the Freie Universität Berlin, Keio University, Chuo University, and Rikkyo University and has held fellowships from the SSRC-MacArthur Foundation Program on International Peace and Security Affairs, the Fulbright Foundation, and the National Science Foundation/Japan Society for the Promotion of Science.

In July 2008 Miranda Schreurs was appointed to the German Advisory Council on the Environment.

Her key research areas are: Environmental governance, climate change policy and politics, energy policy, German, EU, US and East Asian environmental policy.

Dipl. Ing. Michael Schwarze-Rodrian, Director Location Ruhr & Investor's Service, Business Development Agency, Metropol Ruhr GmbH, Mülheim an der Ruhr, Germany

Member of German Academy of Urban Development and Spatial Planning (DASL)

Key Areas of Expertise:

Urban Landscapes

Sustainable strategies and integrated urban development

International exchange of experience

Michael Schwarze-Rodrian was born 1955 in Berlin and studied Landscape Planning at the Technical University Berlin in 1970s. After five years scientific work he came to the Ruhr in mid 1980s. In the 1990s he moderated the Emscher Landscape Park (ELP) in co-operation with the International Building Exhibition (IBA) Emscher Park. From 2001 to 2006 he worked at the state owned Projekt Ruhr GmbH and was responsible for the "*Masterplan ELP 2010*" – now with 20 cities and several regional agencies. Since 2007 he is working in the regional Business Development Agency and stimulates the cities at the Ruhr for sustainable development. With the inter-local working groups of "*Concept Ruhr*", "*Chance of Change*" or "*Knowledge Report Ruhr*" he supports the upcoming Metropolis Ruhr.

Udo Sieverding has been working at the Consumer Advice Center NRW since 1998 in the field climate protection. Since 2007 he has been in charge of the topic energy and currently works as a division manager in this field. In its 75 information centers and on-site with the consumers, the Consumer Advice Center registers about 60,000 consultancy requests a year in projects on energy efficiency and the energy market. In addition, the Center offers consumer information services and information on consumer politics.

Bernd Tischler began his term as lord major of Bottrop in 2009. In 2004, he was elected technical deputy by the council of the city of Bottrop. Part of his department are the building agency, the urban planning agency, the survey agency, the cadaster agency, the building inspection agency, the civil engineering agency, the environmental agency, the public green space agency and the department of building stock. Tischler's department also oversees the sports and public pool facilities of Bottrop.

Mr. Tischler holds a diploma in city and regional planning from the University of Dortmund. After a traineeship with the county government in Cologne, Tischler passed the state exam for higher technical administrative service in 1987 in Frankfurt. He then worked as a deputy chief officer in the agency for city development and economic promotion of the city of Dormagen. In 1989 Mr. Tischler transferred to the city of Bottrop where he started working as a department chief for environmental planning. He then worked as a department chief for obligatory area development planning and later became deputy chief officer. In 1995 Mr. Tischler was promoted to the post of chief of the city planning agency that was charged with tasks regarding urban renewal and the tasks of the housing office. In 1996 Bernd Tischler was appointed to the post of an executive building director.

During his time in the planning office, Bernd Tischler played an important role in major building projects, the reactivation of industrial fallow lands, for instance the former "Hüls-Area" (Hüls-Gelände), and in the establishment of Warner Bros. Movie World and the Alpin-Center. Among his special projects as chief of the planning office is the ongoing renewal of the Bottrop downtown area and the renewal of the land-use plan. Bernd Tischler represents the interests of Bottrop in meetings, such as those of the Emscher association (Emschergenossenschaft)

in Essen. Tischler is also part of several administrative boards. He volunteers as a director of the not-for-profit construction company Bottrop.

7. For further Reading

Medearis, Dale, Garforth, Peter and Blüm, Stefan (2010): Promoting Energy Innovation and Investment Through Transatlantic Transfer of Community Energy Policies, AICGS Report No. 43, available at:
<http://www.aicgs.org/analysis/publications/topics/energyclimate.aspx>.