

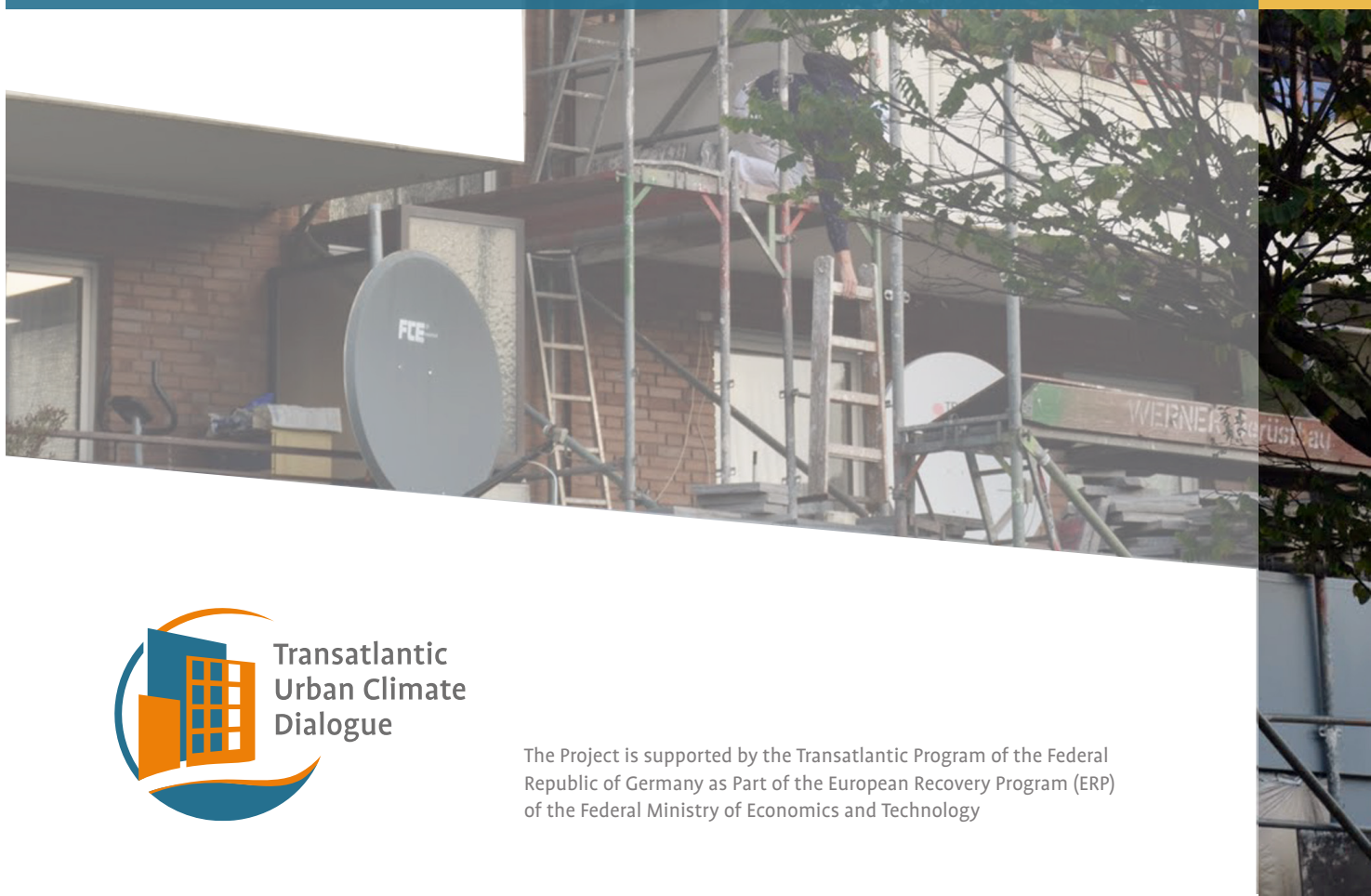
# TRANSATLANTIC URBAN CLIMATE DIALOGUE – WORKSHOP # 1

Urban Redevelopment in the Ruhr Region  
and Integrated Local Energy Planning

Gelsenkirchen, October 16<sup>th</sup>–October 19<sup>th</sup> 2011

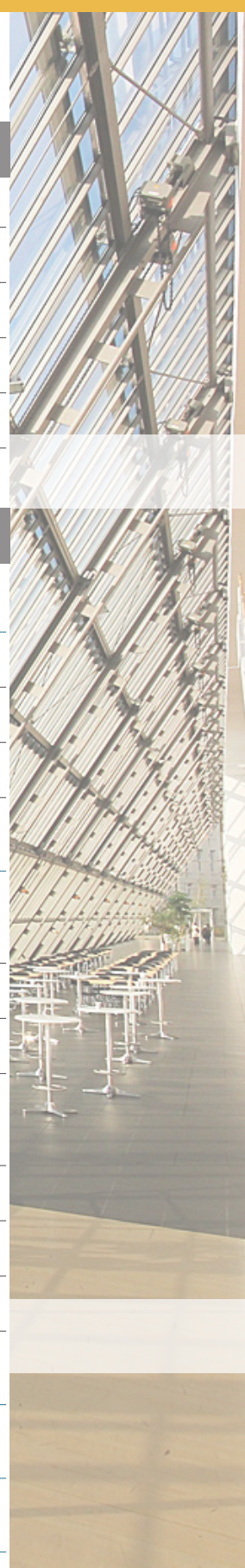
Workshop Proceedings

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The Project is supported by the Transatlantic Program of the Federal Republic of Germany as Part of the European Recovery Program (ERP) of the Federal Ministry of Economics and Technology

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## The Project

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The first workshop of the **Transatlantic Urban Climate Dialogue (TUCD)** took place in Gelsenkirchen, Germany, October 16–19, 2011. This workshop is the first of four problem-focused, goal-oriented and geographically-specific exchanges between local climate and energy policymakers, technical experts and practitioners from German and North American metropolitan regions. The participants represented the urban regions of Northern Virginia, Guelph/Ontario, Stuttgart and the Ruhr Valley. The overall goal of this project, scheduled to take place between 2011 and 2013, is to strengthen the formal search, review and application of mutually beneficial local-level energy and climate change policies between Germany and North America.

This dialogue is grounded in several model institutional partnerships and precedents of successful exchanges on urban sustainability between German and North American regions. These partnerships are characterized by the inclusion of governmental, academic and commercial partners. For instance, since 2000, the Northern Virginia Regional Commission has worked with the Verband Region Stuttgart to exchange and apply urban climate and sustainability policies. Guelph, Ontario, has worked since 2006 with metropolitan regions in Baden Württemberg to apply comprehensive energy planning practices and North Rhine-Westphalia can look back on many years of partnership with Pennsylvania. The work of each of these partnerships has incorporated formal transfers and applications of urban sustainability innovations across the Atlantic.

www

→ [www.fu-berlin.de/tucd](http://www.fu-berlin.de/tucd)

The TUCD is structured to formalize knowledge transfer. To this end, the TUCD emphasizes the merging of informed field visits and critical dialogue among the policymakers and the technical experts in order to advance applications of local energy and climate planning policies and practices. The purpose of the site visits was to create a more formal learning context prior to the workshop so that each of the participants was as informed about the applications of large-scale sustainable energy projects in cities such as Bottrop, Gelsenkirchen, and Herne.

The field visits of the first day included:

- 1 InnovationCity Bottrop →
- 2 Hydrogen Competence Center H2 Herten →
- 3 Energiepark Mont Cenis →
- 4 Science Park Gelsenkirchen →
- 5 Zeche Zollverein, Essen →

The participants toured the projects and were informed about each project's evolution, its performance and its relationship to the broader policy objectives of the city and region's energy planning. The site visits also included discussions concerning how the cities are tying their work together through development of the Emscher Landscape Park across the Ruhr region. The projects and their guides revealed the depth and performance of the Ruhr region's transformation towards sustainable and comprehensive energy planning.

### InnovationCity Bottrop

The site visits started with a look at the **InnovationCity Bottrop** project. The group met with Lord Mayor Bernd Tischler for an overview of Bottrop's ambitious planning and implementation activities. The Lord Mayor described InnovationCity Bottrop as a long-term comprehensive energy conversion program for the City of Bottrop. Innovation City Bottrop started in the context of a regional competition run by the state (Land) of NRW and the "Initiativekreis Ruhr", a group of 69 businesses from the Ruhr valley concerned about sustainable energy policy. The InnovationCity Ruhr competition was intended to find and profile innovative, economically viable urban energy management strategies and to explore their replication across the Ruhr Valley. The motto of the competition was "Blue Skies, Green City" and sought a city in the Ruhr to host and model sustainable energy management and renewal in the Ruhr region. An outcome of the competition was to create a "greener", economically viable region in which economic development was powered by "quality of life" attributes. Bottrop was selected out of a huge number of cities from the Ruhr region that applied to the competition.

**Bottrop's application included practical and realistic emissions reductions of CO<sub>2</sub> by up to 50 percent – if each of the projects proposed in the application are implemented, and an emphasis on energy efficiency between 2011 and 2021 – in a model neighborhood with 70.000 inhabitants energy use will be cut in half.** Bottrop also proposes to blend

Site visits to  
large-scale sustainable  
energy projects

www

→ [www.icruhr.de](http://www.icruhr.de)

Advancing urban  
redevelopment through a  
competition of Ruhr cities



policies of energy efficiency in the housing retrofit sector to promote job creation. Bottrop's existing building stock will be renovated to help meet the state's goals of retrofitting 3 percent of existing buildings for energy efficiency per year. The City of Bottrop opened the Center for Information and Advice in September 2011, and offers the citizens background and information as well as consultations about energy efficiency improvements for their homes - free of charge. The effort faces challenges of how to reach the 3 percent energy upgrade goals (now at about 1 per year). Part of Bottrop's work includes a focus on expanding its public transportation network to cut greenhouse gas emissions and promote the use of electric vehicles for public and private transportation. As part of this effort, the City of Bottrop cooperates with the [Hochschule Ruhr West \(School of Applied Science\)](#), to integrate innovative building construction and energy efficiency into its curriculum.

Another dimension of InnovationCity is the comprehensive approach it took to engage its public and its businesses about the development and goals of the Innovation City program. For the application, over 20,000 citizens signed a proclamation of support for the project, which served as a reminder about the importance of creating a collective vision among the citizens and business community to ensure the project's success. **The 50 businesses that have communicated their interest in working with InnovationCity form a core element of support for the process.** The early success of InnovationCity has captured the attention of the other cities in the Ruhr Valley region. For example, neighboring cities such as Herten and Gelsenkirchen have agreed to match Bottrop's targets to cut emissions of greenhouse gases in half by 2021.

*The key observations and lessons about InnovationCity Bottrop taken by the group included:*

- *Scale – Getting to the large scale is critical and faces numerous challenges, requiring a long-term effort and investment.*
- *Achieving scale requires a carefully crafted and extensive communication and education strategy. People depend on verifiable and accurate information for use in deciding whether to make energy efficiency improvements. Early results in North Rhine-Westphalia show 50 percent of people receiving energy advice implement retrofits, a number that will have to grow if scale goals are to be met.*

The Center for Information and Advice offers consultancy services free of charge



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## Hydrogen Competence Center H2 Ewald, Herten

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The TUCD delegation then travelled to Herten, for a discussion on hydrogen and fuel-cell energy research and production. Herten was once one of the largest mining cities in Europe and has undergone significant structural changes that present barriers but also opportunities in its transformation towards a center for hydrogen and fuel cell energy technology.

The former coal mining plant Ewald in Herten is being converted to host the **Hydrogen Competence Center**, which consists of three main project areas:

- 1 hydrogen production** in the “Blue Tower”, a 13 MW plant which produces green hydrogen from biomass;
- 2 production and development:** the center offers office space, laboratories and workshops and hosts **innovative businesses** that focus on the production and storage of renewable energy;
- 3 hydrogen supply** through a **hydrogen filling station** for hydrogen powered vehicles.

Herten’s success is a consequence of hard work and good luck, as the Center is located next to a large hydrogen pipeline network that already stretches across the northern part of the Ruhr. **A collection of companies, associations, local authorities and research institutions working on the development of hydrogen and fuel cell technology in the Ruhr metropolis has formed the “Ruhr h2” Network.** The Network seeks to promote hydrogen and fuel cell technology as a clean alternative to fossil fuels.

Herten also specializes in mobile applications of hydrogen and has a test fleet of hydro busses, light trucks and cargo bicycles running in the streets of the Ruhr metropolis. The h2 Network also helps store energy from renewable sources through hydrogen so that excess energy can be transformed into electricity to meet peak demand on the grid. In its work, the Network benefits from research on hydrogen and fuel cell technology conducted by local universities (in Bochum, Dortmund, Essen and Duisburg), universities of applied science and renowned research institutions such as the Fraunhofer Institute. Funding for the projects of the h2 Network comes from the “state” (Land) of North Rhine-Westphalia and the European Union. Despite the structural change Herten has witnessed on its way to become a Hydrogen city, it still faces great economic challenges. The Hydrogen industry has created 1200 new jobs in Herten.

www

[www.projekt-ewald.de](http://www.projekt-ewald.de)

Developing strategies to store renewable energy as a response to economic challenges



© Joe Schilling

*The lessons from Herten observed by the TUCD delegation include:*

- Cities and regions must build off of their existing strengths (e.g. Hydrogen infrastructure). Don't turn away from the region's legacy, but use the legacy as a focus to transform the region.
- Recognize the difficulty and amount of work needed to transform the City and region. This requires leadership and a long-term commitment to overcome the economic challenges of transforming from a historically fossil-fuel based economy to one based on sustainable energy choices.

## Energiepark Mont-Cenis, Herne

The TUCD delegation then visited the **Academy Mont-Cenis**, Herne, a vocational training center, city offices and library, and a combined heat and power plant constructed on the site of a former coal mine. The Center serves as the training center for the staff of the Ministry of the Interior in North Rhine-Westphalia, offers seminar rooms, and serves as a hotel and library for the public. **The Center is housed in a large glass enclosed structure, creating a Mediterranean micro-climate that supports one of the largest solar PV arrays in Europe.** The Center also serves as a renewable energy learning laboratory for the entire Ruhr region. In addition, Herne's public utility financed and developed a 20 MW methane-powered cogeneration power facility to heat and power the Center. The solar panels that are integrated into the roof of the Academy Mont Cenis feed 600,000 kw/h per year into the electric grid. Three methane-gas based cogeneration units located next to the Academy produce 9,000 mw/h of electricity and 12,000 mw/h heating energy per year. The heating energy is used for the Academy, for an adjoining residential neighborhood and a local hospital. The heating and cooling systems have been systemically integrated into the surrounding neighborhood and are viewed as non-intrusive by the community. A display sign registers the performance of the entire system. In total, approximately 60 million Euro was invested in the Academy Mont-Cenis – 10 million Euro for the building, 50 million Euro for the solar panel roof. Another 10 million Euro was spent to remediate the site.

*The lessons from Mont Cenis that the group took back include:*

- Community-scale combined heat and power can be seamlessly integrated into a residential community.
- Energy efforts can serve as a symbol of change for a community as it transforms from its past to a more sustainable future.

www

[www.akademie-mont-cenis.de](http://www.akademie-mont-cenis.de)

Combining coal mining heritage and cutting edge energy technologies



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## Science Park Gelsenkirchen

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**Science Park Gelsenkirchen** is a cornerstone of the IBA Emscher Park program. The main objective of the Science Park project was to give Gelsenkirchen, a city that was heavily affected by structural change and decline of the coal and steel industry, a new perspective on its future. The location of the Park on a former steel mill, the integration into the urban setting with a park area and a lake and the architecture of the building are symbols of the changes happening in the Ruhr valley. At a cost of 50 Euro million, the Park was to host one of the largest rooftop solar PV installations in Europe. **Producing over 145,000 kw/h of energy per year, the Park is an internationally acknowledged research centre for solar technology. It is a business incubator and information, education and reference center for Gelsenkirchen.** The technology-center of the Park offers rentable office and laboratory space and room for events and presentations.

With its production of solar energy, the Park is the core of the Gelsenkirchen's efforts to develop renewable energy in general and solar in particular. Gelsenkirchen has declared itself "Solar City" and places particular emphasis on producing solar energy and supporting the development of solar energy technology.

One of the goals of the Science Park is to promote the establishment of new industries in the center of the Ruhr Valley. Since the construction of the Science Park, Gelsenkirchen has experienced several comparative economic benefits. It is a site for innovative businesses in the field of information and communication technologies and a center for renewable energies. Hundreds of jobs have been created in and around the Park as well as a range of related engineering and fuel production consultancies.

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## Zeche Zollverein, Essen

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Zeche Zollverein is both a monument of the Ruhr's past and a symbol of its structural change. **At Zeche Zollverein, an old coal mine industrial site has been regenerated into a cultural center of the Ruhr region.** Now recognized as a World Heritage Site, Zeche Zollverein also hosts a museum focusing on the importance of the coal industry to the region.

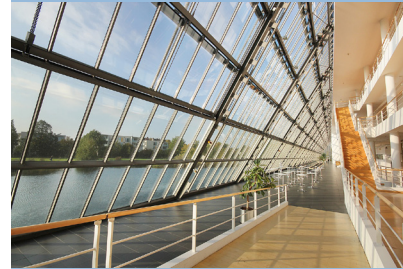
The economic transformation of the region from a coal-based industry has important implications for the cultural identity of the people and was incorporated into the design and function of the Zeche Zollverein. The coal and steel industries were not only at the economic center of the region, they were also an important part of the **cultural and social identity of the region.** Zeche Zollverein highlights the challenge of preserving this cultural and social identity of the people in the context of a rapid transformation of the economy which is necessary in order to create new employment opportunities.

WWW

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[www.wipage.de](http://www.wipage.de)

Solar energy in focus



Science Park  
© Robert Palmese

Promoting the  
establishment of new  
industries and creating  
jobs

WWW

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[www.zollverein.de](http://www.zollverein.de)



Zeche Zollverein  
© Markus Siehr



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## Common Features of Ruhr Projects

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There are several features that the above projects share:

- **First** is the concept binding the integration of multiple cities around a common vision for energy management and a regional framework for sustainable development.
- **Second**, the applications of various competitions to stimulate creative ideas and entrepreneurship. Projects such as InnovationCity, were started in a context designed to stimulate creative and entrepreneurial approaches to local climate and energy initiatives. The approach emulates the origins of the entire International Building Emscher Park (IBA) program, which started in 1989 from a series of design competitions. These efforts included merging the world of sustainable energy management with design to find new uses for old derelict industrial sites and business ventures involving sustainable energy management.
- **Third**, the blend of state-of-the art energy technologies that have not overshadowed the vital and efficient use of conventional or energy systems, such as district energy. Herten, Bottrop, Gelsenkirchen all deployed and nurtured applications of solar energy, hydrogen, and fuel cells. However use of district energy, heat recovery and increasing the efficiencies of district energy, building retrofits and transit-oriented development must be part of the overall efforts.
- **Fourth**, the inclusion of the business and academic sectors to stimulate job creation. The Ruhr Valley highlights the powerful and so far successful link between research and commercial applications at business incubators such as at the Science Park in Gelsenkirchen.
- **Fifth**, the relevance of scale and the need to focus beyond the level of individual buildings.
- **Sixth**, the need for an elaborate communication strategy. The Bottrop information center, Zeche Zollverein and Science Park Gelsenkirchen offer a vast array of information available to the public, including guided tours to inform the public about specific projects. This transparency contributes to the fact that the public is engaged in and supportive of the projects. The citizens become involved in the economic transformation of their hometowns.

### Political Challenges and Community Energy Planning (CEP)

Day two of the TUCD focused on laying the groundwork for the next two years of problem-focused, goal-oriented and geographically-specific exchange of knowledge between the partners of the Transatlantic Urban Climate Dialogue.

#### Similar Challenges

Cities in Germany and North America face many similar energy constraints such as environmental degradation, uncertain supplies and rising prices. In Europe, these issues converged in the 1970s, compelling action at the national and sub-national levels. The result was a range of policy-driven energy and environmental policy innovations from which North American cities can learn. These include the expansion of district heating and cooling systems, the applications of building labels for energy efficiency, and the first large-scale applications of modern renewable energies, such as solar and wind.

Today, metropolitan regions in North America such as Guelph and Northern Virginia face many similar problems, particularly rising energy prices and uncertain effects of climate change. In addition, as long as federal climate and energy policy is stalled, the imperative for local authorities to act will grow. There are already thousands of voluntary initiatives in cities in North America, but many are likely to reach scale because of the lack of long-term quantitatively-driven benchmarks and frameworks to guide energy planning. In the EU, there is also significant activity at the local level, but the cities profit from a policy framework supporting a range of diverse environmental, economic, and energy initiatives.

#### Different Political Frameworks

The role of the EU in local energy and climate management is significant. The members of the EU have signed and ratified the Kyoto Protocol and aspire to meet the Kyoto emission reduction targets of 8 percent below 1990 levels by 2012. In addition, member states have set binding target via the “Triple 20” directive **to reduce emissions to 20 percent below 1990 levels by 2020**. The EU has introduced an emission trading scheme (ETS) to help meet these goals. Moreover, 20 percent of EU energy consumption must come from renewable resources and energy efficiency must be increased by 20 percent by 2020. In 2004, the EU passed a directive that emphasizes the importance of cogeneration in reducing greenhouse gases and meeting energy efficiency goals. It established market frameworks for combined heat and power, and planning and reporting requirements for the EU member states.

In this context, Germany has emerged as a leader in energy and efficiency. Since the early 1970s Germany has enforced minimum energy standards for buildings and since 1991, it passed the **“Federal Electricity Feed-in Law”** (Stromeinspeisegesetz), one of the first national-level policies obligating public utilities to remunerate renewable energy generators

Policy-driven energy and environmental policy innovations in Europe

Imperative for local authorities in North America to act is growing



Alpincenter Bottrop  
© Markus Siehr

at a fixed rate. In 1992, Germany introduced a tax on all oil-based fuels such as gasoline and heating oil. Since 2000, the **Ecological Tax Reform** (Ökosteuer) has used revenue from taxes on gas, diesel fuel, heating oil, natural gas and electricity. Renewable energy sources, small power plants and electricity from cogeneration, nuclear and coal are exempt from this tax. Cogeneration is further supported through the 2002 **Cogeneration Law** (Kraft-Wärme-Kopplung-Vorschaltgesetz), which created incentives like guaranteed feed-in tariffs for the use of cogeneration from conventional fuels. In 2007, the federal government decided on a new **climate and energy program** (Integriertes Energie- und Klimaprogramm) at the “Meseburg Summit”. Among the key objectives of this program are to further increase the share of combined heat and power generation and renewable energy in the electricity sector as well as the tightening of energy efficiency in building. Finally, Germany has committed itself since the summer of 2011 to phase out nuclear energy production by 2022.

The evidence suggests that Germany will meet its Kyoto emission reduction targets of 21 percent below 1990 levels by 2012. For the subsequent period, Germany has agreed to a GHG emission reduction target of 40 percent below 1990 levels by 2020 and 80 percent below 1990 levels by 2050.

By comparison, the U.S. has few solid federal targets for emission reductions or renewable energy. The exceptions are state-level policies. California, for instance, has set its own CO<sub>2</sub> reduction targets and many states have introduced their own renewable electricity standards. In Canada federal climate legislation is on hold as well and the country has just declared its intention to pull out of the Kyoto Protocol. Nevertheless, Canada and the U.S. each use approximately twice the energy per GDP as Germany. Homes and buildings are more than twice as efficient in Germany as they are in the U.S. Some provinces and cities in Ontario and British Columbia, are working to compensate for this vacuum and are benchmarking from the successes of pioneering countries.

In light of these differences, North American communities have now begun to implement energy plans that combine the following three principles:

- 1 Reducing the demand for energy by reducing waste of energy and implementing energy saving measures;
- 2 Using sustainable sources of energy;
- 3 Producing and using fossil fuels as efficiently as possible.

These plans are referred to as Community Energy Plans (CEP) and provide a sustainable framework for implementation.

Germany as a leader in energy and efficiency through various laws since 1991

Germany's target:  
Emission reduction of 80 % below 1990 by 2050

North American communities have begun to implement Community Energy Plans

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## Community Energy Planning

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Community Energy Plans prioritize energy efficiency, heat recovery and getting to scale as well as the applications of renewable energy.

*This prioritization process, otherwise referred to as the loading order includes:*

1. *World class energy efficiency in homes, buildings and vehicles*
2. *Planning that integrates land-use and efficient transport choices*
3. *District energy systems enabling efficient energy conversion and waste heat recovery*
4. *Multi-fuel flexibility including renewable energies*
5. *An integrated (multi) utility approach both technically and institutionally (Stadtwerke)*
6. *Large-scale development or redevelopment to gain early scale of new paradigms*
7. *Community engagement informed by quantitative benchmarks*
8. *Consistent implementation over decades supported by the broad community and political leaders.*

The benefits of successfully implemented CEPs include controlling energy costs, job creation and opportunities for industries to grow their business and create new jobs. Another important benefit and advantage of community energy plans is that the citizens identify strongly with their local CEP efforts through their involvement and participation.

But there are limits to relying on sustainable energy management at the local level. Despite local ambitions and identified opportunities, the political and regulatory landscape may constrain the power of local government. This is when eventually support from the federal and state governments becomes important. The case studies the participants presented highlighted some of the opportunities and constraints of some of the CEP processes.



## Case Studies and Project Presentation

### Guelph, Ontario – Decoupling population growth from energy use by the Community Energy Initiative (CEI)

Guelph, Ontario, lies at the center of the Great Lakes region in Southeastern Canada, an hour west of Toronto. Guelph is one of the fastest growing cities in North America. Given the population and growth pressures, Guelph is working to set goals that allow its growth to occur within its existing boundaries over the next 30 years. To achieve this, Guelph will rely on a blend of infill and brownfields development supported by its **Community Energy Initiative (CEI)**. The CEI calls for Guelph to use 50 percent less energy per capita and reduce GHG emissions by 60 percent per capita by 2031. This would result in a reduction of 1 ton per capita to 7 tons of GHG emissions per inhabitant. The effort will use the close relationship between the City and its municipally owned electric utility, Guelph Hydro. The policy framework for the Guelph CEI is framed at the provincial level in which the provincial government generally acts as a driver of policy in the absence of formal constitutional rights for local authorities. The Municipal Act sets the framework for energy and the Electricity Act sets the framework for electricity policy in the city.

The Guelph CEI grew out of the City's work with IBM to provide reliable, cost-effective, sustainable supplies to a new plant in the City.

The implementation of the Guelph CEI can be divided into five categories:

- 1 Integration
- 2 Networks
- 3 Partners
- 4 Governance, Administration
- 5 Economic Development

The integration activities rely on energy density mapping and the development of building standards. Guelph has used networks of builders, policymakers and citizens to mobilize expertise, advocacy and resources for the CEI process including community partners such as Guelph Hydro, Union Gas and local organizations that align strategically with the CEI. The governance and administration dimension involves leadership and management and include the formation of a **Mayor's Task Force on Community Energy**, which has focused on generating resources and attracting investment. The economic development category includes developing scale projects, attracting investment and creating new jobs. Guelph, also has implemented the **feed-in-tariff policies** adopted by the Province in order to push its renewable energy policies. This has resulted in investment opportunities in Guelph and has facilitated a variety of private sector renewable energy projects. As a result, some 1,000 new jobs have already been created in Guelph that can be attributed to the development of the CEI. A range of "Scale" projects in district energy, involving combined heat and power (CHP) and Solar PV have also been launched.



Efforts for a fast growing city

Networking to mobilize expertise, advocacy and resources for the CEI and to attract investment

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## Northern Virginia – Transforming into a Green Economy

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Northern Virginia confronts a range of energy related challenges linked to its economic and demographic growth which include high per capita emissions (14.2 metric tons in Loudoun County and 13.4 metric tons in Arlington County), unsustainable land-use and transportation systems, limited renewable and clean energy production and a significant population growth. On the positive side, the Washington, DC metro region has experienced a **vast growth in clean jobs** in the past decade. Some 20,500 jobs have been created since 2003, and the overall number of green jobs is estimated at almost 71,000. In Virginia alone there are 66,770 people working in green jobs.

The **Northern Virginia Regional Commission (NVRC)** has recognized these challenges and opportunities and has initiated community energy planning to set goals for the environment, for economic competitiveness, and for energy security. In Arlington, a **Community Energy and Sustainability Task Force** has recommended community wide energy and sustainability goals. The Task Force members represented the different facets of the community: local businesses, citizens, educational institutions, energy providers, local, state and federal representatives, civic associations and regional transportation authorities. Technical leadership was provided as well, for instance through the Northern Virginia Regional Commission and its technical consultants. Having community involvement was critical to the CEP process in Arlington. The Arlington CEP targets represent the priorities of the leading order and include ambitious emission reduction targets to achieve per capita emissions of 3 tons by 2025.

Other Northern Virginia communities are taking on community energy planning. Loudoun County was one of the first US communities to complete a community energy strategy (plan). The City of Alexandria has built on its **EcoCity initiative** to craft its Energy and Climate Change Action Plan (eCAP) setting out short and long term goals. Fairfax County has worked to integrate energy planning into its land use planning process and has a **Private Sector Energy Task Force** assessing additional needed actions. Prince William County is integrating development of a Community Energy Plan into its County Comprehensive Plan. Smaller communities, such as Falls Church, are developing energy and climate plans.

At the regional level, NVRC has worked on the establishment of the Northern Virginia Regional Energy Strategy. This strategy builds off of the local plans, with its emphasis on scale projects, energy efficiency targets and district energy. An important aspect of NVRC's energy planning work is to maintain partnerships to exchange knowledge and experiences with partners in Europe. Another important reason for advancing regional cooperation in community energy planning as a supplement or alternative to municipal planning is that efficiency can be created through scale projects.

Ambitious emission  
reduction targets

Action and energy plans in  
different communities

## Stuttgart – Using energy efficiency to meet the challenges of climate change

Stuttgart has focused much of its community energy planning activities on transportation and mobility. The regions in the state of Baden-Wuerttemberg have the special task of coordinating the activities of their municipalities. This is consistent with German federal planning in which each of the 16 states in Germany designs its own policy framework for regional planning and governance. This includes that right of the individual states to Baden-Wuerttemberg is known especially for the strong role the municipalities play in transportation planning. They also have a strong federal constitutional right empowering them to organize their own economic development efforts in the boundaries of spatial planning. **To achieve sustainable and coordinated urban development, the regions have to transform general guidelines issued by the Land into the binding content of a regional plan.** This regional plan sets mandatory limits for municipalities concerning new settlements. For instance, only municipalities with railway access are allowed to have intensified development of settlement areas. In addition, they must achieve a high settlement density in terms of capita/ha. The regional plan also specifies that the designated location of retail areas is in city centers, since this makes them easily accessible and reduces the kilometers travelled by the people.

What sets the Stuttgart region apart from other regions in Baden-Wuerttemberg is that its regional assembly is elected by a direct vote. This democratic accountability is essential for future-oriented regional development. The responsibility of **Verband Region Stuttgart** comprises regional planning, as well as landscape and transport planning. The operation of regional transport, marketing and the promotion of economic development are also within the jurisdiction of the region.

Sustainable transport is of critical importance. The majority of the 1.42 million strong workforce in the Stuttgart Region 75 percent do not work in their towns of residence. More than 330,000 people use the S-Bahn trains to commute on a daily basis. In total, about 950,000 people in the Stuttgart Region use the S-Bahn, buses, and urban rail network every day. One goal of the region is to further increase this number and to assure inter-regional accessibility – even in rural areas. This is a key feature of the success of the region's energy planning system.

The Stuttgart region, like most European countries, is facing significant demographic change. **The population will decrease and be much older on average in the future.** This will result in a significant change in the demand for infrastructure. Fewer schools and childcare facilities will be necessary. Instead there will be a high demand for homes for the elderly.

Climate change prognoses indicate that the Stuttgart Region will have the climate of today's southern Italy by 2080. In order to gauge the effects of climate change, data has been collected in a climate atlas of the regional level. It informs the region and the municipalities about the adaptation and climate policy measures they have to address. Activities to reduce the emission of carbon dioxide are on top of the region's agenda, as are adaptation



Verband Region  
Stuttgart

Direct vote is essential for  
future-oriented regional  
development

Significant demographic  
change

measures. For instance, the protection of open spaces is very important because they serve as flood protection means and deliver cool air. In its projects, the Stuttgart region benefits from applied research at the University of Stuttgart and a permanent network of experts. Moreover, the region cooperates with other metropolitan regions in Germany and England and with partners abroad, such as Northern Virginia. The Stuttgart case shows the importance for a region or state to assess and focus on its strengths in the CEP. Stuttgart is focusing on climate adaptation and energy planning. Preparing an adaptation program for the region is emerging as a high priority. This includes focusing on critical infrastructure. It also includes developing new building codes that properly address the present and future climatic conditions of the region.

### North Rhine-Westphalia (NRW) – Transforming a Region through Innovative Incentives

North Rhine-Westphalia (NRW) presented different facets of its energy planning activities such as the InnovationCity competition, won by Bottrop, the EnergieAgentur NRW, the consumer association of NRW and the economic approach to community energy planning, pursued by the city of Dinslaken. The Ruhr region's transition to an efficient energy system with a focus on renewable energy and building efficiency is very much in the economic interest of the region. A great challenge for the future of the Ruhr Valley will be the storage of renewable energy to guarantee a constant and reliable supply. Moreover, cities in the Ruhr region and across Germany and Europe will be affected by the changes necessary for the electric grid to meet these demands. Legislation has been passed at the federal level to guarantee that new efficient high-voltage power lines can be built quickly. Modern, highly efficient gas- and coal-fired power stations guarantee a fast transition to a renewable energy based electricity supply as they can level out fluctuations of wind and solar power.

Like the Stuttgart region, the Ruhr region also is preparing to face the consequences of climate change and has started a regional adaptation program. For instance, in 2008, the city of Dortmund was flooded after a severe thunderstorm and in response, is part of a regional-effort to use green infrastructures to retain and slowly convey stormwater to the for the region.

**Promoting energy efficiencies in buildings, pilot projects and transportation are among the main target areas for community energy planning in NRW.** The majority of the existing buildings cannot be considered energy efficient and need to be renovated to meet current efficiency standards. Pilot projects are realized in order to reduce GHG emissions in NRW. Bottrop, for instance, is working with partners from trade and industrial organizations to develop renovation and energy efficiency projects in entire districts of the city. In the transportation sector, the use of electric vehicles and fuel cell technology is strongly encouraged. Some 500 electric vehicles will be on the road in Bottrop in the next few years. Herne is working on a **hydrogen gas station** for vehicles based on hydrogen technology. Moreover, car sharing will be encouraged and implemented on a large scale in NRW's cities. In order to attract community interest in energy planning, NRW was successful in emphasizing

Fast transition to an efficient energy system based on renewable energy

Renovation and energy efficiency projects in cooperation with partners from trade and industry



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the economic opportunities of change. Next to environmental benefits, community energy planning creates a large new market. In NRW, environmental and energy technologies and experience have become international trademarks.

### EnergyAgency.NRW – Fostering Economic Transition through Scale Projects

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■ *EnergyAgency.NRW has several different focus areas. These include climate protection, emission trading, energy efficient building and power plant and grid technologies. The Agency also offers consulting services to firms and citizens. The Agency promotes the renovation of old, inefficient buildings in NRW, but also encourages the construction of new energy efficient buildings. The state of NRW has introduced various energy efficiency model projects. One of them – coordinated through EnergyAgency.NRW and financed by the state government – is the project 50 Solar Energy Housing Estates in NRW.*

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■ *The project combines two goals:*

**First**, an increase in efficiency through a reduction of heating energy demand.  
*This is achieved through solar urban design and architectural features;*

**Second**, the use of solar energy for electricity and domestic hot water.

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■ *The Agency has further projects running in cities such as Gelsenkirchen or Aachen that focus on passive housing based on solar energy. In Cologne, a project successfully concluded in 2004 that focused on retrofitting buildings. A measure of this success includes the reduction of heat demand from 160kWh/m<sup>2</sup>a to 48 kWh/m<sup>2</sup>a. 50% of the hot water demand of the building through solar thermal collectors. All of the recent projects illuminate that significant reductions in energy demand from residential buildings can be achieved through standards for new buildings and through retrofits of old buildings.*

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■ *Next to the Solar Estates, NRW has launched a new project, the 100 Climate Protection Estates in NRW. The project's target is to reduce heat-related CO<sub>2</sub> emissions in residential estates by high insulation standards in combination with fixed CO<sub>2</sub> standards. There are various factors that motivate the people in NRW to retrofit their buildings to make them energy efficient. The people are convinced that they need to refurbish to be ready for the future and to make their apartments more attractive for renters. In the private sector, the notion is widespread that there is a need for sophisticated houses to meet climate challenges. Moreover, energy efficient houses sell for a high price. Renovations are also encouraged by the federal government, which offers financial incentives for passive housing and other energy efficiency measures.*

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## Consumer Association NRW – Consultation as a Means of Promoting Energy Efficiency

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- *The Consumer Association NRW is an independent regional non governmental organization supported through grants of the state government and the municipalities of the state. The tasks of the association include consultancy, information, legal aid, education and lobbying. The consultancy is neutral and without any economic interest. One of the guiding notions of the association is that individual energy consultancy can bridge the gap between economic and ecological efficiency.*
  - *The association offers on-site consultation to its customers. Experts like architects and engineers visit the customer's homes and inform them about renovation possibilities, available public funding for different measures etc. More than 50 percent of the homeowners that received advice from the association upgrade and invest in their home to make it more energy efficient within a period of two years. A majority of private homeowners rely on their own finances to make renovations. Less than 20 percent % use publicly subsidized credit financing. Many of the investments benefit local skilled craftsmen and building materials suppliers.*
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## Dinslaken – The Leading Role of the Stadtwerke

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Dinslaken is a city that relies heavily on clean energy sources, district energy, solar, biomass and on CHP based on natural gas. Some 21 percent of the electricity needs are already met with renewable sources (as compared to 15.6 percent German average).

For its heating energy it relies on CHP from biomass, natural gas as well as coal. Industrial waste heat also plays an important role. Overall, Dinslaken uses 40 percent sustainable sources for its heat supply (the German average is 12.1 percent). As in some of the other cities we have studied, Dinslaken's electricity, heating, natural gas and drinking water is provided by the Stadtwerke, which is the core of energy supply and planning in the city. The Stadtwerke Dinslaken are partly owned by the city.

The example of Dinslaken shows that cities can make an important contribution to CO<sub>2</sub> reductions. They can be achieved with a strictly economic approach.

Strictly economic approach  
to CO<sub>2</sub> reductions

## Lessons Learned

The TUCD workshop in Gelsenkirchen highlighted that the four participating regions face very different political frameworks in which they operate. In Germany, the EU's climate and energy targets combined with Germany's unilateral decision to phase out nuclear power have created a strong context for the development of innovative energy and climate mitigation policies – particularly in the individual German Länder. In Canada and the U.S., where there are fewer policy frameworks to address climate and energy issues and where there is no strong federal climate policy in place, the states, cities and regions must work more entrepreneurially to fill the vacuum with their CEP activities. **Despite these different political frameworks, the workshop revealed that each of the participating regions share the common challenge of climate change, rising energy prices and supply uncertainties.** There are, therefore, similar goals, policies and technologies which can be exchanged and shared among the regions.

The four participating regions find themselves in different stages of community energy planning. Guelph started the implementation of its 25-year CEI in 2007. Loudoun and Arlington counties in Northern Virginia launched their CEPs in 2010. In Germany, some CEP activities have been on the agenda since the 1970s. District heating, for instance, has been in place for decades in many communities. Other initiatives, such as InnovationCity, have been launched only recently. There was a consensus about the importance of identifying the common challenges and economic and environmental opportunities that come with community energy planning on both sides of the Atlantic. Several aspects emerged as important lessons.

**Job Creation.** The issue of fusing job creation and sustainable energy and climate policies is an important CEP element for each of the participating regions. The examples of German cities like Herten and Gelsenkirchen or Northern Virginia show that the implementation of climate and energy policies through CEP can create hundreds or even thousands of jobs, even (or especially) in regions that rely heavily on the coal and steel industry for employment.

**Communication.** Practical experience from Northern Virginia suggested the importance of involving sectors of the community and partnerships as key elements of the planning process in order to guarantee community support for CEP. Cities like Bottrop and Herne have used communication tools to inform their citizens and local businesses about investment opportunities and the progress of CEP projects. They have created special information and public gathering centers for this purpose.

**Integrated Utilities.** The concept of the Stadtwerke (municipal utilities) emerged as a core element of a successful CEP. With the city as a main shareholder in the local utility that provides both heating and electricity, a positive contribution to the city budget is made as opposed to a positive contribution to a private gas company. Stadtwerke is

### Bottrop

- importance of renovation of existing buildings
- funding of renovation costs: state/federal, private, joint funding
- interest of industry in building new products & technologies
- how can buildings be updated? (modern in reality...) → end of nuclear power in Germany, therefore, the first element of the climate protection strategy is to update buildings
- making investments to renovate as a challenge; individual approaches to different types of buildings exist
- InnovationCity Ruhr as a framework!
- TECH as a means to give Bottrop a new direction → strategy for future after 2018, when last coal mine closes
- financial incentives for homeowners: low interest loans, financial aid → information about funding opportunities available, fear of change @ (financial) costs
- unemployment: 15% (same heating)
- optimum incentive level? (in order to motivate homeowners)

- awareness where highly inefficient buildings are, for new construction no renovations necessary
- data collection through databases
- new renovations as an alternative to subsidy/loan?
- Bottrop: homeowners forced by law to use 10% renewable energy, means their heating system
- How do cities collaborate? Is there tension due to the competition?
- close cooperation, meetings every 1 month, continuous exchange of opinions
- competition did create some friction but now Bottrop inspired by all cities as blueprint
- mandatory renovations vs. incentives?
- (Stuttgart)
- may force population living more cost efficient?
- AKW = loans available if assets combine several energy efficiency measures, very necessary
- EU directives example: voluntary measures + transparency most successful

### Session results Bottrop

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### Stuttgart

- accountability for targets?
- there needs to be cooperation between all levels of government
- Adaptation planning as a challenge?
- important for safe investments, therefore essential for energy
- cooperation with cities important in order to gain acceptance for
- role of regional land planning is crucial
- mandatory regional planning as an option?
- lessons can be drawn for U.S. but opposition to mandatory planning
- popular opposition to "green" projects (Stuttgart 21...) as a
- problem: including general public in planning processes may
- attracting large companies to green energy as a challenge?
- on affordable energy... → competitiveness

### Session results Stuttgart region

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an established, efficient model in Germany. In North America, a mixture of publicly and privately-owned utilities are the standard providers of gas and electricity and not of heat. North American efforts must be undertaken in a way that matches with the business needs of these utilities. The reconfiguration of or cooperation with utilities also offers great potentials for renewable energy. In Germany, renewable energy is usually part of both electric generation and heating, while in North America, renewables are not usually used for heating.

**Urban Design.** Urban design is another topic that is interesting for all partners in the dialogue. With its rapidly growing population, Guelph has included brown field development into its CEI. Many cities in the Ruhr region have also made use of former industrial sites – the most prominent example is likely Zeche Zollverein, which is used as a cultural center. But not only the reuse of brown fields, also modern urban design were interesting discussion points in the workshop. The Stuttgart region, for instance promotes efficiency and short distances by integrating commercial areas into the city centers.

**Building Retrofits.** Closely linked to urban design is the renovation of the existing building stock. Large-scale renovations are included in the energy plans of many cities in NRW, in Northern Virginia and in Guelph. These renovations not only bare a huge energy saving potential, but they also increase the quality of the buildings, make them more attractive for renters and buyers and prepare the buildings for the consequences of climate change.

**Sustainable Mobility.** Energy efficiency in transportation is another shared feature of the CEPs that were introduced in the workshop. Guelph is planning to reduce transportation energy use, for instance by using sensitive urban design. In Northern Virginia, new Metrorail stations, bus rapid transit and light rail will be built to encourage the use of mass transit. Stuttgart and NRW focus on the use of electric vehicles and (electric) bicycles to achieve more energy efficiency goals.

Overall, most elements of the **loading order** of successful CEPs can be found in the plans of Guelph, Northern Virginia, Stuttgart and NRW. It was an interesting experience for the workshop participants to learn about the application of these policies as well as the challenges and success stories they entail in each of the regions. The presentations of the CEPs indicated not only many opportunities for transatlantic learning and cooperation but also considerable business and environmental opportunities.

### Northern Virginia

- Geothermal heating → problem of COST; public could be eventually pay off
- Water & sewer as opportunities
- how can projects be brought to scale?
- why cooperate? → national level can be influential; national can projects
- enabling strategies & how are building owners motivated to renovate?
  - ↳ institutionalization into community processes; people need to be brought into building labels & goals in best discussion not productive; broad community involvement as enabling strategy
- ownership characteristics (residential + commercial) as a challenge
- new technologies: structure must be created so that people are co then
- importance of benchmarking for the projects
- increase of scale during the process?
  - scale: starting with relevant projects, moving to larger ones in next steps important
  - circumstances will change over time (e.g. natural gas prices etc.)
  - involvement of private sector important
- role of NREC: enabler, communicator, advisor etc.
  - might be a model for other regions?
- Importance of community involvement
  - interaction of federal & local level: vision for next 5 years
  - what is people's vision of their societies?
  - what to do about "status-quo" -visions?

### Session results Northern Virginia © Georg Hubmann

### Guelph case study G.S.A.:

- reconfiguration of the nature of the utility (e.g. thermal distribution)
  - ↳ what is the conversion of the energy?
  - ↳ centralised distribution, utilities in Guelph, the utility provider is the regulatory framework (not a heavily regulated)
- utility ownership structure? → single ownership, reports to city council, but as a company
- Guelph Hydro Services is the city, mayor or board of directors
- Guelph currently has no district heating/cooling → new initiatives being created
- learning tool for young people as an outreach means? model exists in Germany
- education of others: issue no money from city government → money has to come from funding is a big issue
- biogas will play an important role in reaching emission targets
  - ↳ local gas provider is striving to create the infrastructure
  - ↳ since community may not be supportive, challenge: including stakeholders in process
- district heating/cooling, new distribution methods → Community involvement stakeholders: - - -
  - ↳ how to create support
- when do projects become along fast? → speed of application process, investment "easy sell" → popular for economic reasons...

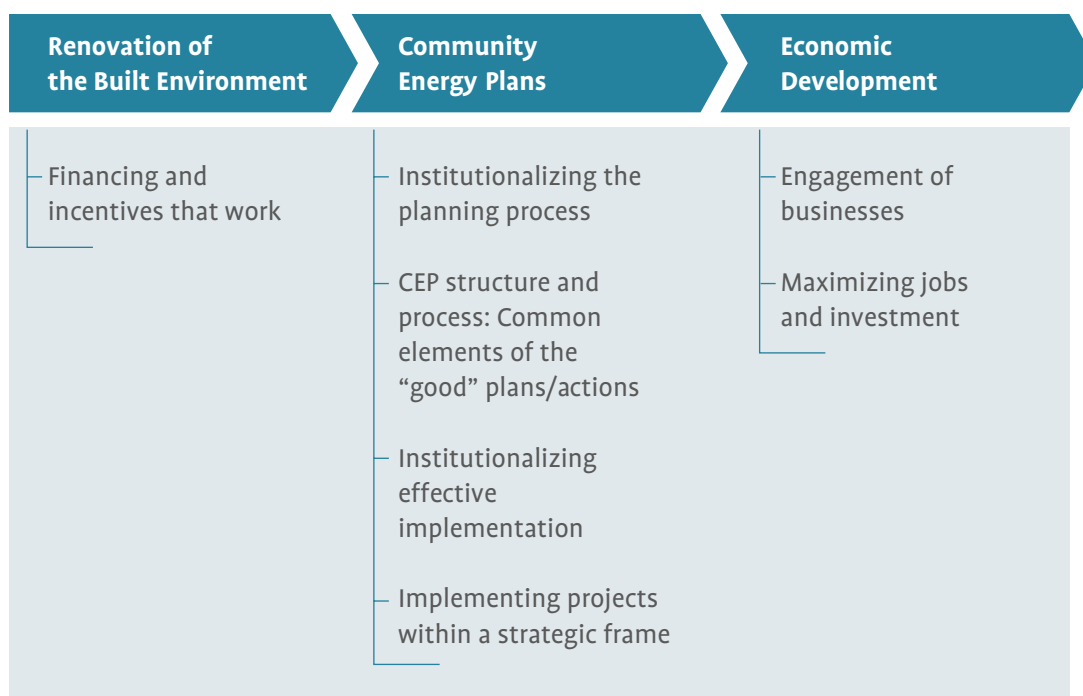
### Session results Guelph © Georg Hubmann



## What Lies Ahead

At the end of the workshop, the participants developed a roadmap for the next 1.5 years of the Transatlantic Urban Climate Dialogue. Inspired by the lessons learned in Gelsenkirchen, each delegation developed a list of priority topic areas in which collaborative, positive conversations would have the most transformative impact on both continents. The list also included the most serious potential barriers or challenges the participants identified for CEP implementation in North America and Germany<sup>1</sup>.

The participants then voted and ranked the following six topic areas that they thought would help frame the discussions for the following workshops:



■ The **next workshop** of the Transatlantic Urban Climate Dialogue takes place on **May 2–4, 2012** in Northern Virginia.

<sup>1</sup> The complete list included: renovation of built environment, integrating industrial parks, advocacy and relations with other government levels, effective inter-municipal cooperation, engagement of businesses, developing municipal utilities (Stadtwerke), implementing projects within strategic frame, educating people on investment benefits, implementing “improvement districts” energy plans, examples of education and outreach tools, measurement and report of progress, examples of effective community plans/actions, Surveying citizens/effective listening, Financing and incentives that work, common elements of the “good” plans/actions, effective regional energy strategies, maximizing jobs and investment, problem areas to avoid/lessons learned, include larger C40 cities in process, evaluating local potential for renewables, evaluating local CHP potential, municipal/regional energy mapping, institutionalizing effective implementation, changing perceptions/encouraging acceptance, process to effectively prioritize implementation, implementing “Passivhaus” districts, role of municipal utility.

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# Transatlantic Urban Climate Dialogue

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