

Documentation

Catch-MR workshop in Berlin

14. – 16. March 2012

IÖW & InnoZ



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Abbreviations

PT	public transport
RE	renewable energy
WG	working group

1 Agenda

1.1 Wednesday, 14th March

12:00	ISC-Meeting (light lunch will be provided)
14:30	Hello to everybody (LP)
15:00	<p>Departure to Site Visit</p> <ul style="list-style-type: none"> • EUREF Campus (European Energy Forum), Torgauer Straße 11 – 15, 10829 Berlin • En route: Stopovers at <ul style="list-style-type: none"> ○ Berlin Central Station ○ "Efficiency House Plus – with Electromobility" ○ Südkreuz

1.2 Thursday, 15th March

09:30	<p>Official Welcome</p> <p>Tina Fischer, State Secretary, Plenipotentiary of the Land Brandenburg to the Federation</p> <p>Ephraim Gothe, State Secretary, Senate Department for Urban Development, Berlin</p>
10:00	<p>Block 1: Living without own car / how to change attitudes</p> <ul style="list-style-type: none"> • Results from the inventory • New Metromobility: Between routines and changes in behaviour and attitudes (Christian Maertins of mobile++) • Experiences from Vienna/Lower Austria (Gregory Telepak) • Experiences from Berlin-Brandenburg (Dr. Frank Wolter of InnoZ / BeMobility)
11:00	Coffee Break
11:30	World Café (small and changing working groups)
13:00	Lunch
14:00	Things to keep in mind from the World Café
14:15	Block 2: Renewable energies in public transport

	<ul style="list-style-type: none"> • Results from the inventory • Experiences from Oslo-Akershus (Halvor Jutulstad of Ruter) • Experiences from Gothenburg Region (Per Kristersson and Svante Sjöstedt) • Experiences from Berlin-Brandenburg (Dirk Polenz of BVG)
15:15	Coffee Break
15:30	Parallel working groups <ul style="list-style-type: none"> • WG 1: Focus on rail-based vehicles: experiences, achievements, barriers, stakeholders • WG 2: Focus on buses: experiences, achievements, barriers, stakeholders • WG 3: Focus on politics, finance and marketing
17:00	Results of the working groups
17:30	End of session

1.3 Friday, 16th March

09:30	Block 3: Renewable Energies in Metropolitan Regions <ul style="list-style-type: none"> • Results from the inventory • Regional Energy Partnership Berlin-Brandenburg and Vienna: Results from external expertise • The first hybrid power plant in Germany (Werner Diwald of ENERTRAG) • Integration of electricity and gas in Berlin-Brandenburg (Otto Berthold of GASAG)
10:30	Coffee Break
10:45	Moderated Panel discussion: one person from each Metropolitan Region <ul style="list-style-type: none"> • What can politics do to push the use of renewables in transport? • What about the costs? How to convince the general public? • Neighbourhood of Metropolis and Region: an advantage or irrelevant?
12:00	Outlook on Ljubljana Workshop
13:00	Lunch

2 Site visits

After an informal welcome in the state representation of Brandenburg the group started for the visit of the EUREF-Campus in Berlin-Schöneberg. Short stopovers were scheduled at Berlin Central Station, the Efficiency House Plus and Berlin South Cross Station.

2.1.1 Berlin Central Station

In the unified City of Berlin the concept for railway operations were reorganized, the so called mushroom concept was developed. The centerpiece of this concept is the new Central Station. The station now is one of the most modern in Europe and due to its remarkable architecture it has become a new landmark of Berlin.

2.1.2 Efficiency House Plus

At the end of 2010, Professor Werner Sobek and the Stuttgart University Institute for Lightweight Structures and Conceptual Design (ILEK) won the competition between universities in collaboration with engineering companies for the design of the project "Efficiency House Plus with Electric Mobility". This demonstration is financed by the Federal Ministry of Transport, Building and Urban Development, because buildings and transport together account for almost 70% of overall final energy consumption. The concept combines a plus energy house with electro mobility under the heading "My house is my filling station". The research project is constructed as a single-family house with around 130 square meters and serves as a "showcase" for innovative developments in building and vehicle technologies.

A very good insulation, an advanced ventilation and illumination concept (to avoid active cooling in summer), and efficient household appliances (like LED lighting) were chosen to result in a very low overall energy demand of 10.000 kWh/a. About 170 m² (22 kWp) of photovoltaic on the roof and in the façade produce electricity which is stored in a lithium ion buffer battery (40 kWh) which comprises second use former vehicle batteries from BMW. The annual electricity production is about 16.000 kWh/a, which is about 60% more than needed to cover electricity demand of all household appliances, ventilation, heating via a heat pump. The surplus of 6.000 kWh/a are enough to cover a projected driving performance of 29.000 km with different concepts of electro mobility incl. e-cars and e-bicycles. A smartphone application allows the inhabitants to choose when they want to make use of a vehicle and the mileage they plan to travel. Based on this information, the optimal charging strategy is applied. A quick-charge system can charge the batteries for a distance of 100 km within 30 min, and an inductive charging system can charge cars contact-free.

Since March 2012, a family of four is living in the building for one year, testing the whole building and different e-cars and bicycles. Consequently, it was not possible to visit the building from inside, but during the workshop the showroom with the charging station and information screens in the open but canopied entrance hall was visited.



2.1.3 Berlin South Cross Railway Station

South Cross is the most important railway station in the south of Berlin and part of the mushroom concept. In the future the importance of the station and its surroundings will increase due to its proximity to the new Berlin-Brandenburg International Airport.

2.1.4 EUREF-Campus

The idea of integrating transport and energy is demonstrated on the Campus of the European Energy Forum (EUREF) in Berlin that was visited by the workshop. Based on an area that was used for gas production in the 19th century a new urban business area is developed. To date five small wind turbines, three photovoltaic systems and a large-scale battery for energy storage have been installed. All new buildings follow the standards of the LEED-Gold, an international recognized certificate for "Leadership in energy and environmental design".

Since 2010 a so-called eMobility Platform has been in operation that is located on the EUREF campus. The eMobility Platform offers a first point of contact on topics that are concerned with energy, mobility and infrastructure and serves as central exhibition and testing ground. Main energy suppliers that participate in the project have installed a number of charging stations across Berlin that are open to the public and to car sharing members respectively. On the eMobility Platform there are about 20 stations that use different types of technology. The participants of the workshop took part in a guided tour of the platform and had the opportunity to test-drive electric cars and pedelecs.

Besides the intelligent linkage of electric mobility and public transport the further development of BeMobility is practicing the integration into a power grid. Therefore a wind measuring system has

been installed that connects the local wind turbines with the charging stations and an energy control room. All energy flows within the micro smart grid are controlled and technical energy management for the electric vehicle fleet and buildings are organized from this control room. In addition to electricity from the national grid locally produced renewable energy can now be used as power for the electric vehicles. During the site visit the workshop participants were able to explore and try different components of the smart grid.





3 Official Welcome

Tina Fischer, State Secretary and Plenipotentiary of the Land Brandenburg and **Ephraim Gothe**, State Secretary of the Department for Urban Development and the Environment of the Senate of Berlin, were welcoming the workshop participants. Both outlined the importance of the workshop and the great possibility to establish international networks and collaborations among the participants in order to exchange ideas and experiences for a more sustainable transportation system.

4 Block 1: Living without own car / how to change attitudes

4.1 Presentations

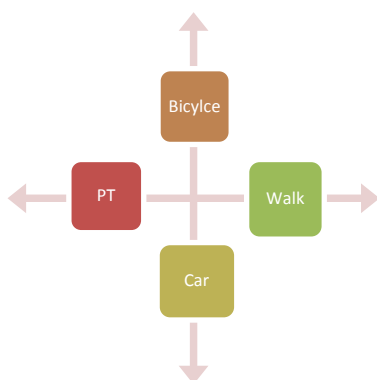
- Results from the inventory (Anna Neumann, IÖW)
- New Metromobility: Between routines and changes in behaviour and attitudes (Christian Maertins of mobile++)
- Experiences from Vienna/Lower Austria (Gregory Telepak)
- Experiences from Berlin-Brandenburg (Dr. Frank Wolter of InnoZ / BeMobility)

4.2 World Café

Round 1: Life without a car or with a “clean” car – how could that be possible? Which mobility concepts or technologies do you imagine to be suitable for this vision?

In the first round of the World Café, the topics were the conditions and concepts for a life without a car or a life with a clean car. **Concepts** that were deemed to be worthy in the discussions are car

sharing (“international car sharing card”), carpooling / common car use, green cars, electric scooters and bikes and the combination of public transport and electric cars (last mile). Children were named as an important target group that might be reached by pedibus / walking bus concepts. Regarding alternatives, they have to be as easy to use as possible to be accepted broadly. Public transport was regarded to be the backbone of the transport system in several groups, being part of a network solution including other modes of transport.



Among other things, the **conditions** discussed can be divided in energy related aspects, local conditions (space and infrastructure) and policies.

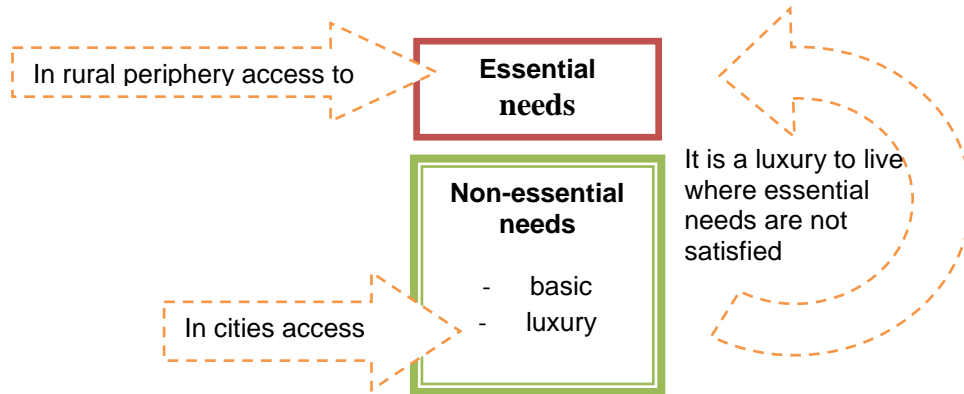
- Regarding energy, especially the source of energy was a topic in the discussions and it was stated, that the source of energy has to be renewable and at the same time should not cause negative impacts on others. Other relevant aspects were related to the storage and efficient conversion of energy from renewable sources.
- Space and infrastructure are other factors influencing mainly the possibility to live without a car. The main point is that everything has to be close by and/or there has to exist an affordable and comfortable public transport system. This aspect is closely related to density and land use planning. Another spatial issue is the use of public space. Participants stated that public space might better be used for car sharing stations than as cheap parking lots for private cars.
- Policies can support the process by restricting car use or give disincentives for private cars (e.g. rising the price of fossil fuels, speed limits in cities) or promoting clean cars (e.g. tax reductions for electric cars).

Round 2: What are the limitations of the concepts and technologies you identified before? Are there even ecological or social risks (e. g. rebound effects like an overall higher energy demand or social exclusion of certain societal groups)?

Round 2 dealt with the limitations and risks of the concepts discussed in round 1. There are some general **limitations** like the missing alternatives to private cars especially in rural areas. Furthermore there are cost limitations due to higher costs of clean cars. This raises the question “Who will finance the development and be the first customer?” Moreover limitations concern individuals and their opinions and believe. New mobility concepts thus could restrict individual opportunities and everyday life organization. The discomfort of having to think about mobility was also mentioned.

The **risks** discussed can be separated in ecological and social risks. Regarding ecological risks, it was mentioned that electrical vehicles must not become a substitute for bicycling/ walking as well

as car sharing should not substitute public transport. It was pointed out that it is not useful to develop alternatives to public transport in densely populated areas. At the same time, social risks exist especially for the people in rural areas who might have problems to organize their life without a car. Furthermore exclusion could rise if clean cars are subsidized instead of public transport.

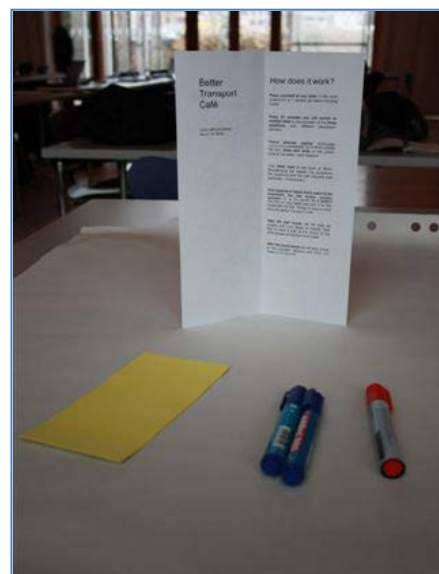
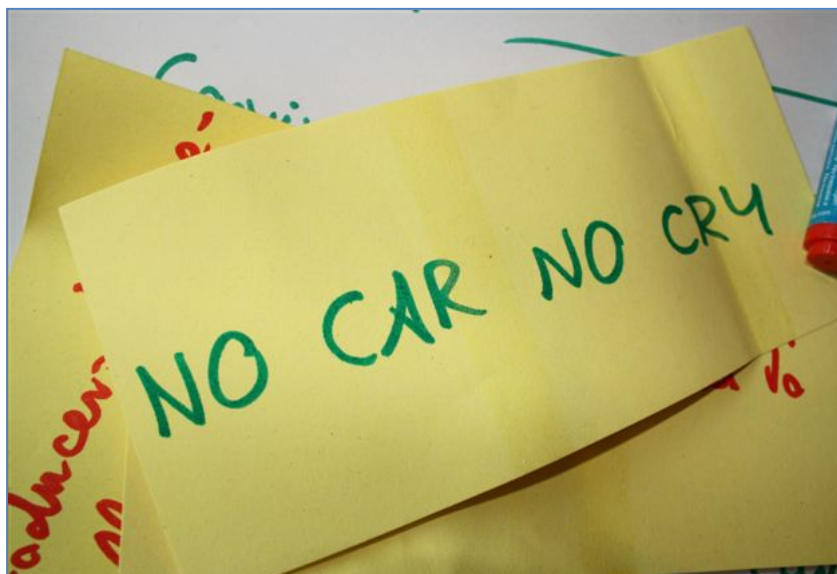


Round 3: How could your region support the switch to a life without an individual car or to a higher deployment of renewable energy technologies in motorized individual transport? What could convince you as well as your car-loving neighbor of such a shift?

Round 3 dealt with possibilities of the metropolitan regions to support alternative concepts and convince consumers. **Measures** by the regions can include the improvement of the infrastructure (e.g. attractive public transport and combined tariff, more charging points for e-car-sharing, more bike-lanes, information systems for alternatives), financial advantages for the use of clean cars or no car, restrictions (e.g. pressure on car manufactures, environmental zone in Berlin, charges for the use of public space as a parking lot), land use planning ("Plan cities for a life without a car.") or educational measures aiming at changing the behavior (e.g. address young people or involve new groups).

Participants developed furthermore some **catchphrases** to convince consumers to shift their mobility behavior, such as:

- "No car, no cry!"
- "Don't consume your and your kids' life!".
- "You'll live more!"
- "Less egoistic way of life!"



5 Block 2: Renewable energies in public transport

5.1 Presentations

- Results from the inventory (Mark Bost, IÖW)
- Experiences from Oslo-Akershus (Halvor Jutulstad of Ruter)
- Experiences from Gothenburg Region (Per Kristersson and Svante Sjöstedt)
- Experiences from Berlin-Brandenburg (Dirk Polenz of BVG)

5.2 Parallel working groups

5.2.1 WG 1: Renewable energies in rail-based public transport

In the first working group, the participants discussed the possibilities of using renewable energies in public transport.

At first, participants exchanged information on the **current use of renewable energies in public transport** in their respective metropolitan regions. An important point of the discussion was that in many regions the share of power from renewable sources corresponds with the national electricity mix. At the same time many countries with high production of renewable energies (e. g. Norway, Austria) export their renewable electricity and import fossil power (if necessary). In this case, the national mix contains less renewable energies in reality than assumed, comparing power production and need. This effect also occurs when a significant amount of green electricity is bought by consumers. Therefore, the expansion of renewable power production is regarded to be highly important.

Some participants believed that **additionally bought renewable electricity** and a therefore higher demand could create a higher production. A practical example regarding public transport in Germany was the possibility for customers to pay additional charges for green electricity for their rail journey. On the basis of this example a discussion arose, if shifting responsibility for green transport from company to consumer was rightfully.

In an example from Berlin-Brandenburg, rising prices for green energy was not **accepted** by the customers of public transport in a survey. But many participants believed that such measures should be possible with a proper political communication. In the opinion of the majority of the members of the working group, acceptance of renewable energies could be increased with the argument of value and job creation and if the energy would be used regionally. Limiting the use of renewable in public transport is its **invisibility**.

Some participants argued that of highest importance is the **shift from car to train**. Although using trains is usually considered to be environmentally friendly, there are some situations where other solutions might be favorable, e. g. scarcely populated areas in Eastern Germany. Due to the low capacity utilization trains can be less environmentally friendly than cars in those areas.

The participant from the Budapest region argued that **other problems** in public transport are of higher importance; therefore use of renewable energies in public transport is a question for the future in this region. Other members of the working group shared the opinion that other possibilities to reduce the greenhouse gas emissions of public transport (e. g. infrastructure, efficiency, shift to public transport etc.) are often more important. Overall, a system change was regarded to be crucial.

5.2.2 WG 2: Renewable energies in public busses

The focus in the partner regions concerning busses is rather not on RE, but on **efficient busses and the reduction of noise and direct pollutions**. Alternative propulsion systems have ad-

vantages regarding those aspects, and can but do not have to, use RE. For example in Gothenburg CNG-busses were introduced on the basis of natural gas, but already with the goal to switch to biogas in the future.

Important **promotional factors** for the introduction of alternative propulsion systems as hybrid busses, hydrogen, electric and gas (CNG) are air quality standards, mitigation goals (GHG-reduction) and the reduction of noise and air pollution (especially in city centers), as there are complaints from citizens. From the point of view of the regions the factors can be divided in internal and external factors, the latter being e.g. raising fuel prices, European or national goals and obligations. In some regions a further internal promotional factor is the local presence of car manufacturing companies willing to cooperate.

The higher **costs** of the busses compared to a diesel bus are an important barrier. This is especially the case for Budapest, where the whole fleet is old (average 16 years) and need a renewal over the next years. In Oslo and Gothenburg costs are not regarded as so important for two reasons: First, till now not the whole fleet has been changed, but rather pilot projects have been conducted which are easier to finance. And second, public transport in both regions is financed by congestion charges. Thus there is no need to raise fares or get more money from politicians. In other regions, low fares are regarded to be crucial as shifting towards public transport is the central aim (e.g. Rome). From the point of view of poorer cities it is important, that those with more money test the different systems in pilot projects and that they are improved over the next years (including a reduction of prices). Subsequently, other regions can introduce the **successfully tested, affordable bus systems**.

Concerning costs, however, it also was mentioned that **busses are much cheaper than other forms of public transport** (subway, tramways ...). Furthermore, busses have advantages when deployed flexibly (e.g. feeder busses versus fast tracks) as they can be bone or supplement of public transport grids. A change in transport policies towards different modes of public transport thus has taken place over the past years: Concerning new lines priorities shifted from subways and tramways towards bus(ways). Still, the image of buses often is a problem as they are considered to be slower and unattractive. Marketing and information on the advantages of buses thus may be needed to gain support for the extension of bus systems.

In addition, there are **special obstacles** for the introduction of some alternative busses. For example, in a part of Budapest's city centre a weight limit for busses exists. This would be exceeded by electric busses due to the weight of the battery.

Regarding the **different technologies**, pros and cons were discussed. Trolley busses were considered to be one possible solution where they already exist (e.g. Budapest). To build up new nets thus is too expensive. Electric busses using a battery are still quite heavy and not suitable for wide-range usage and the charging times are still a problem. However, using high speed charging could in the near future make electro-busses more suitable for bus lines. And small electric busses already are successfully in operation in special niches, e.g. in the city centre of Rome.

Concerning **RE**, the energy production was named to be a crucial factor. E.g. biogas from waste and gasification of biomass can be used for transport, but also for other gas-based appliances (heating and CHP). In Oslo/Akershus no distribution-grid for natural gas exists as heating is mainly

based on electric power, therefore there is no such competition. In Berlin/Brandenburg region, the main question is how to use the regionally produced RE in the transport sector as it mainly consists of wind energy which has a high fluctuation. Therefore, the main problem is storage. Possible solutions thus are wind gas, hydrogen from wind or electric busses with batteries.

5.2.3 WG 3: Focus on politics, finance and marketing

In working group 3, questions concerning politics, finance, and marketing have been discussed. The first two questions were closely connected and concerned the **options for policymakers** to boost the expansion of the use of renewable energy in public transport as well as **instruments** to do so. The participants agreed that **idealism** plays a big role when discussing this issue. The **image** of political parties or politicians could be strongly influenced by their commitment of expanding the use of renewable energies and thus become a driving force in this debate. However, it is necessary that they are convinced that RE is important in the public transport sector.

Since the integration of fluctuating RE (esp. photovoltaics and wind power) in public transport is a complex issue concerning also general problems of high shares of RE in the energy system, an **integrated approach** seems to be necessary. Hence, politicians should facilitate a broad dialogue between the energy sector and the transportation sector. Apart from that, politicians should try to **raise awareness** for the importance of RE in public transport and draw the focus to the individual perspective so that everybody is reflecting about the question “What can I do?”

During the discussion, a couple of **instruments** were identified which might be helpful to implement these options. Legal measures have proven to be quite efficient but radical measures are generally quite unpopular (e.g. second/third car must be an e-car). **Subsidies** can also be helpful to implement a sustainable transport system but need to be financed. This could be achieved by **making conventional transportation more expensive** and thus less attractive (e.g. through toll ring for cars and car parking regulations in the city center) and use the revenues to subsidize RE in public transport. Experiences from Oslo and Gothenburg show that a constant **monitoring and a transparent distribution of the revenues** for a sustainable transportation system can help to increase the public acceptance for these measures. Further examples to raise **public awareness and acceptance** are:

- Results of investment into public transportation should be very visible for citizens in order to raise awareness.
- Young people are most susceptible for awareness campaigns, behavioral change, and idealism. Hence, the importance of RE in PT should be emphasized in school.
- Several campaigns with vehicles that have been labeled for their eco-friendliness (butterflies on buses in Oslo, educational advertising like “Sitting in this bus saves XX CO2 – why are you still sitting in your car?!”, ...)
- Helsinki: Routing planner with indication of calories lost when walking a specific distance → importance of marketing strategies that include some kind of “gaming”.
- In Budapest famous actors announce stops on buses and trams .
- Outlining the positive image of a sustainable public transport system (people also spend more for an efficient refrigerator – why not for RE in PT?)

The discussion had also a focus on the **restrictions** limiting local decision makers to boost the share of RE in PT. A general problem is that many politicians are focusing on their short legislative period and are anxious to lose votes by measures which are believed to be unpopular (e.g. toll rings...). Hence, there is often a lack of continuity which must be compensated in the administrative offices. Furthermore, ecology has generally a much lower priority than economic issues and in many countries PT is regarded as a public good which has to be cheap. Moreover, there is a very strong “fossil lobby” counteracting a boost of RE.

The working group did also discuss if RE in PT might create an added value. Most participants believe that this added value is mainly of psychological nature (a “feeling good” because of responsibility for future generations. This underlines the importance of awareness campaigns mentioned above. Lower emissions of CO₂ and air pollutants are also of importance. Apart from that, the regional production of RE opens the possibility that more people in a wider distribution could participate in the production chain than in the centralized conventional energy sector.



6 Block 3: Renewable energies in metropolitan regions

6.1 Presentations

- Results from the inventory
- Regional Energy Partnership Berlin-Brandenburg and Vienna: Results from external expertise
- The first hybrid power plant in Germany (Werner Diwald of ENERTRAG)
- Integration of electricity and gas in Berlin-Brandenburg (Otto Berthold of GASAG)

Discussion

After the presentations, Frank Segebade asked if the origin of the energy is of any importance. Another question asked concerned the costs of cars powered by CNG.

Mr. Berthold stated that GASAG is a regionally rooted company, hence focusing on projects and investments in the region at the moment. On the other hand, solar power is more efficient in southern Europe. GASAG has no clear opinion on that question and is currently thinking about investing in Greece as well. Concerning the costs of CNG cars Mr. Berthold explained that in Germany, CNG and diesel cars cost about the same. But Biogas is about two to three times more expensive than CNG from Russia.

Mr. Diwald said that the national energy security is quite important. Therefore, it makes sense to produce close to the big cities. Projects like Desertec need a lot of infrastructure, which needs public acceptance.

6.2 Moderated panel discussion

The international workshop ended with a panel discussion in which one person from each metropolitan region was participating. The panel consisted of Matej Gabrovec (Ljubljana), László Sándor Kerényi (Budapest), Helge Jensen (Oslo / Åkershus), Kurt Mittringer (Vienna / Lower Austria), Dario Esposito (Rome), Per Kristersson (Gothenburg), Christina Schlawe (Berlin-Brandenburg) and Julika Weiß (chair, IÖW Berlin).

The discussion started with a brief **review of the current situation** concerning RE in the transportation sector in the different regions. In *Ljubljana*, neither trams nor underground do exist. The share of RE in the electricity production is about 30 % (mainly from hydro power), but no RE is used specifically in the transport sector. Hence, there is a general need to electrify the tracks which are usually run by diesel trains if RE in PT shall be increased. In *Rome*, biogas is produced from waste for usage in regional buses. There are plans to escalate this project. Furthermore, photovoltaics will increase the share of RE of Rome's electricity production. There are also plans for charging points in the city, but there is also a lack of coordination between city and region. *Budapest* has a very old bus fleet. There are plans to replace these old buses, but alternative propulsion

systems do not play a big role in these plans. In *Vienna*, CNG powered buses turned out to be quite expensive and might therefore be replaced. Lower Austria produces wind power and hydro power from the Danube River. There is potential for more hydro power, but its exploitation is complicated because the water belongs to the state. There is also some geothermal energy but this is not easy to use for transport. The use of wind energy is quite limited within Vienna – there are about six huge wind turbines and some small wind turbines. In contrast to that, Burgenland and Lower Austria are almost autarkic using wind power. This situation is quite comparable with *Berlin/Brandenburg*. Brandenburg has huge capacities of wind power which should further increase. There are already many discussions about the public acceptance of huge wind turbines. Communication and involvement of the population turns out to be quite important. Positive experiences were made with so-called “citizen wind power plants” which are owned by local population. Hence, the people are participating on the revenues/ subsidies and are able to influence the location of wind turbines. In *Gothenburg*, the general discussion is focused with the broader sense that somehow, energy has to be produced, distributed and consumed. The higher price of biogas compared to CNG is recognized as a short term view. Hence, the use of biogas and the necessary infrastructure is expanded despite high costs. In *Oslo/Norway*, a general lack of awareness concerning energy saving can be observed, because people are used to have 100 % cheap RE from hydro power. The usage should be much more efficient, so that more electricity can be exported.

The second part of the panel discussion had a focus on the **stakeholders** which are responsible for the regional energy strategies. The participants from *Budapest* did not yet identify the responsible bodies/ agencies. They bewailed that politicians view energy or fossil resources as a „heritage from the past” which is just there and that only some parts of the industry are sensitive for the topic. In *Austria*, national action plans are developed by the federal states. Ministries are financing research and collaborations. Metropolitan regions like Vienna are also acting very responsible. For example, Vienna is developing a smart city project with assistance from the industry (e.g. Siemens). *Italy* has also a renewable action plan at national level, including incentives for electric and CNG vehicles. On the other hand, there is a general lack of communication between stakeholders which results in an ongoing fore-/backwards. The speaker from Oslo outlined the importance of EU-wide plans for RE and energy security. In *Germany*, the energy policy has recently been changed at the national level (nuclear power phase-out). Despite the high share of RE in Brandenburg, brown coal companies have a strong position due to high employment rates. Decision makers come mainly from economic ministries rather than environmental institutions, but it seems to be important to integrate all stakeholders. In *Gothenburg* city and region are working strategically together to achieve the goal of 10 % RE in transport by 2015.

The session was closed by summarizing the most important/ interesting **lessons learned** from this workshop. Many participants appreciated the vast input especially concerning grid and system thinking and the many examples of different technologies and ideas. Among technological issues like smart grids, energy storage, and windgas, the importance of behavioral change, public awareness and acceptance, and the integration of all stakeholders were outlined by the participants of the discussion. Apart from that, the site visits were also emphasized as a positive and blithful experience.

