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Green Growth  
in Brandenburg: An Analysis  
of the Regional Growth Core  
Schönefelder Kreuz

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# **Green Growth in Brandenburg: An analysis of the regional growth core Schönefelder Kreuz**

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## *Preface*

The transition towards a green economy is a key factor for growth and prosperity in the German federal state of Brandenburg. Future living conditions will be determined by the course set now. We have to decide today how we want to live tomorrow, not only in economic terms, but also with regard to environmental stewardship. I am convinced that there is no alternative to a green transition when it comes to shaping the world to be a place worth living in. There are issues we have to deal with, but first and foremost there are great opportunities to seize. The relevant players in Brandenburg are aware of complex challenges resulting from the present transitional process. They are redoubling their efforts to promote further economic development towards sustainability. This study presents the green growth path of the regional growth core (RGC) Schönefelder Kreuz.

In 2004, Brandenburg reassessed its funding policy in order to adapt to emerging challenges. Prioritised funding to 15 regional growth cores was established shortly afterwards. This modern concept should, and will, be continued due to its success. One of the funded RGCs is the Schönefelder Kreuz, situated in the heart of the German capital region. Situated only 20 kilometres from Berlin and 70 kilometres from Poland, Schönefelder Kreuz offers access to both national and international business regions. Around 100 000 people live here. Leading global companies are based in the region as well as scientific institutes and a variety of small and medium-sized enterprises. Many of them pursue innovative approaches, thus driving technological progress. The forthcoming Berlin-Brandenburg International Airport (BER) will be a core infrastructural element, highly relevant far beyond the capital region. Innovative design means BER meets Brandenburg's Energy Strategy aiming at a climate-friendly, economically advantageous, reliable and socially acceptable energy supply. Being an economic booster and a green opportunity, it is a great chance for our future.

This analysis of green growth in Schönefelder Kreuz is a valuable tool for all stakeholders committed to regional development. It provides useful information on the current situation as well as the pathways to further improvements. I gratefully acknowledge the OECD LEED's dedication and experience in assessing the challenges of green growth we face. I am sure that this study will gain a wide readership and acceptance among those dealing with this matter, which is of the utmost importance for our futures.



Dr. Dietmar Woidke  
State Prime Minister  
Federal State of Brandenburg

## Acknowledgements

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## Executive summary

Green growth is an ambition and challenge for many local areas and regions. The ambition comes from the desire to act on climate change and take advantage of positive external environmental and economic factors that can flow from these activities. The challenge lies in managing policy action on climate change in a time of competing policy demands, including the impacts of economic downturns and unemployment and demographic change.

The impacts of climate change and activities to reduce carbon emissions are as evident at local levels as they are at national or global levels. However, to date, much of the attention on understanding these impacts and customising policy to balance negative impacts has taken place at the national or sector level. This project examines the impacts and activities at the local level; the policy recommendations that flow from this analysis are also targeted at the community and regional level.

This report is one of five studies of different local areas and their pathway to green growth. Each study has as its unit of analysis a local area within a specific national and industrial context and therefore the research results are specific to those areas. In the case of this report, the unit of analysis is the Schönefelder Kreuz region on the outskirts of Berlin. This region includes the site of the new combined Berlin airport: BER Berlin Brandenburg Airport.

In selecting each of these areas, typologies of different regions were also considered. The typology explored in this report is how regions with carbon-intensive assets which can have dramatic effects on employment and economic development as well as environmental impacts, such as increased emissions and pollution, can manage the transition to green growth. In examining this region in detail, this report provides an understanding of how the economic and employment development of this region can support both low-carbon transition and growth, and by example provide guidance to other regions that also face a similar mix of carbon-intensity assets and low-carbon growth ambitions.

### The aviation challenge

Globally, transport emissions account for 22% of total emissions (IEA, 2012), the majority of which is taken up by road transport, but aviation emissions are also increasing at a rapid pace. The aviation industry has, however, had a strong focus on increasing carbon efficiency within the sector. From 1997 to 2012, international passenger traffic volumes rose by 96% and cargo volumes by 82%, but in the same time period carbon emissions only rose by approximately 27% (DB Research, 2013).

This progress within the aviation industry highlights the complex interactions between “green” activities in carbon-intensive industries. In these situations, economic and employment development from carbon-intensive industries and assets can be seen as

double-edged – they achieve employment and economic activity but contribute to increases in carbon emissions.

### Airports as magnets for economic and employment growth

The growth of aviation services has been credited with increasing globalisation and regional development. Airports are a critical component of the connectivity of people and places and make important contributions to regional economic development (Florida et al., 2012).

Airports have important development potential, as they are assets that can attract other types of economic activity, for example retail, accommodation and tourism. Also, because airports operate within a network of other airports, those designated as hubs are able to attract denser economic activities including engineering and servicing activities, allied and supplier services, research and development activities, and training and skills development activities. Hub airports are also essential connection points for cities within the global economy (Neal, 2012).

The Schönefelder Kreuz region already supports a vibrant aviation cluster of small and medium-sized firms (SMEs). For example, the Aerospace Technology Centre in Wildau continues to expand as do companies such as Fraunhofer, AneCom, the FTI Group or the Berlin Brandenburg Aerospace Technology PLC (BBAT). The region also provides an ideal environment for further entrepreneurship in this sector.

This pursuit of the connection between economics and ecology is not just a German, or even purely Brandenburg, problem. Instead, we are dealing with a global problem, which concerns highly industrialised countries just as much as it does newly industrialised ones. This is where the dashboard analysis, developed as part of this project, offers a balanced viewpoint of these economic and environmental aspects.

### The Schönefelder Kreuz dashboard

To analyse the data collected against the *Local Indicators for Green Growth* indicator framework and to provide a point of comparison across the five case-study regions within the whole project, a “dashboard” data visualisation tool was developed. The dashboard takes the indicators one step further and helps to summarise and communicate the information. The dashboard tool splits indicators into two categories: *i*) environmental and resource efficiency; and *ii*) economic opportunities.

The results of the exercise for Schönefelder Kreuz can be summarised as follows:

**Environmental and resource productivity:** The per capita carbon emissions of the federal state of Brandenburg, in which the Schönefelder Kreuz region is located, are well above the national and OECD averages. This is a legacy issue, with large concentrations of carbon-intensive industries in power generation, heavy manufacturing and aviation located in the area. In other areas of resource efficiency, including municipal waste and recycling, the state of Brandenburg performs better per capita than German and OECD averages.

**Economic opportunities:** Schönefelder Kreuz performs better than the OECD average on R&D expenditure and employment and all patents including green patents. Germany as a nation performs very well compared with the OECD average.

Figure 0.1. Schönefelder Kreuz dashboard



To further assess the progress of policy responses for supporting a low-carbon economy and green skills and training, a small survey of local stakeholders (representing government, business, trade unions, higher education institutions, etc.) was also carried out.

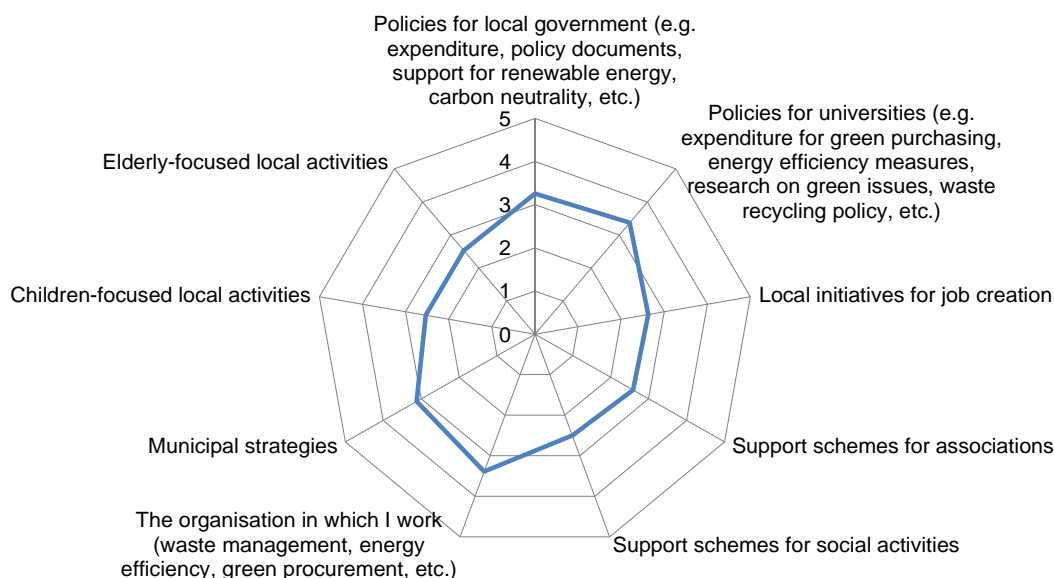
The local policy assessment and skills ecosystem were based upon a short questionnaire submitted to local policy and training stakeholders. These stakeholders were asked to assess the progress of various policy and skills development mechanisms in encouraging local transitions to a low-carbon economy.

The results for each of these two variables are shown in Figures 0.2 and 0.3. The scores for each of the indices represent the average answers on a five-point scale. These results are subjective, but together with the other elements of the indicator framework, can offer a richer picture of the current state of local transitions. If these questionnaires are conducted at frequent intervals, progress in transition will also be evident.

**Policy responses:** Schönefelder Kreuz can progress further. The survey shows that workplaces are seen as having the strongest greening influence. Local government policies and policies for universities also have a higher degree of “greening” than policies for municipalities, job creation initiatives, and support schemes for social assistance, including for the elderly population.

**Green skills ecosystem:** Schönefelder Kreuz’s green skills ecosystem is the strongest in its universities and technical colleges and inter-relationships (industry-science partnerships). In total, there is little variation across the entire skills ecosystem in terms of stakeholders’ perceptions of greening, with all institutions averaging a score of around three.

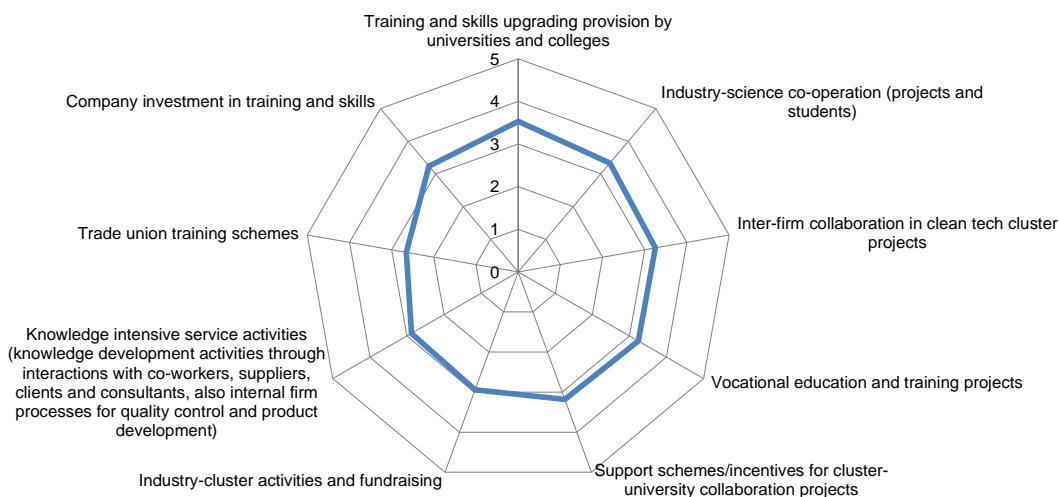
Figure 0.2. **Greening policy index**



Note: Out of a total of 19 responses.

Source: Schönefelder Kreuz survey.

Figure 0.3. **Skills ecosystem for Schönefelder Kreuz**



Note: Out of a total of 18 responses.

Source: Schönefelder Kreuz survey.

## Policy recommendations

This report examines the green growth trajectory of the Schönefelder Kreuz regional growth core. This area has a history of heavy manufacturing, power generation and aviation. This industrial background means there are a number of carbon-intensive industries in the region. The region also has natural assets in the form of national parks, waterways and green spaces, and other socio-economic assets such as educational institutions and technical colleges. In recent years, the region has put forward an ambitious plan to decarbonise its electricity supply. Energy 2030 aims to increase the percentage of the energy supply from renewable sources.

### *Developing Berlin’s green airport*

In recent years, economic development in the Schönefelder Kreuz region has been supported using the “regional growth core” (RGC) model to focus policy attention and associated funding on selected sectors. The RGC has plans for specific projects and measures including infrastructure development, the development of industrial estates, support for skilled personnel and the promotion of technology transfer as well as projects in the fields of culture and tourism.

The policy of prioritising funding for economic development in the RGC is sound, as positive results of similar “cluster” developments are evidenced in many other regions. Constantly increasing performance expectations for the RGCs, and regularly reviewing both the current and near-future economic opportunities as well as the RGC’s capacity to react to these opportunities, will ensure the longevity of the policy.

The aviation industry has made significant progress increasing in the carbon efficiency of the sector, even though there has been rapid sector growth. In this sense, there is opportunity for green growth in the continued research, development and implementation of innovations that increase the fuel efficiency of aviation.

#### Recommendation 1

Develop and communicate future strategy for the Schönefelder Kreuz RGC that includes long-term strategic plans for support to industrial concentrations and define success measures and evaluation criteria for the carbon efficiency of airport industries.

Co-ordination between relevant stakeholders in these planning and implementation processes and within regions can be *ad hoc* if one organisation or group of organisations has the responsibility, authority and resources to engage stakeholders in strategic planning and implementation processes. Institutional and regional boundaries rarely match-up and a pragmatic approach must be developed. One of the first tasks of such a process of stakeholder engagement could be the dissemination of research results from this project and the creation of an action plan to guide further work.

#### Recommendation 2

Formalise and support stakeholder engagement through the levels of government that support the RGC industrial agenda and greening of activities.

Within the RGC it is important to facilitate the entry of private as well as public investment, particularly in the areas of research and development of technology and service activities in the aviation and advanced manufacturing sectors. Growth finance constraints and issues of access to finance are constantly highlighted in economic development efforts worldwide as a major restraint to the growth of small and medium-sized firms, which make up the majority of businesses in most economies.

### Recommendation 3

Develop knowledge of the financial constraints of the SMEs within the region and define how public action can facilitate increased private sector investment and access to finance in these sectors within the Schönefelder Kreuz region.

#### *Fostering employment growth*

The airport will bring new employment in the operation of the airport itself and in all of the associated services that will support the airport, from retail and accommodation to food processing and security. Many of the jobs will be casual and/or require low skill levels, which makes employees vulnerable to economic changes. This can be detrimental to the sustainable labour force participation of these workers if they are not also matched with opportunities for skills development and labour force mobility. The development of green skills is of particular importance to support the transition to a low-carbon economy in the region.

### Recommendation 4

Ensure that educational and training institutions are able to deliver the skills development that meets the needs of industry and provides labour force mobility. Green skills development needs to be supported by specific action plans and embedded in the training curriculum at both public and private sector level.

### Recommendation 5

Support innovative strategies that enable labour force mobility between firms and across occupational classifications through flexible training and skills acquisition. Focus on transferrable skills development such problem solving and management and communication skills.

#### *Making sure the benefits outweigh the costs*

The new airport has negative impacts for the region, including environmental issues from pollution (including air and noise pollution), congestion, and industrial development causing the loss of green spaces. The airport project provides a window of opportunity for the local region to negotiate trade-offs to these downsides. The airport creates a special circumstance that is not normally available.

Environmental monitoring, and the public reporting and communication of the results of this monitoring, is essential to assure local populations that any negative impacts are kept within acceptable boundaries. The dashboard analysis and discussion in Chapter 3

show that investments in environmental monitoring and communication are in place but this support will need to be revised and updated as the airport increases traffic and presence in the region.

### Recommendation 6

Continue to resource monitoring and communicating environmental quality measures. Advise city councils in the region on how to monitor these measures as part of their strategic approach to the transition to a low-carbon economy. The Schönefelder Kreuz regional growth core can be an example of how this monitoring should be used at the local level for strategic policy development.

The research presented in this report, including the dashboard report of the green growth indicators, shows the analysis that is possible at the local level. This information is vital for setting policy, tracking the success of implemented policy through to outcomes and reporting these outcomes to local residents. The levels of investment associated with the activities of the RGC and the airport are significant, and therefore equally significant attempts should be made to ascertain the effectiveness or otherwise of measures seeking to make positive economic, employment or environmental impacts.

Green growth indicators are currently an emerging field, but as the importance of the sectors and technologies associated with them grow, we will be able to track the progress and industrial competitiveness of such activities. As local, national and international dynamics will operate for green growth, particularly in the labour market, data and information at the local level to understand and manage the transition will be as important as at the higher levels of aggregation.

### Recommendation 7

Resource detailed statistical data linked to an agreed indicator framework for each municipality that is proximate to the airport and at the regional growth core Schönefelder Kreuz level.

Trade-offs that the region can make for accepting higher emissions may include greater investments in protecting the environment, sustainable land use, greener management of public resources, more parks and natural reserves – despite the big physical transformation accompanied by a large airport project. The very vulnerability of local communities may turn into an asset and leverage for long-term benefits (10-20 years ahead).

Examples of possible long-term benefits are Sydney and Barcelona. Mainly because of the Olympics in both cities, parts of the cities underwent great changes. Industrial wasteland was changed into Olympic venues, new houses or apartments. Barcelona was able to negotiate great improvements for a beach near the airport, which became a popular and novel attraction.

However, the strength of this negotiating position requires a shared understanding of the types and level of trade-offs that are acceptable. To arrive at a shared position requires engaged, representative and knowledgeable stakeholders to come to agreement and advocate for this position. Recommendation 8 speaks directly to this requirement.



### Recommendation 8

Prioritise and support low-carbon community assets as part of the trade-off for future developments at the airport.

### Summary of policy recommendations

**Recommendation 1:** Develop and communicate future strategy for the Schönefelder Kreuz RGC that includes long-term strategic plans for support to industrial concentrations and define success measures and evaluation criteria for the carbon efficiency of airport industries.

**Recommendation 2:** Formalise and support stakeholder engagement through the levels of government that support the RGC industrial agenda and greening of activities.

**Recommendation 3:** Develop knowledge of the financial constraints of the SMEs within the region and define how public action can facilitate increased private sector investment and access to finance in these sectors within the Schönefelder Kreuz region.

**Recommendation 4:** Ensure that educational and training institutions are able to deliver the skills development that meets the needs of industry and provides labour force mobility. Green skills development needs to be supported by specific action plans and embedded in the training curriculum at both public and private sector level.

**Recommendation 5:** Support innovative strategies that enable labour force mobility between firms and across occupational classifications through flexible training and skills acquisition. Focus on transferrable skills development such problem solving and management and communication skills.

**Recommendation 6:** Continue to resource monitoring and communicating environmental quality measures. Advise city councils in the region on how to monitor these measures as part of their strategic approach to the transition to a low-carbon economy. The Schönefelder Kreuz regional growth core can be an example of how this monitoring should be used at the local level for strategic policy development.

**Recommendation 7:** Resource detailed statistical data linked to an agreed indicator framework for each municipality that is proximate to the airport and at the regional growth core Schönefelder Kreuz level.

**Recommendation 8:** Prioritise and support low-carbon community assets as part of the trade-off for future developments at the airport.

## *Chapter 1*

### **Towards local transition to low-carbon growth**

*The current challenge of the transition to a low-carbon economy is occurring simultaneously with economic and employment crises in many OECD countries. All economies are seeking to create the ideal balance between employment growth; particularly “good” employment that provides people with a sustainable means of workforce participation whilst also supplying industrial sectors with increasing demand for knowledge-intensive skills. This chapter sets out the context for green growth in Schönefelder Kreuz within the international environment.*

## The green transition and its challenges

The pressure to decarbonise our economies and production systems is growing, and there is increasing need for policy attention to accelerate the industrial transition required to achieve the levels of emissions reduction required to avoid dangerous climate change. The challenge of the green transition for policy attention is also being matched by other short- and long-term policy challenges. The economic recessions and continuing high levels of unemployment in many OECD member countries are stretching public resources. Demographic trends, such as an ageing population, are also affecting labour markets.

Two recent OECD reports (OECD, 2012a; 2012b) highlight the expected impacts of these fundamental demographic and economic changes over the coming four decades to 2050:

- An additional 2 billion people will need to be accommodated, with rising living standards across all countries and a quadrupling of global GDP.
- Increasing life expectancy will mean an ageing population for some countries, while for other countries, particularly developing ones, young populations and workforces will be a competitive advantage.
- The majority (70%) of people will be living in cities by 2050, offering resource efficiency opportunities but also placing greater emphasis on the need for solutions to air pollution, traffic congestion and the management of water, waste and energy in urban environments.

The growth of carbon emissions at the global scale continues, although there is significant regional variation. In Annex 1<sup>1</sup> to the UN Framework Convention on Climate Change countries, annual emissions in 2010 were collectively 3.7% below 1990 levels, with Kyoto Protocol countries<sup>2</sup> collectively at 12.4% below 1990 levels (IEA, 2012). However, in absolute terms, global emissions are increasing as growth in emissions from non-Annex 1 countries outpaces the rate of decline in other countries. Non-Annex 1 countries now account for 54% of global emissions (IEA, 2012).

### *The aviation challenge*

Globally, transport emissions account for 22% of total emissions (IEA, 2012), the majority of which is taken up by road transport, but aviation emissions are also increasing at a rapid pace. International aviation bunkers<sup>3</sup> emissions grew by 6.7% between 2009 and 2010, and by 2012 had increased by 78.3% from 1990 levels (IEA, 2012).

The aviation industry has, however, had a strong focus on increasing carbon efficiency within the sector. From 1997 to 2012, international passenger traffic volumes rose by 96% and cargo volumes by 82%, but in the same time period carbon emissions only rose by approximately 27% (DB Research, 2013). This progress within the aviation industry highlights the complex interactions between “green” activities in carbon-intensive industries. In these situations, economic and employment development from carbon-intensive industries and assets can be seen as double-edged – they achieve employment and economic activity but contribute to increases in carbon emissions.

### ***Airports as magnets for economic and employment growth***

The growth of aviation services has been credited with increasing globalisation and regional development. Airports are a critical component for connecting people with places, and they make important contributions to regional economic development (Florida et al., 2012).

Airports represent important development potential, as they are expensive assets that can attract other types of economic activity, for example retail, accommodation and tourism. Also, because airports operate within a network of other airports, those designated as hubs are able to attract other and denser economic activities including engineering and servicing activities, allied and supplier services, research and development activities, and training and skills development activities. Hub airports are also essential elements of connectedness for cities within the global economy (Neal, 2012).

This report examines the impact of the new Brandenburg-Berlin Airport within the Schönefelder Kreuz region. In examining this region in detail, it is anticipated that an understanding of the potential green and dynamic economic and employment development can be encouraged, and provide guidance to other regions that are also facing a similar mix of carbon-intense assets and low-carbon growth ambitions.

Employment and labour market impacts are one of the major concerns in understanding the impact of the new airport on the Schönefelder Kreuz region. The following section defines some of the key concepts of a green transition, and the context for policy development at the regional and national level. An important consideration when looking at policy implications is the ability to assess the action taken and measure the impact of activities to be sure progress is in fact being made. Indicator development and ongoing assessment are needed to support these activities, and need to be carried out at local levels as well as at the more prominent national level.

### **Labour market impacts from the green transition**

The labour market will be affected significantly by the transition to a low-carbon economy. The impacts will vary at individual sector and occupational levels with some strongly affected and others only mildly. The employment impacts of large regional assets, such as airports, also need to be carefully understood in this context so that the benefits can be maximised. It is therefore relevant to discuss what we mean by labour market impacts from the green transition.

A number of prominent reports have recently sought to define and isolate these impacts in further detail. The first of these reports, *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World* (UNEP et al., 2008), highlighted that the impacts of greening would be far-reaching within the labour force, and felt at the individual, company and associated labour-organisation level. This finding was further reinforced by research that showed that the boundaries between what is and what is not considered a low-carbon job were becoming increasingly blurred (Cedefop, 2010).

A recent OECD report, “The jobs potential of a shift towards a low-carbon economy” (OECD, 2012c), likens the forthcoming changes to similar industrial transformations such as the information and communications technology (ICT) revolution. Impacts of the ICT revolution were extensive, but unevenly distributed; some occupations were significant and had direct impacts on the positive (job creation) and the negative side (job

destruction). This also applied at the sector level – some sectors grew rapidly in response to ICT, other declined.

For the vast majority of sectors and occupations, however, the ICT revolution brought moderate changes to the tasks of individual workers, and the processes and products of businesses. A similar impact is forecast for the low-carbon economy. Recent analysis (Hanna, 2010) has highlighted that the productivity gains flowing from the ICT transformation took more than 20 years to materialise. This is a useful reminder that such large and extensive industrial transitions will not occur overnight.

Other reports have identified the economic sectors likely to experience the most profound changes in the type and volume of employment. These sectors include agriculture and fisheries, beach and skiing tourism, infrastructure, finance and insurance (Council of European Union, 2010). Cedefop identified further sectors such as renewable energy, energy efficiency (particularly in buildings, new and old), transport, primary manufacturing and recycling sectors (Cedefop, 2010; 2012).

The debate on the need for action on climate change initially highlighted the job creation potential of a low-carbon economy. This continues, with the reality of recession and austerity making the idea of green employment growth a welcome antidote to the high unemployment rates in many countries. In countries and areas where there are large concentrations of carbon-intensive employment, climate change action is usually framed in a “job killer” context.

On the whole, there now seems to be agreement that a low-carbon economy will have in aggregate, a neutral or slightly positive overall impact on the labour force in terms of total employment (Cedefop, 2013; OECD, 2012c; UNEP, 2011), but impacts will be spread unevenly across countries, regions and types of workers.

## Encouraging green growth and the need for indicators of transition

Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this, it must act as a catalyst for investment and innovation, which will underpin sustained growth and give rise to new economic opportunities (OECD, 2011a).

The OECD Green Growth Strategy adopted by the Ministerial Council Meeting in 2011 posited green growth as the pursuit of economic growth and development, while preventing costly environmental degradation, climate change, biodiversity loss and unsustainable natural resource use (OECD Green Growth Strategy, 2011).<sup>4</sup>

Achieving greener growth will involve capitalising on opportunities to develop new green industries, jobs and technologies, as well as managing the transition for greening the more traditional sectors and the associated employment and distributional effects. It will require adopting new technologies, developing new products and supporting new patterns of demand from households, companies and governments.

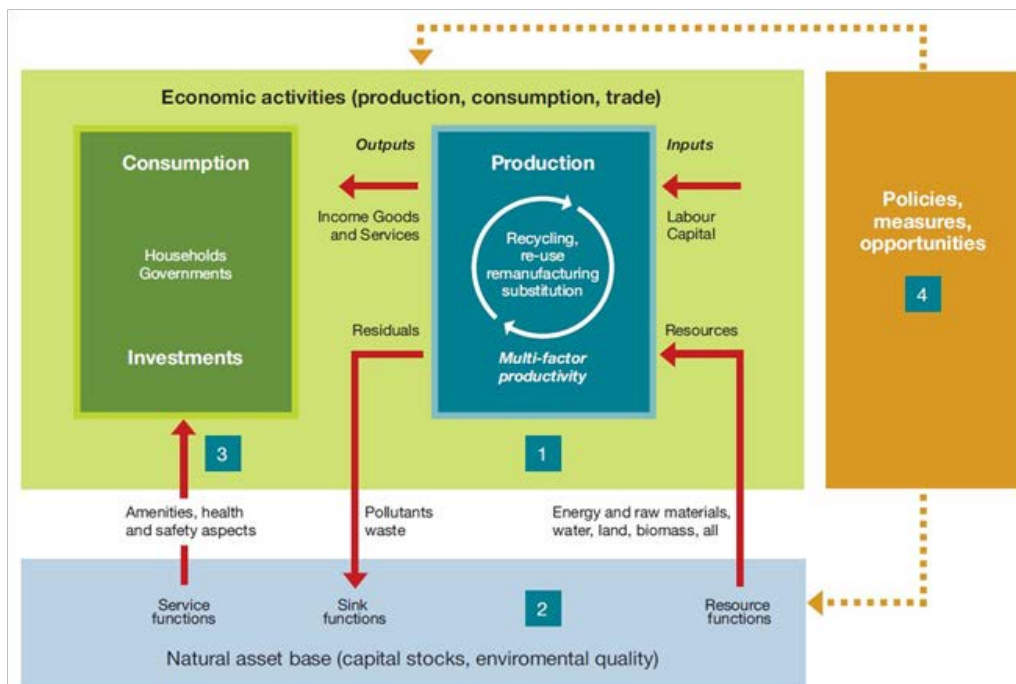
There is very limited information regarding how progress can be assessed when standards and measures are uncertain and based on traditional measures of economic activity. While efforts at the national level are progressing, and many initiatives can be found at the local level, there are a significant number of inconsistencies, and a lack of agreement concerning the indicators needed to analyse, amongst other questions: How do local economies, firms, clusters and regional ecosystems adjust to low-carbon activities?

How are local labour markets making the transition? How do firms re-structure their organisation and production processes? How do skills, education and training systems adapt to the development of new areas of growth?

The need for measurable indicators has been well established within the framework of the greening strategy, targeting four areas of analysis (Figure 1.1):

- changes in productivity in the use of environmental assets and natural resources
- natural asset base
- environmental dimensions of quality of life
- policy responses and economic opportunities.

Figure 1.1. OECD Framework for Green Growth Indicators



Source: OECD (2011), *Towards Green Growth*, OECD Publishing, <http://dx.doi.org/10.1787/9789264111318-en>.

This monitoring will be essential for policy makers at national levels to create and implement green growth strategies. The progress towards green growth will not be equally distributed within countries; therefore, it is also important that progress be monitored at the *local and regional levels*.

The central tenet of the green growth framework is the recognition of natural capital as a factor of production and its role in enhancing well-being (OECD, 2011b). This provides a new dimension for understanding growth and is a counterpoint to how economic activity has been measured and understood throughout much of the modern era, with gross domestic product (GDP) being the central measure for understanding economic performance. The weakness of the GDP approach is that it fails to account for depletion of natural assets in the current production and consumption regimes, and how these natural stocks are just as important and relevant to current and future growth as capital and labour stocks.

Natural capital stocks include natural resource stocks (both renewable and non-renewable), land and ecosystems (as shown in Figure 1.1). Alongside recognition of the natural asset base within the economic model, the indicator framework includes an understanding of policies and measures that can provide a balance between the factors of economic activity. Public policy is needed to provide incentives and develop market structures, which will allow trade-offs between production, consumption and the natural asset base to be made over longer periods of time. It will also allow encouragement and incubation of innovations that can provide a more efficient, less burdensome use of our natural capital in the future.

The green growth framework understands growth not only through the prism of economic activities of production consumption and trade, but also through the inter-relationships of these activities with our natural asset base and the public policy measures and mechanisms available to our governments.

#### Box 1.1. OECD framework for thinking about green growth

Economic growth is conventionally thought of as the process through which workers, machinery and equipment, materials, and new ideas and technologies contribute to producing goods and services that are increasingly valuable for individuals and society. A framework for thinking about green growth builds on this with four additional elements:

- Capturing the importance of changes in the comprehensive wealth of an economy. This means attention to all types of capital: natural (e.g. ecosystems); human (e.g. education and skills); physical (e.g. machinery and equipment); and the intangible assets, which are so crucial to human progress, such as ideas and innovation. Captured within this are some important aspects of growth, including the nature of trade-offs, which arise at the frontier of production possibilities. For example, substituting environmental assets in production or consumption is not necessarily a smooth process; critical thresholds can be crossed after which assets that are renewable cease to be so (e.g. fisheries or soil), or assets that are non-renewable are depleted to a point where substitution with other inputs or goods and services becomes impossible (e.g. climate or biodiversity), potentially short-circuiting growth in well-being. This introduces uncertainties regarding thresholds, irreversible outcomes and discontinuities, all of which complicate policy design.
- Incorporating the dual role played by natural capital in this process. Natural capital contributes to production by providing crucial inputs, some of which are renewable but others of which are not. It also influences individual and social welfare in various ways, via the effects the environment has on health, through its amenity value and through provision of ecosystem services.
- Acknowledging that investment in natural capital is an area in which public policy intervention is vital, due to weak or non-existent market incentives. This is largely because the contribution of natural capital to production is often not priced and the contribution of natural capital to individual welfare is not appropriately valued. The lack of proper valuation and market incentives or signals can affect behaviour and truncate the foresight of households and firms in ways that set the economy on trajectories that are unsustainable (or conversely, which miss growth opportunities), or that are not necessarily maximising well-being. This means that in many cases, better management of natural capital (e.g. via proper valuation of pollution) will be consistent with higher GDP and a lower environmental impact of economic activities. A clear example is when an inefficient energy mix (involving excessive use of fossil fuels) is improved upon by eliminating harmful fossil fuel subsidies.



### Box 1.1. OECD framework for thinking about green growth (*cont.*)

- Recognition that innovation is needed to attenuate trade-offs that arise between investing in (depleting) natural capital and raising consumption or investing in other forms of capital. Indeed, once resource productivity is raised and inefficiency eliminated, a “frontier” is reached along which these trade-offs become more pronounced. Through innovation, the frontier at which trade-offs start to bind can be pushed outwards; essentially greening growth.

Source: OECD (2011), *Towards Green Growth*, OECD Publishing, <http://dx.doi.org/10.1787/9789264111318-en>.

The OECD has identified seven main sources of green growth (OECD, 2011b):

- productivity enhancements through greater efficiencies of resource use
- innovation in addressing environmental problems spurred by policies and frameworks encouraging conditions for innovation
- new markets from the demand for “green” technologies, goods and services, and the job growth opportunities these new markets will bring
- confidence from investors with greater predictability and policy stability
- stability of macroeconomic conditions and reducing the price volatility around resource costs
- resolution of resource bottlenecks (including human capital resources) that can make new investments more costly
- resolving imbalances in natural systems that will reduce the risks of more profound and abrupt changes to the natural environment through climate change.

The transformation of industries will have a large impact on regional and local ecosystems for employment creation, development of skills and green entrepreneurship. However, although there are significant upsides for some local areas and regions, for others the positive effects of the low-carbon transition will be outweighed by negative job losses. A solid empirical foundation by which to understand how the low-carbon transition will unfold at the regional and local level is still lacking. The “Indicators of Local Transition to a Low-Carbon Economy” project is part of an effort to provide more empirical evidence at the local level.

The identification of indicators is therefore imperative in order to measure economic progress towards low-carbon activities in such a way that policies, strategies and programmes can be periodically informed by data that is solid and comparable, yet relevant to the local area, industry clusters and regional ecosystems under analysis.

### Different pace of transition

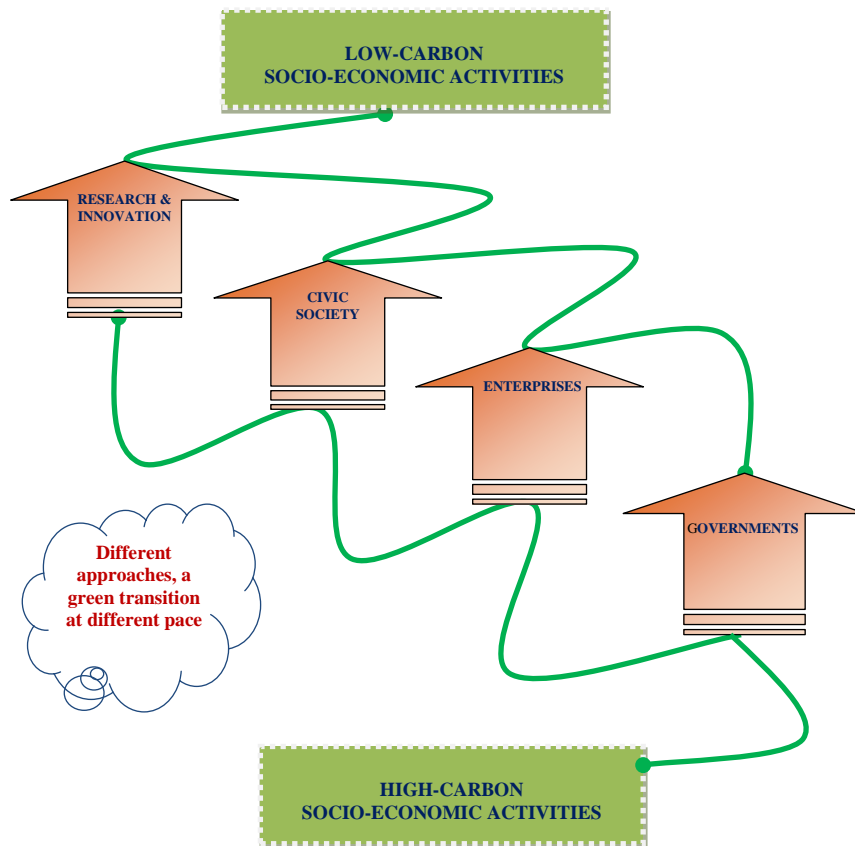
The “transition” from a high-carbon to a low-carbon economy is taking place in different environments and at a varying pace, as the Rio+20 conference clearly shows: efforts led by researchers and innovation, by the civil society (non-governmental organisations [NGOs], trade unions, community groups), the corporate world (large firms



and SMEs), and governments are happening at different levels and not necessarily along the same pathways, although the goal is the same.

Figure 1.2 exemplifies the multiple paths and pace of transition, as well as the different participants and drivers involved. We have already seen earlier in this chapter the different pace of government action at the various levels of jurisdiction, and the challenges for businesses operating within the uncertainties and risks of the low-carbon transition. There are, however, two other factors in this transition: civil society and frontier research and innovation activity.

Figure 1.2. **Transition pathways to a low-carbon economy**



Source: OECD (2012a),

Community driven action to combat climate change has a long history, well exemplified by the first Rio conference on Sustainable Development, Rio+10, Rio+20 and all other sustainable development conferences where NGOs, trade unions and community groups have been active – if not around the negotiation table, then in the streets as the negotiations took place. Social symbolism is also happening at the global level: the lights being switched off in cities in 147 countries across the world marked the Earth Hour on 1 April 2013. This demonstration of global solidarity began a mere five years ago, when the lights were first switched off at Sydney’s iconic Opera House, creating momentum for the rest of the city to follow suit.

Germany has introduced one of the most significant energy policies witnessed in living memory – a programme to shut down all of Germany’s nuclear reactors – in the wake of the Japanese tsunami that caused a catastrophe at the Fukushima nuclear plant. This decision will result in Germany spending around EUR 200 billion on renewable energy sources. In fact, the German government had initially planned to shut down its reactors by 2032. Such is the momentum and demand by the community for a green economy that this decision has been brought forward by ten years to 2022 (see Financial Times, 2012).

Such policy decisions have significant implications for investment and future research and development. For instance, two of Germany’s largest energy companies, E.ON and RWE, are now withdrawing from plans to build nuclear reactors in the United Kingdom. Instead, the funds earmarked for these nuclear plants will be invested in wind farms, including off the coast of the United Kingdom. This shift means these energy companies will concentrate on renewable energy so that within the next five years E.ON and RWE will have approximately 25% of all their energy investments in hydro and wind power (see OSW, Centre for Eastern Studies, 2012). This also means that these companies can now position themselves as leaders in one of the world’s fastest growing knowledge-intensive markets.

### Different pace but interconnected pathways

As this green momentum continues to gather pace, individual governments and companies continue to activate green mandates and green projects. From the planning and building of green cities in the Middle East and the People’s Republic of China to countries such as Australia and New Zealand joining the group of nations with Emission Trading Schemes, this change is taking place in a highly charged and competitive marketplace – companies competing against other companies. Wind energy companies such as Germany’s Siemens, Denmark’s Vestas, China’s Suzlon and the United States’ General Electric are currently battling for supremacy in the global economy.

Countries are also competing head to head as they attempt to give their own domestic companies a head start in an emerging and lucrative marketplace of the future. During the global financial crisis of 2008, the United States introduced a USD 80 billion green stimulus package only to have China introduce a USD 217 billion green package of its own. The European Union in turn responded with its own green stimulus package of around EUR 23 billion. Such programmes over the past four years have acted as an accelerant for the creation of new products and services and have sped up, for example, the introduction of electric vehicles and new fuel cell and battery technologies.

As the transition to a low-carbon economy continues, businesses and communities are demanding to know how to measure this progress towards becoming more sustainable. Indicators are becoming increasingly important. They form part of the evidence-based framework at the centre of formulating sound policy, which can then inform practical programmes to meet the community’s aspirations for a greener world.

### *Local dynamics of green growth*

There are two main reasons why monitoring and understanding progress towards green growth needs to be tracked at the national/international level and the local level:

1. The impacts of climate change will be variable at a local level.

2. The impacts of responding to climate change, such as carbon pricing, switching to less carbon-intensive energy supply and production, and appropriating the opportunities presented by a transition to a low-carbon economy (including both the creation of new employment and industries) will be distributed differently across regions. This will be especially evident in labour markets.

Therefore, whilst national and international responses are required for carbon emissions mitigation, it is at the local and regional levels that strategies for dealing with the impacts of mitigation action will be required. Of the sources of growth, four have local dynamics that are directly relevant to this project:

- productivity enhancement through efficient resource use
- innovation in addressing environmental problems
- new markets and employment opportunities from green technologies, products and services
- resolution of resource bottlenecks, including human capital development (e.g. skills and training).

Despite limited capacities to respond to climate change, especially the mitigation component, with the majority of the effective policy levers existing at the national level in most countries, local authorities do have policy levers available in procurement and energy efficiency activities within their own buildings and urban environments. Local government can encourage the adoption of green skills through promoting sustainability and triple bottom line reporting, and sustainable practices in the building and construction industry.

### ***Germany's green transition and the role of the Berlin-Brandenburg area***

“It lies within our grasp to take the necessary action so that people not only today, but also in the year 2050, can live in a world in which economic prosperity for all goes hand in hand with social cohesion and the protection of natural resources – a world which recognises a commitment to intergenerational equity and the peaceful coexistence of peoples” (Federal Government of Germany, 2012: 12). Germany has had a National Sustainable Development Strategy for the past ten years (since 2002), and is constantly refining it.

The progress in sustainability is based on three elements of sustainability management (Federal Government of Germany, 2012: 13): business, social affairs, environment, in an integrated and cross-cutting way. In this context, the strategy is geared towards improving intergenerational equity, quality of life, social cohesion and international accountability. Sustainability must never lose sight of the “whole picture” (Federal Government of Germany, 2012: 23).

### ***Sustainability indicators and goals***

Indicators show the progress made on the road to sustainable development. Goals highlight the need for action. They are important milestones for measuring progress and success. In sum, Germany's National Sustainable Development Strategy contains 21 topics with a total of 38 goals (Federal Government of Germany, 2012: 13). “Indicator 1b: Primary energy consumption” is one example of these 21 indicators. The new goal from the federal government's Energy Concept is to lower primary energy consumption from 2008 levels by 20% by 2020 and by 50% by 2050 (Federal

Government of Germany, 2012: 59). Two other examples are “Indicator 2: Greenhouse gas emissions” and “Indicator 3b: Share of renewable energy sources in electricity consumption”. The related goals are “Reduction of greenhouse gases by 80-95% by 2050 compared to 1990” and “Share of renewable energy sources in electricity consumption of at least 35% by 2020 and at least 80% by 2050 (1990 base)” (Federal Government of Germany, 2012: 59).

Every four years, a *Progress Report of the Federal Government of Germany* presents in detail the status of Germany’s sustainable development. The report is complemented by the biennial *Indicator Report of the Federal Statistical Office* detailing the trend of the sustainability indicators (Federal Government of Germany, 2012: 13). Looking at the progress reports and the indicator reports, we see that Germany has made significant progress in sustainability during the last years.

In terms of progress made towards sustainability, at present (2012/13), many topics are under discussion. Examples are “sustainable transport, sustainable consumption and production, preserving and managing natural resources, reducing consumption of new land for development, preserving biological diversity, agriculture and forestry, health, social inclusion, demography and migration, global challenges relating to poverty and sustainable development, sustainable and responsible financial policy, sustainability in Europe, [and] sustainability within the framework of the United Nations” (Federal Government of Germany, 2012: 15). When talking about sustainability in concrete terms, there are three major priorities for the federal government of Germany, which are outlined below.

### *Sustainable economic activity*

In the federal government’s opinion, the economy plays a key role in the necessary switch to a low-carbon, resource-efficient society. Sustainable economic activity and innovation are closely linked. A sustainable economy will enable Germany to remain internationally competitive. The economic sphere is a source of not only challenges but also great opportunities for sustainability policy (Federal Government of Germany, 2012: 115).

Climate and energy are central issues in the context of sustainable development. Climate change mitigation and adaptation are among the greatest challenges facing mankind in the 21st century. That is why Germany’s Energy Concept envisages the above-mentioned 80-95% reduction in greenhouse gases by 2050 (Federal Government of Germany, 2012: 14).

Water policy also contributes to sustainability, and includes all water cycles and partial cycles, related uses and necessary protection concerns. The German Sustainable Water Policy includes:

- Ensuring the availability of water in its various forms as a resource for present and future generations, with due regard to aspects such as general interest services and business location choices.
- The long-term protection of water as a habitat and a central element of ecosystems as well as the protection of ecosystems which are important for the sustainable availability of water.
- The development of options for lasting, eco-friendly economic and social development” (Federal Government of Germany, 2012: 157).

Sustainability is not just the responsibility of the federal government. Sustainability actions are also the responsibility of the federal states of Germany including Berlin and Brandenburg, the municipalities, and civil society.

The Metropolitan Region Berlin-Brandenburg and the regional growth core Schönefelder Kreuz as a vital part of this region play a significant role in Germany's green transition. On the one hand, we will see that this area has its own strategy with respect to sustainability and progress to sustainability. On the other hand, we will see that this area and its progress to sustainability are heavily influenced by the construction and subsequent operation of the new BER Berlin Brandenburg International Airport.

## Report overview

This report is divided into six chapters. Chapter 2 describes the physical and socio-economic characteristics of the Schönefelder Kreuz region. Chapter 3 examines the new BER Berlin Brandenburg Airport and its influence on the economic growth and the ecological development of the regional growth core Schönefelder Kreuz. Chapter 4 discusses the labour market impacts and dynamics of transition, including strategies to reach SMEs and to develop green skills and a training ecosystem. The chapter poses questions, and augments and discusses findings from the Schönefelder Kreuz workshop, as well as policy positions regarding new airports, like the BER. The final chapter highlights policy implications and provides recommendations from this report. It also introduces the Schönefelder Kreuz region dashboard. The further aim of this study is to test the suitability and adaptability of the OECD green growth framework in understanding this transition, and to provide a mechanism that will enable monitoring and reporting on progress to a low-carbon future at a local level.

## Notes

1. The Annex I Parties to the 1992 UN Framework Convention on Climate Change (UNFCCC) are: Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, the Czech Republic, Denmark, Estonia, European Economic Community, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lichtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, New Zealand, Norway, Poland, Portugal, Romania, the Russian Federation, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom and the United States.
2. Kyoto Protocol countries are all Annex 1 countries except for Belarus, Malta and Turkey.
3. International aviation bunkers include deliveries of aviation fuels to aircraft for international aviation. Fuels used by airlines for their road vehicles are excluded. The domestic/international split should be determined on the basis of departure and landing locations and not by the nationality of the airline (*Source: IEA*).
4. [www.oecd.org/greengrowth](http://www.oecd.org/greengrowth).

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## *Chapter 2*

### **The regional growth core Schönefelder Kreuz**

*This chapter provides relevant information about the federal state of Brandenburg, and in particular the regional growth core (RGC) Schönefelder Kreuz. The RGC policy initiative was launched in 2004, and provides public support to industrial activities that are identified as specialisations in geographical regions throughout Germany.*

*The RGC Schönefelder Kreuz is located within Metropolitan Region Berlin-Brandenburg and consists of the municipalities of Schönefeld, Königs Wusterhausen and Wildau. It has extensive environmental assets as well as industrial concentrations in power generation, manufacturing and aviation. This last industry is set for expansion with the recently constructed BER Berlin Brandenburg Airport located within the region. The airport is seen as both a catalyst and challenge for green growth in Schönefelder Kreuz.*



## The regional growth core Schönefelder Kreuz

The federal state of Brandenburg is one of 16 federal states of the Federal Republic of Germany. The federal state of Brandenburg has its own state government with its own policies, as do the other 15 federal states. In 2004, the federal government started to concentrate on funding 15 so-called regional growth cores (RGCs). The idea is to “strengthen the strengths”, which means to support economic growth and employment and to use subsidies in a more efficient way in each of these RGCs.

Each RGC defined a concept with concrete activities for optimising infrastructure, the development of business parks, personnel development, technology transfer, etc. Experts and politicians evaluate the results of these measures periodically and results to date have been positive. The RGCs are success factors in the economic development of the federal state of Brandenburg. They will therefore continue over the coming years (STK, 2012a; 2012b; 2012c).

Figure 2.1 shows the federal state of Brandenburg and the capital of Germany, Berlin. Both federal states contain the Metropolitan Area Berlin-Brandenburg, which is the core of the Berlin-Brandenburg metropolitan region. In a broader regional context, metropolitan regions are considered as motors, innovators and problem-solvers. The Berlin-Brandenburg metropolitan region is one of 11 metropolitan regions in Germany. In terms of population, it is the second-largest in Germany. With regard to the number of employed persons who are subject to social security contributions, the region ranks 5th out of 11 and 7th concerning gross domestic product (Deutsche Metropolregionen, 2010: 5).

The regional growth core Schönefelder Kreuz (highlighted in purple in Figure 2.2) is a part of this Metropolitan Area Berlin-Brandenburg. It is located to the south-west of Berlin in a very central part of Brandenburg and is comprised of the municipalities of Schönefeld, Wildau and Königs Wusterhausen.

The distance between Schönefelder Kreuz and the Berlin city centre is about 20 kilometres; the distance between Schönefelder Kreuz and the Polish border to the east of Brandenburg (Figure 2.1) is about 70 kilometres. Neighbouring communities, including the growth core, comprise 100 000 inhabitants. Schönefelder Kreuz has a catchment area of about 110 000 people (RWK Schönefelder Kreuz, 2009: 13).

These few facts show that the RGC Schönefelder Kreuz has a prominent position in the federal state of Brandenburg as well as in the Federal Republic of Germany and in Europe. The following chapters of this report underpin this statement. They particularly illustrate that the RGC Schönefelder Kreuz is a success story and that the new BER Berlin Brandenburg Airport dominates the RGC’s position. The airport is seen as a major driver of future economic activity in the region.

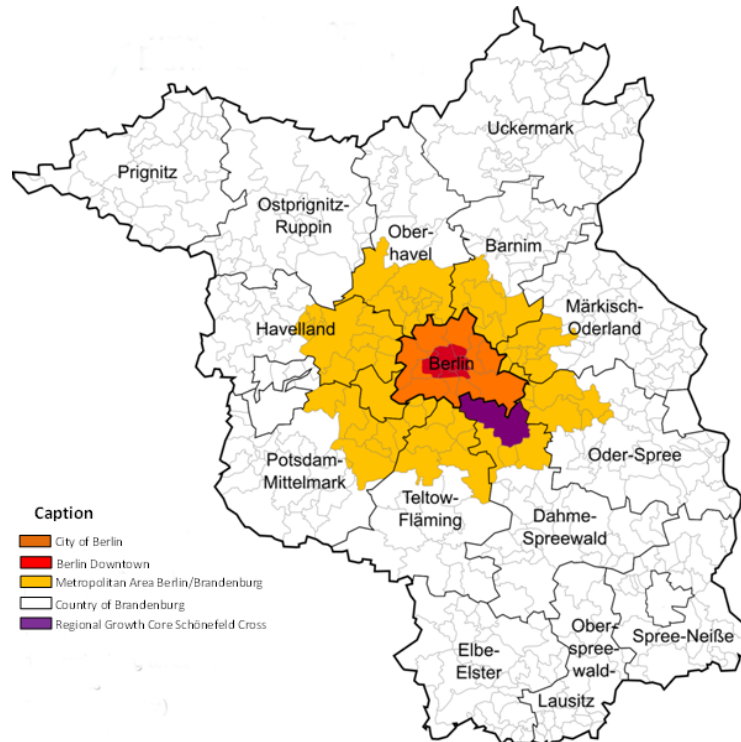
Figure 2.1. Federal Republic of Germany



*Note:* This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

*Source:* LWL (2012), *Map of Germany*, Westphalia-Lippe Regional Association, Munich, available at: [www.lwl.org/aufbruch-download/bilder/popups-politik-grenzen-brd-1097661487\\_0.jpg](http://www.lwl.org/aufbruch-download/bilder/popups-politik-grenzen-brd-1097661487_0.jpg) (accessed 19 May 2012).

Figure 2.2. Metropolitan Area of Berlin Brandenburg



*Note:* This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

*Source:* Wikimedia (2012), *Metropolitan Area Berlin-Brandenburg*, available at: <http://upload.wikimedia.org/wikipedia/commons/thumb/4/4e/Metropolregion-BerlinBrandenburg.png/481px-Metropolregion-BerlinBrandenburg.png> (accessed 19 May 2012).

## Socio-economic context and characteristics of the RGC Schönefelder Kreuz

### *Population*

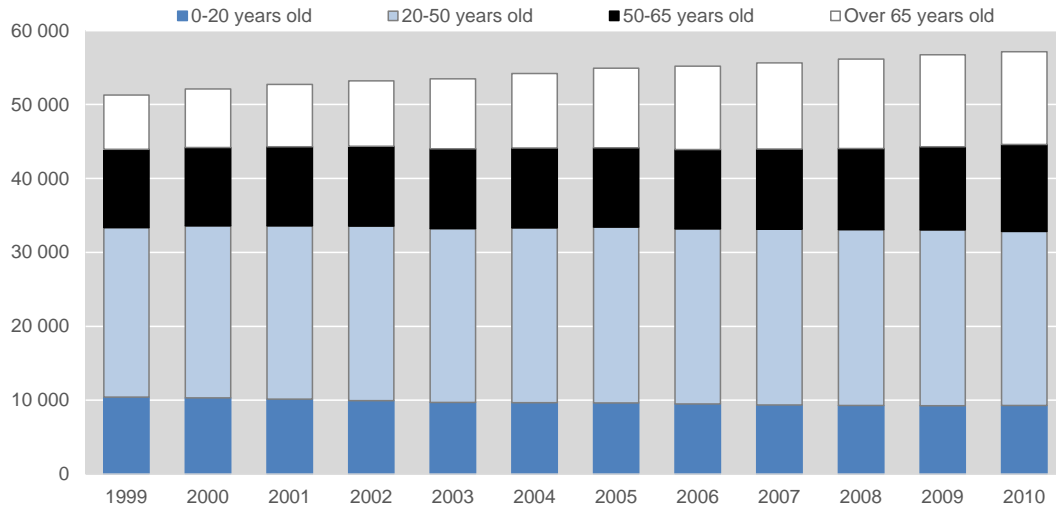
At the end of 2004, just before the RGC Schönefelder Kreuz was established, the population in this region was about 54 200 (Figure 2.3). By mid-2009, it had already increased to 56 400 inhabitants, or by approximately 4%.

However, over the coming decades a decline in population is forecast for the federal state of Brandenburg; with a population contraction of 12% expected by 2030. Population growth in the entire Dahme Spreewald district is expected to increase by about 5% by 2030. The population losses in the Southern District will be largely compensated by the positive development of the RGC Schönefelder Kreuz. In particular, the municipality of Schönefeld may benefit from a strong increase in population. In 2009, the total population was recorded to be 12 967 inhabitants. In this region, an increase of almost 56% to 20 200 inhabitants is expected by 2030 (Complan, 2010: 10).

Königs Wusterhausen is the most populous city of the district. However, growth is weaker here than in the municipalities of Schönefeld and Wildau. In 2009, the city had approximately 33 500 inhabitants. A population decrease of about 8% is forecast by 2030.

In 2009, the municipality of Wildau had approximately 9 900 people. By 2030, a significant increase in the population, to more than 11 000 inhabitants, is forecast. This corresponds to an increase of almost 13% (Complan, 2010: 10).

Figure 2.3. Population growth in RGC Schönefelder Kreuz



Source: LASA (2012), *Bevölkerungsentwicklung Schönefelder Kreuz*, Potsdam, available at: <http://fis.lasa-brandenburg.de> (accessed 15 July 2012).

Despite the generally positive development of population numbers, a demographic change is noticeable in the Schönefelder Kreuz region. The effects are less serious than in other parts of the federal state of Brandenburg, but the three municipalities of Schönefelder Kreuz are also experiencing an ageing population: the age group of 65 years and older will see the strongest growth by 2030. In Wildau and Königs Wusterhausen, the increase in population aged 65 and over will be almost 50%. Schönefeld will not only have a sharp increase in population as a whole, but will also see a significant increase in the population of pensionable age. The increase of people aged 65 and over is forecast to rise by approximately 170 times by 2030 compared to 2008 (Complan, 2010: 10).

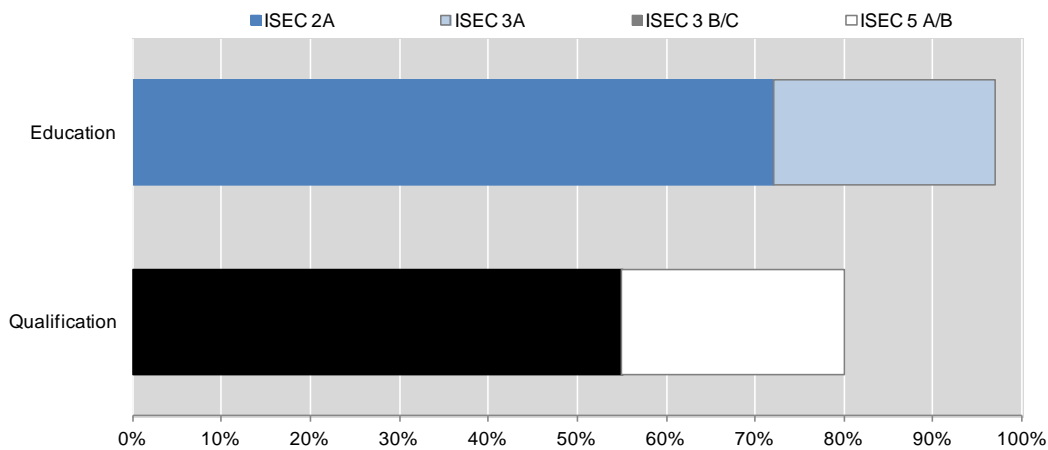
On the other hand, there are positive developments in the proportions of the working-age population. An increase in this population is expected, in particular in Schönefeld. The proportion of the population aged 15-65 will increase by about 40%. In contrast, in the town of Königs Wusterhausen, the proportion of the population of working age is expected to fall by almost 25% (Complan, 2010: 11; Bertelsmann Stiftung, 2012).

### **Education**

The population of the federal state of Brandenburg can be described as well-educated and well-qualified. In terms of formal education, the federal state of Brandenburg's labour force is clearly above the German average, according to the levels defined within the International Standard Classification of Education (UNESCO, 1997). About 72% of adults have attained a lower secondary level of education (ISEC 2A) and 25% have attained an upper secondary level of education (ISEC 3A). On this basis, about 55% of all

adults have gained a professional qualification (ISEC 3B/C) and over 25% were able to achieve a tertiary level qualification (ISEC 5 A/B) (Statistisches Bundesamt, 2012).

Figure 2.4. ISEC levels of educational qualification in Brandenburg



Source: Statistisches Bundesamt (2012), *Bildungsstand der Bevölkerung 2011*, Statistisches Bundesamt, Wiesbaden, p. 21, available at: [www.destatis.de/DE/Publikationen/Thematisch/BildungForschungKultur/Bildungsstand/BildungsstandBevoelkerung5210002117004.html](http://www.destatis.de/DE/Publikationen/Thematisch/BildungForschungKultur/Bildungsstand/BildungsstandBevoelkerung5210002117004.html) (accessed 5 May 2012).

The federal state of Brandenburg continues to make considerable efforts, both to keep the skills of the young people at this high level and to improve these skills. In 2007, Brandenburg spent about EUR 2.16 billion on the educational sector, which is 4.1% of the state's gross domestic product (GDP) (ISQ, 2010: 56). Another important fact is that studying in the Berlin-Brandenburg region is still affordable in economic terms: in contrast to many other German states, the universities do not charge study fees.

One consequence of these political decisions is that in 2011, over 50 000 students were registered in Brandenburg's four universities and five universities of applied sciences (Amt für Statistik Berlin-Brandenburg, 2012a).

The Technical University of Applied Sciences, Wildau was founded in 1991. Today it is the largest university of applied sciences in the federal state of Brandenburg, with over 4 200 students. Overall, it offers 23 study programmes (Master and Bachelor degrees), all related to the fields of practical application in engineering, economics and administrative science programmes. This makes the Technical University of Applied Sciences, Wildau an attractive partner for the economy, especially for the region's small and medium-sized enterprises (SMEs). Co-operation covers the development of curricula for science education, joint research and development activities by teachers and businesses, as well as practical work for students in companies, whether in internships or during their final theses (Technische Hochschule Wildau, 2012).

### ***Employment and job market***

Between 2004 and 2009, the total number of employees covered by social insurance in the RGC Schönefelder Kreuz increased by over 25%, reaching 24 433. In concrete terms, this means over 5 100 new jobs. Currently, there are three new employment opportunities per day in the RGC. This is an absolute peak in the federal state of



Brandenburg, which has seen an increase of approximately 6% during the same period. The region is one of the most dynamically growing locations (Complan, 2010: 11).

The regional growth core Schönefelder Kreuz is a key driver of economic performance in Brandenburg. This is demonstrated by the high ratio between the number of employees and the number of residents in 2010 (43%, or 43 employees per 100 residents) compared to 2005 (38%) and to the Brandenburg average (29%). The majority of jobs in the municipality of Schönefeld are due to the airport. The companies in the designated industry competence fields have established themselves as engines of economic growth. Currently, about a quarter of the above-mentioned 24 433 jobs are located in companies in these industries. The airport directly affiliated corporate sectors such as air transport technology (14% more employees from 2004 to 2008) and logistics (44% more employees) (Complan, 2010: 11).

### ***Income***

The annual average gross salary per employee in the RGC Schönefelder Kreuz ranges from EUR 23 000 to EUR 25 000 (Amt für Statistik Berlin-Brandenburg, 2012b).

Updated information regarding monthly and annual income is expected once the results of a German-wide Census carried out in 2011 are published (Zensus, 2011). The sample census from 1991 to 2009 shows a clear increase in the average net income per private household in Berlin and Brandenburg (Kuchta and Nauenberg, 2012). Of particular significance is the 2% increase in 2009 over the previous year in the monthly average net income of employees Brandenburg-wide. This increase was the largest in all of Germany.

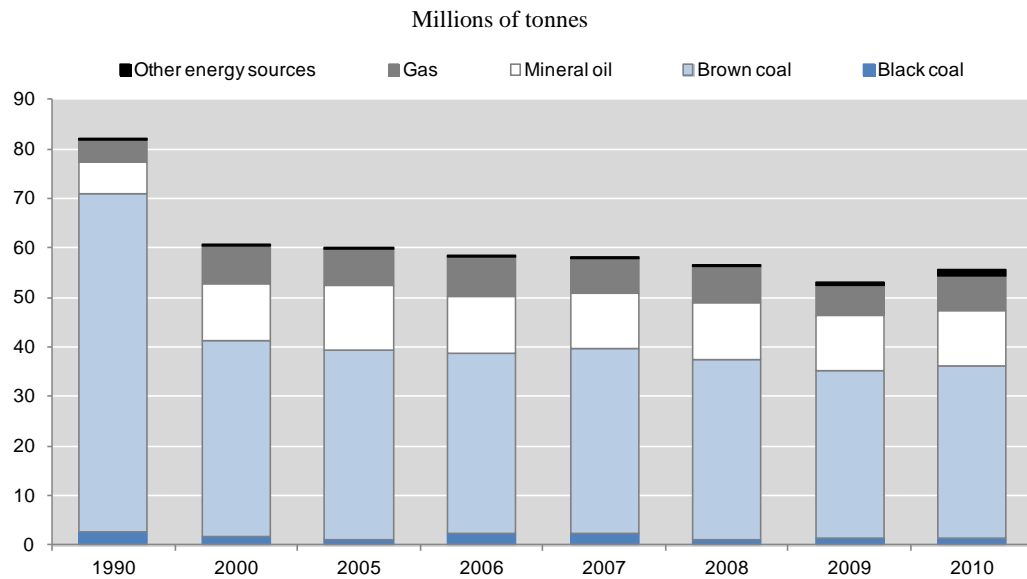
## **Environmental and resource productivity of the economy of Schönefelder Kreuz**

### ***Energy Strategy 2030***

The federal state of Brandenburg is a traditional energy region, due to its large lignite deposits. It has produced and exported electricity for decades. The electricity production of lignite-fired power plants in the Lausitz region in southern Brandenburg produces very high CO<sub>2</sub> emissions. Figure 2.5 shows the CO<sub>2</sub> emissions by type of energy source in millions of tons of CO<sub>2</sub>. The high level of CO<sub>2</sub> emissions requires a strong public awareness and commitment to protect the environment. Therefore, the government of the federal state of Brandenburg is aiming to reduce these emissions by 40% in 2020 and by a further 35% in 2030 (over 1990 levels) (Bost et al., 2012: 13).

To achieve this, the current government has developed the “Energy Strategy 2030”. This strategy aims for an environmentally friendly, economical, safe and socially acceptable energy supply. There are six strategic objectives that are implemented through an action plan supervised by different institutions (MWE, 2012a: 36):

- increase energy efficiency and reduce energy consumption
- increase the share of renewable energies in energy production
- guarantee a reliable and affordable energy supply
- reduce energy related CO<sub>2</sub> emissions
- assure a regional participation and public acceptance
- stabilise employment and value creation.

Figure 2.5. CO<sub>2</sub> emissions in Brandenburg

Source: LUGV Brandenburg (2011), *Klimagasinventur 2010 für das Land Brandenburg Darstellung der Entwicklung der wichtigsten Treibhausgase und Analyse zur Minderung der energiebedingten CO<sub>2</sub>-Emissionen (Fachbeiträge des LUGV Heft Nr. 118)*, p. 1, available at: <http://www.mugv.brandenburg.de/cms/media.php/lbm1.a.3310.de/kginv10.pdf> (accessed 24 June 2012).

Since the implementation of the Energy Strategy 2030, the energy supply in the federal state of Brandenburg is increasingly being covered by renewable sources. Figure 2.6 shows the primary energy consumption divided by energy sources in the federal state of Brandenburg in 2000 and 2008 in terajoules.

The German Agency for Renewable Energies has awarded the “guide star” twice to the federal state of Brandenburg for its achievements in expanding the use of renewable energies, most recently in 2010. Brandenburg has become a leading region in producing wind power, as well as in the use of bio- and geothermal energy, and has large production sites of solar power (Agentur für erneuerbare Energien, 2012: 64). Nationwide, the federal state of Brandenburg holds second place after the federal state of Lower Saxony regarding wind energy (currently around 4 300 MW) (DEWI, 2011).

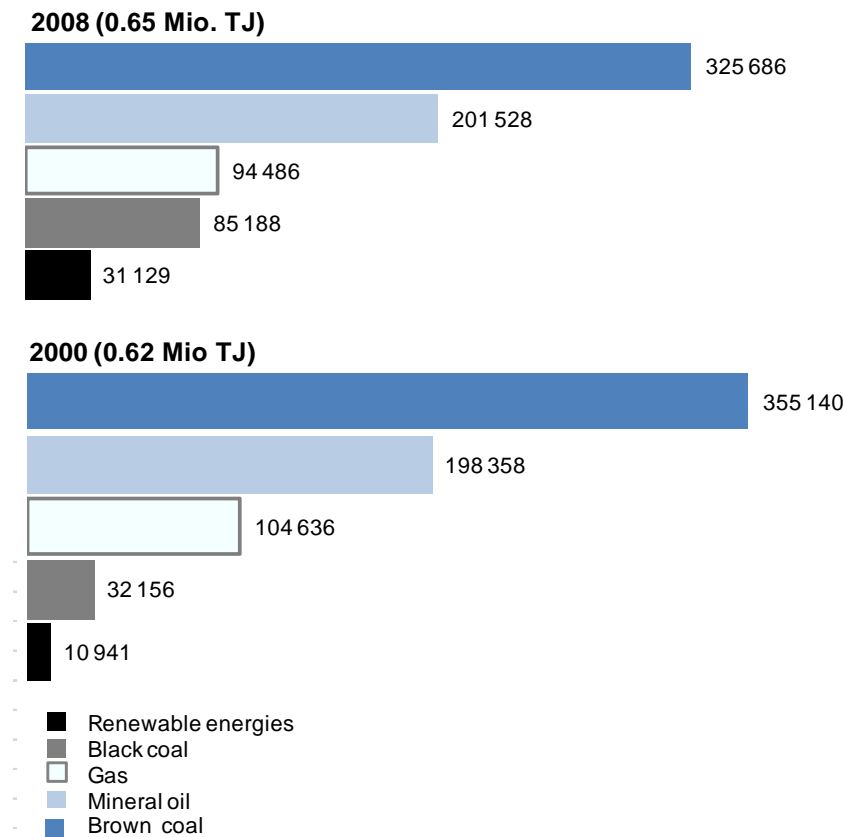
### *Selected environmental policy measures*

To substantiate these first good results, there are a variety of support programmes in place that assist the commitment to reducing greenhouse gases (Agentur für erneuerbare Energien, 2012: 70). The following important technologies and activities illustrate the wide range of the federal state of Brandenburg’s environmental policy measures.

#### *Carbon capture storage (CCS)*

CO<sub>2</sub> capture and storage could play an important role in reducing emissions from coal-fired power plants. Using technology for the capture, transport and storage of CO<sub>2</sub> prevents emissions to the atmosphere. The idea is to capture CO<sub>2</sub> from coal-fired power plants, compress it to a liquid and permanently store it deep underground (Vattenfall, 2012).

Figure 2.6. Development of renewable energy



Source: Agentur für erneuerbare Energien (2012), *Bundesländer mit neuer Energie - Jahresreport Föderal-Erneuerbar 2011/12 – Zahlen, Daten Fakten*, p. 65, available at: [www.foederal-erneuerbar.de/tl\\_files/aee/Jahresreport%202012/AEE\\_Jahresreport%20F-E%2012-BB.pdf](http://www.foederal-erneuerbar.de/tl_files/aee/Jahresreport%202012/AEE_Jahresreport%20F-E%2012-BB.pdf) (accessed 5 May 2012).

There is a pilot site in Ketzin in the federal state of Brandenburg, 40 kilometres west of Berlin, where the German Research Centre co-ordinates European CCS projects for Geosciences (GFZ, 2012). Another pilot site belonging to Vattenfall is situated in the Lausitz region near the “Schwarze Pumpe” power plant, one of the largest CO<sub>2</sub> emitters in Germany (Vattenfall, 2012).

CCS technology is an important part of the state’s Energy Strategy because of the possibility of reducing the CO<sub>2</sub> emissions from the coal-fired power plants in the Lausitz region (Arms et al., 2011: 33). However, the German population has a lot of doubts about the safety of the new technology, which is why the implementation of the CCS technology is under discussion and resisted by many politicians from other federal states in Germany, besides Brandenburg. The success of CCS in Germany will depend on public perception. To improve the situation, the energy industry has to clearly communicate the intention of the new technology, its risks and opportunities to the public (Dirschauer, 2012).



### *Power-to-gas*

In October 2011, the first hybrid power plant capable of producing hydrogen with wind power in continuous operation was built in Prenzlau, in northern Brandenburg. The concept of the so-called “power-to-gas” is a new technology for the storage and transport of renewable energy in the form of hydrogen or methane. This means that non-storable sources of energy (e.g. wind power) can be converted into storable forms of energy (e.g. hydrogen). This conversion from electrical to chemical energy, its storage and transport, and its delayed re-transformation into heat, mechanical or electrical energy is possible at the same or at another location. This concept could be a key component of future intelligent power grids such as the “smart grid” (Kersten, 2012; VDI, 2012).

### *Wind energy*

The federal state of Brandenburg is a windy state. At the end of 2011, a total of 3 053 wind turbines with a total capacity of 4 600 megawatts contributed to reducing greenhouse gases. In the area of renewable energies, Brandenburg is the front-runner in the field of wind energy. Since 2001, the capacity of wind turbines has more than quadrupled. Nationwide, the federal state of Brandenburg holds second place after the federal state of Lower Saxony regarding installed wind energy (currently around 4 300 MW) (DEWI, 2011). The goal for 2020 is to generate about 7 500 MW from wind energy (MWE, 2012b).

### *Photovoltaic industry*

The solar power industry has become one of the most innovative growth sectors in the federal state of Brandenburg. More than 40% of the solar panels produced in Germany are produced in the German Capital-Region. In the federal state of Brandenburg, several important photovoltaic plants have been constructed, including the Solarpark in Lieberoser Heide (with 53 MW it is the second largest PV-plant worldwide) and the solar electricity generation plant “Finow Tower” close to Eberswalde, which represents the fifth largest open air, PV-plant in Germany. Further open air PV-plants on a similar scale are planned or under construction (MWE, 2012b).

### *Eberswalde University for Sustainable Development*

The University of Applied Sciences in Eberswalde is dedicated to the sustainable development of rural areas. This university combines different disciplines related to rural areas, i.e. forestry, landscape management and nature conservation, organic agriculture, wood science and technology, regional management and tourism. In all, 15 programmes have been developed which have shaped the university’s profile as a place of genuine commitment to the concept of sustainable management. The university’s lead project, “Renewable Energy from Forestry and Agricultural Biomass”, takes into account the overall concept of sustainability (Eberswalde University for Sustainable Development, 2012).

### *Institute for Energy-Optimized Sites at Lausitz University*

Expertise taken from several departments and programmes of the University of Lausitz in Senftenberg and Cottbus is united in the Institute for Energy-Optimised Sites (EOS, 2012). Project financing from the Energy Region Lusatia provides funding for the institute. The EOS helps communities, businesses and private consumers to make the best individual and future-proof decisions. The aim is interdisciplinary, to develop effective

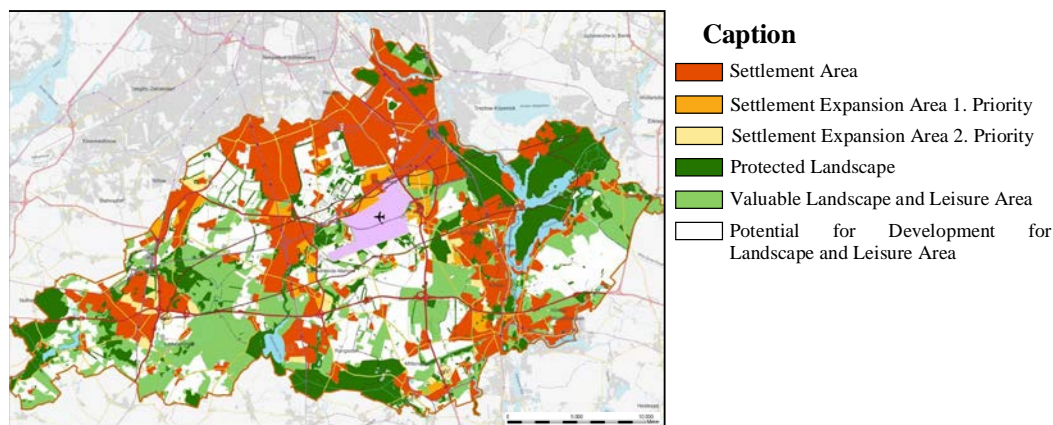
long-term energy policies and to implement them in order to meet future demands on the energy efficiency of their supply areas. The EOS carries out research and consultation in the fields of architecture, housing and social building, energy and power engineering, transport, energy management, energy and environmental economics. It is based on the principles of sustainability, efficiency and security of supply (Lausitz University, 2011).

In summary, the region of Schönefelder Kreuz and the federal state of Brandenburg are influenced by Germany's national energy policy and its related objectives. The success in the expansion of renewable energies in Brandenburg and the above-mentioned measures show how the first steps to reduce greenhouse gas emissions can be taken. The Energy Strategy 2030 focuses on energy policy in the federal state of Brandenburg by expanding renewable energies and their integration into the existing energy system. Conventional technologies such as the use of CO<sub>2</sub>-intensive coal technologies serve as a bridge until the date on which only renewable energy sources will be available. The technological advances in the next decade, especially in the areas of system integration of volatile renewable energies, will determine the duration and degree of the future use of lignite for electricity generation. The exit from fossil fuel technologies to full power generation from renewable sources will be determined, ultimately, by the development of innovative energy storage and smart-grid integration concepts (MWE, 2012a: 7).

### Natural asset base of the regional growth core Schönefelder Kreuz

The RGC Schönefelder Kreuz itself does not have any natural resources like Lausitz in the south of the federal state of Brandenburg or the Uckermark in the northeast. Residential estates, business premises and conservation areas characterise the area (Figure 2.7).

Figure 2.7. Settlement and landscape areas



*Note:* This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

*Source:* GLBB (2006), *Umfeldentwicklung Flughafen Berlin Brandenburg Willy Brandt (BER)*, available at: <http://gl.berlin-brandenburg.de/bbi/index.html> (accessed 15 July 2012).

### ***Recreation and environmental protection***

The federal state of Brandenburg has 1.1 million hectares of forest, which is 37% of the state's area, making it one of the most forested areas in Germany. The state also has 30 000 kilometres of rivers and 3 000 lakes, which makes it the largest contiguous area of water in Europe. Overall, 11 nature parks, 3 biosphere reserves and the Lower Oder Valley National Park make up a third of the area of the federal state of Brandenburg. They also form part of the National Nature Landscapes Alliance, a grouping of all large protected areas in Germany. They are a part of the national natural heritage. The Department for Large Protected Areas and Regional Development of the State Office for Environment is responsible for looking after, developing and administering these 15 national nature landscapes. Its objective is to integrate nature conservation aspects into all forms of land use, from agriculture and forestry to tourism. This department also intends to develop and promote sustainable types of living, economy and management (MWE, 2012a).

The whole region of the RGC Schönefelder Kreuz is situated in the upper part of the Dahme Lake District, which stretches in the north from the confluence of the rivers Dahme and Spree to the Lower Spreewald in the south. To the east, the natural landscape continues with the Dahme-Heideseen Nature Park with an area of nearly 600 km<sup>2</sup> with more than 100 lakes and the Scharmützel Lake District. To the west, the natural landscape continues with the lakes of Rangsdorf, Mellen, Wünsdorf and the Nuthe-Nieplitz Nature Park (Tourismusverband Dahme-Seen, 2012a). Together, these areas form a “green belt” around 30 kilometres south of the capital city of Berlin which is appreciated all year around by water sports enthusiasts, cyclists, campers and nature lovers for its accessibility and scenic charms.

The natural asset base of the RGC Schönefelder Kreuz consists of pristine natural parks and lake districts of inestimable value. The Department for Large Protected Areas and Regional Development of the State Office for Environment is responsible for managing, preserving and developing this national nature landscape for further use as a recreation area. It is obvious that the new BER Berlin Brandenburg Airport will influence the value of the area as a recreation area, both for people living in the region and for tourists. Therefore, simultaneously with the development of the airport, measures to protect nature are required. Stakeholders know this and have acted accordingly. Concrete examples like tree protection can be found in Haack et al. (2012).

### ***Tourism and quality of life***

For active individuals, families and nature lovers, Brandenburg provides a wide range of recreational activities. Over 4 000 kilometres of hiking and biking trails, 22 golf courses, more than 100 equestrian centres, water parks and numerous wellness and sports facilities can be used for active recreation. Brandenburg also offers an excellent environment for art lovers. Apart from Potsdam's buildings listed on the UNESCO World Heritage List, including Sanssouci Palace, the region offers an exceptional cultural landscape composed of more than 500 palaces, parks and old churches. Furthermore, the German Capital Region encompasses 3 opera houses, 130 theatres and 220 museums, as well as several world-famous symphony orchestras, a large number of renowned choirs, and a multifaceted club and music scene. Well-developed road and rail networks connect Berlin and the surrounding Brandenburg region to the rest of the world. Moreover, Germany's largest public transport network ensures mobility for about 6 million people (Zukunftsagentur Brandenburg, 2009: 44).

Supported by the construction of the BER Berlin Brandenburg Airport, the infrastructure of the Schönefelder Kreuz has also benefited. Today it is served by a multimodal transport system, an integrated network of road links and inland waterways, as well as rail and air links – this also makes it attractive as a destination for visitors from near and far. For example, many sites of cultural interest can be found in the city of Königs Wusterhausen, such as the Prussian Hunting Castle with its exhibition on the life of Frederick the Great or the museum on the Funckerberg dedicated to the birthplace of German radio. Combined with the bordering lakes and forests, this makes Königs Wusterhausen a popular tourist attraction (Tourismusverband Dahme-Seen, 2012b).

Brandenburg is also very attractive to families. In 2007, a study referred to Potsdam, the capital of the federal state of Brandenburg, as the number one town in Germany with respect to family friendliness and the federal state of Brandenburg as one of the “top regions for families”. A further 11 out of 14 districts were ranked in the first third of 439 German districts and towns. The reasons for this high ranking were the family friendliness, the possibility to combine family and work, the good educational environment, and the multifaceted leisure facilities for children and young adults (Prognos, 2008). In particular, there is a lot of support for young families; in 2007, Brandenburg spent more money on childcare centres than any other federal state in Germany (ISQ, 2010: 56).

The cost of living in the federal state of Brandenburg is reasonable. Rent is affordable and building costs are low. According to an annually published rent level index, the rents in the federal state of Brandenburg’s towns with more than 20 000 inhabitants such as Potsdam, Cottbus, Brandenburg an der Havel, Frankfurt/Oder or Eberswalde are all lower than the national average (F+B, 2012). The results differ for the Schönefelder Kreuz region where flats are rare and rents are increasing due to the effects of the new airport (rental development for the Schönefelder Kreuz region can be found at Allesklar, 2012).

### *Air quality*

The monitoring of air quality in the federal state of Brandenburg is implemented by an automatic air quality measurement network with more than 100 instruments under the EU guidelines (the EU determined limit values for fine dust, nitrogen dioxide, etc. for ensuring air quality in the Air Quality Directive [2008/50/EG] and on the basis of a concept validated by the federal state of Brandenburg Ministry of Environment [Umweltministerium, 2012a]). Up-to-date measurement values of the pollutants ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), particulates (PM<sub>10</sub>&PM<sub>2.5</sub>), sulphur dioxide (SO<sub>2</sub>) and carbon monoxide (CO) are promptly published on the State Environment/Consumer Protect Information System (LUIS-BB) (Complan, 2010). These results are accompanied by a set of applicable limit values, as well as monthly and annual analyses.

The automatic air quality measurement network consists of 17 permanent stations in towns and rural areas and 5 permanent stations to monitor the air in areas close to traffic (real-time information for all monitoring stations can be found at Umweltministerium, 2012b). Temporary stations with special tasks complement the system of monitoring of particulate pollution in declared traffic focal points. The Schönefelder Kreuz region, as a part of the automatic air quality measurement network, is equipped with a permanent station in the centre of Königs Wusterhausen and, since 2011, with a temporary station on the property of the Berlin Brandenburg Airport.

Since 1990 there has been a significant decrease in the concentrations of sulphur dioxide and particulate matter (dust) recorded in the federal state of Brandenburg caused by the downsizing and closure of many production sites, increased use of less-polluting fuels and modern technologies for emission reduction. Due to the substantial increase in road traffic, the values for nitrogen oxides and ozone have remained at a constant level. Studies show that for the federal state of Brandenburg this trend will continue in the coming years, only the area around the Berlin Brandenburg Airport will show increasing values for nitrogen oxides and particulates caused by the expected increase of traffic on the road and in the air (IVU, 2011: 32, 40). A detailed overview of the automatic air quality measurement network is provided in the annual report for air quality published by the Brandenburg Ministry of Environment (Umweltministerium, 2012c).

### ***Noise pollution***

With the combination of detailed noise reduction plans and precautionary noise protection in urban planning, the federal state of Brandenburg aims to reduce all types of harmful noise. This takes place in close conjunction with infrastructure planning and all measures concerning air pollution. The project is called “The Brandenburg Way” (Umweltministerium, 2012d) and it is the basis for the implementation of the European Environmental Noise Directive 2002/49/EG. In accordance with this directive, the federal state of Brandenburg started to produce strategic noise maps for defined research areas in 2007. All main roads with a traffic volume of over 3 million vehicles per year, the Potsdam urban area and the Berlin Brandenburg Airport are included (Umweltministerium, 2012e). The results are published online (Noise Map Service, 2012) and contain statistical information on areas affected by noise as well as noise maps with extensive isophone imaging of noise pollution divided by day, evening and night. This data is used as a starting point for the state’s noise action planning.

The dominating source of noise for the RGC Schönefelder Kreuz is obviously the BER Berlin Brandenburg Airport. We will come back to this fact later in this report.

Today the RGC Schönefelder Kreuz supports a remarkable quality of life, but it is obvious that the new BER Berlin Brandenburg Airport will influence future life quality in the area. Therefore, simultaneously with the development of the airport, measures to protect quality of life are required, examples of existing measures are described in Haack et al. (2012).

## **Economic opportunities and policy responses in Schönefelder Kreuz**

### ***Municipal budgets***

The municipal budgets of the RGC Schönefelder Kreuz have improved constantly due to population growth and dynamic economic development, especially since 2005 with the airport as a promoter in the areas of income and trade tax revenue. The economic strength of the RGC Schönefelder Kreuz with its three municipalities (Schönefeld, Königs Wusterhausen and Wildau) provides 50% of the Dahme-Spreewald district levy (STK, 2012d).

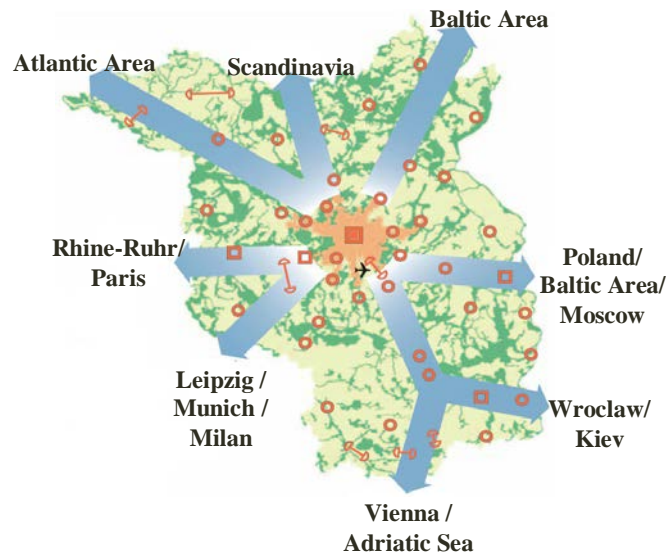
### ***Infrastructure and transport***

As mentioned above, the regional growth core Schönefelder Kreuz is centrally located in the federal state of Brandenburg. In terms of infrastructure, the Schönefelder Kreuz is in the middle of several important transnational traffic and

transport corridors (Figure 2.8). The Berlin-Brandenburg region has 856 kilometres of motorways at its disposal, 2 000 kilometres of waterways and 3 400 kilometres of rail in all directions. All important European markets are a lorry day trip from the region (German Capital Region, 2012).

The core element of the regional infrastructure is the forthcoming BER Berlin Brandenburg Airport, discussed in detail in Chapter 3.

Figure 2.8. Transnational traffic and transport corridors



*Note:* This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

*Source:* BRAVORS (2009), *Verordnung über den Landesentwicklungsplan Berlin-Brandenburg (GVBl.II/09, [Nr. 13], S.186)*, available at: [www.bravors.brandenburg.de/sixcms/detail.php?gsid=land\\_bb\\_bravors\\_01.c.48069.de](http://www.bravors.brandenburg.de/sixcms/detail.php?gsid=land_bb_bravors_01.c.48069.de) (accessed 5 May 2012).

Another important element of transport infrastructure in the region is the inland port of Königs Wusterhausen, which has the capacity to handle 3 million tonnes of cargo per year, making it one of the top 20 harbours in Germany, and the largest in the federal state of Brandenburg (Statistik Berlin Brandenburg, 2011: 10, 19). The port currently has a daily turnaround of 20 inland watercraft, 200 trucks and 7 trains.

Besides airports and inland ports, the railway is one of the most important transport infrastructures for a modern economy. There are three important cargo turnover facilities in the Metropolitan Region Berlin-Brandenburg. One of them is located near the Schönefelder Kreuz: the brand new Cargo Transport Centre Berlin-South in Großbeeren operated by DB Schenker Logistics. It was opened in January 2012 and is a state-of-the-art facility, especially in terms of green growth potential.

As the first plant of DB Schenker, the terminal was equipped with a combination of geothermal energy production and innovative air conditioning technology. The location is heated by a low temperature system. The DB Schenker Company plans to reduce all of its CO<sub>2</sub> emissions by more than 20% by the year 2020 (DB Schenker, 2012).

### ***Industry and technology areas***

The priority industry competence fields in the area includes logistics, aeronautical engineering, automotive, media/ICT and biotechnology/life sciences, as well as metal processing for Wildau and Königs Wusterhausen (STK, 2012e: 38). The industry expertise in the regional growth core Schönefelder Kreuz acts as a catalyst for a wide range of start-ups and new settlements in the region.

**Logistics** is the largest and fastest growing branch in the RGC Schönefelder Kreuz. This is mainly due to the existing logistics facilities in the area, the forthcoming Berlin Brandenburg Airport, many service providers which implement more and more complex logistics solutions in the region and the close connection to the Technical University of Applied Sciences, Wildau with its R&D activities in logistics (Complan, 2010: 15).

**Aerospace engineering:** This sector is already an important priority sector at the site and will receive further positive impetus through the expansion of the BER Berlin Brandenburg Airport. In addition, the site is marked by more important companies in the state such as MTU and Rolls-Royce Germany and a high density of competent expertise at the site (Fraunhofer Institute PYCO) (Complan, 2010: 16).

**Automotive:** The automotive branch is very significant, too in the RGC Schönefelder Kreuz. The most important driver is Daimler with its factory in Ludwigsfelde – the largest automotive factory in the federal state of Brandenburg (Complan, 2010: 17).

**Media:** This industry focus is only below average due to the heterogeneous and small-scale corporate structure with different business directions. The proximity to Berlin and the scientific orientation of the Technical University of Applied Sciences, Wildau has positive development prospects (Complan, 2010: 18).

**Biotechnology and life sciences:** A strong profile in the field of bioinformatics generates biosensors and biosystem engineering, focused on the research orientation of the Technical University of Applied Sciences, Wildau. Numerous small and research-intensive companies that co-operate closely with each other are integrated in the current research landscape that characterises the region (Complan, 2010: 19).

**Metal processing:** Despite a stable and expandable base in the RGC Schönefelder Kreuz (especially in Wildau and Königs Wusterhausen) the metal processing industry only makes a small contribution to the economic structure. There are, however, special skills in the field of heavy machine building, accompanied by application-related research activities at the Technical University of Applied Sciences, Wildau. The site is characterised by micro and small enterprises involved in research and development to a considerable degree (Complan, 2010:20).

### ***Exports and imports***

There are currently not enough statistics about export and import for the regional growth core Schönefelder Kreuz. Therefore, statistics from the federal state of Brandenburg will be used in the following section.

In 2011, the export volume of the federal state of Brandenburg reached a total value of EUR 13.5 billion. According to the Statistical Office of Berlin-Brandenburg, this exceeded the value of the previous year by 10.0%. Exports to EU countries amounted to EUR 9.1 billion, representing an increase of 7.7% (Gründungsnetz Brandenburg, 2012). The strongest export customer was France, followed by Poland and the United States. In

2011, the main exports from the state of Brandenburg were specialised aircraft, with a market share of 17.5% of the total export volume, followed by pharmaceuticals (11.9%), sheet-iron or steel (5.0%) and paper, cardboard, plastics, trucks and special vehicles (Gründungsnetz Brandenburg, 2012).

In 2011, the import volume of the federal state of Brandenburg reached a total value of EUR 18.5 billion. According to the Statistical Office of Berlin-Brandenburg, this exceeded the value of the previous year by 27.9% (Gründungsnetz Brandenburg, 2012). The Russian Federation is the most important importing country, with a share of the total import volume in 2011 of 38.3%. It was followed by Poland with a market share of 13.2% and the United Kingdom (5.0%). At the top of the list of imported goods in the state of Brandenburg were oil and natural gas, with a share of the total import volume of 38.5%. Aircraft reached a share of 8.8% (Gründungsnetz Brandenburg, 2012).

The efficient infrastructure of the regional growth core Schönefelder Kreuz is a key advantage for export and trade. Of particular significance here is the BER Berlin Brandenburg Airport, the harbour at Königs Wusterhausen, the motorway system and the railway system.

### ***Research and development***

With the foundation of the Technical University of Applied Sciences, Wildau in 1991, academic teaching and the scientific research and development in Wildau was firmly established. The regional economy and business management benefit directly through close co-operation, attracting young specialists and executives from among the graduates, as well as degree courses tailored to the needs of companies and institutions.

The task of the “TH Wildau Transferstelle” is to initiate technology transfer between the university and companies in the federal state of Brandenburg and to promote relationships between the university and companies. The focus is on small and medium-sized enterprises (SMEs) (Complan, 2010: 25).

The “Branchentransferstelle Logistik” (BTL) is focused on relationships between companies working in the field of logistics and the University of Applied Sciences, Wildau. Co-operation includes common projects, the development of funding opportunities and special education programmes (Complan, 2010: 25).

The purpose of the “Service Centre for international Knowledge and Technology Transfer” (SeWiTec) is to carry out discussions between companies and research institutions in terms of support programmes for the European Union (Complan, 2010: 25).

The Fraunhofer Institute for Polymer Materials and Composite PYCO is also present in the area. This Fraunhofer Institute specialises in the development of high-polymer materials for lightweight construction. Such innovative materials are used particularly in the construction of aircraft and vehicles.

### ***Business start-up offers***

Two key institutions located in the area surrounding the Technical University of Applied Sciences, Wildau are the Technology and Business Incubator (Technologie- und Gründerzentrum, TGZ) and the Aerospace Technology Centre Schönefelder Kreuz (Zentrum für Luft-und Raumfahrt Schönefelder Kreuz, ZLuR).



Target groups of the Technology and Business Incubator are founders and young entrepreneurs. It does not focus on any particular sector. There are currently 28 companies in the TGZ, with a total number of employees of nearly 150 (Complan, 2010: 26).

In contrast to the Technology and Business Incubator, the Aerospace Technology Centre Schönefelder Kreuz has a clear focus on companies from the aerospace industry. Approximately 15 enterprises are located in 3 modern buildings. One important example is the BBAT AG (Berlin Brandenburg Aerospace Technology Public Company). Amongst others, this company produces and tests engine components on behalf of Rolls-Royce (Complan, 2010: 27).

### ***Regulatory framework***

The federal state of Brandenburg is moving its policies and legislation within the framework of European and national policies and laws. Therefore industrial plants and commercial operations, which have a particular effect on the environment, have to receive an authorisation from the Ministry of Environment of the federal state of Brandenburg. The approval process is integrated and includes the different environmental fields, planning permits, and occupational health and safety. In some cases this is combined with an environmental impact assessment. In addition, a monitoring programme has been established by the state where on-site checks are carried out by the responsible authorities to verify that the required measures to prevent harmful environmental effects have been met (Umweltministerium, 2012f).

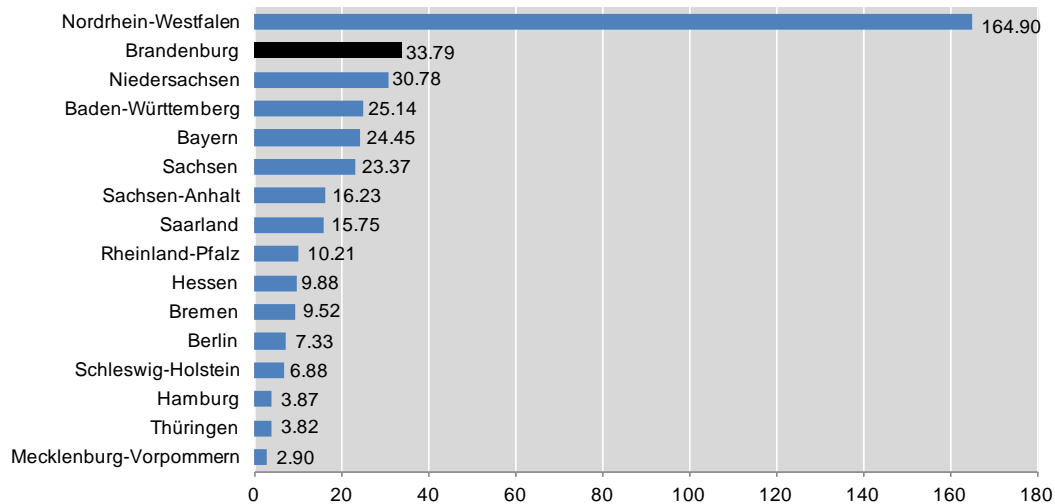
The amount of emissions produced by reportable industrial equipment in Brandenburg is published on the federal state of Brandenburg's Ministry of Environment's website (Umweltministerium, 2012g). In addition, the *Environmental Data Report* (Umweltministerium, 2012h), compiled at the request of the state government, is a reference work for all citizens and specialists interested in the environmental situation in the state. All of the most important data and facts, research results and measurements regarding soil, water, air and climate, as well as the projects of the State Office of Environment, are presented in this report. It also contains several indicators of the Brandenburg "sustainable development" programme, a collaboration between the departments of agriculture, forestry and health (LUGV Brandenburg, 2012).

The state of Brandenburg endorses and supports European and national efforts for the rapid development of a sustainable energy supply. Objectives include increasing energy efficiency, developing renewable energies and storage technologies, improving the national electricity grid and reducing greenhouse gases. The following national laws (excerpt of the most important) form the regulatory framework in Germany and have strong influences on the energy sector and its stakeholders (Energiewelt Brandenburg, 2012):

- Renewable Energy Law
- Renewable Energies Heat Act
- Energy Saving Act
- energy saving regulations
- Energy Management Act
- Combined Heat and Power Act
- regulation on the production of electricity from biomass.

Furthermore, international and national CO<sub>2</sub> emissions trading also play a role. The CO<sub>2</sub>-intense lignite industry in Brandenburg provides a major source of CO<sub>2</sub> trading in Germany (Figure 2.9) as the two coal-fired power stations “Schwarze Pumpe” and “Jaenschwalde” are situated in Brandenburg. These power plants are two of the ten largest CO<sub>2</sub> emitters in Germany. Two-thirds of the power generated by the power stations is exported to other federal states (LUGV Brandenburg, 2011: 12).

Figure 2.9. Emissions allowances by region in Germany



Source: Ministerium für Ländliche Entwicklung, Umwelt und Verbraucherschutz des Landes Brandenburg (2008), *Maßnahmenkatalog zum Klimaschutz und zur Anpassung an die Folgen des Klimawandels*, p. 33, available at: [http://brandenburg.de/cms/media.php/2328/mk\\_klima.pdf](http://brandenburg.de/cms/media.php/2328/mk_klima.pdf) (accessed 5 May 2012).

## Conclusion

The regional growth core Schönefelder Kreuz is characterised by a variety of economic options, which derive both from the favourable geographical location of the RGC Schönefelder Kreuz and from political measures supporting the region. In particular, the political decision to locate the new BER Berlin Brandenburg Airport in Schönefeld, as well as the definition of RGCs as part of the promotion policy of the federal state of Brandenburg, led to a gradual improvement in infrastructure and transport routes. These measures and the possibilities of co-operation between science and industry, provide a growing attraction for a wide range of companies. Not every industrial plant or commercial operation is accepted. Companies which have a particular effect on the environment have to receive permission to settle from the Brandenburg Ministry of Environment.

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## Chapter 3

### Regional and green dynamics of the new airport

*The new BER Berlin Brandenburg Airport will influence the regional growth core Schönefelder Kreuz in different ways. This chapter analyses the in-depth green growth effects of the airport. These effects concern both the airport itself and the airport's periphery. The chapter examines whether the airport is a green airport and the effects of the airport on its periphery.*

*First, despite its ambitions, the airport is a conventional, mainstream, medium-sized, “grey” airport project which so far cannot, and does not, lay claim to being a “green beacon project”, meaning that it is not a prominent, high-visibility, large-scale model demonstration of new concepts and technology applications, with a visionary, stimulating, encouraging effect both for business and public acceptance.*

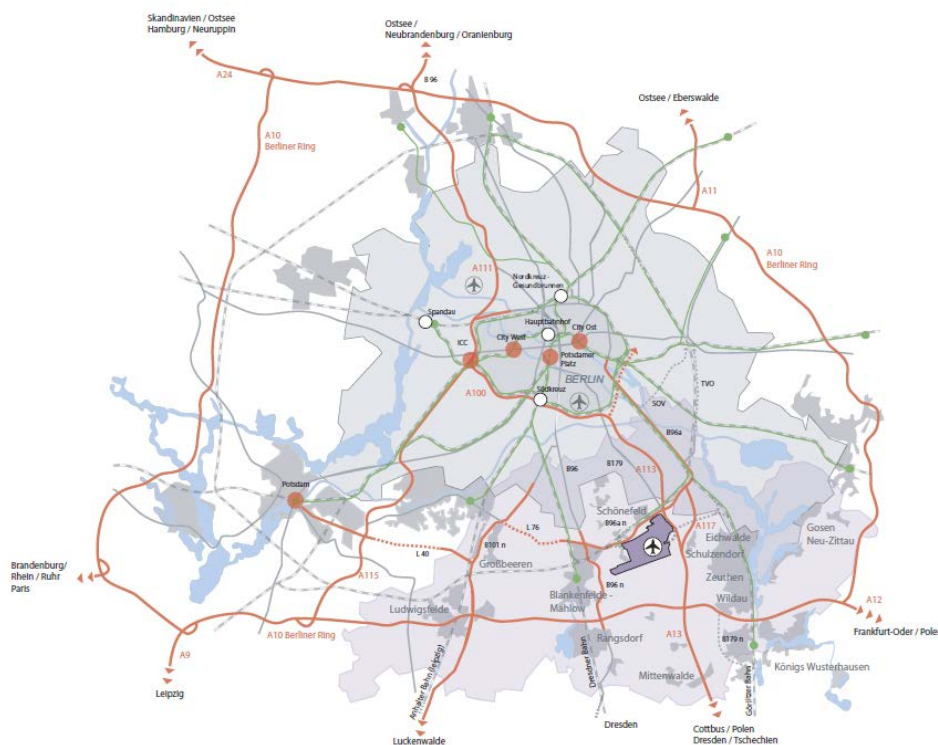
*Second, the airport will influence municipalities in its periphery both in positively and negatively depending, for example, on the location of the municipality. Positive economic influences contrast with negative ecological influences so that in the end a balance of interests of the municipalities involved is recommended.*



## The BER Berlin Brandenburg Airport – facts and figures

Until 2008 there were three airports in the Metropolitan Area Berlin-Brandenburg: Tempelhof (THF), Tegel (TXL) and Berlin-Schönefeld (SXF) as shown in Figure 3.1. In October 2008, Tempelhof Airport was closed. The current Berlin-Brandenburg airport system (2013) thus consists of two airports: Tegel and Berlin-Schönefeld. When the BER Berlin Brandenburg Airport (Willy Brandt) opens, the air traffic in Germany's capital region will be entirely concentrated in Schönefeld, in the RGC Schönefelder Kreuz, south-east of Berlin. Tegel Airport is due to close when the Berlin Brandenburg Airport opens (Berlin Airport, 2012: 2).

Figure 3.1. Berlin's airport system until 2008



*Note:* This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

*Source:* GLBB (2008), *Flughafenumbfeld Berlin Brandenburg International (FU-BBI): Planungsatlas (Teil a)*, p. 5, [http://gl.berlin-brandenburg.de/imperia/md/content/bb-gl/flughafenumbfeld\\_bbi/planungsatlas\\_teil\\_a.pdf](http://gl.berlin-brandenburg.de/imperia/md/content/bb-gl/flughafenumbfeld_bbi/planungsatlas_teil_a.pdf) (accessed 31 October 2012).

In 2011, about 24.5 million passengers used the Tegel and Berlin-Schönefeld airports (approximately 250 000 take-offs and landings). According to this data, the BER will have a starting capacity of about 24.5 million passengers per year, which can be expanded incrementally to 45 million passengers per year (Flughafen Berlin Brandenburg, 2012: 9).

When the BER opens its doors, 75 airlines will serve 173 destinations in 50 countries. The airlines will increase their flight frequencies and offer a total of 16 new destinations (Berlin Airport, 2012: 2). Figure 3.2 shows an artist's impression of the new airport terminal.

Figure 3.2. Artist's impressions of the new BER terminal



Source: Der Tagesspiegel (2011), *Simulation des neuen Terminals am Großflughafen*, [www.tagesspiegel.de/mediacenter/fotostrecken/berlin/fotostrecke-simulation-des-neuen-terminals-am-grossflughafen/4270882.html#](http://www.tagesspiegel.de/mediacenter/fotostrecken/berlin/fotostrecke-simulation-des-neuen-terminals-am-grossflughafen/4270882.html#) (accessed 31 January 2013).

### ***BER's accessibility***

The Berlin Brandenburg Airport has a six-track underground railway station with three platforms. The so-called Airport Express already connects Schönefeld Airport with downtown Berlin in about 30 minutes (Alexanderplatz). Deutsche Bahn will include Berlin Brandenburg Airport Willy Brandt in its network and its international and regional connections. In addition, the Capital Airport provides good accessibility for motorists: its own exit from the A113 motorway offers a fast and direct link to downtown Berlin and the A10 ring. With the four-lane B96a dual carriageway, which runs parallel to the motorway, the airport has a second connection to Berlin (Berlin Airport, 2012: 4).

The new airport also includes a shopping mall, providing passengers with a wide range of non-aviation services, with approximately 150 shops, restaurants and service facilities spanning more than 20 000 m<sup>2</sup> (Berlin Airport, 2012: 4).

To the north-east of the BER Airport, the capital's biggest business park, Business Park Berlin, is to be built. The "landscaped 105-hectare site offers a selection of plots, which can be flexibly divided up into made-to-measure, fully developed sites, suitable for all types of businesses – from business start-ups to back offices, from regional distribution centres to multinational producers" (Berlin Airport, 2012: 10).

The 14-hectare entrance area to the Business Park Berlin is on the way to becoming an urban centre for offices, hotels and service industry companies. This entrance area provides an additional infrastructure to the extensive commercial properties located to the south.

The idea is that technology and sales companies, light industry, and extensive trade and logistics centres will find the central area of the park (75-hectares) an ideal location for their new headquarters. In addition to conventional commercial sites, there are also industrial sites in the southern part of the development that are suitable for businesses with 24-hour operations.

Currently, nearly 41 hectares of the Business Park Berlin have been sold to investors (Berlin Airport, 2012: 10).

### *Current employment situation*

The Berlin airports of Schönefeld and Tegel are among the largest employers in the federal states of Berlin and Brandenburg, with nearly 20 000 people currently working at the airports and on the BBI construction site (Berliner Akzente, 2012). “Berlin Brandenburg Airport is the key infrastructure project for the future viability of the capital region [...] and up to 40 000 new jobs will be created in the region as a result of the additional purchasing power effects” (Berlin Airport, 2012: 11).

In the future, Berlin-Brandenburg will be the third-most important location of the aerospace industry in Germany. Approximately 18 000 people currently work at the 2 Berlin airport sites. In addition, the region is home to Deutsche Lufthansa AG, MTU Aero Engines, Rolls-Royce Deutschland and about 60 SMEs. There are 15 technical colleges and institutes and the Technical University of Applied Sciences, Wildau focusing on aerospace industry (Berlin Airport, 2012: 11).

### **BER and green growth**

The new BER is expected to have the following economic and ecological benefits:

- The new airport will be an **economic driver** for businesses in the Berlin Brandenburg area due to the concentration of aviation activities in one location and the efficient/effective connection of the Berlin-Brandenburg region to the rest of the world.
- The BER is declared to be a **“green airport”** with minimal negative impact on the environment and for the people living in the surrounding area.

The substitution of one airport for three will have important consequences for the Berlin metropolitan region and the regional growth core of Schönefelder Kreuz. From an aviation perspective, concentrating operations in one airport, together with the recent movement of Air Berlin to join Oneworld, represents an opportunity for Berlin to develop a hub airport with a stronger presence in the long-haul market. This would certainly boost the region’s economy.

From a spatial and regional point of view, the new airport represents a change in the distribution of economic activity and power within the region, meaning a higher concentration of economic potential around the Schönefelder Kreuz. From the viewpoint of the regional growth core, while this brings new services, companies and production to the area, it can also represent a challenge in terms of land availability and brownfield developments, an increasing demand for skilled workers and a higher concentration of the externalities associated with the airport’s activity (Suau-Sanchez and Mason, 2012: 6).

Nevertheless, these are more promises than facts, so two main questions remain with respect to “green growth” in the RGC Schönefelder Kreuz:

- Is the new BER a “green airport”?
- What are the impacts of the new BER airport with respect to the surrounding area?

### ***BER – on the way to a green airport***

Although aviation only represents between 1% and 3% of the global CO<sub>2</sub> emissions (depending on the data source), from the local viewpoint, an airport can considerably diminish the local air quality and represent an important share of the local CO<sub>2</sub> emissions.

The major reduction of CO<sub>2</sub> emissions in the new BER airport will come from an increasing share of public transport in the ground transportation modal split and a reduction of more than 50% of the emissions of the buildings and operations (from 78 300 tonnes to 36 700 tonnes) compared to 2010. This will be achieved mostly by an onsite, combined-cycle power station and procuring electricity from regenerative sources. The airport will consider other measures for cutting emissions, including hydrogen vehicles for platform operations, and will perform regular air quality assessments with air quality testing units and bio-monitoring plants and bees.

Although the new BER airport markets itself as one of the world’s greenest airports, it will essentially be using mainstream technology and thus it will be as green as any other new building. It will not, therefore, be a cutting-edge airport in terms of green technology or strategy (Suau-Sanchez and Mason, 2012: 9).

The BER is a new airport and thus its resource performance will be improved by the use of standard, higher performance building design and equipment, but it is unclear what, in addition to this, is innovative and worthy of the label “green”. In other words, ecology and sustainability were integrated in the general planning as a routine matter, following established standards – but not conceptualised as a priority (compare GLBB, 2008a, 2008b, 2008c). This may represent a missed opportunity.

The growth of air transport contributes to increasing carbon emissions, even if, as noted earlier, the industry itself has enhanced its carbon efficiency at a much higher rate than passenger and cargo growth. So while a new airport may be greener, it is still a hard case to sell in terms of ecology and environmental protection. In the light of massive protest against the BER’s location and expected flight routes, which increase annoyances and emissions (noise and other), it seems unlikely to communicate a credible green message. One critical perspective, well-debated in the Berlin-Brandenburg metropolitan region, is that the final location maximised rather than minimised the number of people and communities exposed to noise and other emissions. When figures of the number of residents affected by the BER airport are compared to those affected by the combination of the three old Berlin airports (Tegel, Tempelhof and Schönefeld), this seems like a good, green message. However, alternative locations for the new airport further out in the rural areas could have dramatically reduced the number – with, naturally, longer travel distances to and from the airport, which was not politically acceptable. Alternative locations would have had a variety of other ecological disadvantages, but it cannot be said that, on balance, Schönefeld was the greenest possible location.

The BER seems more like a conventional, mainstream, medium-sized, “grey” airport project which so far cannot, and does not, lay claim to being a “green beacon project”. A beacon project is a prominent, high-visibility, large-scale model demonstrating new concepts and technology, which has a visionary, stimulating, encouraging effect both for business and public acceptance.

Keeping this in mind, it does make sense to compare the BER and the regional growth core Schönefelder Kreuz with the Hamburg aviation cluster’s beacon project “Efficient Airport 2030”, which places efficiency front and centre – presenting efficiency not only as a means to better use economic resources but also to improve ecology and

sustainability. Efficiency is well suited to the aviation industry’s own economic interests (from aircraft design, fuel use and handling to airport operations like ground connections, passenger and cargo ground transport). Hamburg has rounded up various stakeholders, including R&D institutions and the German air transport research centre DLR to pursue this goal and deliver measurable indicators. This opportunity does not seem to have been a core objective of the BER – or it has been under-communicated. It thus appears possible for innovative technologies and processes to lead to “greener” airports (DLR, 2012a, 2012b). Therefore a potential recommendation from this research is for communication between the two airport projects on issues related to more modern and innovative ways to build greener airports.

### *The airport region – expectations and advertisement, stresses and strains*

By 2007, the Metropolitan Area Berlin-Brandenburg – sometimes called “the capital region” – had become a first-rate location (Business Location Center, 2012a). It attracts people and companies from all over the world (Business Location Center, 2012b).

As a region with a significant rate of economic growth in Germany, the Metropolitan Area Berlin-Brandenburg offers a lot of opportunities for business success. It is possible to drive international trends and help shape the future in an international atmosphere. The area’s universities and laboratories provide remarkable opportunities for co-operation with research and academic programmes. The region is Germany’s political centre and therefore enhances companies’ reputations internationally and supports high-level contacts. In the future, the BER will also provide a high level of accessibility. Attractive commercial sites and affordable office space make launching a business in the area that much easier. It is likely that graduates from Berlin’s and Brandenburg’s universities will be able to fill the human resource needs of the various businesses surrounding the airport.

Beyond that, the expectation was, and is, that the region’s “excellent transport connections and central position provide a gateway to the new markets in the east. The new airport Berlin Brandenburg International will reinforce its role as a hub of international air traffic. This is of the utmost importance – and not just for commerce. The capital city is a magnet that attracts everyone – and the airport region is its most fertile soil for ideas and investment” (Business Location Center, 2012a).

Schönefeld, as a part of the regional growth core Schönefelder Kreuz, “is well prepared for its new role as a focal point within the airport region. The value of its proximity to the airport and motorway has been recogni[s]ed for years and close co-operation has been fostered with investors” (Business Location Center, 2012a).

These were also the arguments of a large number of well-known companies and institutions and numerous leaders and experts from science, research, culture, administration, and politics to explain the advantages of Schönefeld. They drew far-reaching economic hope from the new BER airport. The expectations were that BER would be a trigger for innovation:

- making the Berlin Brandenburg region fit for the future
- increasing the importance of the region as a player in global competition
- creating a burst of growth because of investments from Germany and abroad, and as a consequence
- driving progress for the municipalities in the BER periphery.

To ensure that the demands BER Airport will be facing are met, the “Joint Structural Concept for the Area surrounding BER Airport” was developed. In order to build consensus in the course of the planning process, the Joint Spatial Planning Department brought together relevant stakeholders, including municipal, city and *Länder* administrators, as well as the administrative districts, regional planning authorities and the Berlin Schönefeld Airport Company, providing them with the opportunity to state their respective needs and interests. A jointly developed guiding principle set out the basic tenets of the agreed future development of the airport environment.

The area surrounding the airport is exceptionally suited to helping establish the BER Airport on an equal footing with its international competitors. The Mutual Structural Concept has created “the framework within which the airport region will develop in economic terms, and will ensure the co-operation of all stakeholders in the long term” (GLBB, 2007: 3).

The Joint Spatial Planning Department Berlin Brandenburg was, and is, aware of this double action resulting from building and using the new airport (Becker et al., 2012: 16). It therefore utilised the expertise of the „Regional economic report of the effects of the Berlin Brandenburg Airport on the development of communities in the environs of the airport” (Becker et al., 2012). The idea is to utilise this expertise as a basis for balancing the interests of all municipalities, cities and *Länder* in the BER periphery – including the RGC Schönefelder Kreuz (Becker et al., 2012: 16).

This plan has three main goals:

- Creating a complete and consistent database for describing and analysing the economic and demographic development of the airport periphery during the ten years from 2002 to 2012 – the decade before the opening of BER.
- Deriving a forecast of the economic and demographic development of the airport periphery for the following ten years to 2022 – the decade after the opening of BER.
- Describing recent results on the structure’s capacity to balance the interests between local communities and the airport, and to develop recommendations for the best use of the environment of the BER.

## Conclusions

Four challenges exist for integrating the development of the airport into the wider socio-economic processes of green transition in Brandenburg: skills availability and development, quality of jobs created, generating job multiplier effects as an engine of growth, and the future development at the airport as an international hub. Each of these is discussed in further detail below.

### *Skills availability and development*

One of the main concerns of the participants at the workshop organized for this study was related to the need for the region to provide the required skilled workforce for all of the knowledge-intensive companies located in the airport region. The region is already in a position to supply highly skilled workers according to the needs and requirements of local industry and firms, e.g. there are strong links between the Technical University of Applied Sciences, Wildau and some industrial and R&D firms in the Schönefelder Kreuz.



Likewise, the industrial orientation of an important percentage of the companies is linked with the airport and the aviation industry. Among these firms are the engine manufacturer Rolls-Royce and the polymeric materials producer Fraunhofer-PYCO, which in turn have strong ties with university and academia (Suau-Sanchez and Mason, 2012: 7).

An ongoing challenge for the region will be finding the right combination of bottom-up and top-down strategies to incorporate green knowledge and skills into the set of skills demanded by companies. The goal is to achieve sustainable demand-led green skills growth rather than the more common situation of supply-led growth

### ***Quality of the jobs and low-skill segment***

While it is true that aviation supports and boosts a region's economy, the quality of the jobs onsite can be quite poor, especially in the areas of ground handling and retail. Most of these jobs are part-time and very precarious, which represents a threat for the socio-economic development of the region, not only in the present, but also in the future, as these kinds of jobs make it difficult to, for example, build up pension claims. *Therefore, the strategic-policy conclusion is that ongoing opportunities for training and skills development to enable labour force mobility must be part of the overall economic development strategy for the airport region.*

### ***The airport as an engine of economic development***

Several strong links exist between numerous firms and the airports. It is, however, difficult to get a systematic picture from the available data examined for this study of the inter-firm connections in the airport region beyond these few anecdotal cases. The lack of formal co-operation structures and inter-firm connections has ramifications in terms of how embedded the airport is within the region.

There are minimal formal structures for organising the spatio-economic spillover of the airport. One of these is the airport city, which is part of the airport master plan and has a floor area of 210 000 m<sup>2</sup>; another is AirTown, a private development near the airport including housing, retail and office space (Suau-Sanchez and Mason, 2012: 8).

Another formal structure for the economic development of the region is the Brandenburg Economic Development Board (ZAB). While the Brandenburg strategic clusters for regional development are synthetics/chemistry, metal, food sector and tourism, the Berlin strategic clusters have a more specialised profile: health, energy technology, optics, transport and logistics, and ICT and media. The ZAB is a:

...one-stop agency for a variety of business support services. It provides assistance in pursuing investment projects in Brandenburg, but it is not a specific agency for the promotion of airport-related business nor for the marketing of the airport as a regional business engine. Specific agencies are not as common as should be, but we can find them in some world-class airports, this is the case of the Amsterdam Airport Area and the Schiphol Area Development Company in the Amsterdam-Schiphol airport. (Suau-Sanchez and Mason, 2012: 8).

There is mixed evidence of co-ordination between participants and municipalities when it comes to the definition of common strategies and views of the future. The regional growth core strategy itself is a supra-municipal organisation based on informal co-operation, it does not have an institutional structure and only has a limited annual budget of EUR 150 000 for strengthening co-operation. The RGC's resources do not extend to providing this co-ordination or provision for data collection.

While this might not be an immediate issue, the organisation of the links and integration of the airport and its carriers with the regional hinterland is essential for the definition of efficient supply chains that can allow the region and its firms to be competitive in the global market. Today, competition is more between supply chains than between firms (Kasarda, 2000, 2011). Previous studies show that the airport city concept is already outdated and that other conceptual visions of the airport-region integration (e.g. city-port, aerotropolis, airport corridor, airport region) are “more helpful for the definition of a vision to take full advantage and return from the airport activity [...]” (Suau-Sanchez and Mason, 2012: 8).

### *The hub ambitions*

The new Berlin-BER airport will provide the quality infrastructure required by airlines to develop a hub. The new airport is already designated as a hub for Air Berlin. Hub status airports can attract denser levels of economic activity to the airport region with the addition of maintenance, engineering, and head and back office functions also being sited at the airport. Two limitations have been identified for the BER to hub activities (Suau-Sanchez and Mason, 2012: 9):

- First, the Berlin-BER airport will start operations with a capacity of 27 million passengers, when the current traffic in the Berlin airport system is around 24 million passengers. The limited spare capacity could be a threat for the further development of air traffic, especially when the plans for further airport development are not scheduled and there are no land-bank measures.
- Second, and in relation to the previous point, the limited airport capacity could impact on peak capacity, which is required for the development of hub operations, since the traffic is distributed in a wave-system to allow flight transfer in an efficient time frame. According to Air Berlin, peak capacity would not be an issue in the new airport, since they state that they are already performing hub operations at Berlin-Tegel. Although it is true that one can identify six waves of inbound and outbound flights in the Air Berlin Tegel operations, their transfer ratio is only around 5%. Therefore, from an objective point of view, it could not be considered that today Air Berlin has a hub in Berlin in the strict sense of the term. The further integration of Air Berlin into Oneworld could provide a boost in the connecting traffic of the airline, which would be beneficial for the region as more long-haul operations could be sustained. From the region’s perspective it is important to have realistic expectations of the competitive position of the airport in terms of hub development (Suau-Sanchez and Mason, 2012: 9).



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## *Chapter 4*

### **Greening development in the RGC Schönefelder Kreuz**

*This chapter discusses the pathways for greener development of the RGC Schönefelder Kreuz, as discussed by local stakeholders at the workshop organised in September 2012. Local and regional stakeholders discussed two key pathways for the RGC: greening production and consumption and sustainable strategies for local public and private stakeholders. This chapter captures those strategies local stakeholders saw as feasible and necessary for moving towards a low-carbon growth in the airport region while participating in the opportunities it brings for economic and industrial development. One of the arguments presented is the idea of “fair compensation” – a concept to balance BER-induced advantages and disadvantages.*

Every region, including the RGC Schönefelder Kreuz, will start the transition process to a low-carbon economy with different assets – physical, industrial and human capital. The Schönefelder Kreuz workshop investigated the environmental assets and addressed issues of environmental quality such as air and water quality, and the availability of green spaces and biodiversity. It also looked at how the local areas contribute to this quality by examining transport emissions and waste volume and how the region responds to issues of regeneration of industrial and contaminated sites and threats to decreasing biodiversity. The environmental assets and the quality of these assets are important in determining the ability of the RGC Schönefelder Kreuz to mitigate its carbon footprint.

Regarding a green growth strategy while moving to a low-carbon economy, workshop participants (see Annex D) pointed out that green energy is very cost-intensive and has massive fixed costs: a possible setback for regional firms in a highly competitive environment.

Moreover, the transition to a low-carbon economy is an issue of ecological and social interest. Public acceptance for green change and ecological consciousness within the Brandenburg society are most important to enforce change. Therefore workshop participants agreed that a clearly targeted strategy not only for the RGC Schönefelder Kreuz but for the federal state of Brandenburg and Berlin is needed, in which the federal state of Brandenburg and Berlin work together to be successful and competitive in the long-term.

### Greening production and consumption

There are widely expected economic benefits from new airports. The local industry base and labour markets are the key beneficiaries, along with start-up and spinoff businesses, as they will have ready links to major customers and a network of businesses. However, building an airport alone is not enough to capture these benefits, it is also a question of encouraging an efficient supply chain and connections between companies and the airport.

This economic activity will not by itself be considered green growth. As established in the previous chapter, the BER airport is not “green” in any landmark or innovative way, but merely representative of the more resource-efficient building design and operation levels that are standard in 2013. The perception is that the “green” message has been undervalued as a concept and under-communicated to stakeholders and the public. In other words, ecology and sustainability are integrated in the general BER planning as a routine matter, following established standards – but not conceptualised as a priority. This highlights that the BER:

- Has been positioned as an economic growth driver, but *not* as a green growth driver.
- Has *not* been built because the region primarily wanted a greener airport. The region wanted higher capacities for flight operations, i.e. more flying (not greener flying – or less flying, which would be greener).
- Has been officially positioned as a “most modern airport,” and modernity may include green aspects. But it has *not* been positioned as a “modern” model for greening aviation infrastructure and the hub of a greener economy around it.
- Has been officially positioned as “the largest infrastructure project in East Germany,” but *not* as the largest green infrastructure project. When considering the complexity and long period for constructing the airport, one important

economic policy aim was to show that Germany is able to realise such a large infrastructure project and use the best innovative technology available – a sign of international competitiveness. What was also less visible was any attempt to signal that this was about innovative green construction (about a building process that itself is greener than before).

In other words, if the BER-induced economic growth is supposed to be green growth, then where does the green come from? Which are the core industries that are pushing the green effects? It is important to measure whether greener industries (and greener jobs) are located near the airport and integrated into its economic network. Some obvious examples are industries with a clear claim to enhance sustainability, reduce waste or produce renewable energy. But there is a broad range of industries beyond the inner core of environmental technologies and services which must be considered. The BER is situated in a growth core with high concentrations of aviation service and manufacturing, logistics, transport and related business, such as IT, from transport-specific telematics to broader “green computing” and greener telecommunications services. It should be noted that the federal state of Brandenburg is much less an IT location than the IT hotspot Berlin, so progress must be tied into what is happening in the city.

Some of the questions that can guide further development and measuring are: In what way are these businesses green or greener than before? Can we measure how they make environmental protection an integral part of their business processes and products? Do they implement an environmental management system? Do they train managers and employees continuously on green issues? Do they follow, measure and monitor green standards? Do they have audits, reviews and certification schemes in place (e.g. ISO or EMAS) and do they offer results and measurements publicly (such as in sustainability reports)? Is there a driving force that brings greener business practices here because of the BER’s concepts and governance priorities? If the BER is indeed a greener airport (compared to older models), does a greener airport automatically mean greener industry around it? Does the greener airport actually need greener industry nearby? Is there a measurable green spill-over?

### ***Aviation-related manufacturing and maintenance***

Schönefelder Kreuz prides itself on being an important cluster for aviation-related manufacturing and maintenance. In aircraft engine construction and maintenance, many firms work on increasing efficiency and reducing waste and emissions, improving recycling and repair (over replacement), making engines ready for biofuels, etc. For instance, various airlines, like Lufthansa, have launched biofuel initiatives. It was noted that aircraft biofuel development may connect to Schönefelder Kreuz core industries in life sciences, green biotechnology and agrotechnology. This would be an indirect effect supporting green industries.

Firms like MTU AeroEngines or Rolls-Royce do have a greening track record. The open question is whether their suppliers and networks in the region will follow their example, and whether there are incentives for them to do so (from their industry partners or from governments)? There could be an indicator measuring this.

### ***Green jobs and skills for the transition to a low-carbon economy***

The development of new “green” sectors and the greening of existing industrial sectors are closely related to the ability of a region to attract and retain the right pool of talent and skills, create the right labour market conditions, and support and retain “green know-how” within the region. This study examined the operation of local training and

skills development organisations, also known as the skills and training ecosystem in the Schönefelder Kreuz area, and the implications for the labour market of the transition to a low-carbon economy. Specific skill sets are needed for emerging green clusters, but also generally throughout the local Schönefelder Kreuz economy to allow existing industries to become greener through more efficient production and operation of local businesses.

There is a large field of green jobs. Currently, there is a shift from traditional jobs in the first sector to green jobs, which is part of a more general move away from traditional jobs to other sectors. This is not about job loss or creation. It is about a change of jobs that requires further identification of those green jobs that can already be identified, in which parts of the industry and what developments are associated to them. Existing companies willing to move into greener production also need to define the skills needs in these area so that special working programmes for green sectors can be developed in partnership with local organisations.

Further reflections discussed by workshop participants include:

- Basic education (e.g. in study programmes) plays a very important role, because all industries are greening. Some industries have to make greater transitions than others, but in the end, basic education will be indispensable. Another initiative could be to offer incentives for companies to go green.
- There is a need to forecast the type of industries that will be attracted to the region in order to plan for greener development and the skills these industries may need. One of the challenges ahead is the lack of data on green industry and employment.
- In addition, an analysis is needed of the skills ecosystem in the federal state of Brandenburg to account for skills providers who already have a separate provision process, e.g. there are public professional schools and companies which are sharing competencies for the skills ecosystem in the region. Furthermore the chamber of commerce and industry is responsible for developing new training programmes and green schemes.
- One of the problems the regional growth core Schönefelder Kreuz is facing is the imbalance of skills demand and skills supply. While in transition to a low-carbon economy, a clear analysis of green skill suppliers and green skills demand must be ensured, SMEs in Brandenburg are searching for skilled workers with green knowledge who already have challenges attracting skilled workers. There is a general problem of salary differences between the eastern and the western federal states in Germany. Eastern companies must therefore offer incentives and appropriate working conditions.
- One beneficial aspect within the local labour market is that Brandenburg has an aware, green-skilled workforce and green graduates. Moreover, the local economy has aware consumers and a green-conscious society to drive developments. Creating learning networks can support a green-skills approach and foster greener jobs.

### **Sustainable strategies for local public and private stakeholders**

Regional policy makers and other local stakeholders are faced with the challenges of combining a business-friendly and competitive local economy that offers employment and skills development opportunities for local residents while at the same time protecting and enhancing the natural environment.

Identifying policy priorities for local public authorities and firms in order to stimulate the new economy requires a new way to debate and think about sustainability in order to increase the level of interest in this topic. The focus should be on developing a strong knowledge base and enabling informed choices, which need to find places in politics. Since it is inevitable to aim for a low-carbon society, every policy maker and every company should put their efforts into achieving this objective in order to transform the RGC Schönefelder Kreuz into a highly competitive region.

This is a process in which local authorities need to become more involved. Organisations participating in the workshop indicated the need to involve society, political institutions and companies in order to bring everyone on board. Conceding that the federal state of Brandenburg is lagging far behind, it was explained that there are many diverse interests, especially among companies (the coal industry employing many people, renewable energy companies looking for employees) making it very complicated to involve all stakeholders and develop a sustainable strategy that satisfies all of them.

Brandenburg, with several regions, mayors and policy makers, is less centralised than Berlin. Due to this diversity, all of the different people involved are interested in different aspects and have different objectives. A possible political platform for decision makers is a “Government/Council of Mayors”, similar to policy initiatives in the Netherlands. This co-ordinating body can provide a platform for local politicians across neighbouring jurisdictions to come together, discuss, gain consensus and drive further action. Neighbouring local government areas should work together rather than compete when discussing investments.

One of the main challenges is the obvious gap between energy strategies and what is realised in local areas. The region needs a project involving all of the different goals. This report highlights the fact that policy makers at all local levels need a clear vision and clear objectives, which should be established in:

- local agendas
- local measures
- local planning and financing
- defined responsibilities.

Even though students and other private households are informed and aware of climate change, renewable energy resources and sustainability, many of them do not actively incorporate green solutions into their lifestyle. Consequently, policy makers and companies should be role models, encouraging everyone to make sustainability a part of their daily lives.

In addition to the above-mentioned aspects, workshop participants discussed the following regional policy suggestions.

### *Green competition*

Green competition may be a strategic imperative for the region and growth core – although it is not easy to accomplish. While it does not have the ecological disadvantages of heavy industry concentrations, it is very focused on the transport sector, which means high emissions and ever-growing low-density land use, including suburban sprawl with high dependence on road transport/motor traffic, which brings more pollution, fossil-fuel use, and lower land, water and air quality. The RGC Schönefelder Kreuz should study



other regions in Germany (or Europe) in terms of building a greener economy, and look for “smart growth” strategies.

*Inter-relationship between hierarchies, multi-level governance and the negotiating power of municipalities*

The discussion started with the inter-relationship between hierarchies, multi-level governance and the negotiating power of municipalities while planning for, and experiencing, change. The new airport provides the opportunity to place demands on the agenda which are normally not open for discussion. As one participant noted, “the airport project is a window of opportunity for negotiation which would not be possible in other situations.” A key point is the demand for compensation measures to offset disadvantages arising from the new development. A new airport certainly brings the promise of great benefits (for example, jobs, commercial and industrial dynamics, infrastructure investment, and a growing tax base); but local communities also must bear costs and long-term disadvantages. They can use this as leverage to successfully demand compensation from higher levels of government. This negotiating power is politically strengthened by the strong symbolic power of the large airport project, which provides an opportunity to discuss critical questions between politicians, business interests, and local citizens and their representatives.

Compensation may include greater investment in protecting the environment, sustainable land use, greener management of public resources, more parks and natural reserves – despite the major physical transformation accompanied by a large airport project. So, the very vulnerability of local communities may turn into an asset and leverage for long-term benefits (10-20 years ahead) if the locals have a strategy and plan well.

Examples for possible long-term benefits are Sydney and Barcelona. Mainly because of the Olympics in both cities, parts of the cities underwent great changes. Industrial wasteland was changed into Olympic venues, new houses or apartments. Barcelona was able to negotiate important improvements for a beach near the airport, which became a popular and novel attraction.

Since the BER is almost completed, many planning and compensation questions have already been settled. However, more changes and airport expansion are expected soon, which may include new local costs and disadvantages, and that means new rounds of negotiation. Do the local governments have a strategy in place for these? Have they planned ahead? What kind of strategy making and planning have they used? Some answers are included in the following parts of Chapter 4 and Chapter 5.

*Connecting employment opportunities and green demands*

A key public question refers to the connection between employment opportunities and green demands: Does the airport create good green jobs? The economic promise is usually “more good jobs at good wages.” But does it also translate into “more good green jobs at good wages”? Looking at the BER airport project, are there specific employment opportunities that make the airport green or greener? Does the airport-induced economic growth increase the number of green jobs in relocated or start-up businesses?

Public priorities and strategies will probably centre on conventional economic growth (“any” employment, number and stability of located businesses, spending power, tax base) rather than a specific green-growth objective. Creating a green workforce, or having

a “green job initiative,” is unlikely to be a top priority for local communities – even if they make a commitment to a greener economy or subscribe to renewable energy or even a greener airport concept. An indicator could look at how policy makers develop priorities and initiatives for a green workforce.

It was noted at the workshop that the city-state of Berlin during the 2011 election campaign saw a considerable point of debate on the employment dimension of a greener economy; specifically what the Green party calls “a Green New Deal”, i.e. policy proposals for creating green jobs through training and investment. This tied into initiatives at the EU level (Europe 2020 Strategy and the Council adoption in 2010 of a European Parliament resolution to foster green jobs as part of the European Employment Strategy). This policy debate has been much less intense in the state of Brandenburg, despite its probably higher percentage of real green jobs compared to Berlin.

A core argument discussed at the workshop is that a greener economy is a more labour-intensive economy and can therefore stimulate the demand for jobs in general. Governments can help solve labour market and social problems by financing and providing green training opportunities.

However, this approach does not connect well to current topical themes for the RGC Schönefelder Kreuz with its focus on aviation and transport-related employment, which is inherently not green in the understanding of “Green New Deal” proponents.

It is likely that Schönefelder Kreuz will experience job growth in both “high-carbon” jobs (not green) and “low-carbon” jobs (greener). It is possible that both job sectors will compete with each other. An indicator should ideally measure both – but runs into a definition problem of what *is* a green job (see above), a question not yet settled despite a prominent UNEP definition, which has also been used by the EU (UNEP, 2008). It seems there is a political tendency to set a very low threshold in defining green jobs, which is counter-productive to clear measurement.

The BER airport planners expect 40 000 new jobs to be created. Today it is impossible to forecast whether this figure can be achieved. Employee representatives and trade unions – such as multi-service union Ver.di – tend to be sceptical and state that so far the reality has fallen short of these promises, even for the construction phase of the airport. There are serious concerns about the quality of jobs because of the high number of outsourced, temporary workers with non-standard working contracts which pay less and offer less job security. Unions fear this may continue after the airport opens.

Regional growth core and cluster strategies often focus strongly on highly skilled, specialist and academic jobs in a knowledge-driven economy. They stress training needs at this level and the interface between business, R&D activities, science parks, tech exchanges, technical schools, colleges and universities, producing well-qualified graduates, technology transfer and innovative start-up and spinoff enterprises.

However, the non-academic, low-to-medium qualified, and particularly the unqualified, unskilled workforce also need opportunities that need to be part of the new economy. The airport reflects the German labour market structure: it brings a lot of service jobs with many temporary and part-time workers, and there is a high likelihood that many new jobs will be low-quality jobs. Airports and many related businesses are part of the service sector, which has a great share of unskilled workers and temporary, precarious and non-standard contracts. They pay less, sustain only low consumer power, and generate a lower tax income and a less stable job base. This may be problematic in terms of social sustainability.

Even if the vision of a greener airport with a green economy is realised, new jobs may include a large share of low-quality jobs – and perhaps not the kind of jobs the local region wanted and hoped for. Greening employment also does not mean an all-out positive net effect for the economy and labour markets. The UNEP “Green Jobs” report (2008) notes that new, additional jobs are only one effect of four: at the same time, some jobs will be substituted, some jobs will be eliminated without direct replacement, and many existing jobs will be transformed and redefined. Indicators should measure the greening effects of new job creation, substitution, elimination and job transformation.

In relation to the RCG Schönefelder Kreuz, indicators could measure the percentage of full-time, standard, secure jobs versus low-paying, non-standard contract jobs (which may be called “unsustainable”). They should also measure the developing tax base (of payroll taxes) to study the income progress and quality of job creation. Higher-quality jobs generate higher taxes. Job mobility and contract length and conditions may also be measured to assess progress.

Indicators should also measure the development of “greener” service-sector jobs versus “greener” industrial jobs for Berlin-Brandenburg and the RGC Schönefelder Kreuz. There is a chance to rebuild the industrial base, from which blue-collar workers may benefit disproportionately.

Several questions can guide further development for the region: What exactly is the contribution of training institutions and universities to rebuilding the industrial base from a green perspective? How many participants can benefit from their offerings, and at what levels? Does taking a green course improve job and career chances? Do companies accept the graduates? Do companies send their employees for training, and do educational institutions accelerate the “industrial intake” in particular, non-traditional students?

### *Fair compensation*

Compensation measures such as nature protection were planned and carried out as soon as the decision to build the new Berlin Brandenburg Airport in the vicinity of the old Berlin-Schönefeld Airport was taken. But it is an open question whether nature protection measures are an effective compensation for noise pollution. Diverse reconciliations of interests led to the conclusion that co-operation between the involved municipalities was needed to support their negotiation and decision processes (Becker et al., 2012: 133).

In 2008, the municipalities in the periphery of the BER started a co-operative planning and decision processes. The idea was to enable each municipality, burdened with disadvantages because of the new airport, to participate in the BER advantages. Compensation measures such as improvements to infrastructure and a neighbourhood fund financing the measures were planned.

The municipalities are requested to test the original measures, using last year’s BER periphery development as a basis, and they are asked to decide about new measures and continuing, changing or deleting the original measures. In doing so, the municipalities *Dialogforum* offers a good platform for development (Becker et al., 2012: 151).

Last but not least, the future measures must be embedded in the strategic context of each BER municipality and their effectiveness has to be monitored. This needs/requires a detailed statistical database for each BER municipality, and for the regional growth core Schönefelder Kreuz as well (Becker et al., 2012: 20).

## Conclusions

Overall, the relationship between RGC Schönefelder Kreuz and the new Berlin airport presents some of the common issues that exist in most relationships between airports and regions.

First, the airport may struggle to develop intercontinental services and hub traffic. Although Air Berlin has recently joined the Oneworld alliance and states that it is operating a hub in Berlin-SXF, in real terms the actual rate of transfers of Air Berlin at Berlin-SXF is only 5%. Taking this into account, and the difficulties in establishing new hubs in Europe, the airport should reinforce its strategy to develop intercontinental services. These do not necessarily have to be a classic hub; other airports such as Dusseldorf or Milan-Malpensa are developing alternative innovative strategies to attract long-haul traffic (Suau-Sanchez and Mason, 2012: 10).

Second, the region may have difficulties in taking full advantage of the airport's potential in promoting socio-economic prosperity, both from the perspective of the quality of the jobs and the definition of clear supply-chain relations. The lack of coordination between regional policies and airport development could lead to long-term inefficiencies that might not be easy to detect at this early stage when the airport is about to open. In the same vein, there is a strong focus on the master plan of the airport, which could lead to an excessive rigidity in the airport-region relationship by not taking advantage of other potential benefits (Suau-Sanchez and Mason, 2012: 10).

Third, there is a lack of incentives to reduce greenhouse gas emissions; the existing motivations to cut aviation emissions are exclusively cost and market-driven and present important challenges in terms of international intergovernmental relations (e.g. European Trading Scheme).

Regarding noise, the policy effort is on acoustic factors (sensory disturbance from the amount of noise received), when in fact the literature has proven that these only represent one-third of the annoyance. In contrast, non-acoustic factors (such as the predictability of the noise exposure, the transparency and comprehensibility of information, the trust between parties and the opportunities to exert influence on the airport operations) account for two-thirds of the annoyance, and for the psychological stress mechanisms behind aircraft noise annoyance).

Overall, the general recommendation in terms of policy is that the process of developing the BER region should include a more multi-scalar and relational perspective. “The concept of multi-scalar...refers to the fact that the airport acts as node linking global forces (airline network, economic interests and trade, etc.), regional forces (urban dynamics, urban system and hinterland, cities interests, etc.) and local forces (commuting and congestion, noise annoyance, air quality, etc.). Each of these forces are putting pressure on the airport from a different scale and, usually, solving an issue on one scale level creates a problem on another level (for example, if you protect citizens from noise, you are impacting on airport capacity, airline operations, CO2 emissions, and limiting the economic impact of the airport in the region).

Therefore, airport managers and regional policy makers should consider the projection of the airport as a hot-spot that can only be understood in the context of its relations with the region and the global players. Relational planning is needed through a management structure to facilitate a strategy-making process that leads in the same

collective direction to achieve prosperity in the region as a factor of success identified in other examples of airport regions (Suau-Sanchez and Mason, 2012: 11).

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## *Chapter 5*

### **The Schönefelder Kreuz green dashboard: Guidelines for moving forward**

*This chapter presents further analysis of the transition to green growth in the regional growth core Schönefelder Kreuz by presenting data collected from the OECD local green growth indicator set, as well as the visualisation of this data into a “dashboard”. The dashboard provides insights for policy conclusions on the Schönefelder Kreuz region’s future activities in green growth. It also highlights implications relevant to other cross-border regions. The chapter concludes with overall findings for the report and policy recommendations based on these findings.*

At the OECD Ministerial Council meeting in June 2009, ministers acknowledged that green and growth can go hand-in-hand, and they therefore asked the OECD to develop a green growth strategy. As a part of this strategy, a monitoring framework was established to track how countries are progressing on their low-carbon transition.

This framework was developed based on the understanding that the measurement variables of economic growth and development that have been used in the past would no longer be adequate to describe or understand the transition to green growth. The framework allows progress towards green growth to be measured using internationally comparable data, embedded in a conceptual framework that is able to be communicated to a wide audience of policy makers and the public at large (OECD, 2011a).

These indicators represent a starting point in understanding green growth at the national level, and they will be further elaborated as new data becomes available and concepts evolve. It is important to recognise that no single indicator will be effective in capturing progress towards green growth, and not all of the indicators presented are measurable today. The OECD framework contains 25 separate indicators, arranged into 5 themes. An outline of the indicator framework is shown in Table 5.1. The five themes covered include: the environment and resource productivity of the economy; the natural asset base; the environmental dimensions of quality of life; economic opportunities and policy responses; and context indicators covering the socio-economic characteristics of growth.

The challenges for Schönefelder Kreuz in decarbonising its economy are evident, so too are the opportunities, but how these challenges and opportunities are conceived, measured and addressed in comparison to the activities of other regions and areas is a question many policy makers are asking. What are the lessons that other local areas can learn from Schönefelder Kreuz, and what are the critical markers of transition and how effective have policy responses been in encouraging this transition? Making this assessment required indicators with suitable variables at the local level.

A first step in identifying locally sustainable indicators is to test how useful the framework developed at the national level is to describe activities at the local level. Does the framework increase understanding of the transition at the local level and, if so, in what areas? And if not, what are the important missing elements and how might we start to fill the gaps, whether with proxies or suggestions for further data collection in the future.

## Differences between national and local indicator frameworks

Three factors summarise the differences in context between the national and local situations for green growth. These factors need to be considered in designing the local indicators.

First, each area will have a different baseline. Green growth indicators must begin from a baseline. If we are to accurately assess green growth, then this baseline will need to incorporate what is already present in an area. Every area has an array of existing production structures (its production function), including the labour force and capital stock (machinery, built environment, etc.) as well as stocks of renewable and non-renewable natural resources. These existing activities and assets will shape the trajectory of the local area's pathway to a low-carbon future.

The OECD definition of green growth was outlined in the introduction to this report. This definition acknowledges that green growth has several dimensions, and the opportunities for growth will occur through varying sources including:

- new opportunities emerging from new markets and activities
- net growth emerging from greening activities across the entire economy
- growth that takes into consideration the environmental impacts and externalities of our current production and consumption activities.

Local indicators of green growth will differ from those at the national level in three areas:

- composition of stocks at a defined level of geography
- available policy levers and jurisdictions
- data availability.

Local trajectories will be unique for each area because of the different compositions of stocks and activities. However, at the national level, the aggregation of these activities masks some of the winners and losers of the transition to greener growth. This makes understanding and communicating local pathways to a low-carbon economy a different, but no less important, task than at the national level.

Second, the policy responses available to local policy makers to direct the transition pathway are more curtailed than at the national level. For example, most local authorities do not have significant taxation revenue-raising powers. However, policy makers at the local level have the ability to interact closely with their citizens, and can influence policy that has a direct impact on daily life, for example through waste, recycling, and active and public transport options. Therefore, the same set of economic opportunities and available policy responses that exist at the national indicator level will not be suitable at the local level.

Finally, data is not available at the local level for all of the measurement variables. This is where proxies and other future data collection exercises will need to fill important gaps.

### Method for identifying local indicators

The method of designing a local indicator set for local green growth transition was a two-step process. The first step was to make an assessment of the relevance of the national OECD Green Growth Indicator framework and the relevance of the individual variables in describing Schönefelder Kreuz's transition to a low-carbon economy. This assessment was completed in collaboration with local research partners and was informed by the three previously mentioned constraints on local trajectories, namely:

- different baselines of productive and knowledge activities and stocks of renewable and non-renewable assets
- the policy reach of the local area
- the availability of data.

In creating this indicator framework, the OECD made a conscious effort to be pragmatic, acknowledging that this is an emerging area and that analysis of green growth will be imperfect until this indicator framework, and the data sources upon which it relies, mature. However, it is important to attempt to identify and test which areas will work and to investigate what data is available with which to assess the current situation.

Table 5.1. OECD Green Growth Indicators groups and themes

Indicator groups	Topics covered
1. The environmental and resource productivity of the economy	<ul style="list-style-type: none"> <li>– Carbon and energy productivity</li> <li>– Resource productivity: materials, nutrients, water</li> <li>– Multi-factor productivity</li> </ul>
2. The natural asset base	<ul style="list-style-type: none"> <li>– Renewable stocks: water, forests, fish, resources</li> <li>– Non-renewable stocks: mineral resources</li> <li>– Biodiversity and ecosystems</li> </ul>
3. The environmental dimensions of quality of life	<ul style="list-style-type: none"> <li>– Environmental health and risks</li> <li>– Environmental services and amenities</li> </ul>
4. Economic opportunities and policy responses	<ul style="list-style-type: none"> <li>– Technology and innovation</li> <li>– Environmental goods and services</li> <li>– International financial flows</li> <li>– Prices and transfers</li> <li>– Skills and training</li> <li>– Regulations and management approaches</li> </ul>
5. Socio-economic context and characteristics of growth	<ul style="list-style-type: none"> <li>– Economic growth and structure</li> <li>– Productivity and trade</li> <li>– Labour markets, education and income</li> <li>– Socio-demographic patterns</li> </ul>

### Schönefelder Kreuz and the Green Growth Indicator framework

The previous chapters have outlined the progress of the regional growth core Schönefelder Kreuz towards a low-carbon economy. Schönefelder Kreuz is a critical component of Berlin's economy and is characterised by its manufacturing and aeronautical past. The Brandenburg Airport, currently under construction, will be a major driver of economic activity for the area in the future. Throughout this report, significant evidence has demonstrated the impact of the green growth ambitions of the area and the effect that a single economic activity (an airport) can have on the emissions profile, labour market and innovation dynamics of the Schönefelder Kreuz and wider Berlin.

Table 5.2 shows an assessment of the variables within the OECD Green Growth Indicator framework with relevance to Schönefelder Kreuz's transition to a low-carbon economy. The table provides one of the key translation points from local specific indicators or activity to a cross-region comparable indicator framework set. Each region participating in the OECD Local Indicators Project ranks the variables within the framework according to the relevance of an individual indicator to their region. Each variable is rated low, medium or high in terms of its ability to contribute to the green growth assessment at the local level.

The highest rated variables are in labour market characteristics and dynamics (unemployment rates, educational attainment, labour force training and skills development), resource productivity (energy, water and carbon productivity) and the knowledge intensity of the city, which is linked to its ability to embrace green economy opportunities (innovation and patenting activity, size and growth of the environmental goods and services industry). The effectiveness of policy responses in encouraging these green economy opportunities and ensuring that the net economic benefit is captured for Schönefelder Kreuz is also seen as an important measurement variable.

Table 5.2. **Schönefelder Kreuz's green growth indicators and the local transition**

		Relevance to local transition*
<b>Socio-economic context and characteristics of growth</b>		
Economic growth, productivity and competitiveness	GDP growth	M
	Net disposable income	M
	Labour productivity	M
	Trade weighted unit labour costs	M
Labour markets, education and income	Labour force participation	M
	Unemployment rates	M
	Population growth	M
	Life expectancy	M
	Income inequality	M
Environmental and resource productivity	Educational attainment	H
	Co <sub>2</sub> productivity	H
	Energy productivity	H
	Material productivity (non-energy)	L
	Water productivity	M
Natural asset base	Multi-factor productivity	M
	Renewable stock	
	Freshwater resources	L
	Forest resources	L
	Fish resources	L
Non-renewable stocks	Mineral resources	L
Biodiversity and ecosystems	Land resources – land use state and changes	M
	Soil resources – agricultural land affected by soil erosion	L
	Wildlife resources – endangered species	L
<b>Environmental quality of life</b>		
Environmental health and risks	Environmentally induced health problems – exposure to air pollution	H
	Exposure to natural or industrial-related losses	H
	Connection to sewage treatment	H
	Connection to safe drinking water	H
<b>Economic opportunities and policy responses</b>		
Innovation	Renewable energy R&D	H
	Environmental technologies R&D	H
	All purpose R&D	H
Patents important to green growth	Environmentally related patents	M
	All patents	M
Environmental goods and services	Gross value added of environmental goods and services	M
	Employment in environmental goods and services	M
International financial flows important to green growth	Official development assistance	M
	Carbon market financing	M
	Foreign direct investment	M
Prices and transfers	Environmentally related tax revenues	M
	Structure of environmentally related taxes	M
	Energy pricing	M
	Water pricing and cost recovery	M
Regulations and management	TBD	M
Processes		
Training and skills	Students in environmental goods and services	M
	Courses in environmental goods and services	M

Note: \* H: high; M: medium; L: low.

The variables with a lower rating are not considered of lower importance in green growth, but of lower relevance to understanding green growth at the local level, due to the three reasons mentioned earlier (composition of stocks, availability of policy levers, data availability). For example, indicators for natural assets resources such as forests and fisheries are not applicable to most regions as they do not have these resources (particularly urban ones), regions either do not have the capacity to effectively measure resources within their jurisdiction, or do not have the ability through their policy remit to influence how these natural stocks are used or depleted.

This assessment was then used to inform the second phase of the development of the local indicator set: selecting suitable local variables. Workshops with stakeholders in Schönefelder Kreuz determined that there were three specific areas of the green growth indicator framework which were especially meaningful for understanding local components of the green transition:

- resource efficiency, but extended to include waste efficiency and the level of recycling within the local area
- knowledge intensity and green economy opportunities
- policy responses to support green growth.

Three of the five headline themes of the OECD national framework were kept in the local indicators set. The headline theme of environmental and resource productivity remains in the local framework, although the variables are modified to per capita rather than productivity based measures to align with the availability of local data sources. The natural asset base and environmental quality of life measures, whilst seen as very relevant for the national level, presented data collection (particularly in being able to collect meaningful local data) and policy jurisdiction issues (limited local policy reach in these areas) at the local level.

The economic opportunities and policy response themes were considered the most relevant for understanding the local situation and were expanded to include economic opportunity measures and policy responses as well as skills and training measures. The socio-economic context indicators also remain, as important indicators of the local context for interpreting the previous variables. These were modified to take advantage of likely local data sources. The five theme areas of the local indicator framework are each explained in further detail below.

1. **The socio-economic context:** describes the social and industrial characteristics of the area under investigation. As noted earlier, local trajectories towards a low-carbon economy will be strongly shaped by the existing industrial and human capital, therefore, it is important to show indicators within this context.
2. **Environmental and resource productivity:** captures the headline resources' productivity figures for the local area.
3. **Economic opportunities:** examines the capacity of the local areas to act on the low-carbon opportunities. It includes measures of research and knowledge intensity, students and learning, and the value and number of jobs associated with the green economy.
4. **Skills and training ecosystems:** can be very path dependent and will require significant momentum and time to change. This item captures the progress of

green skills development in the local areas and the patterns of change in the skills and training ecosystems that will manage this progress.

5. **Policy responses:** each local jurisdiction has different policy levers available to it, but additionally, each jurisdiction has a different pattern of policy action and learning. Green policy is a new area of knowledge and policy development for many local and regional governments; they need to build not only political consensus for action, but also internal capability and capacity for policy design, implementation and evaluation. Theme 4 captures the progress of local policy makers in green policy making.

Specific variables and data for the first four themes were identified and developed from existing data sources. Data collection for the fifth theme (policy responses) was collected through a survey of stakeholders.

Considerations used to shape this framework include data availability, current and proposed policy activity, cross-border implications and an assessment of the literature on green jobs and skills for data collection methods and options.

In many cases the variables were the same measurement variables used in other forms of regional development (productivity, employment, business start-up and survival), innovation (R&D spend, R&D employees, patents) and resource efficiency (energy, water and waste per capita). Data collection for these variables was easier because they were established concepts and data collection against these variables was already being carried out, if not at the specific local level then at the regional or national level.

Similar issues also exist when analysing the skills dimensions of the green growth transition. It is clear that such a major change in industrial processes and activities will also have a resulting impact on the knowledge and skills that employees require – but currently we do not yet have metrics and data available that can characterise the evolution of so-called “green” skills.

Indicators and data sources were more difficult to identify and collect in areas where the indicators are not well-established or were already being collected. This included areas such as eco-innovation, green jobs and investment, and green knowledge and skills.

One noticeable gap in the emerging variables for economic opportunities of the low-carbon economy is an indicator of the prevalence of green tech and/or resource efficiency knowledge and skills within the labour force. A measure of students (in both university and vocational training) studying environmental-related subjects is proposed as an initial proxy for measuring green skills. Measuring the number of students studying these subjects year on year will allow a picture of the skills capacity in this area within the labour force to be built up over time. Further measurement variables will be required to gain a more sophisticated understanding of the greening of skills and occupations, but the identification of this variable was seen as a first step.

A collaborative process between the five case study areas participating in the OECD LEED Local Indicators for a Low-Carbon Economy project agreed on the final variables for the local indicator set, bearing in mind that the variables had to be suitable to a range of local areas across OECD member countries. Table 5.3 shows the data collection for Schönefelder Kreuz against the local indicators set. Comparisons are then made with corresponding OECD, EU or national averages, depending on data availability.

Table 5.3. Data table for Schönefelder Kreuz dashboard

	Schönefelder Kreuz	Unit	Source	Comparison	Source
<b>Socio-economic context</b>					
Entrepreneurship rate	187 (Dahme Spreewald; 2010)	Firms	<a href="http://www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf">www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf</a> , p. 438 (accessed 9 February 2013)		
Firm survival rate	96.09%	%	<a href="http://www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf">www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf</a> , p. 451		
Employment creation	1 971 (RGC Schönefelder Kreuz)	Persons in capital region	Regional Report, Figure 2.8 – Ratio of employees subject to social insurance contribution: Municipalities in the BER periphery (2004: 100%) Source: Becker, C., et al. (2012), p. 50.		
Productivity	USD 50 000 (Dahme Spreewald; 2008)	USD/per capita	<a href="http://www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf">www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf</a> , p. 451 (accessed 9 February 2013) EUR 1 = USD 1.33 ( <a href="http://www.finanzen.net/waehrungsrechner">www.finanzen.net/waehrungsrechner</a> , accessed 18 February 2013)		
Educational attainment	Federal state of Brandenburg (2009): Without general education: 1.7% ISCED 2A: 72.7% ISCED 3A: 25.6%	Persons aged 25-34	<a href="http://www.berlin.de/imperia/md/content/sen-bildung/bildungsstatistik/bildungsbericht_isg_2010.pdf?start&amp;ts=1302080419&amp;file=bildungsbericht_isg_2010.pdf">www.berlin.de/imperia/md/content/sen-bildung/bildungsstatistik/bildungsbericht_isg_2010.pdf?start&amp;ts=1302080419&amp;file=bildungsbericht_isg_2010.pdf</a> , p. 69 (accessed 18 February 2013)		
Income per worker	USD 35 236 (Federal state of Brandenburg; 2006)	USD/employ ee	<a href="http://www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf">www.statistik-berlin-brandenburg.de/produkte/jahrbuch/jb2011/JB_2011_BB.pdf</a> , p. 490 (accessed 9 February 2013) EUR 1 = USD 1.33 ( <a href="http://www.finanzen.net/waehrungsrechner">www.finanzen.net/waehrungsrechner</a> , accessed 18 February 2013)		



Table 5.3. Data table for Schönefelder Kreuz dashboard (cont.)

	Schönefelder Kreuz	Unit	Source	Comparison	Source
<b>Environmental and resource productivity</b>					
Per capita emissions	22 Federal state of Brandenburg	t/per capita	<a href="http://www.mugv.brandenburg.de/cms/media.php/bm1.a.3310.de/kginv10.pdf">www.mugv.brandenburg.de/cms/media.php/bm1.a.3310.de/kginv10.pdf</a> ; p. 11 (accessed 18 February 2013)	Compared to OECD average 10.36137828, 9 for Germany	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i>
Energy consumption	End energy consumption per 1 000 EUR GDP = 4 PJ (0.10 MtoE)	PJ/USD 1 billion	<a href="http://www.statistik-berlin-brandenburg.de/Publikationen/Stat_Berichte/2013/SB_E04-04-00_2010j01_BB.pdf">www.statistik-berlin-brandenburg.de/Publikationen/Stat_Berichte/2013/SB_E04-04-00_2010j01_BB.pdf</a> (accessed 1 July 2013)	End energy consumption per 1 000 EUR GDP = 6.36 PJ (EU27) End energy consumption per 1 000 EUR GDP = 5.9 PJ (Germany)	<a href="http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Consumption_of_energy">http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Consumption_of_energy</a> (accessed 1 July 2013)
Water consumption	Water consumption per capita in the federal state of Brandenburg = 98L/day 35.8kL/annum	kL/per capita/annum	<a href="http://www.epochtimes.de/bundesbuergersenkten-ihren-wasserverbrauch-weiter--498182.html">www.epochtimes.de/bundesbuergersenkten-ihren-wasserverbrauch-weiter--498182.html</a> (accessed 1 July 2013)	Compared with OECD average 870kL/annum,	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i>
Municipal waste collection	385 kg (2010)	kg/per capita	<a href="http://www.brandenburg.de/cms/media.php/lbm1.a.3310.de/bilanz2010.pdf">www.brandenburg.de/cms/media.php/lbm1.a.3310.de/bilanz2010.pdf</a> (accessed 1 July 2013)	Compared with OECD 540 kg/per capita (2009) and 597 kg/capita Germany (2011)	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i> <a href="http://de.statista.com/statistik/daten/studie/152320/umfrage/kommunales-abfallaufkommen-in-der-eu-27">http://de.statista.com/statistik/daten/studie/152320/umfrage/kommunales-abfallaufkommen-in-der-eu-27</a> (accessed 1 July 2013)
Recycling per capita	189 Federal state of Brandenburg (2009)	kg/per capita	<a href="http://www.mugv.brandenburg.de/cms/media.php/bm1.a.3310.de/bilanz2011.pdf">www.mugv.brandenburg.de/cms/media.php/bm1.a.3310.de/bilanz2011.pdf</a> , Table 6	121 t/per capita EU (Eurostat, 2009) <sup>1</sup> 282 kg/c in Germany	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i> <a href="http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/8-08032011-AP/EN/8-08032011-AP-EN.PDF">http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/8-08032011-AP/EN/8-08032011-AP-EN.PDF</a> (accessed 18 February 2013)
Treatment of contaminated land	1	Binary 1= yes, 0=no	<a href="http://www.gesetze-im-internet.de/bundesrecht/bbodschg/gesamt.pdf">www.gesetze-im-internet.de/bundesrecht/bbodschg/gesamt.pdf</a> (accessed 18 February 2013)	1	
<b>Economic opportunities</b>					
R&D employment	10.9 Federal state of Brandenburg	Per 1 000 employees	<a href="http://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEPersonalBundeslaenderSektoren.html">www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEPersonalBundeslaenderSektoren.html</a> (accessed 18 February 2013)	Compared with 6.3 EU27 average Germany 20.9	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i> <a href="http://statistik.arbeitsagentur.de/nn_31966/SiteGlobal/Forms/Rubrikensuche/Rubrikensuche_Form.html?view=processForm&amp;resourceId=210368&amp;input=&amp;pageLocale=de&amp;topicId=17362&amp;year_month=201012&amp;year_month.GROUP=1&amp;search=Suchen">http://statistik.arbeitsagentur.de/nn_31966/SiteGlobal/Forms/Rubrikensuche/Rubrikensuche_Form.html?view=processForm&amp;resourceId=210368&amp;input=&amp;pageLocale=de&amp;topicId=17362&amp;year_month=201012&amp;year_month.GROUP=1&amp;search=Suchen</a> (accessed 18 February 2013)
Students in the labour force	6.78% Federal state of Brandenburg	% of workforce	<a href="http://www.destatis.de/DE/Publikationen/Thematisch/BildungForschungKultur/Schulen/SchnellmeldungAusbildungsberichterstattung5211002117004.html">www.destatis.de/DE/Publikationen/Thematisch/BildungForschungKultur/Schulen/SchnellmeldungAusbildungsberichterstattung5211002117004.html</a> (accessed 18 February 2013)	7.49% of workforce in Germany	<a href="http://statistik.arbeitsagentur.de/nn_31966/SiteGlobal/Forms/Rubrikensuche/Rubrikensuche_Form.html?view=processForm&amp;resourceId=210368&amp;input=&amp;pageLocale=de&amp;topicId=17362&amp;year_month=201012&amp;year_month.GROUP=1&amp;search=Suchen">http://statistik.arbeitsagentur.de/nn_31966/SiteGlobal/Forms/Rubrikensuche/Rubrikensuche_Form.html?view=processForm&amp;resourceId=210368&amp;input=&amp;pageLocale=de&amp;topicId=17362&amp;year_month=201012&amp;year_month.GROUP=1&amp;search=Suchen</a> (accessed 18 February 2013)

Table 5.3. Data table for Schönefelder Kreuz dashboard (cont.)

	Schönefelder Kreuz	Unit	Source	Comparison	Source
Students in environmental subjects	NA	% of work force	No available sources	N/A	No available sources
All purpose R&D	1.5% (2010) Federal state of Brandenburg	Regional GDP	<a href="http://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEAusgabenUndBIPZeitreihe.html">www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEAusgabenUndBIPZeitreihe.html</a> (accessed 18 February 2013)	Compared with 2.33 OECD average (2011) 2.8 Germany (2010)	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i> <a href="http://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEAusgabenUndBIPZeitreihe.html">www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEAusgabenUndBIPZeitreihe.html</a> (accessed 18 February 2013)
Triadic patent applications for climate change mitigation technologies	3 (2007-2010) Federal state of Brandenburg	per million	<a href="http://www.foederal-erneuerbar.de/landesinfo/kategorie/forschung/bundesland/D/auswahl/217-anzahl_der_patente_i/#goto_217">www.foederal-erneuerbar.de/landesinfo/kategorie/forschung/bundesland/D/auswahl/217-anzahl_der_patente_i/#goto_217</a> (accessed 18 February 2013)	5 (2007-2010) in Germany	<a href="http://pdwb.de/nd05.htm#2010">http://pdwb.de/nd05.htm#2010</a> (accessed 18 February 2013) Source: <a href="http://www.statistik-berlin-brandenburg.de/produkte/Faltblatt_Brochure/brandenburg_in_Zahlen_de.pdf">www.statistik-berlin-brandenburg.de/produkte/Faltblatt_Brochure/brandenburg_in_Zahlen_de.pdf</a> (accessed 18 February 2013)
All patents	120 (2007-2010) Federal state of Brandenburg	per million population	<a href="http://www.parldok.brandenburg.de/parladoku/w5/drs/ab_3200/3206.pdf">www.parldok.brandenburg.de/parladoku/w5/drs/ab_3200/3206.pdf</a> (accessed: 19 February 2013) and <a href="http://www.statistik-berlin-brandenburg.de/produkte/Faltblatt_Brochure/brandenburg_in_Zahlen_de.pdf">www.statistik-berlin-brandenburg.de/produkte/Faltblatt_Brochure/brandenburg_in_Zahlen_de.pdf</a> (accessed 19 February 2013)	Compared with OECD average 37.3 (2009)  Germany 727 (2007-2010)	<i>OECD Factbook 2011-2012: Economic, Environmental and Social Statistics</i>  <a href="http://www.hannover.ihk.de/ihk-themen/innovation-umwelt/innovation/innovationsprozess/schutzrechte-patente/management-tipps/patentstatistikzahlenfuer2011.html?type=123">www.hannover.ihk.de/ihk-themen/innovation-umwelt/innovation/innovationsprozess/schutzrechte-patente/management-tipps/patentstatistikzahlenfuer2011.html?type=123</a> (accessed 18 February 2013) and <a href="http://pdwb.de/nd05.htm#2010">http://pdwb.de/nd05.htm#2010</a> (accessed 18 February 2013)
Turnover of environmental goods and services industries	N/A	USD million	No local data available	8% in 2007 and 14% in 2020 estimated (Federal Republic of Germany; p. 30)	<a href="http://www.mugv.brandenburg.de/cms/media.php/lbm1_a.2315.de/uwirtschaftbb.pdf">www.mugv.brandenburg.de/cms/media.php/lbm1_a.2315.de/uwirtschaftbb.pdf</a> (accessed 19 February 2013)
Employment in environmental goods and services	22 000 (2009) Federal state of Brandenburg	persons (2009)	<a href="http://www.recyclingmagazin.de/rm/news_detail.asp?ID=14911&amp;NS=1">www.recyclingmagazin.de/rm/news_detail.asp?ID=14911&amp;NS=1</a>	101 608 (2007)	<a href="http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&amp;lang=en">http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_ac_egss1&amp;lang=en</a> (accessed 18 February 2013)
Foreign direct investment	1	Binary 1= yes, 0=no	<a href="https://sixcms.brandenburg.de/media_fast/3246/Entwicklungspolitische_Leitlinien_BB.pdf">https://sixcms.brandenburg.de/media_fast/3246/Entwicklungspolitische_Leitlinien_BB.pdf</a> (accessed 19 February 2013) and <a href="http://entwicklungspolitik-brandenburg.mixxt.de">http://entwicklungspolitik-brandenburg.mixxt.de</a> (accessed 19 February 2013)	1	<a href="http://www.bmz.de/de/index.html">www.bmz.de/de/index.html</a> (accessed 19 February 2013)

## Dashboard for data visualisation

To analyse the data presented in the indicator framework, and to provide a point of comparison across the five case-study regions within the whole project, a “dashboard” data visualisation tool was developed. The dashboard takes the indicators one step further and helps the information to be summarised and communicated. The dashboard tool has been used in numerous global indicator programmes, including the UN Commission for Sustainable Development and the Sustainable Development Index (SDI) in the United States. Out of the 23 indicators developed by the OECD monitoring framework, the local indicators framework focuses on 14 (6 for environment and resource productivity and 8 for economic opportunities).

At this stage, a dashboard has only been created for environmental and resource productivity and green economic opportunities as these will be the main points of comparison across the five case studies. After initial feedback on the dashboard tool from stakeholders and policy makers, the tool may also be extended to cover the socio-economic context and policy response. These themes will require further thought as to how they can be ranked using the dashboard tool, particularly in areas where an OECD average is lacking.

In the interim, the socio-economic variables are only reported in Table 5.2. For Schönefelder Kreuz, the data was validated in a workshop held in the region in September 2012. The dashboard shows the challenge of decarbonisation in a region that has a lot of carbon-intensive industry. This is a challenge shared by many other regions where major industry and infrastructure (such as airports) are located and highlights the need to keep regional indicators in the context of national efforts and the importance of time-based analysis in a region over a period, as well as making comparisons between regions.

As earlier chapters have shown, Schönefelder Kreuz has made significant commitments to decarbonising its energy supply. The new BER airport will be a major driver of economic activity in the area. Although it represents a missed opportunity for leading-edge resource efficiency, it will still represent improved efficiency compared to the performance of the 40-year plus old buildings that the new airport will replace. Also, as has been noted previously in this report, the aviation industry has taken significant steps to increase the carbon efficiency of the sector at the same time as the sector has experienced rapid growth.

Dashboard data was collected for most variables at the Schönefelder Kreuz regional level. In some important areas related to green growth employment and value of turnover, consistent data sources are still not available, neither the local nor the national level. The problem is partly one of definition (i.e. how are green industries defined) and secondly one of determination (how is the “green” element isolated from the wider impact of greening and increased focus on resource efficiency that is happening across the entire economy?). It is in these areas that we are really at the frontier of defining and measuring green industrial activity.

The results of the exercise for Schönefelder Kreuz can be summarised as follows:

**Environmental and resource productivity.** The per capita emissions of the federal state of Brandenburg, in which the Schönefelder Kreuz region is located, are well above the national and OECD averages. This is a legacy issue with large concentrations of

carbon-intensive industry in power generation, heavy manufacturing and aviation located in the area. In other areas of resource efficiency, including municipal waste and recycling per capita, the state of Brandenburg performs better than German and OECD averages.

**Economic opportunities.** Schönefelder Kreuz performs better than the OECD average on R&D expenditure and employment and all patents including green patents. Germany as a nation performs very well compared with OECD average figures.

Figure 5.1. Schönefelder Kreuz dashboard



To further assess the progress of policy responses for low-carbon economy support and green skills and training, a small survey of local stakeholders (representing government, business, trade unions, higher education institutions, etc.) was carried out. As noted, the local policy assessment and skills ecosystem were derived from a short questionnaire submitted to local policy and training stakeholders. These stakeholders were asked to assess the progress of various policy and skills development mechanisms in encouraging local transitions to a low-carbon economy.

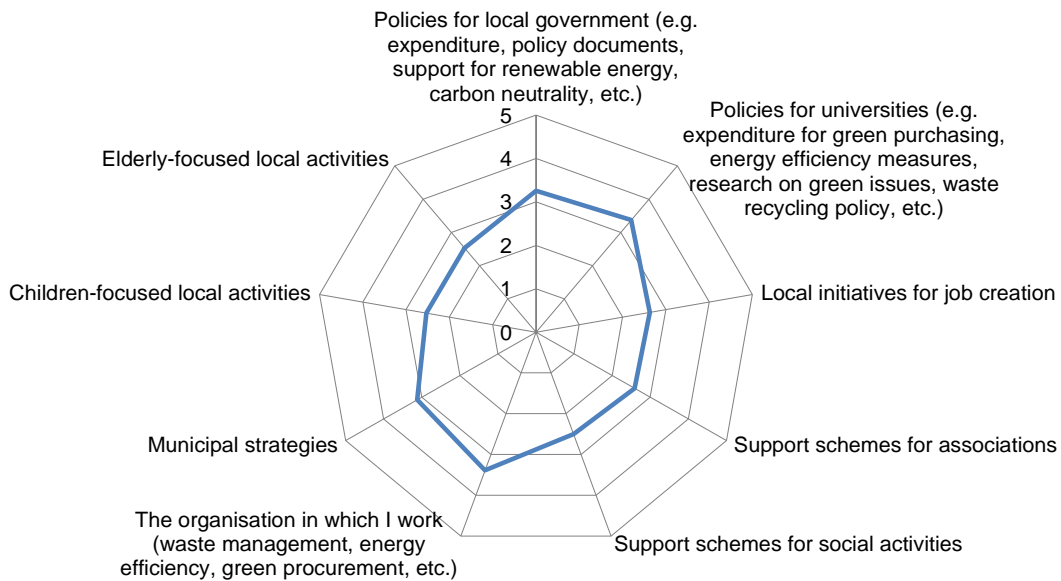
The results for each of these two variables are shown in Figures 5.2 and 5.3. The scores for each of the indices represent the average answers on a five-point scale. These results are subjective but, together with the other elements of the indicator framework, can offer a richer picture of the current status of local transitions. If these questionnaires are conducted at frequent intervals, progress in transition will also be evident.

**Policy responses.** Schönefelder Kreuz can progress further. The survey shows that work places are seen as having the strongest greening influence. Local government policies and policies for universities also have a higher degree of “greening” than policies

for municipalities, job creation initiatives and support schemes for social assistance, including for the elderly population.

**Green skills ecosystem.** Schönefelder Kreuz’s green skills ecosystem is the strongest in its universities and technical colleges and inter-relationships (industry-science partnerships). In total, there is little variation across the entire skills ecosystem in terms of stakeholders’ perceptions of greening, with all institutions averaging a score of around three.

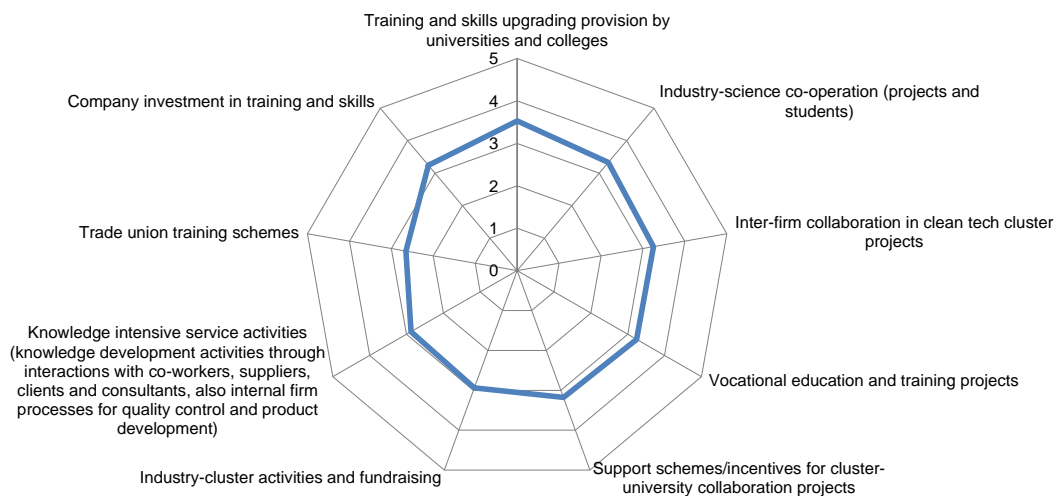
Figure 5.2. Greening policy index



Note: Out of a total of 19 responses.

Source: Schönefelder Kreuz survey.

Figure 5.3. Skills ecosystem for Schönefelder Kreuz



Note: Out of a total of 18 responses.

Source: Schönefelder Kreuz survey.

## Conclusions and policy recommendations

This report examines the green growth trajectory of the Schönefelder Kreuz regional growth core (RGC). This area on the outskirts of the German capital of Berlin has a history of heavy manufacturing, power generation and aviation (with the location of two airports – Schönefeld and Tempelhof, both of which will close when the new Brandenburg Airport is opened).

This industrial background means there are a number of carbon-intensive industries in the region. The region also has natural assets in the form of national parks, waterways and green spaces, and other socio-economic assets such as educational institutions and technical colleges. In recent years, the region has put forward an ambitious plan to decarbonise its electricity supply. Energy 2030 aims to increase the percentage of the energy supply from renewable sources. The new Brandenburg Airport represents an opportunity for significant economic and employment growth over the coming years. Can this growth be described as green growth?

### *Berlin’s green airport*

If we look at the actual resource efficiency of the new airport, it is significantly better than the three older airports that it is replacing, and the concentration of airport services in one location allows efficiency to be achieved in other areas, which would also provide carbon savings.

The new airport, however, does not represent best practice or a “beacon” project in resource efficiency for its design and operation. The aviation industry has significantly increased the carbon efficiency of the sector, even though the sector has grown rapidly. Overall emissions from the sector have risen over the past decade, but at one-third the rate of the growth of the sector. In this sense, there is opportunity for green growth in the continued research, development and implementation of innovations that increase the fuel efficiency of aviation.

In recent years, economic development in the Schönefelder Kreuz region has been supported using the RGC model to focus policy attention and associated funding on select sectors. All of the RGCs have prepared plans from which specific projects and measures are formulated, including infrastructure development, the development of industrial estates, support for skilled personnel, the promotion of technology transfer, and projects in the fields of culture and tourism. These plans are regularly evaluated and updated.

The policy of prioritising funding for economic development in the RGCs is sound, and positive results of similar “cluster” developments are evidenced in many other regions. Constantly increasing performance expectations for the RGCs, and regularly reviewing both the current but also near-future economic opportunities and the RGCs’ capacity to react to these opportunities will ensure the longevity of the policy.

### Recommendation 1

Develop and communicate a future strategy for the Schönefelder Kreuz RGC that includes long-term strategic plans for support to industrial concentrations and define success measures and evaluation criteria for the carbon efficiency of airport industries.

Co-ordination between relevant stakeholders in these planning and implementation processes and within regions can be *ad hoc* if one organisation or group of organisations

has the responsibility, authority and resources to engage stakeholders in strategic planning and implementation processes. Institutional and regional boundaries rarely match-up and a pragmatic approach must be developed. One of the first tasks of such a process of stakeholder engagement could be the dissemination of research results from this project and the creation of an action plan to guide further work.

### Recommendation 2

Formalise and support stakeholder engagement through the levels of government that support the RGC's industrial agenda and greening of activities.

Within the RGC it is important to also facilitate the entry of private, as well as public, investment, particularly in the fields of research and development of technology and service activities in the aviation and advanced manufacturing sectors. Growth finance constraints and issues of access to finance are constantly highlighted in economic development efforts worldwide as a major restraint to the growth of small and medium-sized firms. These are the firms that make up the majority of businesses in most economies.

### Recommendation 3

Develop knowledge of the financial constraints of SMEs within the region and define how public action can facilitate increased private sector investment and access to finance in these sectors within the Schönefelder Kreuz region.

### *Fostering good employment growth*

The airport will bring new employment, both in the operation of the airport itself as well as in all of the associated services that will support it, from retail and accommodation to food processing and security. Many of the jobs will be casual and/or require low skill levels. Low skill levels make employees vulnerable to economic changes. This can be detrimental to sustainable labour force participation for these workers if they are not also matched with opportunities for skill development and labour force mobility. The development of green skills is of particular importance to support the transition to a low-carbon economy in the region.

### Recommendation 4

Ensure that educational and training institutions are able to deliver the skills development that meets the needs of industry and provides labour force mobility. Green skills development needs to be supported by specific actions and plans and embedded in the training curriculum both at both public and private sector level.



### Recommendation 5

Support innovative strategies that enable labour force mobility between firms and across occupational classifications through flexible training and skills acquisition. Focus on transferrable skills development, such as problem solving and management and communication skills.

#### *Making sure the benefits outweigh the costs*

The new airport has negative impacts for the region, which include environmental issues from pollution (including air and noise pollution), congestion and industrial development causing the loss of green spaces. The airport project provides a window of opportunity for the local region to negotiate trade-offs to these downsides.

Environmental monitoring and the public reporting and communications of the results of such monitoring is essential to ensure local populations that any negative impacts are kept within acceptable boundaries. The dashboard analysis and discussion in Chapter 3 show that investments in environmental monitoring and communication are in place.

### Recommendation 6

Continue to resource monitoring and communicating environmental quality measures. Advise city councils in the region on how to monitor these measures as part of their strategic approach to the transition to a low-carbon economy. The Schönefelder Kreuz regional growth core can be an example of how this monitoring should be used at the local level for strategic policy development.

The research presented in this report, including the dashboard report of the green growth indicators, shows the analysis that is possible at the local level. This information is vital for setting policy, tracking the success of the implemented policy through to outcomes and reporting these outcomes to local residents. The levels of investment associated with activities of the RGC and the airport are significant, and therefore equally significant attempts should be made to ascertain the effectiveness or otherwise of measures seeking to make economic, employment or environmental impacts.

Green growth indicators are currently an emerging field, but as the importance of the sectors and technologies associated with these sectors grow, we will be able to track progress and competitiveness in these activities. Local as well as national and international dynamics will operate for green growth, particularly in the labour market, data and information at the local level to understand and manage the transition will be as important as at the higher levels of aggregation.

### Recommendation 7

Resource detailed statistical data linked to an agreed indicator framework for each municipality that is proximate to the airport and at the RGC Schönefelder Kreuz level.

Trade-offs from higher emissions may include greater investments in protecting the environment, sustainable land use, greener management of public resources, more parks and natural reserves – despite the big physical transformation accompanied by a large airport project. So, the very vulnerability of local communities may turn into an asset and leverage for long-term benefits (10-20 years ahead).



Examples for possible long-term benefits are Sydney and Barcelona. Mainly because of the Olympics in both cities, parts of these cities underwent great changes. Industrial wasteland was changed into Olympic venues, new houses or apartments. Barcelona was able to negotiate great improvements for a beach near the airport, which became a popular and novel attraction.

However, the strength of this negotiating position requires a shared understanding of the types and level of trade-offs that are acceptable. To reach a shared position requires engaged, representative and knowledgeable stakeholders to come to agreement and advocate for this position. Recommendation 8 speaks directly to this requirement.

### Recommendation 8

Prioritise and support low-carbon community assets as part of the trade-off for future developments at the airport.

### Summary of policy recommendations

**Recommendation 1:** Develop and communicate future strategy for the Schönefelder Kreuz RGC that includes long-term strategic plans for support to industrial concentrations and define success measures and evaluation criteria for the carbon efficiency of airport industries.

**Recommendation 2:** Formalise and support stakeholder engagement through the levels of government that support the RGC industrial agenda and greening of activities.

**Recommendation 3:** Develop knowledge of the financial constraints of the SMEs within the region and define how public action can facilitate increased private sector investment and access to finance in these sectors within the Schönefelder Kreuz region.

**Recommendation 4:** Ensure that educational and training institutions are able to deliver the skills development that meets the needs of industry and provides labour force mobility. Green skills development needs to be supported by specific action plans and embedded in the training curriculum at both public and private sector level.

**Recommendation 5:** Support innovative strategies that enable labour force mobility between firms and across occupational classifications through flexible training and skills acquisition. Focus on transferrable skills development such problem solving and management and communication skills.

**Recommendation 6:** Continue to resource monitoring and communicating environmental quality measures. Advise city councils in the region on how to monitor these measures as part of their strategic approach to the transition to a low-carbon economy. The Schönefelder Kreuz regional growth core can be an example of how this monitoring should be used at the local level for strategic policy development.

**Recommendation 7:** Resource detailed statistical data linked to an agreed indicator framework for each municipality that is proximate to the airport and at the regional growth core Schönefelder Kreuz level.

**Recommendation 8:** Prioritise and support low-carbon community assets as part of the trade-off for future developments at the airport.

## *References*

- OECD (2011a), *Towards Green Growth: Monitoring Progress: OECD Indicators*, OECD Green Growth Studies, OECD Publishing, <http://dx.doi.org/10.1787/9789264111356-en>.
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## *Annex A*

### Note on contributors

**Prof. Dr. Bertil Haack** is the Dean of the Faculty of Business, Administration and Law of the Technical University of Applied Sciences, Wildau (since 2007). He started working in Wildau as an Assistant Lecturer in 2003, became Visiting Professor in 2004 and Professor in 2006. His research focuses on project management, quality management (the area in which he obtained his doctoral degree in 1995) and sustainability. One of his main interests is related to sustainable project management.

**Dr. Cristina Martinez-Fernandez** is a Senior Policy Analyst on Employment and Skills, Green Growth and Southeast Asia at the Organisation for Economic Co-operation and Development (OECD), Local Economic and Employment Development (LEED) Programme. She works on issues related to the challenges of skills and training systems for SMEs, entrepreneurial and innovation activities; industrial policy, climate change and the transformation of labour markets into the low-carbon economy; and the challenges of demographic change and an ageing society for skills and employment development. Cristina also manages the OECD/LEED initiative on Employment and Skills Strategies in Southeast Asia (ESSSA). Before joining the OECD she was an Associate Professor at the Urban Research Centre, University of Western Sydney in Australia where she led the Urban and Regional Dynamics Program, which analyses industry change, urban performance and socio-economic development within the frameworks of innovation, globalisation and the knowledge economy.

**Dr. Keith Mason** is Head of the Air Transport Management Group. He is the Director of the Business Travel Research Centre and Reader in the Department of Air Transport at Cranfield University. He lectures on airline economics, airline business models, airline marketing and market research. His research focuses on the business travel market and low-cost airlines, and over 30 of his articles, papers and reports have been published. Dr. Mason has been involved in a number of major consultancy projects for airlines, airports, civil aviation authorities, airplane manufacturers and the EU. He has led projects for AMEX, the Association of Corporate Travel Executives and the Institute of Travel Management. Dr. Mason has given presentations for the Royal Aeronautical Society, ACTE, ITM, the London Travel Forum, the Hamburg Aviation Conference and the World Airline Entertainment Association. He is a Fellow of the Royal Aeronautical Society and Committee Member of the Air Transport Research Society.

**Dr. Samantha Sharpe** is Principal Research Fellow at the Institute for Sustainable Futures, University of Technology Sydney. Her research focuses on regional economic development, innovation and technology development within firms, and science-based commercialisation of technology. Science and technology policy, particularly in the areas of green technology and economic development policy, are of ongoing research interest. Outcomes of this research are policy development and industry advice around the support of innovative activity in places, the incubation of new technology, and the role public policy can play in the “green economy” in establishing emerging markets for

environmental technologies and services, particularly in energy efficiency and renewable energy.

**Dr. Pere Suau-Sanchez** is Research Fellow at the Department of Air Transport, Cranfield University; Treasurer of the Association of Professional Geographers of Catalonia; and Co-editor and Co-founder of the Bloq La Trama Urbana. He received his PhD in Geography from the Universitat Autònoma de Barcelona, Spain. His thesis “Unevenness in air transportation: A multi-scalar analysis” is mainly based upon his scientific work both as a PhD researcher (2007-2011) at the Department of Geography, Universitat Autònoma de Barcelona and as Guest researcher (2008-2010) at the Worldwide Scientific Network for Aviation Research and Policy (Airneth) and the Amsterdam Aviation Economics (SEO Economic Research).

## *Annex B*

### Summary note on the Schönefelder Kreuz workshop

The OECD LEED Programme, the regional growth core Schönefelder Kreuz and the Technical University of Applied Sciences, Wildau held the third workshop of the project on “Measuring the Potential of Green Growth: Indicators of Local Transition to Low-Carbon Economy” in Wildau and on the ILA International Berlin Air Show fairground on 10-11 September 2012.

The meeting was organised as a dialogue of experts, politicians, as well as representatives from both business and academia to discuss “Measuring the Potential of Green Growth in the Regional Growth Core Schönefelder Kreuz”. This regional growth core (RGC) is one of 15 RGCs in the federal state of Brandenburg. It is located in the south-west of Berlin in a very central position of Brandenburg and comprises the municipalities of Schönefeld, Wildau and Königs Wusterhausen.

The distance between Schönefelder Kreuz and the Berlin city centre is about 20 kilometres; the distance between Schönefelder Kreuz and the Polish border in the east of Brandenburg is about 70 kilometres. Neighbouring communities, including the regional growth core, comprise 100 000 inhabitants. Schönefelder Kreuz therefore has a catchment area of about 110 000 people.

During recent years, including at the time the workshop was held, the BER Berlin Brandenburg International Airport was, and still is, a topic around which a lot of different interests are focused. The BER is the core element of the regional infrastructure. On the one hand, the airport is an economic growth driver. On the other hand, the question is whether the airport is also a *green* growth driver?

Workshop participants discussed these aspects and analysed the RGC Schönefelder Kreuz’s transition to a low-carbon economy, keeping in mind the advantages and disadvantages for Schönefelder Kreuz induced by the BER. The following four themes were discussed in detail.

#### Green environmental assets and infrastructure

Every region, including the RGC Schönefelder Kreuz, will start the process of transitioning to a low-carbon economy with different endowments of assets – physical, industrial and human capital. The Schönefelder Kreuz workshop investigated the environmental assets and addressed issues of environmental quality, such as air and water quality, and the availability of green spaces and biodiversity. Participants also examined how the local areas contribute to this quality by transport emissions and waste volume and how the region responds to issues of regeneration of industrial and contaminated sites and threats to decreasing biodiversity. The environmental assets and the quality of these

assets are important in determining the ability of the RGC Schönefelder Kreuz to mitigate its carbon footprint.

One of the key questions addressed during the discussion was the importance of the regional assets. Moreover, the influence of these regional assets in the transition to a low-carbon economy was the centre of interest. Finally, useful indicators for a low-carbon future were analysed.

Workshop participants underlined that the federal state of Brandenburg offers green assets like lakes, water ports and beautiful landscapes. Schönefelder Kreuz itself does not have the same level of natural resources, but is more characterised by residential estates, business premises and conservation areas. Aerospace engineering, biotechnology enterprises, metal processing and automotive industries are prospering branches in the RGC Schönefelder Kreuz.

In terms of a green growth strategy for transitioning to a low-carbon economy, workshop participants pointed out that green energy is very cost-intensive and has massive fixed costs, which could be a mitigating factor for regional firms in a highly competitive environment.

Moreover, the transition to a low-carbon economy is an issue of ecological and social interest. Acceptance for green change within the society of Brandenburg and ecological consciousness are most important to enforce change. Workshop participants agreed that complex green growth models are needed, as well as clarifying responsibilities at the political level. A clearly targeted strategy not only for the RGC Schönefelder Kreuz but for the federal state of Brandenburg and Berlin is needed, in which the federal state of Brandenburg and Berlin work together hand in hand to be successful and competitive over the long term.

In summary, workshop participants developed the following recommendations:

- A political long-term strategy is needed.
- Innovations are necessary to lower the costs for green energy.
- Motivate locals for change; show inhabitants the benefits of green energy.
- Support sustainable ideas and regional corporations.
- Think globally, act locally.

## Greening production and consumption

During their discussions, workshop participants examined the local industry base, its links with the wider economic and labour markets in surrounding areas and highlighted key competitive advantages in local industry clusters. They also looked at the prevalence of start-up and spin-off businesses. Discussions built on the above-mentioned aspect that the new airport incurs advantages and disadvantages on the surrounding municipalities. On the one hand, there is the potential of the existing airport industry base for “greening” economic development; on the other hand, the airport and increasing economic activities mean that a lot of noise and air pollution will affect people in the BER periphery.

Workshop participants analysed the reasons for and the effects of the strong opposition voiced by many inhabitants, who formed organisations to stop the construction of the airport, even though it is very important for the region’s economic infrastructure. In this context, they talked about residents’ fear of aircraft noise and how such strong

opposition (on television and in the printed media) against this construction project could have been avoided. There was consensus that there should have been a certain level of communication between inhabitants and policy makers since transparency could have avoided such a lack of public acceptance. Additionally, public consultation, including offering ideas and solutions, could have created greater acceptance among all inhabitants affected by the BER.

Workshop participants shared the opinion that building an airport is definitely not sufficient for making a region more attractive for industries. It is, however, also a question of an efficient supply chain and infrastructure and the connection between companies and the airport. Policy makers should keep in mind that the public sector, especially concerning the BER project, has huge economic power. It is not only competition, but co-operation as well, that are driving forces in the economy. Because pure competition alone is ineffective, everyone involved in such projects should establish a climate of tolerance and acceptance. Consequently, they can create a competitive advantage where the public sector can be involved.

For some workshop participants, the question “Why is the BER a green airport?” has, so far, very inconclusive answers – even after various presentations were made on the subject at the conference. The perception is that the green message has been undervalued as a concept and under-communicated to stakeholders and the public. In other words, ecology and sustainability were integrated in the general BER planning as a routine matter, following established standards – but not conceptualised as a priority. This may have been a missed opportunity. Perhaps political ambitions to position the BER as a green project were low.

On the other hand, workshop participants noted that there may be built-in barriers to any attempt to do so “because air transport is not green at all” and has credibility problems. A new airport may be greener but remains a hard case to sell in terms of ecology and environmental protection. In the light of massive protest against the BER’s location and expected flight routes, which increased annoyance and emissions (noise and other), it seems unpromising to successfully communicate a credible green message. In addition, workshop participants discussed the characteristics of energy supply. One potential key argument here is efficiency. Efficiency is, of course, a good measurable indicator. Efficiency could also be a powerful symbol for the new airport – if it is more efficient than others, it will be greener, which could be a positive promotional message, enhance public support and bring on “beacon” status.

The federal state of Brandenburg was portrayed as an energy supplier (wind and solar energy; turning conventional fossil fuels like lignite more environmentally friendly). The focus was very much on green energy supply, but there was not much talk about energy efficiency.

Energy efficiency may be a better connecting central theme for a greener economy. From aviation to logistics, trucking, transport to manufacturing and even shopping, a more clearly “efficiency-driven” local economy could boost the region’s standing. It could be measured, and it could boost the wider public appreciation of the value of energy efficiency, changing individual behaviour and consumption. It may be worth measuring, as an indicator, whether “efficiency-driven” economic growth has this wider effect.

Looking at energy efficiency is necessary but not sufficient to discuss “greening production and consumption”. In other words, if the BER-induced economic growth is supposed to be green growth, then where does the green come from? Which are the core industries that are pushing the green effects? Indicators need to reflect this. It is important to measure whether greener industries (and greener jobs) are located near the airport and integrated into its economic network. Some obvious examples are industries with a clear claim to enhance sustainability, reduce waste or produce renewable energy. But there is a broad range of industries beyond the inner core of environmental technologies and services which must be considered. The BER is situated in a growth core with high concentrations of aviation service and manufacturing, logistics, transport and related business, such as IT, from transport-specific telematics to broader “green computing” and greener telecommunications services.

In what way are these businesses green or greener than before? Can we measure how they make environmental protection an integral part of their business processes and products? Do they implement an environmental management system? Do they train managers and employees on green issues continuously? Do they follow, measure, monitor green standards? Do they have audits, reviews and certification schemes in place (e.g. ISO or EMAS)? Do they make available results and measurements (such as in sustainability reports)? Is there a driving force that brings greener business practices here because of the BER’s concepts and governance priorities? If the BER is indeed a greener airport, compared to older models, does a greener airport automatically mean greener industry around it? Does the greener airport actually need greener industry nearby? Is there a measurable green spillover?

One topic of discussion was aviation-related manufacturing and maintenance. Schönefelder Kreuz prides itself as being an important cluster in this field. In aircraft engine construction and maintenance, many firms work on increasing efficiency and reducing waste and emissions, improving recycling and repair (over replacement), making engines ready for biofuels, etc. For instance, several airlines, like Lufthansa, have biofuel initiatives. It was noted that aircraft biofuel development may connect to Schönefelder Kreuz core industries in life sciences, green biotechnology and agrotechnology. This would be an indirect effect on supporting green industries.

Firms like MTU AeroEngines or Rolls-Royce do have a greening track record. The open question is whether their suppliers and networks in the region will follow their example, and whether there are incentives for them to do so (from their industry partners or from government). There could be an indicator measuring this.

## **Green jobs and skills for transition to a low-carbon economy**

The development of new “green” sectors and the greening of existing industrial sectors are closely related to the ability of the region to attract and retain the right pool of talent and skills, create the right labour market conditions, and support and retain “green know-how” within the region. Workshop participants examined the operation of local training and skills development organisations, what we refer to as the skills and training ecosystem in the Schönefelder Kreuz area, and the implications for the labour market of transitioning to a low-carbon economy. Specific skills sets are needed for emerging green clusters but also generally throughout the local Schönefelder Kreuz economy to allow existing industries to become greener, through more efficient production and operation of local businesses.



In order to know which green job skills will be needed, it is important to see which industries will settle into the region. The new airport will attract more industries, especially service industries. But it is difficult to determine exactly what skills will be needed. Communication is a key factor in solving this issue. It is important to communicate from the industry-based view and from the green job-based view itself: *Green dialogue!*

What support mechanisms are required for the transition to a low-carbon economy through more locally targeted training and research? First, it is important to get the right representatives together. Appropriate bodies must be set up to ensure that supportive research and innovation locations exist. Research and innovation are important for developing a greener job market and strengthening a greener skills base and, in the long-term, a general greening of the economy. The most important issue will be to enable an effective transfer of knowledge from key people to industry.

At the end of the workshop, participants developed the following suggestions for green jobs and skills, and for a transition to a low-carbon economy:

- Create learning networks to support a green-skills approach.
- Have external consultants interact with companies to enable knowledge transfer.
- Co-ordinate responsibilities more effectively.
- Check possible subsidies from the government and the European Union.
- Urge more financial commitment from companies to meet the green demand.

### Sustainable strategies for local public and private actors

Regional policy makers and other local stakeholders are faced with the challenge of combining a business-friendly and competitive local economy that offers employment and skills development opportunities for local residents, but which at the same time protects and enhances the natural environment.

Therefore, workshop participants wanted to find policy priorities for local public authorities and firms in order to stimulate the economy. Consequently, they put emphasis on the fact that everybody needs a new way to debate and think about sustainability in order to create greater motivation for this topic. The priority should be focused on developing the knowledge base and thus informed choices, which in turn need to find a place in politics. Since it is inevitable to aim at a low-carbon society, every policy maker, as well as company, should focus their efforts on reaching this objective in order to transfer the RGC Schönefelder Kreuz into a highly competitive region.

There was a consensus among all of the workshop participants that more local authorities need to be involved in this process and that they should all be more individually committed. To achieve this, they need to involve the society, political intuitions and companies in order to bring everyone on board. Conceding that the federal state of Brandenburg is lagging behind in general green targets, it was explained that there are many diverse interests, especially among the different industries (the coal industry employs a lot of people on the one hand and renewable energy companies are looking for employees on the other), making it very complicated to involve all stakeholders in realising a sustainable strategy that can satisfy everyone.

The federal state of Brandenburg, with several regions, mayors and policy makers, is less centralised than Berlin. Due to this diversity, each stakeholder is interested in different aspects and has different objectives. Workshop participants suggested a political platform for decision makers: a “Government of Mayors”; which could encourage and involve all local politicians and drive more actions. All of these different players should be aware that the overall concept cannot only be about competition, but must also be about co-operation, even when discussing investments.

One of the main challenges is the obvious gap between energy strategies and what is realised locally. Therefore, the region needs a project involving all the different goals. Workshop participants agreed that policy makers at all local levels need a clear vision and clear objectives, which should be established in:

- local agendas
- local measures
- local planning and financing
- clear responsibilities.

Finally, the workshop participants agreed that sustainable strategies are less important for private actors. Even though individuals are informed and aware of climate change, renewable energy resources and sustainability, many of them do not actively factor green solutions into their lifestyle. Consequently, policy makers and companies should be role models, encouraging everybody to make sustainability a part of their daily lives.

*Annex C*  
Workshop agenda

**OECD Workshop**  
**Indicators for local transition to a low-carbon economy**  
**in Germany**

**Case study 3: The Regional Growth Core**  
**Schönefelder Kreuz**

**Regional Growth Core Schönefelder Kreuz, 10-11 September 2012**

**Germany**

**Agenda**

*Organised by*

*OECD LEED Programme, Regional Growth Core Schönefelder Kreuz  
and the Technical University of Applied Sciences Wildau*

*Hosted by*

*The Mayor of Königs Wusterhausen and the Technical University of Applied Sciences Wildau*

**Background**

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The regional growth core Schönefelder Kreuz is one of the most dynamic economic areas in Central Europe. The driving force is the new BER Berlin Brandenburg International Airport. This is a time of major change for airports and the aerospace industry in Europe with the inclusion of aviation into the European Union Emissions Trading Scheme (ETS) from 2012 and the competitive pressure and innovation among airlines for more fuel-efficient aircraft and cost-efficient business models. This workshop will focus on how Schönefelder Kreuz is transitioning to a low-carbon economy and how the region can maximise the opportunity for green growth in aviation to the regions' advantage.

Achieving greener growth will involve seizing opportunities to develop new green industries, jobs and technologies, as well as managing the transition for greening the more traditional sectors and the associated employment and distributional effects. It will require adopting new technologies, developing new products and supporting new patterns of demand from households, companies as well as governments.

The regional growth core Schönefelder Kreuz and the Technical University of Applied Sciences Wildau, in partnership with the OECD Local Economic and Employment Development Programme (LEED), are working on defining and collecting measurable indicators at the regional/local level that can inform over time of the transition to a low-carbon economic and industrial activities. These indicators will address the two aspects of the green growth economy: fostering job creation and economic development in new areas of growth and sustainable development.

The regional growth core Schönefelder Kreuz (part of the Metropolitan Area Berlin-Brandenburg) will be focussed on in an in-depth analysis.

This study is proposed within the framework of the [OECD Green Growth Strategy](#). The results of the whole project – especially the above-mentioned indicators – will be the base for all regional decision makers.

For more information on the project visit the OECD LEED website

[www.oecd.org/cfe/leed/projects/lowcarbon](http://www.oecd.org/cfe/leed/projects/lowcarbon)

or Regional Growth Core website

[www.rwk-schoenefelder-kreuz.de](http://www.rwk-schoenefelder-kreuz.de)

**Venue: Seehotel Zeuthen, Zeuthen; ILA Berlin Air Show (Berlin-Schönefeld Airport);  
Technical University of Applied Sciences Wildau**

## ■ Monday, 10 September 2012

### Morning and afternoon session

10:30 – 11:00

*Registration and coffee*

*Venue: Technische Hochschule Wildau, Room 100-214, Bahnhofstraße, D-15745 Wildau*

11:00 – 11:30

#### **Welcome and opening**

**Ralf Christoffers**, Minister of Economics and European Affairs Brandenburg

**Heino von Meyer**, OECD Berlin Centre

**Sabine Hübner**, Head of Department, Ministry of Labour and Social Affairs Brandenburg

**Prof Dr. László Ungvári**, President, Technical University of Applied Sciences Wildau

11:30 – 12:00

#### **Low-carbon agenda of Brandenburg**

**Prof Dr. Peter Schulze**, Head of Unit, Ministry of Economics and European Affairs

#### **The Green Airport Strategy of BER**

**Jochen Heimberg**, Head of Unit, Berlin Airport Authority

12:00 – 13:00

#### **Lunch and visit of the campus**

**Prof Dr. Bertil Haack**

13:00 – 13:30

#### **OECD indicators and local transition to low-carbon economy**

**Dr. Cristina Martinez**, OECD LEED Programme

**Dr. Samantha Sharpe**, University of Technology Sydney, Australia

13:30 – 14:00

#### **Schönefelder Kreuz area and the BER business corridor**

**Prof Dr. Bertil Haack**

14:00 – 14:15

#### **Explanation of the roundtable sessions**

The roundtable sessions are one of the primary forms suggested by the OECD for data collection for the local case studies. There are four one-hour long topical sessions on this programme. Two sessions run in parallel. Each session will serve to invite participants to

respond to the material they have heard in the presentations before, particularly the background note and first suggestions for local indicators of transition for this topic. The local session leader introduces each topical session. Discussions then take place amongst all workshop participants grouped around the tables in order to identify priorities of what matters for regional transition and what might be measured. Each table has a discussion leader and a rapporteur. A member of the OECD expert delegation will also be on each roundtable to welcome participants, pose questions and add commentary to the roundtable discussions. The results of the session will be collected at each table and discussed in the following “Feedback from Roundtables”.

After each session, participants (except table facilitators, rapporteurs and OECD experts) are invited to change tables to create different group dynamics over the day.

Roundtable leader: [Dr. Cristina Martinez](#)

14:15 – 15:15

### **Roundtable session 1. Green environmental assets & infrastructure**

Every region will start the process of transitioning to a low-carbon economy with different endowments of assets – physical, industrial and human capital. This first roundtable session investigates the environmental assets and addresses issues of environmental quality such as air and water quality, and the availability of green spaces and biodiversity. Also how do the local areas contribute to this quality by examining transport emissions and waste volume and how does the region respond to issues of regeneration of industrial and contaminated sites and threats to decreasing biodiversity. The environmental assets and the quality of these assets are important in determining the ability of local regions to mitigate and adapt to Regional Growth Core Schönefelder Kreuz. The background note presented some analysis of the environmental quality of the Schönefelder Kreuz region. This session builds on that information.

*Key questions to be addressed include:* How important are these environmental assets to the region? How will they assist the local area in transitioning to a low-carbon future? Which indicators can be used?

*Experts:* [Dr. Samantha Sharpe \(University of Technology Sydney\)](#); [Prof Hans Bruyninckx \(HIVA, University of Leuven\)](#), [Dr. Maj Munch Andersen](#)

*Table facilitators:* [Philipp Ruta \(Future Agency Brandenburg\)](#), [Dr. Frank Hartmann \(TH Wildau\)](#), [Martin Bradbeer \(TH Wildau\)](#)

### **Roundtable session 2. Greening production and consumption**

This roundtable examines the local industry base, its links with the wider economic and labour markets to surrounding areas and highlights key competitive advantages in local industry clusters. This session will also look at the prevalence of start-up and spinoff businesses.

This session builds on this evidence to discuss the potential of the existing (airport) industry base for “greening” economic development, by increasing economic activities that ensure greater carbon efficiency of production and operation. Identifying emerging opportunities for the region for economic development that do not rely on increased material production and consumption will also be discussed. Of special interest in this theme will be the relationship and linkages of the new airport and the opportunities to leverage these linkages for cluster development.

*Key questions to be addressed include:* How is the emerging airport supported? What is the potential of other industrial sectors for greening? How might the currently established industry and the emergent airport interact and what might be the implications for the greening of industrial production and the job market? How will this affect the competitiveness of the regional growth core Schönefelder Kreuz? Which indicators can be used to monitor the

		transition?
		<p><i>Experts:</i> Dr. Alwine Woischnik (Ministry of Environment, Chile); Dr. Pere Suau-Sanchez (Cranfield University, United Kingdom), Mr Robert Strauss (European Commission), Mr Klaus Rovsing Kristiansen (Copenhagen Capacity)</p> <p><i>Table Facilitators:</i> Dr. Gerd Harms (ENERTRAG AG), Prof Dr. Marco Althaus (TH Wildau), Dr. Greg Bond (TH Wildau)</p>
15:15 – 15:45	<b>Feedback from roundtables</b>	
	<i>Facilitator:</i> Prof Dr. Bertil Haack	
15:45 – 16:15		<i>Coffee</i>
16:15 – 17:15	<p><b>Roundtable session 3. Green jobs and skills for transition to a low-carbon economy</b></p> <p>The development of new “green” sectors and the greening of existing industrial sectors is closely related to the ability of the region to attract and retain the right pool of talent and skills, create the right labour market conditions and support and retain “green know-how” within the region. This session examines the operation of local training and skills development organisations, what we refer to as the skills and training ecosystem in Schönefelder Kreuz area, and the implications for the labour market of transitioning to a low-carbon economy. Specific skills sets are needed for emerging green clusters but also generally throughout the local Schönefelder Kreuz economy to allow existing industries to become greener, through more efficient production and operation of local businesses.</p> <p><i>Key questions to be addressed include:</i> What are the characteristics of the current skills ecosystem in the area? What are the advantages and challenges currently facing the local labour market for green skills development? What role might research and innovation play in developing a greener job market, skills base, and more general the greening of the economy? What support and mechanisms are required for transition to a low-carbon economy through more locally targeted training and research? How will the region succeed in attracting the necessary high-qualified human resources? Which indicators can be used for monitoring the</p>	<p><b>Roundtable session 4. Sustainable strategies for local public and private actors</b></p> <p>Regional policy makers and other local stakeholders are faced with the challenges of combining a business-friendly and competitive local economy that offers employment and skills development opportunities for local residents but at the same time protects and enhances the natural environment. The background note presented some of the local policy positions on a number of key environmental variables.</p> <p><i>Key questions to be addressed include:</i> What should the policy priorities be for local public authorities and for firms to stimulate a new economy? How do we identify these priorities? What should the role of government and other stakeholders be in understanding and acting on issues such as job creation for young people, access to capital, emissions reduction, environmental protection, and social integration? Where does the local governance have the strongest leverage? Which indicators can be used for monitoring the transition?</p> <p>OECD expert: Dr. Pere Suau-Sanchez (Cranfield University), Prof Hans Bruyninckx (HIVA, University of Leuven), Alwine Woischnik (Ministry</p>



	<p>transition?</p> <p>OECD experts: Mr Robert Strauss (European Commission), Dr. Samantha Sharpe (University of Technology Sydney), Dr Maj Munch Andersen</p> <p><i>Table Facilitators:</i> Philipp Ruta (Future Agency Brandenburg), Dr. Frank Hartmann (TH Wildau), Martin Bradbeer (TH Wildau)</p>	<p>of Environment, Chile), Mr Klaus Rovsing Kristiansen (Copenhagen Capacity)</p> <p><i>Table Facilitators:</i> Dr. Gerd Harms (ENERTRAG AG), Prof Dr. Marco Althaus (TH Wildau), Dr. Greg Bond (TH Wildau)</p>
17:15 – 17:45	<p align="center"><b>Feedback from roundtables</b></p> <p align="center"><i>Facilitator:</i> Prof Dr. Bertil Haack</p> <p>1 rapporteur per roundtable presents key points.</p>	
17:45 – 18:00	<p align="center"><b>Closing remarks and programme of the next day</b></p> <p align="center">Dr. Cristina Martinez-Fernandez, OECD</p> <p align="center">Prof Dr. Bertil Haack, Technical University of Applied Sciences Wildau</p> <p align="center">Dr. Lutz Franzke, Mayor, Königs Wusterhausen</p>	
18:00 – 18:15	<p align="center"><b>Bus transfer to Seehotel Zeuthen</b></p>	
<p><b>Evening session</b></p>		
19:00 – 22:00	<p align="center"><i>Dinner offered by the Regional Growth Core Schönefelder Kreuz at “Weinladen am Kanal” Königs Wusterhausen</i></p> <p align="center"><i>Hosts:</i> Dr. Lutz Franzke, Prof Dr. Bertil Haack</p>	

## ■ Tuesday, 11 September 2012

### Morning session

10:00 – 10:30	<p><b>Bus transfer to ILA Berlin Air Show (Berlin-Schönefeld Airport)</b></p> <p><i>Facilitators:</i> Dr. Lutz Franzke, Prof Dr. Bertil Haack</p>	
10:30 – 11:00	<p><b>Transfer and welcome coffee at Exhibition Space Schönefelder Kreuz</b></p> <p><i>Chair:</i> Dr. Lutz Franzke and Prof Dr. Bertil Haack</p>	
11:00 – 11:30	<p><b>Welcome notes</b></p> <p>Matthias Platzeck, Prime Minister, Federal State of Brandenburg</p> <p>Katherina Reiche, State Secretary, Federal Ministry of Environment, Nature Conservation and Nuclear Safety</p> <p><i>Chair:</i> Dr. Lutz Franzke</p>	
11:30 – 13:00	<p><b>Panel session – Local transition to green growth</b></p> <p>Panel session with the international experts with reflections on discussions from the previous day’s roundtable sessions and what this means for the transition to economic development that is also sustainable in the Schönefelder Kreuz area and the BER business corridor.</p> <p>Key questions for the panel include how does the Schönefelder Kreuz area make the transition to a low-carbon future, what will be the key resources and policy settings for optimal transition and how will the transition be measured.</p> <p>Dr. Cristina Martinez-Fernandez, OECD</p>	

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Prof Dr. Hans Bruyninckx, HIVA – University of Leuven, Belgium  
Dr. Maj Munch Andersen, Technical University of Denmark, Denmark  
Dr. Samantha Sharpe, University of Technology Sydney, Australia  
Dr. Alwine Woischnik, Ministry of Environment, Chile  
*Chair: Prof Dr. Bertil Haack*

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13:00 – 14:00 **Lunch**

#### Afternoon session

14:00 – 16:00 **Panel session – Greening aviation and airport clusters**

Panel session discussing the role of air traffic and the aviation industry in the economic development and the greening industry in Germany and the Schönefelder Kreuz Area.

Dr. Steffen Kammrath, Managing Director, ZAB Business Promotion Brandenburg

Dr. Pere Suau-Sanchez, Cranfield University, United Kingdom

Sebastian Dreyer, Senior Manager, Air Berlin

Prof Dr. Monika Bauer, Director, Fraunhofer Institute Pyco

Dr. Edmund Ahlers, Managing Director, AneCom Aero Test

*Chair: Prof Dr. Hans Bruyninckx, HIVA – University of Leuven, Belgium*

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16:00 – 16:30 **Closing remarks and next steps**

Tina Fischer, State Secretary Brandenburg, Plenipotentiary of the Land of Brandenburg to the Federation

Dr. Cristina Martinez-Fernandez, OECD

Prof Dr. Bertil Haack, Technical University of Applied Sciences Wildau

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16:30 *Bus transfer to Seehotel Zeuthen and to airport/Berlin City/visit ILA Berlin Airshow/reception State of Brandenburg*

*Guidance: Prof Dr. Bertil Haack, Dr. Lutz Franzke*

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## *Annex D*

### Workshop participants

Last name	First Name	Organisation/Job title
Aha	Klaus	Board Member, CFO Vattenfall Europe Mining & Generation
Ahlers, Dr.	Edmund	Managing Director, AneCom Aero Test
Althaus, Prof. Dr.	Marco	Technical University of Applied Sciences Wildau
Andersen, Dr.	Maj Munch	Danmarks Techniske Universitet
Bascón-Scheffler	Drina	Embassy of Chile
Bauer, Prof. Dr.	Monika	Fraunhofer Institute Pyco
Bitzer	Max	DGB Verdi Trade Unions
Bochert	Daniel	Technical University of Applied Sciences Wildau
Bond, Dr.	Greg	Technical University of Applied Sciences Wildau
Bradbeer	Martin	Technical University of Applied Sciences Wildau
Bruyninckx, Prof. Dr.	Hans	HIVA, University of Leuven, Belgium
Christoffers	Ralf	Minister for Economics and European Affairs
Danckert, Prof. Dr.	Peter	MoP Bundestag
Dreyer	Sebastian	Senior Manager, Air Berlin
Fellermeyer	Gabriele	gsub mbH
Fischer	Tina	State Secretary Brandenburg
Franzke, Dr.	Lutz	Mayor, Königs Wusterhausen
Gärtner	Thomas	Technical University of Applied Sciences Wildau
Haack, Prof. Dr.	Bertil	Dean, Department of Business, Administration and Law, Technical University of Applied Sciences Wildau
Harms, Dr.	Gerd	ENERTRAG AG

Last name	First Name	Organisation/Job title
Hartmann, Dr.	Frank	Technical University of Applied Sciences Wildau
Heimberg	Jochen	Head of Unit, Berlin Airport Authority
Hildebrandt, Dr.	Swen	State Chancellery Brandenburg
Hoffmann	Matthias	Technical University of Applied Sciences Wildau
Homeyer	Dierk	MoP Brandenburg
Hübner	Sabine	Head of Department, Ministry of Labour and Social Affairs
Kammrath, Dr.	Steffen	Managing Director, ZAB Business Promotion Brandenburg
Kast	Alexandra	gsub mbH
Kristiansen	Klaus Roving	Copenhagen Capacity
Kuhn	Wolf-Rüdiger	Managing Director Jobcenter Dahme-Spreewald
Lausch, Prof. Dr.	Wolfgang	Managing Director, GmbH
Lehmann	Sandra	tbz Königs Wusterhausen
Ludwig	Stefan	MoP Brandenburg
Mack	Gerlinde	Jahn, Mack und Partner
Mackenney	Francisco	Embassy of Chile
Mahalingam	Dharini	Technical University of Applied Sciences Wildau
Martinez, Dr.	Cristina	OECD LEED Programme
Meyer, von	Heino	OECD Berlin Centre
Micklich	Sascha	Technical University of Applied Sciences Wildau
Mooren	Hans	Benelux Team Market Secretariat-Generaal
Mücke	Clemens	Business Promotion Berlin-Neukölln
Muth	Alexander	Technical University of Applied Sciences Wildau
Platzeck	Mathias	Prime Minister, Federal State of Brandenburg
Popowski, von	Matthias	Managing Director, ComPlan
Reiche	Katherina	State Secretary, Federal Ministry of Environment, Nature Conservation and Nuclear Safety
Reimann	Michael	Managing Director, Urban Social

Last name	First Name	Organisation/Job title
Rixrath	Kai	Managing Director, McParking
Ruta	Philipp	Future Agency Brandenburg
Schiemann	Lisa	Technical University of Applied Sciences Wildau
Schmuck	Klaus	Business Advisor Sustainability
Schneider	Milena	Technical University of Applied Sciences Wildau
Scholz	Helmut	MoEP
Schulze, Prof. Dr.	Peter	Head of Unit, Ministry of Economics and European Affairs
Schütz	André	Technical University of Applied Sciences Wildau
Seelig	Heiko	EWE Germany
Sharpe, Dr.	Samantha	University of Technology Sydney, Australia
Straube, Dr.	Rainer	Managing Director, tbz Königs Wusterhausen
Struck	Carmen	Chamber of Industry and Commerce
Suau-Sanchez, Dr.	Pere	Cranfield University, United Kingdom
Teltewskaja	Gundula	LUTRA GmbH
Tomczak	Raimund	MoP Brandenburg
Ungvári, Prof. Dr.	László	President, Technical University of Applied Sciences Wildau
Wille	Martin	President District Dahme-Spreewald i.R.
Wirth	Denise	Technical University of Applied Sciences Wildau
Woischnik, Dr.	Alwine	Ministry of Environment, Chile
Zehrfeld	Thomas	Deputy Director, Lex & Hesse

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## **ABOUT LEED**

The OECD Programme on Local Economic and Employment Development (LEED) has advised governments and communities since 1982 on how to respond to economic change and tackle complex problems in a fast-changing world. Its mission is to contribute to the creation of more and better quality jobs through more effective policy implementation, innovative practices, stronger capacities and integrated strategies at the local level. LEED draws on a comparative analysis of experience from the five continents in fostering economic growth, employment and inclusion.

## **ABOUT THE REGIONAL GROWTH CORE SCHÖNEFELDER KREUZ**

The federal state of Brandenburg is one of the 15 federal states of the Republic of Germany. In 2004, the federal government funded 15 regional growth cores (RGCs) as a mechanism to support economic growth and employment and to use subsidies in a more efficient way in each of these RGCs. Each RGC defined a concept with concrete activities concerning the optimisation of infrastructure, the development of business parks, personnel development, technology transfer, etc.

The RGC Schönefelder Kreuz is a part of the Metropolitan Area Berlin-Brandenburg. It is located to the south-west of Berlin, the capital of Germany, in a very central position of Brandenburg and combines the municipalities of Schönefeld, Wildau and Königs Wusterhausen. Amongst others, the importance of the RGC Schönefelder Kreuz results from the future Berlin Brandenburg Airport Willy Brandt embedded in the municipality of Schönefeld.



# Green Growth in Brandenburg:

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