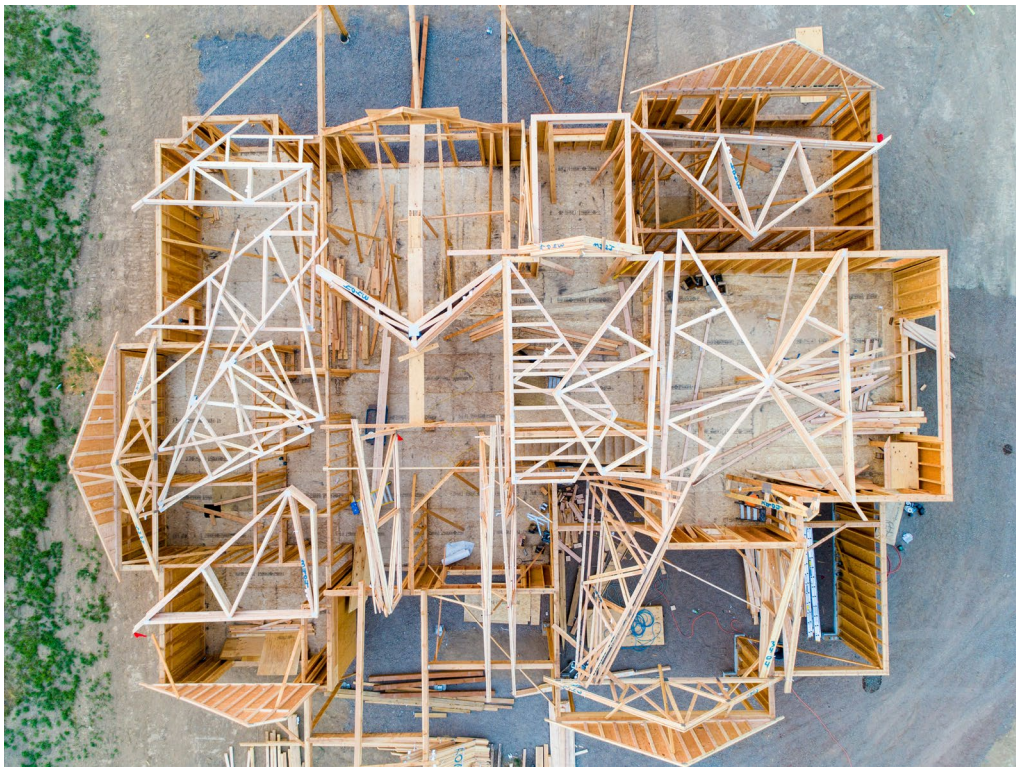
RENEWS PAPER NO. 2

SKILLED WORKERS FOR THE ENERGY TRANSITION

ENERGY TRANSITION TOWN TWINNINGS

SUMMARY

Skilled workers are urgently needed for a continuous energy transition. As part of the project 'Energy Transition Town Twinning 3.0' (EWPS 3.0), the German Renewable Energy Agency (AEE) and eight partner municipalities from four countries have identified two main factors that are hindering local transformation. Firstly, towns and villages often face financial challenges which affect employment and fair remuneration of administrative staff as energy managers or climate protection managers as part of the municipality. Secondly, there is a shortage of skilled workers to support the energy transition. The number of people working in craftsmanship is often insufficient and those who are currently employed in the crafts are regularly working in the fossil industry. By retraining skilled workers, the energy transition can speed up and secure future-proof long-term positions. In the following, we will present these challenges using examples of the EWPS 3.0 twinning towns and present opportunities for solution in order to speed up the energy transition.



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WITH SUPPORT OF

Federal Foreign Office

IN COLLABORATION WITH

RENEWABLE ENERGY AGENCY

INTRODUCTION

The energy transition is continuously evolving – globally and locally. It is influenced by multiple challenges: wars in Ukraine and the Middle East, weakened democracies through a rise of autocratic tendencies, extreme climate events such as droughts and floods, financial crises, rising living costs, and unemployment, among others. Conversely, the transition of energy supply towards renewables can help mitigate many of these developments. By implementing local renewable energy resources which do not depend on imports and external factors, countries and regions can become independent of global insecurities and strengthen their own economy. Renewables can create employment opportunities, contributing to both individual and national financial security.

Nevertheless, there are multiple challenges which have to be dealt with on the way to achieve further employment in the field of renewables. In order to realise energy transition, economic and human resources are necessary. Personnel are needed in research, production, maintenance, and communication among others. Whilst some skilled workers have already found their determination in the sector of renewables, others are working in the production of coal, gas or combustion engines and are fearing to lose their jobs. They have to be taken by their hands to get informed about the opportunities of the energy transition and to be reskilled in time. Additionally, many municipalities are lacking personnel due to under-financing or skilled workers choosing to work in the private sector.

At the same time, city administrations are the ones who know best about the situations of local companies and the challenges the towns are facing themselves regarding skilled workers. This is why challenges regarding skilled workers have been a reoccurring topic in the partnerships of the project EWPS 3.0 funded by Germany's Federal Foreign office (AA) and carried out by AEE. Soon, it has shown that all four town twinnings from Stuttgart to Bălți, from Düsseldorf to Chernivtsi, from Hoyerswerda to Novovolynsk and from Greifswald to Goražde are discussing issues regarding skilled workers. In this paper we will address the most apparent matters. Firstly, retraining of skilled workers and secondly, fighting brain drain from the public sector to private companies and into other countries.

CHALLENGES

Due to differences in size, history, regional surroundings, and political context, all EWPS 3.0 twinning towns face different challenges. In Ukraine, we have Chernivtsi and Novovolynsk which are directly affected by the Russian invasion. There is Bălți in the small Republic of Moldova which is influenced by a historical dependency on Russia and its oil and gas and by financial support through grants and funds from the European Union and other international partners. Goražde in Bosnia and Herzegovina has experienced multiple financial and social changes that can be traced back to the aftermath of the Bosnian War between 1992 and 1995.

In Ukraine, Bosnia and Herzegovina, and the Republic of Moldova, the lack of skilled personnel is reinforced due to a brain drain. Many qualified workers tend to migrate

to metropolitan areas or abroad. This brain drain especially affects municipalities which are missing qualified workers in order to advance the local energy transition as they cannot pay the same wages as companies in the free economy. In an interview with AEE, Senada Mirvić from the Bosnian public utility company 6 Mart stated:

> "The company's biggest challenge still remains the lack of qualified personnel. Considering the nature of our work, it is also necessary to modernize our machinery, equipment, and vehicle fleet, which would greatly facilitate the work of our employees. Due to insufficient financial resources, we are not able to hire new staff, even though they are greatly needed — from the Water Factory to city maintenance operations."

Insufficient payment in the public sector reinforces the issue for municipalities and town halls. In the Republic of Moldova, the average monthly salary for engineers is around 1,500 Euros in order to create attractive positions for skilled workers. Meanwhile, salaries for energy experts in the local public sector range from 500 to 800 Euros, explains GIZ's energy specialist Evgheni Camenscic. Therefore, the local administration is not attractive for such professionals. Many skilled workers are employed in the private sector or migrate due to economic instability, or low wages.

In Novovolynsk and Chernivtsi, the municipalities face an additional challenge: the Russian invasion of Ukraine. The Ukrainian population is either actively fighting in the war, is taking care of infrastructure and doing care work, migrated within the country (internally displaced people) or sought refuge abroad. Iryna Semenenko, project manager from the Novovolynsk City Council has emphasised this challenge for the municipalities but especially for the Ukrainian people multiple times during the project. Furthermore, many of the cities participating in the EWPS 3.0 project either have or had a historic dependence on Russian gas and oil or are in an ongoing transition from coal mining to renewable energy. Both Hoyerswerda and Novovolynsk have a history connected to the fossil industry and are now both experiencing undergoing changes. Iryna Semenenko elaborates:

> "Novovolynsk is a city with an industrial past that is now undergoing a transition period. The phase-out of the mining industry brings both challenges and new opportunities. We firmly believe that retraining and upskilling are essential to ensuring a just transition for our workforce. We support education in areas aligned with the needs of the modern economy, such as green construction, energy-efficient renovation, and installation and maintenance of renewable energy systems. Accordingly, our community needs to modernize existing vocational and technical institutions and to establish new educational spaces."

The city of Hoyerswerda, part of the energy district Cottbus of the former German Democratic Republic (GDR), faces similar challenges. Only through GDR's coal mining which began in the 1950s, population and wealth started to grow in the region. The population peaked in 1981 when 71,000 people were living in Hoyerswerda. However, since the German reunification in 1990 and the planned coal phase-out later on, population has declined and local economy has shrunk. Today, only 30,000 people live in Hoyerswerda, and it is estimated that the population might further decline. The examples of Hoyerswerda and Novovolynsk show how certain cities are in urgent need of a structural change. A transformation towards renewable energy can

use the infrastructure and the personnel formerly employed in the fossil industry to establish future-proof green energy in the region. This change requires money and workforce. While the issue of funding the energy transition will be discussed in another RENEWS paper, we will show best-practice examples of cities that were able to attract workforce and present further steps which are needed for qualified workforce to strengthen the European energy transition.

The East German towns Greifswald and Hoyerswerda are part of a similar transition following the German Reunification which is yet very different. They are both struggling economically and are fighting against a decline in population. Meanwhile, Düsseldorf and Stuttgart as large West German towns which are growing both in the sense of population and economy may seem more advanced in the transition towards renewables. Nevertheless, they are also facing issues in financing projects and securing valuable work force in their administrational units. Florian Konen, climate protection manager of the town of Düsseldorf states:

> "There is a mismatch between existing skills and labour market needs – a significant portion of workers have experience in declining sectors, such as the coal mining industry. Furthermore, Germany has a big outmigration of youth and talent – many residents are leaving for larger cities or are going abroad in search of better opportunities, resulting in a brain drain. There is also only a limited access to training programs - the number of local education providers is small, and existing programs do not always reflect the demands of the future economy. And despite Germany's rich economy there is often a lack of funding — especially in renewable energy. The community cannot implement large-scale retraining programs without external support."

Overall, the so-called 'Fachkräftemangel' – the lack of skilled workers – is one of the key challenges for Germany and the German energy transition – especially in the field of crafts. This shortage of labour is reinforced by the small number of young people starting a career in crafts. In addition to this, many workers of the generation of baby boomers will retire over the next few years. Many young people in Germany want to study at university and do not consider an 'Ausbildung' – the training in crafts – as attractive career path. Florian Konen further explains:

> "To address these challenges, we are seeking partners willing to co-develop and implement training programs focused on practical skills, certification, and real employment outcomes."

It is not only the sector of renewable energy which is under-financed but German city administrations are struggling economically as well. These issues are not only apparent in Düsseldorf, but all over Germany.

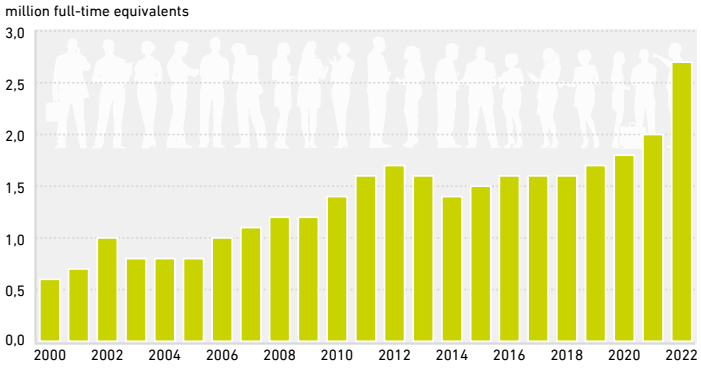
OPPORTUNITIES

DEVELOPMENT OF EMPLOYMENT IN RENEWABLE ENERGY

While many people fear losing economic stability and employment through phase-out of fossil energy and investing in renewable energy, studies presented by the United Nations (UN) show that green energy not only provides economic independ-

ence but also increases job opportunities. It is estimated that renewable energy can generate up to 14 million jobs while only 5 million jobs in the fossil industry might be lost until 2030. In addition, in the production of electric vehicles or hydrogen technologies energy-related industries could provide further 16 million jobs[1]. As AEE's figures show, the employment in renewable energy and the energy efficiency sector has already grown significantly in the European Union. It rose from around 0.5 million full-time equivalents in 2000 and around 1.5 million full-time equivalents in the 2010s, reaching over 2.5 million full-time equivalents in 2022 (Fig. I). Despite the growth, all four EWPS 3.0 partnerships recognised the necessity of further skilled personnel in the field of energy transition.

Employment in the renewable energy and energy efficiency sector in the European Union



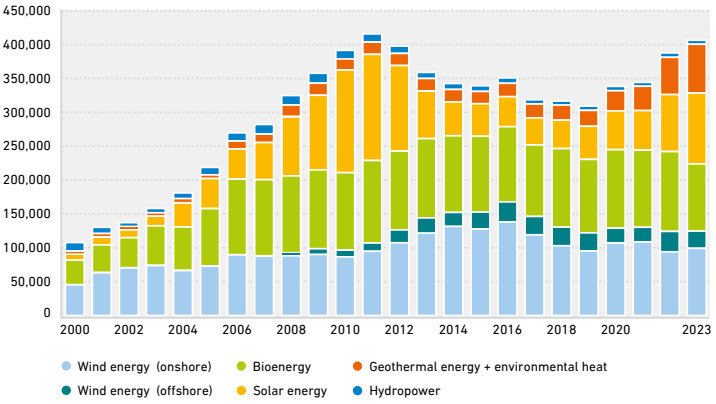
Source: Eurostat; as of 2/2025

Fig. I

In Germany, it shows that more and more people are employed in the field of renewables. From 2000 to 2023, the numbers rose from roughly 100,000 employees to 406,300 employees (Fig. II). The trend is continuing. Today, around three quarters of German employees in the sector renewable energy are working in wind energy, photovoltaics and bioenergy (Fig. III, p. 6). According to the brochure 'GreenTech made in Germany 2025' published by the German Environment Agency (UBA), renewables created 314 billion Euros in value for the German economy in 2023. It is estimated that the value could rise up to 622 billion Euros by 2045[2].

Development of employment in renewable energy in Germany

In 2023, a total of app. 406,300 people were employed in the renewable energy sector.



Source: GWS; as of 02/2025

Fig. II

This shows that the energy transition offers plenty of economic potential for cities and companies. The United Nations further explain that investments in renewable energy are cheaper than past subsidies in fossil energy and will reduce dependence. Besides the economic reasons, local renewable energy allows for more independence and resilience and therefore more security of supply. Within these developments, it is important that just transition lies at the heart of the energy transition and that nobody will be left behind. An initial investment will be required to begin with, but overall, one dollar of investments in renewables creates three times more jobs than it would create in the fossil industry. Nevertheless, many cities in Europe are not able to finance the transition by themselves and therefore rely on external funds by the national government or international programmes, for example by the European Union.

1 www.un.org/en/climatechange/raising-ambition/renewable-energy

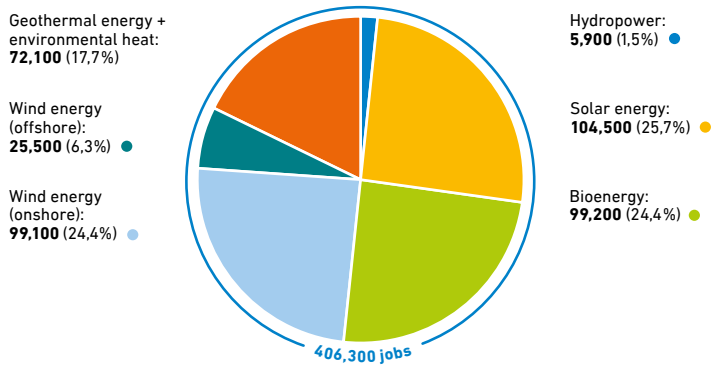
2 www.umweltbundesamt.de/publikationen/greentech-made-in-germany-2025-0

RETRAINING OF SKILLED WORKERS

Generally speaking, the craft sector is facing one of the biggest lack of employees in Germany. They are a core field of work to bring the energy transition from theory to the field of practice. In order to successfully transform the energy sector, personnel are needed to face the rising demand in green energy and to develop new technologies. To solve the so-called 'Fachkräftemangel' (shortage of skilled workers) in the energy transition, Düsseldorf has phrased two solution approaches to encourage young people to choose a career in crafts. Firstly, they aim to make relevant crafts attractive for entrants. Secondly, they aim to retrain or continue to educate skilled craftspeople in renewable technologies such as photovoltaics and heat pumps or introduce them to the topic of energy consultancy.

Employment in renewable energy in Germany in 2023

Number of jobs by sector



Source: GWS; as of 02/2025

Fig. III

To do so, the 'Umweltakademie', an environmental academy, was founded on behalf of the 'Kreishandwerkerschaft', the district craftsmen's association, to facilitate the retraining and further education of craftspeople easier. At this academy, craftspeople receive advanced training on topics of energy transformation and climate (photovoltaics, heat pumps, funding acquisition, roof greening, circular economy etc.). The city of Düsseldorf covers personnel and space costs. In addition, since autumn 2025, Düsseldorf University of Applied Sciences offers the dual study programme 'Haus-, Energie- und Anlagentechnik' (building, energy and system technology) which is financially supported by the city of Düsseldorf. Students have to complete and internship or a craftspeople training in advance and gain professional experience during their studies. In addition to their bachelor of engineering, graduates also become master craftspeople when they hand in their masterpiece at the trade cooperation. The goal of the part-time studies is to win young adults for crafts.

In Ukraine, retraining is considered a major step for the energy transition, too. Hennadii Dudko, energy expert from the Chernivtsi municipality highlights the need to update the knowledge of personnel in accordance with modern technologies:

> "We plan to involve employees in retraining programmes in the field of renewable energy, in particular in the installation and maintenance of solar systems, automation and energy efficiency. Cooperation with specialized training programmes and international partners is important."

LACK OF QUALIFIED PERSONNEL IN MUNICIPALITIES

In addition to the 'Fachkräftemangel', many German towns struggle economically and have under-financed households. For this reason, 13 mayors of state capitals in Germany have published a jointly written letter to the German chancellor Friedrich Merz. While German municipalities have to spend more money every year, the communal income does not rise[3]. In times of a lack of money in municipalities, cities tend to save money in the area of social matters, education, public and voluntary services like environment protection or culture. Education and promotion regarding energy

3 www.stuttgart.de/pressemitteilungen/2025/oktober/gemeinsamer-brief-zur-konnexitaet-hauptstaedte-aller-flaechenlaender-fordern-von-bund-und-laendern-aus-koemmliche-finanzierung-der-uebertragenen-aufgaben-6831993.php.media/437942/Anschreiben-der-OBs-zur-Konnexitaet-an-Bundes-und-Landesregierungen.pdf

transition is therefore often under-financed. Local climate protection managers are often only financed through funds like the national climate protection initiative (NKI) with a limited duration. When these positions get cancelled after the project ends, it is hard to ensure a continuous energy transition.

In order to fight the economic struggles in the Lusatian region of Eastern Germany, a qualification network for renewable energies was established (Qualifizierungsverbund in der Lausitz für Erneuerbare Energien – QLEE)[4]. Lausitz Energie Kraftwerke AG (LEAG), the Institut für Betriebliche Bildungsforschung (IBBF) and the German Renewable Energy Federation (BEE) are working together to support structural change and to create new economic opportunities for local companies. Hereby, continuous education and training for employees are a core aspect. Within the project, the coal phase-out is regarded as an opportunity for fastening the expansion of renewables and creating jobs in a growing economic field with new work profiles. The town of Hoyerswerda which is located in Lusatia, faces these challenges and benefits from projects like QLEE. As part of EWPS 3.0, project partners from Germany and Ukraine had the opportunity to visit Hoyerswerda. Under the guidance of the municipality's transformation manager Marco Bloch, the delegation was able to see the structural change in person and to talk to involved people from the town hall, the lignite power plant Schwarze Pumpe and the open-cast coal mine Welzow-Süd. The mine is Brandenburg's last running open-cast coal mine which is supposed to shut down until 2038.

Through the coal phase-out, the city of Hoyerswerda was also lucky enough to receive funds for structural change. In progress of developing the region, Hoyerswerda achieved to stop the decline in population. As part of the campaign '#WHY – Welcome to Hoyerswerda' the municipality shows the history and the structural change towards a modern city. Ecological and social projects provide a core part to transform the region through economy, research and education. Nevertheless, Eastern German towns like Hoyerswerda and Greifswald face challenges which can be traced back to the history. One of the main difficulties in the area of former German Democratic Republic (GDR) on contrast to the Western part of Germany is a broader scepticism against transformation since the last fast significant local change through the German reunification led to economic deprivation and high unemployment in comparison to Western Germany. The 'blooming landscapes' which were promised by former chancellor Helmut Kohl never became reality. According to conversation with citizens and the State Energy Agency of Saxony-Anhalt (LENA), Eastern German municipalities haven't been systematically involved in the initial roll-out of renewables. While the state, investors, and operators, earned money from building, operating, and selling wind turbines, municipalities and inhabitants didn't profit that much from the expansion of renewable energy. Therefore, one could argue that there is an exhaustion of change[5]. This highly challenges the communication surrounding the energy transformation. It is important to focus on the positive aspects and to show the economic advantages this transformation could bring.

Greifswald also demonstrates how to actively and successfully stop the decline of population. The number of inhabitants is constantly at around 60,000 people since the 1980s. The municipality managed to adapt to the changes in politics and the

4 www.qlee.eu/en

5 www.bpb.de/shop/zeitschriften/apuz/312263/der-osten-als-problemzone

economy. Greifswald University attracts and educates young people, and institutions like the Greifswald Mire Centre appeal renowned scientists. Furthermore, the town hall and employees like the climate protection managers Michael Haufe and Dr. Juliane Brust-Möbius are actively participating in creating a green transition while learning from the past. Investments in combined heat and power, communal heat planning, renaturation of mires, renovation of public buildings and a developed bicycle infrastructure do not only make the town liveable and sustainable, but also create jobs.

A similar need was revealed in the Moldovan town of Bălți during the exchange with the city of Stuttgart as part of the project EWPS 3.0. Even though the second biggest town in the Republic of Moldova has developed ambitious plans how to transform the city and the energy supply, it faces one central challenge: the continuous implementation of the energy transition. This issue is closely connected to funding and financing. Besides a need of project fundings, the city is also unable to adequately pay an energy manager's salary. According to the local regulations, the monthly income of city employees cannot compete with the income a skilled worker in energy management could earn in the private sector. This is why many young experts choose to work in the free market rather than for the local administration. To address this problem, cities have to be encouraged to change their legal framework and the payment model to make jobs within the city administration attractive for skilled workers. Examples in this paper demonstrate that investments can pay off in the long term. Creating new positions or adjusting the wages have to be regarded as such an investment, both in local city administrations and on a national scale.

In Germany, the Rhein-Hunsrück district is a great example of how such investments can pay off in the future. AEE has awarded them as 'Energy municipality of the month' twice, in September 2010 and November 2018. Thanks to their long-term commitment they were also elected 'Energy municipality of the decade' in 2018. Their best practice example is regarded as role model all over Germany and demonstrates how continuous efforts can stabilize and strengthen the local energy transition. The first step of monitoring and reducing energy – and therefore costs – was made in 1999 with the implementation of energy controlling. Since then, they have generated more than 44 million Euros of communal value creation every year through renewable energy. Wind energy constitutes their main source of income . The money can be spent on schools, streets, clubs, and visions. Long-term employments in the field of energy management and climate protection are the best ways to ensure efforts.

CONCLUSION

In summary, the energy transition can only be successful if local stakeholders collaborate on it and receive support from national and international political strategies. It has been repeatedly shown that renewable energy achieves a higher acceptance when local energy projects benefit the population. An initial start-up funding can help raising acceptance and lead to a bigger pay-off in the future. Furthermore, the energy transition is a marathon which needs continuous work on it. Therefore, cities and villages need long-term employees such as energy managers or climate protection managers to work on the transformation. They can strengthen the transition

through continuous efforts, exchange with the local population, and education of employees and inhabitants. In Germany, the role of climate protection managers is also highly dependent on financial opportunities of the municipalities, financial support through programmes like the 'Nationale Klimaschutzinitiative' (NKI) – the German national climate protection initiative – and political will. As part of the 'Energy Transition Town Twinning 3.0' project, we demonstrated that many cities are willing to work on a local energy transition. However, many municipalities face underfunded city budgets for a transition and underemployed administrations – especially in the field of sustainability and climate protection.

Implementing energy managers through funding like the German NKI or through external institutions can be a first step. Nevertheless, cities are in need of funding ongoing positions in the city council focusing on the communal energy transition. In order to achieve a transition of the work sector, town halls are in need of support by the local government and national and international regulations. Legal frameworks and financial support are essential to establish a wide-scale transition of the economy and retraining of workers. A lack of qualified personnel is clearly linked to a lack of investment in the sector of renewable energy. Therefore, we will also address funding as topic in one of the upcoming RENEWS Papers.