Just Transition and the Renewable Energy Industry – To What Extent Does the German Energiewende Consider Decent Work and Job Quality?

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Abstract
The paper refers to the concept of Just Transition and examines the corresponding interface of energy and labor policies in the German renewable energy sector, a subject which has received only little attention in the political and scientific debates surrounding the German *Energiewende*. On the one hand, the renewable energy industry directly and indirectly benefits from various forms of state support. On the other hand, unions criticize below-average wages, widespread agency work, underdeveloped employee representation and co-determination, low coverage of collective agreements, a poor gender balance and low apprenticeship ratios. Several manufacturing and other companies have been even blamed for trade union busting. Focusing on wind turbine manufacturing, the paper explores to what extent labor and other social sustainability concerns get integrated into energy policy formulation, implementation and monitoring. It examines perspectives of good governance and "sustainable content policies" seeking to link financial support for enterprises to socially and environmentally sustainable production. The findings suggest that current energy policy strategies and principal renewable energy support schemes do only marginally address job quality and decent work. Social conditionalization of financial support, as demanded by unions and other stakeholders, have not entered the political agenda so far. However, job quality criteria are increasingly integrated into regional structural assistance support and public procurement, but have not the potential (yet) to noticeably influence working conditions and collective labor relations in the renewable energy industry.

Keywords: energy policy, renewable energy, green jobs, Just Transition, social sustainability

Introduction

Many studies are available analyzing the quantitative gross or net employment effects of the "green transition" including the transition from a fossil fuel based economy to a renewable energy based one. However, our knowledge about the qualitative employment effects including working conditions and collective employment relations including employee representation and participation within the renewable energy industry is fairly limited (Littig 2012, 585; Mattera et al., 2009). Generally, engagement with the wider issues of equity, justice and vulnerability within energy systems is still a new and emerging field (Hall, Hards & Burkey, 2013). An interdisciplinary research project involving two research organizations at the Freie Universität Berlin, the Environmental Policy Research Centre and the Management Department, seeks to improve our understanding of these specific issues. The purpose of the research project supported by the Hans Böckler Foundation is to examine the process of institutionalization of collective employment relations[1] in the German wind turbine manufacturing industry. One of the items under scrutiny refers to the concepts of "Just Transition" and "Good Governance" and the perspectives of "Sustainable Content" [2] policies (Adolf & Corbach, 2012). This paper presents selected findings of this research project and explores to what extent labor concerns are linked to renewable energy policies in order to support fair working conditions and the institutionalization of collective labor relations in the renewable energy industry.

Methodology

The paper is based on a policy analysis and explores to what extent renewable energy policies are linked to labor issues in order to facilitate the development of fair working conditions and the institutionalization of collective labor relations in the renewable energy industry. It has a special focus on the principal renewable energy support scheme in Germany, the Renewable Energy Sources Act, and asks to what extent the recent amendments adopted in July 2016 consider employment issues and, specifically, to what extent financial support is linked to job quality/decent work criteria („social conditionalization"). Methodologies applied include primary and secondary literature analysis and the findings of 30 semi-structured, qualitative stakeholder interviews with with elected politicians, policy makers, policy advisory organizations, representatives from trade unions and associated research and advisory organizations, Chambers of Labor, wind turbine manufacturing enterprises and business associations.

The wind turbine manufacturing industry in Germany

Germany is Europe's leading wind energy market with an installed capacity of almost 45 Gigawatt (EWEA, 2016). The number of employees almost constantly increased

[1] The main processes of the (collective) employment relations system include co-determination at the workplace and enterprise levels, collective bargaining and industrial disputes (Keller & Kirsch, 2016:187).

[2] The term „sustainable content" policies was introduced by Adolf and Corbach (2012) suggesting to link financial support for enterprises to socially (e.g. employee-friendly) and environmentally sustainable production. The term has been used as an analogism to „local content" policies which have been adopted by several countries requiring or encouraging the use of locally manufactured technology in domestic wind energy projects, e.g. by mandating a certain percentage of local content for wind turbine systems installed in some or all projects within one country (Lewis & Wiser, 2007: 1851).

from approximately 46.000 in 2002 to 149.200 in 2014 (BWE 2016). In 2014, 130,500 persons were employed in the onshore segment and 18,700 in the offshore segment (O'Sullivan et al., 2015). The wind energy sector includes, inter alia, manufacturers of wind turbines, suppliers of components, service companies, wind farm developers and operators, financing institutions, certification and other service companies.

Within the last 20 years wind turbine manufacturing has developed as a significant part of the German mechanical engineering sector. In 2015, the leading six companies Enercon (28.2%), Siemens (25.6%), Vestas 16.1%), Senvion (13.6%), Nordex (8.9%) and GE (5.5%) accounted for roughly 98 per cent of the newly installed capacity (onshore and offshore). In the onshore segment, Enercon (37.3%), Vestas (21.3%), Senvion (18.0%), Nordex (11.8%) and GE (7.3%) are the leading market players, whereas Siemens dominated the offshore segment covering 100% of the market (DEWI 2016).

Besides pioneering companies like Enercon, Vestas Nordex, or Senvion (formerly REpower), which have established themselves over the last twenty to thirty years being exclusively dedicated to wind energy, the spectrum of companies active on the German market includes transnational technology corporations (e.g. Siemens, GE), for which renewable energy represents one element of their overall corporate strategy. Manufacturing companies from Asia are increasingly active on the German market, as the following examples illustrate: in 2008, the Chinese company Goldwind, global market leader in 2015, acquired a majority stake in the manufacturing company Vensys, whereas in 2007 REpower (now Senvion) became (temporarily) a subsidiary of the Indian group Suzlon Energy.

The German wind equipment manufacturing industry, which holds a 20 per cent share of the global market, exported two-thirds of its production in 2015 (GWEC, 2016). However, Germany plays still a key role as reference market. With the growing internationalization of the industry, competition has been steadily increasing. Market consolidation and company mergers are ongoing, as the recent mergers of Nordex and Acciona or Siemens and Gamesa illustrate.

Some turbine manufacturers only produce parts of the turbines in-house (e.g. the blades), whereas other key components are outsourced and provided by suppliers (e.g. the direct drive or the gears). The German market leader for onshore wind turbines Enercon is known for its high level of vertical integration producing almost all of its components in-house. Its business model comprises not only manufacturing and installation of wind turbines, but also service, operation and maintenance, project development, logistics, operation of wind power plants, storage solutions, electric grid operation and electricity sales to final customers.

The wind power industry in Germany has evolved over the last thirty years in a politically-driven market. The development of wind energy was a mutually reinforcing process of innovation and targeted state support (Ohlhorst, 2009). State support helped to trigger both technological development and market uptake (ibid.:237). The wind turbine manufacturing industry directly and indirectly benefits or benefitted from various support measures, including:

- Federal and federal state research and development programs,

- Early demonstration programs, including the 100/250 MW wind energy program,
- Low interest loans by state owned banks,
- Measures promoting market deployment through feed-in-tariffs and premiums under the Electricity Feed-In Law (*Stromeinspeisungsgesetz,* 1990) and later under the Renewable Energy Sources Act (*Erneuerbare Energien-Gesetz,* 2000),
- Amendments to the Federal Building Code in 1997 (*Baugesetzbuch*) providing wind turbines a privileged status in spatial planning,
- Investment, settlement and infrastructure support (e.g. under the regional structural assistance programs of the federal states),
- Export promotion.

Depending on their individual business models, the wind turbine manufacturing companies benefit indirectly and directly from the Renewable Energy Sources Act being the principal support scheme for electricity from renewable energy sources in Germany. The law has been regularly updated and fine-tuned with the most recent amendments adopted by both parliamentary chambers on 8 July, 2016. The latest amendments mark a fundamental change from guaranteed feed-in tariffs and feed-in premiums to a support system based on competitive bidding and tenders.

Retarded institutionalization of collective labor relations in the wind energy industry

For several years, trade unions (IG Metall, 2013; IG Metall Vorstand, 2011; 2014), Chambers of Labor (Arbeitnehmerkammer Bremen, 2012; 2015), research and advisory organizations (Gemeinsame Arbeitsstelle RUB/IGM, 2007; Dribbusch, 2013, Behrens & Dribbusch 2014, Winter & Wagener, 2014; Agentur für Struktur- und Personalentwicklung, 2014), environmental organizations, media and policy makers have criticized the comparatively poor working conditions in parts of the wind turbine and solar panel manufacturing industries, like below-average wages, excessive overtime work, non-typical employment including widespread agency work and contract work, underdeveloped co-determination[3], low coverage of collective bargaining agreements[4], a poor gender balance and low apprenticeship ratios.

[3] A dual structure of interest representation is typical of the German industrial relations system which means that workers' representation at workplace and enterprise levels is separated from the collective bargaining system at industry level. Works councils represent employees of one company and can by law be elected if a firm has five or more employees. The works councils have the right of information by management and the right of consultation in terms of e.g. planning of human resources. Board-level co-determination at the enterprise level applies only for corporations. Generally, one can differentiate between parity representation in corporations with 2,000 employees or more, and one third representation in corporations with 500 to 2,000 employees (ibid.). Special rules apply for the coal, iron and steel industries. The second pillar of interest representation includes collective bargaining. Unions and employers' associations (or individual employers) engage in collective bargaining in order to regulate pay and other working conditions. (Müller-Jentsch, 2016). Instead of adhering to an industry-wide agreement, some enterprises – particularly SMEs – conclude their own enterprise agreements. IG Metall is by far the dominant trade union in the metal and electrical industry and negotiates terms and conditions for employees with the relevant employers' associations. Sectoral collective agreements are considered the norm in the metal and electrical industry, however, a number of collective agreements at company level also exist (Vogel & Kraemer, 2010).

[4] See FN 3.

Several manufacturing companies like the domestic market leader in onshore wind turbine manufacturing Enercon were blamed for their anti-union practices and trade union busting. Enercon was heavily criticized for exerting massive pressure on employees willing to organize in trade unions or seeking to establish works councils, and for obstructing the election and practical work of works councils.

Trade unions blamed Enercon also for systematic curtailment or avoidance of enterprise-level and workplace level co-determination, e.g. by splitting up the enterprise into hundreds of smaller companies. Other companies like Nordex and REpower (now: Senvion) were criticized for evading parity co-determination in the company's board by splitting up the company or by transforming the legal status of the company to a European Company (*Societas Europaea*, SE) when the number of employees reached critical thresholds (EWC, 2011).

The evolution of collective labor relations has been rather heterogeneous so far: in the field of non-specialized component supply (e.g. steel, mechanical parts, electrical equipment), trade union representation, co-determination and collective bargaining are rather widespread, whereas in the field of specialized component supply and genuine wind turbine manufacturing the institution-building has been fairly slow so far, although the situation is improving since a couple of years. Particularly, in those turbine manufacturing companies with roots in shipbuilding or steal production where trade union representation is traditionally high and co-determination and collective bargaining well developed, works councils and company level agreements were generally faster established.

In the meantime, thanks to targeted and effective organizing campaigns, which started in 2010, manifold networking activities, public campaigns, and political lobbying performed by the trade union IG Metall, works councils were widely established in the turbine manufacturing industry. The industry currently undergoes a process of "retarded formalization" (*nachholende Formalisierung*) (Gemeinsame Arbeitsstelle RUB/IGM, 2007) and "maturation referring to the social dimension of sustainability" (Nicklich & Krug, 2015). Besides path-dependencies and trade union organizing activities, there are several other drivers which might further facilitate the institutionalization of collective labor relations and improvement of working conditions: the deficit of and growing competition for skilled labor and the decision of Siemens, a global player with traditionally well-developed co-determination structures and collective bargaining agreements to construct a new facility for manufacturing nacelles of offshore wind turbines. Siemens decided to invest €200 million with the new production facility offering jobs for up to 1,000 employees in Cuxhaven (Lower Saxony) (Siemens AG, 2015). Recently the company, the corresponding works council, the regional administration of the trade union IG Metall and employers' association concluded an agreement envisaging to apply the existing sectoral collective agreement of the metal and electrical industry to the employees of the new facility. Trade unions expect that this will likely increase the pressure on other manufacturing companies to adjust the level of wages and other labor standards (IG Metall Küste, 2016).

Trade union demands– social conditionalization of public support?

In Germany, trade unions, employers' associations and public institutions play a key role in the governance of the employment relationship, working conditions and industrial relations structures. They are interlocking parts in a multilevel system of governance that includes the European, national, sectoral, regional (provincial or local) and company levels. Trade unions and employers and their associations engage in collective bargaining largely without any state interference (Keller & Kirsch, 2016). The state has mainly the role of legal framework setting. It may take a more active role through corporatist arrangements where governments include unions and employers' associations in processes of socio-economic policy making (ibid. 186). There is growing evidence, however, that decisions on working conditions are increasingly taken beyond the traditional and established forms of bilateral negotiations between employers and employees, with the state playing a more active role (Jaehrling, 2015).

This leads us to the question, if at all and to what extent sectoral policies, like e.g. energy and/or industrial policies integrate social considerations and can support the development of fair working conditions and the further institutionalization of collective labor relations. Already for several years, the trade unions including IG Metall and the Confederation of German Trade Unions (DGB)[5] in numerous statements and opinions have called for a social conditionalization of financial support, i.e. to link financial support for the renewable energy industry to the compliance with social minimum standards and the principles of decent work (IG Metall, 2016; Thomas, 2016; DGB Bundesvorstand, 2014a; 2014b; 2015; 2016). In their argumentation German trade unions refer increasingly to the concept of "Just Transition" (IG Metall Vorstand, 2015) which shall be shortly explained in the following section.

"Just Transition": from a trade union concept to an imperative of global climate governance

The concept of "Just Transition" originated in the US trade union movement of the 1970s and 1980s initially referring to the protection of vulnerable jobs in industries affected by environmental legislation (Newell & Mulvaney, 2013). The concept evolved as an instrument for workers and communities to claim and ensure attention for their transitional needs in the transformations towards a low-carbon and climate-resilient society (Rosemberg, 2010). "Just Transition" can be understood as the conceptual framework in which the labor movement captures the complexities of the transition towards a low-carbon and climate-resilient economy, highlighting public policy needs and aiming to maximize benefits and minimize hardships for workers and their communities in this transformation (ibid.). The concept has been broadened aiming to "take appropriate measures to protect jobs in vulnerable high- carbon sectors and to ensure that new jobs created in low-carbon sectors provide 'decent' jobs" (cf. Newell & Mulvaney, 2013; Bird & Lawton, 2009).

From a concept that was known to just a handful of activists, it slowly took root at the international level (Rosemberg 2013). "Just Transition" was gradually adopted by other community and NGO groups, by national governments, by the European

[5] Traditionally, the industry unions engage in collective bargaining, while the umbrella organization, the German Trade Union Confederation (Deutscher Gewerkschaftsbund, or DGB) which represents eight trade unions, is responsible for political activities including lobbying (Keller & Kirsch, 2016).

Commission, and several UN organizations and agencies including ILO, UNEP, UNCSD and the UNFCCC. The latest achievement to date was the recognition of the concept by the UN Framework Convention on Climate Change. Building on the Cancun Agreement of 2010 (Rosemberg, 2010) and subsequent initiatives, the Paris Agreement[6] adopted by 195 countries in December 2015 acknowledges in its preamble the "imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities" (UNFCCC, 2015), however, without stipulating any further commitments.

Until recently, the translation of the concept into policies has been poor (Stevis & Felli, 2015). However, the International Labour Organization, the only tripartite UN agency, recently adopted Guidelines for A Just Transition Towards Environmentally Sustainable Economies and Societies for All (ILO, 2015). Those guidelines contain, inter alia, policy recommendations for a number of policy areas. Referring to the policy implications of the "Just Transition" concept, the significance of good governance and cross-sector policy integration was highlighted by Lena Olsen (2010): "A just transition is primarily about good governance. It is about applying the right policies in consultation and with the involvement of those concerned. Ideally, involvement must take place from the policy development stage to that of the monitoring of progress. (…). In this regard, for climate change policies to be socially sustainable, one requirement is that they should be linked to employment and labor market policies and take into account industrial relations. Governments have to involve trade unions in addressing the needs of industries and communities at large in order to ensure that the transition to a carbon friendly future is just and fair to all – that development is sustainable".

In the following we will present selected findings of our research exploring the interface of (renewable) energy policies and labor policies. We will examine to what extent renewable energy support policies take into account labor issues, particularly job quality and industrial relations, and to what extent renewable energy policies might support a Just Transition in the renewable energy industry.

Target architecture of the *Energiewende* and the role of labor

The term "Energiewende" (energy turnaround, energy transition) is commonly used to describe the decision of the German federal government under Chancellor Angela Merkel taken after the Fukushima nuclear accident in 2011 to phase-out nuclear power by 2022 and to accelerate the expansion of renewable energy. However, the nuclear phase-out marks only the latest in a series of policy initiatives in response to a long history of nuclear skepticism, growing awareness of potential peak oil, and concern over climate change and sustainable development issues that have been prevalent in the country for decades, not only in terms of energy (Quitzow et al., 2016).

In 2011, the Ethics Commission which was set up by the government to provide advice on the risks of nuclear power emphasized: "In the course of the energy

[6] The 21st Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) in December 2015 adopted the Paris Agreement. This includes a long-term goal to keep the global temperature increase well below 2°C above pre-industrial levels and to pursue efforts to keep it to below 1.5°C.

transition, numerous new businesses will be established and existing ones will expand their capacity and create new jobs. These must be committed to the successful principles of social partnership. Respecting the rights of the workers and their representatives is also an ethical pre-requisite for a sustainable energy transition" (Ethik-Kommission, 2011).

However, up to now energy policy strategies and concepts at federal level do only marginally address employment issues, specifically job quality and decent work. The Energy Concept of 2011 remains rather vague when it comes to employment issues. The federal government's target architecture for the *Energiewende* includes more than 20 quantitative energy policy targets, and six qualitative objectives (Bundesministerium für Wirtschaft und Energie, 2015). The qualitative objectives include "Investment, Growth, Employment", an item which is further specified by "Securing jobs in Germany and laying the foundations for sustainable growth and quality of life". Job quality is not explicitly addressed. However, industrial and employment policy objectives tend to play a more prominent role in the energy strategies of the federal states.

The federal government's regular monitoring and progress reports on the *Energiewende* cover almost exclusively quantitative employment effects. Qualitative effects including working conditions, labor relations, or current employment challenges such as shortage of qualified labor or training and qualification needs are not addressed. The accompanying opinions of an independent expert commission do not pay any attention to those issues either.

Likewise, the Renewable Energy Sources Act, the key support scheme for renewable energy, does not include any employment related objectives. Its key rationale is to "enable the energy supply to develop in a sustainable manner in particular in the interest of mitigating climate change and protecting the environment, to reduce the costs for the economy not least by including long-term external effects, to save fossil energy resources and to promote the further development of technologies to generate electricity from renewable energy sources".

Social conditionalization of renewable energy support?

In some areas of public support policies, in particular in the field regional structural assistance provided by the federal states, employment-related criteria are increasingly incorporated as a funding condition. Examples include adherence to collective bargaining agreements or maximum quotas for temporary work. However, many of these criteria have been either recently established or they are part of bonus systems. Hence, the potential of such criteria to noticeably influence working conditions and to facilitate the institutionalization of collective labor relations in the wind industry is very limited. Furthermore, manufacturing companies have different financing options. Their market power and the competition among federal states and regions for industry settlements often makes it difficult to impose demanding social or job quality criteria.

The Renewable Energy Sources Act has promoted the use of electricity from renewable energy sources by feed in tariffs and feed in premiums by requiring the grid operators to connect renewable energy installations and remunerate the electricity fed into the power grid. The difference between the wholesale market price on the

electricity exchange and the higher remuneration rate for renewable energy is generally borne by the electricity customers via a surcharge included in the electricity price.

Despite continuous demands formulated by the trade unions to make financial support for renewable energy conditional on the compliance with decent work criteria (see above), up to now the German Renewable Energy Sources Act contained only few and marginal provisions addressing job quality[7].

The Renewable Energy Sources Act was amended on 8 July, 2016. The latest amendments mark a fundamental change from guaranteed feed-in tariffs and feed-in premiums to competitive bidding and market-based tenders. From 2017 onwards, remuneration rates for renewable energy based electricity will no longer be fixed by the federal government, but will be determined through a tendering scheme. Under a tendering scheme, governments solicit bids to install a certain capacity (or to produce a certain quantity) of renewable-based electricity. Project developers submit offers which are evaluated on the basis of the price per unit of electricity, energy output or other criteria (IRENA 2013, 58). The tendering system was introduced to comply with the corresponding EU Guidelines on State Aid for Environmental Protection and Energy 2014-2020 (2014/C 200/01). The federal government decided to implement an auction design which is based on a purely price only selection process, i.e. the only award criterion is the support level for the renewable electricity. The tenders are expected to stabilize the costs for renewable energy and to provide the mechanism for adhering to specific growth corridors by auctioning a specific amount of capacity volume each year.

Already during the policy formulation process, the trade unions in several opinions pointed to the risk of a "race to the bottom" regarding the implications of a purely price-based auctions for labor standards at the expense of labor standards and with the risk to drive companies with higher labor standards and collective bargaining agreements out of the market. (IG Metall, 2016; DGB Bundesvorstand, 2016; Thomas, 2016).

It is at least conceivable to link financial support to the compliance with certain social or labor requirements, either as a pre-qualification criterion to participate in the bidding process, or as additional award criteria to select winning bids in the frame of a multi-criteria selection. Multi-criteria selection, however, was never considered by the Federal Ministry of Economy and Energy. Its priorities were clearly to control the growth dynamics and cost of renewable energy and to ensure market liquidity under the tendering scheme. Generally, there are only very few international examples for the integration of social and employment related criteria in the context of renewable energy support schemes, like South Africa and Portugal (del Rio, 2016a, del Rio, 2016b).

[7] Electricity-intensive companies can qualify for exemptions from the renewable energy surcharge if they fulfil certain criteria, e.g. exposure to international competition, high electricity consumption, and high electricity costs reaching a certain percentage of gross added value. In order to avoid misuse, the Renewable Energy Sources Act of 2014 contained a provision according to which electricity-intensive enterprises in order to qualify for the exemptions were not allowed to deduce the staff costs for temporary agency work in their calculations of gross value added.

Labor issues featured marginally in the public, political and scientific discourses surrounding the revision of the Renewable Energy Sources Act. These were rather dominated by the general implications of tendering systems for the renewable energy industry, renewable energy targets, expansion corridors, and annual tendering volumes for each sub-sector. Furthermore, employment issues were outweighed by other issues of social justice such as the question how to safeguard actor variety under a tendering system, providing equal opportunities for small developers and citizen and community energy, social acceptance of renewable energy, or the affordability of electricity prices.

Trade unions failed to concretize their demands regarding social conditionalization of financial support. They also failed to mobilize sufficient political support for their demands. Furthermore, the pressure for state interference has decreased through the continuous, albeit delayed institutionalization of co-determination and (company level) collective bargaining in the renewable energy industry.

The future auctions will certainly increase the cost pressure along the entire industrial value chain affecting also wind turbine manufacturing and component supply. However, it is unclear yet, to what extent they will affect the manufacturing companies' human resources strategies, induce a „race to the bottom" regarding wages and labor standards and jeopardize the further institutionalization of co-determination and collective bargaining in wind turbine manufacturing and other renewable energy industries.

Conclusion

There are both drivers facilitating and barriers inhibiting the institutionalization of collective labor relations in the wind turbine manufacturing industry. Path dependencies and traditions of co-determination and collective bargaining in parts of the industry, particularly those rooted in shipbuilding or steel production, effective organizing campaigns and accompanying actions launched by the trade unions, first and foremost IG Metall, led to a continuous establishment of works councils and an increasing number of company level collective agreements. The increasing competition for skilled labor can be regarded as a further driver. On the other side, the internationalization and consolidation of the industry, the persistent pressure to reduce the levelized cost of electricity, and the overall tendency towards more market based support instruments, including competitive bidding, provide certain risks for the further stabilization of collective labor relations. It is unclear yet, to what extent the future auctions will lead to a "race to the bottom" regarding wages and labor conditions as expected by the trade unions.

The concept of "Just Transition" is closely related to good governance and inter-sectoral policy integration. In this context, trade unions and other stakeholders demand to link financial support for the industry to job quality/decent work criteria. However, our research findings suggest that integration of renewable energy support and labor policies has been fairly poor so far. So far, renewable energy support policies in the electricity sector did only very marginally address job quality and decent work. Social conditionalization did not enter the political agenda as policy responsiveness has been very low so far. Labor issues featured marginally in the discourses surrounding the revision of the Renewable Energy Sources Act.

Translating our findings into recommendations for policy, the federal government might consider to

- integrate job quality/decent work criteria into the target architecture of the *Energiewende.*
- extend the existing monitoring system for the *Energiewende* to consider qualitative employment effects, including development of working conditions, job quality, co-determination and collective bargaining, education and qualification needs, gender balance, health and occupational safety,
- effectuate social impact assessments of legislative proposals to include working conditions,
- intensify the social dialogue with trade unions and employee associations in order to foster a "Just Transition" in line with the Paris Agreement under the United Framework Convention of Climate Change, and the recently published guidance of the International Labour Organization,
- depending on the outcomes of the tendering system, to consider introducing multi-criteria selection covering decent work criteria,
- ensure a stable and predictable policy framework.

References

Adolf, M., & Corbach, M. (2012). Solarförderung in Deutschland – Änderungen am Erneuerbaren-Energien-Gesetz (EEG) zur Förderung der Photovoltaik 2012. *EnEV aktuell*, *3/2012*, 12-16.

Agentur für Struktur- und Personalentwicklung GmbH (2014). *Die (Offshore-)-Windenergieindustrie in Bremen/Bremerhaven*. Branchenstudie im Auftrag der Arbeitnehmerkammer Bremen**.**

Arbeitnehmerkammer Bremen (2012). *Die Windenergiebranche im Land Bremen. Untersuchungsergebnisse einer Betriebsumfrage sowie mehrerer Experteninterviews zu den Themen Branchenstruktur, Leiharbeit, Fachkräftebedarf und Ausbildung/Fortbildung. Referat für Wirtschaftspolitik*. Bremen

Arbeitnehmerkammer Bremen (Ed.) (2015). *Strukturwandel in Bremen. Befunde und Herausforderungen.* Bremen.

Behrens, M, & Dribbusch, H. (2014). Arbeitgebermaßnahmen gegen Betriebsräte: Angriffe auf die betriebliche Mitbestimmung? *WSI-Mitteilungen 2/2014*, 140-148.

Bird, J., & Lawton, K. (2009). *The future's green jobs and the UK low carbon transition*. IPPR. London.

Bundesministerium für Wirtschaft und Energie (2015). *Ein gutes Stück Arbeit. Energie der Zukunft. Vierter Monitoringbericht zur Energiewende*. Berlin.

BWE (Bundesverband Windenergie) (2016). *Number of employees in the wind sector*. Retrieved from https://www.wind-energie.de/en/infocenter/statistiken/deutschland/number-employees-wind-sector

Del Rio, P. (2016a). *Case Study: Renewable energy auctions in South Africa.* Report D4.1-ZA, March. AURES.

Del Rio, P. (2016b). *Auctions for renewable support in Portugal: instruments and lessons learnt*. Report D4.1-PT, March. AURES.

DEWI (Deutsches Windenergie-Institut) (2015). *Windenergie in Deutschland Aufstellungszahlen für das Jahr 2015*. Retrieved from http://www.dewi.de/dewi_res/fileadmin/pdf/statistics/Infoblatt_2015_Dezember.pdf

DGB-Bundesvorstand (2014a). *Stellungnahme des Deutschen Gewerkschaftsbundes zur Reform des Erneuerbare-Energien-Gesetzes*. 23.05.2014.

DGB-Bundesvorstand (2014b). *Stellungnahme des Deutschen Gewerkschaftsbundes zum Konsultationsverfahren: „Eckpunkte für ein Ausschreibungsdesign für Photovoltaik-Freiflächenanlagen" des Bundesministeriums für Wirtschaft und Energie*. 21.08.2014.

DGB Bundesvorstand (2015). *Stellungnahme des Deutschen Gewerkschaftsbundes zum Konsultationsverfahren zum Eckpunktepapier „Ausschreibungen für die Förderung von Erneuerbare-Energien-Anlagen“ des Bundesministeriums für Wirtschaft und Energie.* 24.09.2015.

DGB Bundesvorstand (2016). Ökostrom: Kein Verdrängungswettbewerb durch Ausschreibungen. *klartext*, 5/2016.

Dribbusch, H. (2013). Nachhaltig erneuern. Aufbau gewerkschaftlicher Interessenvertretung im Windanlagenbau. In D. Wetzel (Ed.), *Organizing. Die Veränderung der gewerkschaftlichen Praxis durch das Prinzip Beteiligung* (pp. 92-118). Hamburg: VSA Verlag Hamburg.

Ethik-Kommission Sichere Energieversorgung (2011). *Deutschlands Energiewende – Ein Gemeinschaftswerk für die Zukunft*. Berlin.

EWC (2011): *European Works Council News* 2/2011. Retrieved from http://www.ewc-news.com/en022011.htm

EWEA (European Wind Energy Association) (2016). *Wind in Power 2015. European Statistics*. February. Retrieved from https://windeurope.org/about-wind/statistics/european/wind-power- 2015-european- statistics

Gemeinsame Arbeitsstelle RUB/IGM der Ruhr-Universität Bochum (2007). „*Öko-Branche“ im Aufwind. Erkenntnisse aus einer explorativen Bestandsaufnahme. Dilog*: Wissenschaft & Arbeitswelt. Bochum.

GWEC (Global Wind Energy Council) (2016), Germany adds 3.5 GW onshore wind, bringing the total new installations to over 5.8 GW in 2015. Press Release, Retrieved from http://www.gwec.net/germany-adds- 3-5- gwin-2015

Hall, S.M., Hards, S., & Bulkeley, H. (2013), New approaches to energy: equity, justice and vulnerability. Introduction to the special issue. *Local Environment*, 18, 413-421.

IG Metall (2013). *Arbeitnehmer – Verlierer der Energiewende? Auswertung der IG Metall-Entgelterhebung Erneuerbare Energien*. Frankfurt, Juni 2013.

IG Metall (2016). *Stellungnahme der IG Metall im Rahmen des Konsultationsverfahrens zum Entwurf eines Gesetzes zur Einführung von Ausschreibungen für Strom aus erneuerbaren Energien und zu weiteren Änderungen des Rechts der erneuerbaren Energien, Referentenentwurf des BMWi (IIIB2) Bearbeitungsstand 14.04.2016*.

IG Metall Küste (2016). *Siemens, Betriebsrat, IG Metall Küste und NORDMETALL einigen sich auf Vertragswerk. Tarifbindung für Beschäftigte im Siemens-Werk in Cuxhaven*. Retrieved from http://www.igmetall-kueste.de/wind/news/beschaeftigte-im-neuen- siemens-werk- in-cuxhaven- profitieren-von- tarifbindung

IG Metall Vorstand (2007). *“Ökobranche” im Aufwind: Konsolidierungsphase der*

regenerativen Energiewirtschaft und Folgewirkungen für Beschäftigung und Mitbestimmung. Erkenntnisse aus einer explorativen Bestandsaufnahme. Bochum, Frankfurt.

IG Metall Vorstand (2011). *Weißbuch Windenergieanlagen-Bau*. Frankfurt.

IG Metall Vorstand (Ed.) (2014). Nachhaltig - aber auch sozial? Arbeitsbedingungen und Einkommen in den Erneuerbaren Energien. Frankfurt.

IG Metall Vorstand (Ed.) (2015). *Do You Speak Climate? IG Metall und Klimapolitik*. September. Frankfurt a.M.

ILO (International Labour Organization) (2015). *Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for all*. Geneva.

IRENA (International Renewable Energy Agency) (2015). *Renewable Energy and Jobs*. Abu Dhabi.

Jaehrlin, K. (2015). Öffentliche Auftragsvergabe – eine neue Arena der industriellen Beziehungen? Konzeptionelle Überlegungen und erste empirische Befunde. *Industrielle Beziehungen*, *22*, 325-344.

Keller, B., & Kirsch, A. (2016), Employment relations in Germany. In J. Greg et al. (Eds.), *International and comparative employment relations*. *National regulation, global changes* (pp. 179-207). Crows Nest: Allen & Unwin.

Leipziger Institut für Energie (2015). *Marktanalyse – Windenergie an Land. Untersuchung im Rahmen des Vorhaben IIE zur Stromerzeugung aus Windenergie.* Auftraggeber: Bundesministerium für Wirtschaft und Energie. Hamburg.

Lewis, J.I., & Wiser, R.H. (2007). Fostering a renewable energy technology industry: an international comparison of wind industry policy support mechanisms. *Energy Policy*, *35*, 1844-1857.

Littig, B. (2012). Von Rio 1992 zu „Rio+20“. Arbeit im Kontext der aktuellen Nachhaltigkeitsdiskussion. *WSI-Mitteilungen*, 8/2012, 581-588.

Mattera, P., et al. (2009). *High road or low road? Job quality in the new green economy*. A report by Good Jobs First. Washington.

Müller-Jentsch, W. (2016). Formation, development and current state of industrial democracy in Germany. *Transfer*, 22, 45–62.

Newell, P., & Mulvaney, D. (2013). The political economy of the `just transition`. *The Geographical Journal*, *178*, 132-140.

Nicklich, M., & Krug, M. (2015). *Arbeitsbeziehungen in der deutschen Windenergiebranche*. Thesenpapier zum Workshop „Sozialwissenschaftliche Forschung zum Transformationsprozess in der Energiewirtschaft“ am 5. und 6.November 2015 in Cottbus.

O'Sullivan, M., Lehr, U., & Edler, D. (2015). *Bruttobeschäftigung durch erneuerbare Energien in Deutschland und verringerte fossile Brennstoffimporte durch erneuerbare Energien und Energieeffizienz. Zulieferung für den Monitoringbericht 2015*, September. Forschungsvorhaben des Bundesministeriums für Wirtschaft und Energie. Makroökonomische Wirkungen und Verteilungsfragen der Energiewende (21/15).

Ohlhorst, D. (2009). *Windenergie in Deutschland. Konstellationen, Dynamiken und Regulierungspotenziale im Innovationsprozess*. VS Verlag für Sozialwissenschaften: Wiesbaden.

Olsen, L. (2010). Supporting a just transition: The role of international labour standards. *International Journal of Labour Research, 2*, 294-318.

Quitzow, L. et al. (2016). The German Energiewende - what's happening? Introducing the special issue. *Utilities Policy* (2016) (in press).

Rosemberg, A. (2010). Building a Just Transition The linkages between climate change and employment. *International Journal of Labour Research*, *2*, 125-162.

Rosemberg, A. (2013). Developing global environmental union policies through the International Trade Union Confederation. In N. Räthzel, & D. Uzzell, *Trade unions in the green economy. Working for the environment* (pp. 15-28). London and New York: Routledge.

Siemens AG (2016). *New Wind Power Plant in Cuxhaven, Germany*. Press Release, June 13, 2016. Munich /Cuxhaven. Retrieved from http://www.siemens.com/press/en/feature/2015/windpower-renewables/2015-08-cuxhaven.php

Stevis D., & Felli, R. (2015). Global labour unions and just transition to a green economy. *International Environmental Agreements: Politcs, Law and Economics*, *15,* 29-43.

Thomas, A. (2016). *Stellungnahme zur öffentlichen Anhörung des Ausschusses für Wirtschaft und Energie am 04. Juli 2016 zum Erneuerbare-Energien-Gesetz 2016 (BT-Drs. 18/8860)*. IG Metall Vorstand.

UNFCCC (United Nations Framework Convention on Climate Change) (2015). *Paris Agreement*. FCCC/CP/2015/L.9/Rev.1, Retrieved from https://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf

Vogel, S., & Kraemer, B. (2010). *Representativeness of the European social partner organisations: Metal sector – Germany*. EurWORK European Observatory of Working Life. Retrievcd from http://www.eurofound.europa.eu/observatories/eurwork/comparative-information/national-contributions/germany/representativeness-of-the-european-social-partner-organisations-metal-sector-germany

Winter, M., & Wagener, A. (2014). *Die Windenergieindustrie in Norddeutschland. Branchenstudie im Rahmen des Projektes "Struktureller Wandel und nachhaltige Modernisierung – Perspektiven der Industriepolitik in Norddeutschland*.

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