# Materials on Development Finance

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## How TVET enables a Just Energy Transition and how KfW contributes

- While investments in the green energy sector grow, qualified workers are becoming a bottleneck for the energy transition.
- Technical and Vocational Education and Training (TVET) provides the skilled workforce for the energy transition and opens up job opportunities especially for those at risk of losing their jobs.
- TVET in countries of the global south needs to be strengthened and modernised to pave the way for people to find jobs in the clean energy sector.
- Financial Cooperation (FC) supports TVET in partner countries, so they become a driving force in a Just Energy Transition.

### No energy transition without skilled workers

The energy transition is at the centre of global efforts to tackle the challenges of climate change and shape a sustainable future. As in other major technological transitions, investments in technology and hardware are the driving force. For instance, investment allocations towards clean energy supply chains reached USD 135 billion globally in 2023 (Bloomberg 2024). Still, the energy transition from fossil-based to zero-carbon sources is facing many challenges.

One challenge is the lack of skilled labour to develop, install, and maintain renewable energy technologies (IRENA 2024). In fact, by 2030, there will be an estimated lack of 7 million green energy workers globally. Accordingly, a growing number of energy companies cite the shortage of skilled labour as the main obstacle to expand their activities (IEA 2023a). There is great demand especially for electricians, as well as science, technology and engineering professionals (IEA 2023a).

The skills shortage also affects the African continent. At 87 percent, the vast majority of CEOs in Africa are concerned about the availability of key skills and 45% note that they are “extremely concerned”. This is the highest proportion among the continents (PwC 2019). In addition, the shortage of skilled labour dampens the growth prospects of African companies (World Economic Forum 2019).

### The energy transition produces job winners and losers, also in countries of the Global South

The transformation of the energy sector is a driver of job growth. According to the *Net Zero Emissions by 2050 Scenario*, 30 million new clean energy jobs will be created by 2030 (IEA 2023). That is twice the number of jobs lost due to the transition (IEA 2023a). In addition, more than half of the employment growth in recent years has been in just five branches related to the energy sector: photovoltaics (PV), wind power, electric vehicles and batteries, heat pumps, and critical minerals extraction. Of these, PV is the largest employing subsector with four million jobs. Electric vehicles and batteries, however, are the fastest growing with well over one million additional jobs since 2019 (IEA 2023b). However, this growth dynamic needs to be put in context.

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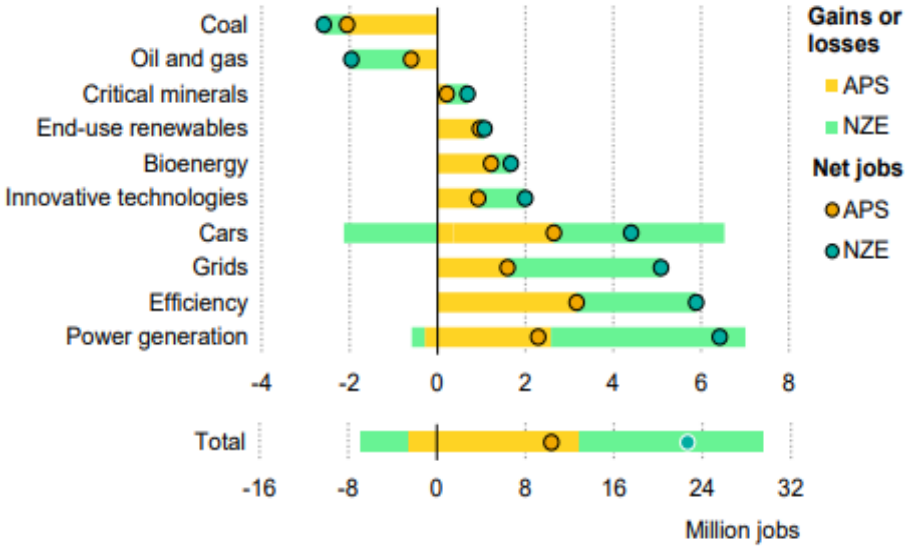
First, not all clean energy jobs are considered to be long-term and full-time employment. Many jobs will be in construction and installation and thus temporary. Furthermore, especially in “low maintenance” technologies like PV, only one quarter of jobs are usually of a permanent nature (IRENA 2022b).

**Box 1: Employment by scenario and subsector (Source: IEA 2022)**




Note: IEA scenarios: Announced Pledges Scenario (APS) where all announced climate pledges were met on time and in full, and the Net Zero Emissions by 2050 Scenario (NZE), which is consistent with limiting global surface temperature warming to 1.5 °C by 2100

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Second, job growth in the green energy transition is accompanied with job loss. Due to the energy transition, close to 13 million jobs in fossil fuel-related industries are at risk (IEA 2023a). Direct jobs and jobs along value chains, e.g. in mining, extraction, refining, distribution, logistics, and power generation with fossil fuel sources, are affected (IRENA 2022b). Closing mines, for instance, creates a persistent, destabilising demand shock and leaves many people unemployed, unable to transition to new jobs (World Bank 2021). This ultimately reduces wealth of communities and puts pressure on public finances (World Bank 2022a). Therefore, a "just" energy transition is needed to mitigate negative effects on employment and the economy.

The Global South needs a just energy transition as well, although the transition here is more about upscaling the energy provision. In Africa, the energy transition is expected to yield five million jobs in the renewable energy sector by 2030, (Statista 2024). In Kenya, for example, renewables already make up 90% of the energy mix, with plans to reach 100% by 2030. In line with the goal of achieving universal energy access, Kenya's power grid operation is projected to generate 110,000 direct and indirect green jobs annually until 2030 (RTI 2022). To meet this higher demand for a skilled labour force, TVET capacities will have to be expanded drastically.

In contrast, the South African energy industry is still heavily dependent on fossil fuels (ASSAF 2023). The coal value chain in South Africa employs approximately 150,000 workers directly, with 72% of those linked to the coal sector (TIPS 2021). Therefore, mitigating the negative social impact of the energy transition is a larger issue in South Africa than in Kenya. Still, in both countries people will need the right skills to benefit from jobs in the energy sector.

### Skills are the key to unlock a just energy transition

Even though the number of jobs created or lost during the energy transition provides an idea of the social impact, this helps little to *manage* this impact. A closer look at changes in the skilled labour supply and demand is needed. On the one hand, the demand for personnel in more complex and skill-intensive occupations will increase. In fact, the clean energy sector requires more advanced skills than the majority of other industries, with 36% requiring tertiary level education and 51% requiring TVET (IEA 2023b). This change is relevant across various occupations. Consequently, over the long run, higher skills will be needed to find employment in the energy sector. This is also the case in African countries (see box above).

Hence, the impact of the energy transition on labour also depends on the skills composition of the labour force. The demand shift will ultimately have a particularly adverse impact on low-skilled jobs, necessitating skill upgrades and qualifications. The good news are: many skills required for jobs in expanding clean energy industries can already be found among workers who are currently employed in coal and other fossil fuel-related fields (e.g. chemical engineering) (IEA 2022). However, especially in countries of the Global South, where skills and work experience are often acquired informally, skills formation systems are not providing enough people with the basic skills needed. Therefore, the challenge of managing a just energy transition extends beyond targeted upskilling of workers to addressing skill supply and demand within the TVET system in general.

### TVET needs financing to provide the skills needed for a just energy transition

TVET, in this context, fulfills a double function: providing the labour force with skills for the transition and opening employment opportunities for those at risk of job or wage loss.

In order to do this, TVET, on the one hand, must attract young adults to initial TVET in occupations relevant for the energy sector (e.g. electricians). On the other hand, TVET must also provide reskilling and upskilling opportunities for workers who wish or need to transition to job opportunities in the field of clean energy. For instance, coal miners may be trained in solar panel installation, allowing them to transition into the renewable energy sector (IRENA 2022c).

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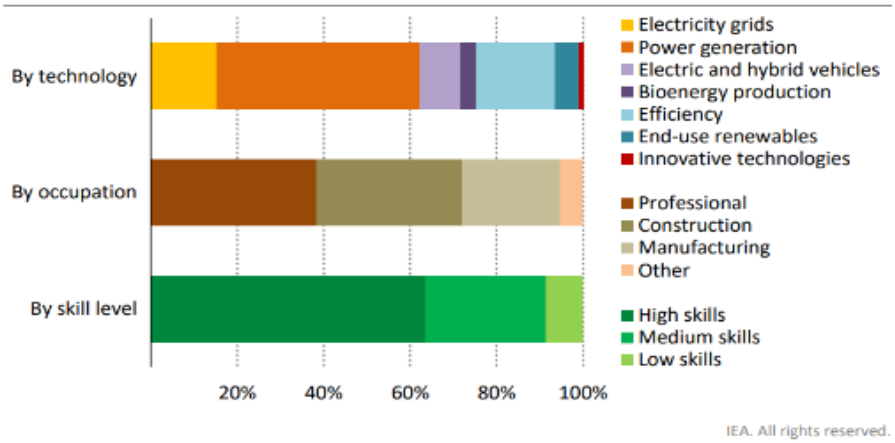
Accordingly, for a just energy transition, both initial and further TVET are crucial. However, in many partner countries of development cooperation, neither initial nor further TVET are up to this task. In those partner countries, employers do not yet play a key role in in-company training. That is due to a lack of capacity and willingness to invest systematically in skills formation. In addition, public TVET providers often lack the means to train people according to the demand of the energy sector.

**Box 2: Jobs created in clean energy and related sectors in the SAS, 2021-2030 (Source: Africa Energy outlook 2022)**




*Of the clean energy jobs created across Africa to 2030, the majority are related to power generation and energy efficiency, spread across occupations*

Finally, while training needs are enormous, job seekers hailing from vulnerable groups have had little prior access to technical education and hence labour market perspectives (see, for instance, South Africa, SEDA 2021 ).

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In this context, TVET may also provide economic and social returns especially to women. At present, 32% of all employees in the renewable energy sector are female, compared to 22% in the oil and gas industry only (IRENA 2019). Training women for jobs in the clean energy sector may contribute both, providing the much needed skilled labour for the transition and helping women to gain access to better and future-oriented jobs (World Bank 2022b).

For TVET to meet all these challenges, one key element is financing. However, TVET in countries of the Global South is largely underfinanced. Low and middle-income countries spend only 0.2% of their GDP on vocational training, while high income countries spend on average 0.46% (World Economic Forum 2023). Moreover, public TVET institutions remain understaffed with student teacher ratios up to 66, compared to Europe where the ratio averages 10 only (European Commission 2015, Eurostat 2021).

Accordingly, to make TVET fit for the just energy transition, investments are needed. Especially in TVET institutions where young people are trained to become skilled workers. These institutions require the resources to attract skilled professionals such as teachers, modern equipment, and facilities to provide training in line with the standards of the energy industry.

### KfW is investing in Green TVET for a just energy transition

Green jobs and skills are a key area of investment of the German government.

As part of supporting the just transition in countries of the global south, KfW Development Bank finances the development of TVET institution. Increasingly, those investments have a focus on “green” TVET. Greening TVET includes providing skills for a sustainable economy but also setting up the structures such as TVET centres, that integrate sustainability in their operations (see also here). Currently, nine KfW projects in seven countries finance vocational training relevant for the green energy sector. Exemplary KfW projects supporting “green” TVET with relevance for the just energy transition are the Centre for green TVET in Vietnam and the upcoming Skills4Jet project in South Africa.

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