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Skills for the just energy transition Is skills research on track

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Skills for the just energy transition: Is skills research 'on track'?

There is widespread agreement that skills development is a vital dimension of the just energy transition (JET). Skills development for JET is rapidly emerging and involves complex inter-sectoral systems of skills development and new methods for demand analysis. Currently in South Africa, learning pathways into green jobs, enterprise development and more sustainable job options, including those required for JET at entry and technical levels, are unclear, ad hoc and fragmented. At best, we have fragmented offerings of courses and qualifications and few systemic approaches to skills analysis and development. There is also a narrow reliance on supply and demand discourses that are ill-fitting for the type of skills that need to be developed. Drawing on a group of regional and local studies focusing on skills supply and demand for JET, the paper analyses the responsiveness of skills systems, with specific focus on institutions and institutional arrangements that underpin skills planning and anticipation. The paper critiques the metaphor of 'supply' and 'demand', which, it argues, is the wrong lens, as it focuses attention on certain parts of the skills system dislocated from the broader conditions that they are imbedded in. We pose new methodological questions for engaged skills research that can enable a green and just future, and the systemic transformations that are needed to catalyse a low-carbon transition.

Significance:

The research findings offer a critical reflection on the current approach to research focused on skills for the just energy transition. The review highlights the limitations of the dominant supply-demand approach of skills analysis, and we argue that it promotes a neoliberal, market-led discourse on skills that privileges industry and excludes the voices of communities and workers.

Introduction

The transition of the energy sector is broadly regarded as an important socio-technical change that links people-technology-ecological relationships in relation to broader systemic issues, such as rising energy costs, energy insecurity and pressures to decarbonise. Skills are seen as one of the main drivers to achieve a just energy transition (JET). For skills to become central in transitions, and in a green and just recovery, the identification, anticipation and provision of relevant skills is crucial. This paper hence unpacks the nub of the dilemma in raising questions on the way current JET skills research is being conceptualised and executed. We argue that the dominant research approach is framed within a skills demand and skills supply narrative and that, given the scope of the transition, it is wholly insufficient.

We further argue that current studies reviewed have been shaped by a neoliberal ideology and that transitions to low-carbon economies are experienced differently by different stakeholders and perceived as complex and contested. This creates rapidly changing knowledge contexts that require a revitalised approach to how skills development can be conceptualised and implemented, and as espoused by Green and Gambhir[1], there needs to be a strong focus on retraining affected workers to facilitate labour market adjustment and on on-the-job retraining.

We then argue that conceptualising skills for JET requires a framework that moves beyond the individual, to organisations and systems with the purpose of jointly fostering systemic change and counteracting pervasive entrenchments that keep us trapped in unsustainable linear and siloed practices. Skills development that supports these transitions will only be realised when reciprocity is established between various stakeholders including employers, workers and communities within which a business operates.

The just energy transition in South Africa

JET in South Africa is and will have a major impact on the current energy system (including distribution to industry and local communities).[2–4] Aside from being fossil fuel dependent, the country's economy is energy-intensive – with the energy sector contributing 95% of South Africa's total CO_2 emissions in 2020.[4] It also faces significant disruptions to energy supply through enforced power outages, which are compounded by increasing energy costs.[5] Given these challenges, there is a recognised need to shift away from fossil fuels and to improve the resilience of the energy system through the diversification and decarbonisation of the electricity sector and to optimise energy usage.[5] The government has a net-zero emissions aspiration by 2050, with shorter term targets of 398–510 Mt CO_2-eq per year for 2021–2025 and 350–420 Mt CO_2-eq per year for 2026–2030.[4,6] Concurrently, there is a drive for expansion into new domestic and export markets, like green hydrogen.[7]

Literature review

Clarifying what a transition to a green economy is, is important to the core argument of this paper. If the transition to a greener economy is understood as an economic development strategy that "results in improved human well-being and social equity, whilst significantly reducing environmental risks and ecological scarcities"[8(p.16)], then simply removing high-carbon industrial activities for an energy transition would be insufficient. Greening the economy would therefore mean that jobs created through a green and/or energy transition should be 'decent', whether a 'green job' or not, with reasonable terms and conditions. We draw on the United Nations Environment Programme's

(UNEP)[8] notion of decent green work as adequate wages, safe working conditions, job security, skilled and satisfying work and worker voice.

Montmasson-Clair[9] argues that a just transition contains key elements that are pivotal for inclusive decent work and encompasses the elimination of inequalities. A just transition places emphasis on the incorporation of marginalised groups such as women, youth and people living with disabilities in decision-making processes. Some authors[10,11] do, however, caution that an overriding theme of transformative strategies is that they tend to depend on entry-level skills, that offer low wages and hence pose the risk of enhancing existing inequalities. This highlights the need for precise objectives related to the creation of decent green jobs as sustainability transitions take place.[10]

Skills in this paper are used to refer to the knowledge, expertise and the capacity to conduct work. While we believe that this definition has its limitations seen through the simplification of a complex theoretical and empirical concept, this meaning of skills is widely used in policymaking and implementation. Skills development plays a crucial role in seizing opportunities and unlocking the potential for reimagining jobs and work in JET. Drawing from the green skills framing[12], these skills could be viewed as 'the abilities, values and attitudes people need to build and support a sustainable and resource-efficient society'. Green skills therefore need to result in "improved human well-being and social equity, whilst significantly reducing environmental risks and ecological scarcities"[8(p.16)]. Thus, skills for JET are multidimensional and are not solely linked to technology and improved productivity but also include strong social, environmental and public imperatives and cover work, learning and community contexts. Therefore, these skills carry not only the key to unlocking renewable energy industries but also the potential to promote equity and social inclusion under an alternative version of sustainable economic growth. Green and Gambhir[1] also emphasise the need for capacity to steer long-term, participatory, cooperative processes that empower diverse local actors to recombine their existing knowledge, skills and competences in new ways to broker dialogue and reconfigure knowledge networks and engage in activity that shifts cultural norms and worldviews.

Skills to support greening are also not homogeneous. This has methodological implications for how green skills research is designed, structured and who the central actors are.[13] The skills needed for the transition need to be viewed as a continuum (Figure 1); at one end, green skills are understood as skills to green work (e.g. the work of engineers, electricians and scientists) and skills that are directly linked to jobs and as such central to the jobs at the core of transitioning the economy. At the other end of the continuum are more transformative skills and competencies that are meant to disrupt the *status quo*, such as transformative systems thinking and analysis of unequal systems of power. Figure 1 further shows that nestled between these two ends are core life skills that are central to a transition, such as empathy, resilience and collaborative thinking.

It has been argued that skills approaches within the green transition are often critiqued for being conceptualised as skills for green jobs, framed through a 'skills gap' and 'skill deficit' argument, reminiscent of human capital approaches.[14] The critical challenge with this position is that it presents a linear relationship between education, skills, and the economy. Its neoliberal framing defines the purpose and relevance of education and skills in terms of how it serves the market and hence locates skills within the traditional economic discourses. This approach perpetuates the idea that market-responsive skills development will solve broad developmental problems, that is, what jobs and skills are needed by the market, and therefore, what skills should be taught? Allais[15] and Balwanz and Ngcwangu[16] argue that this conceptualises skills development in a reductive and instrumental frame.

Looking more broadly beyond 'skills gaps', there exists a belief that skills formation should not only have a business-centric influence, as this negates the socio-economic needs of workers and communities. It has also been argued[10] that these economically framed skills responses place little emphasis on skills systems holistically. This leaves skills development and training to private providers who operate within a reactive and short-term nature that presents potential sustainability pitfalls. Further, there are arguments that see skills as needed in one place and produced in another rather than "society and an economy as an organism of which skill formation is a complex set of moving parts, shaped by the economy and how different spheres of society interact with each other"[15]. We draw on Allais's[15] argument that the metaphor of 'supply' and 'demand' is the wrong lens, as it directs our attention towards siloed aspects of the skills system minus considering broader structural elements.

Overview of empirical work

This paper draws on different empirical studies undertaken by the Centre from 2022 to the present. All respond to skills demand and supply linked to South Africa's energy transition and include:

a) The South African Energy Skills Roadmap (2023)[5] which sought to identify energy-related skills to facilitate an energy transition for the country. Data collection included the analysis of 200 energy research documents, a review of over 700 energy jobs, a trend and future scenarios analysis, interviews and validation workshops.

b) Research undertaken on Installation, Repair, and Maintenance (IRM) skills ecosystem: Atlantis[17] focused on understanding the interconnected factors and stakeholders that influence IRM skills acquisition and utilisation to inform the development of a skills training hub to support township-based Small, Medium and Micro Enterprises (SMMEs) and to build green economy pathways for

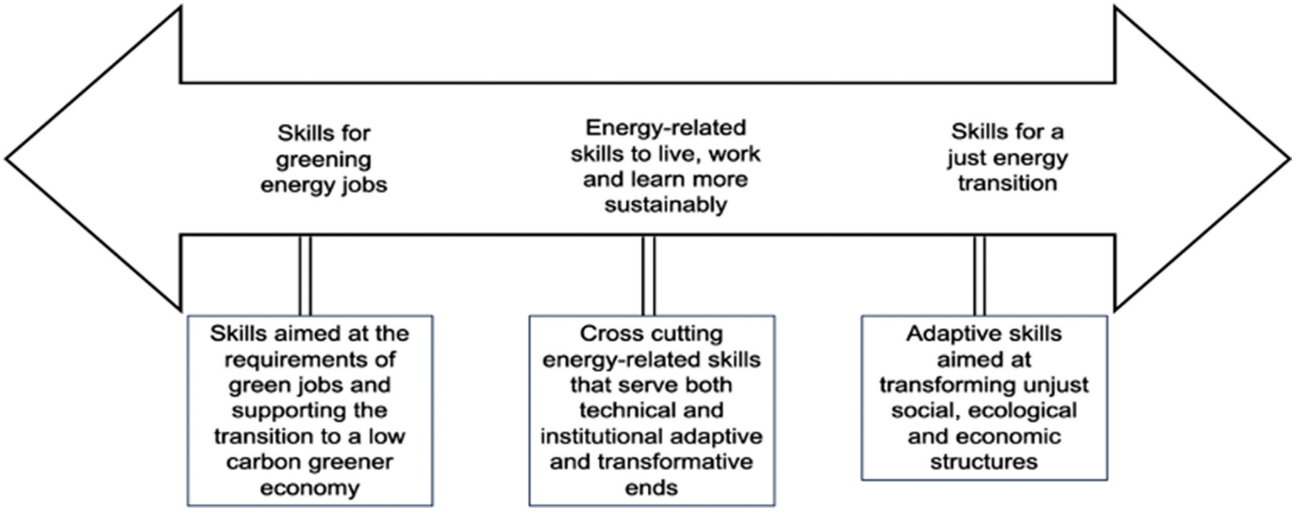


Figure 1: Skills for a just transition as a continuum.

youth. Data were collected through 58 interviews, 5 focus groups with local learners and unemployed youth, a survey with 2763 IRM users and a stakeholder workshop.

c) Research undertaken to understand the key leverage points in the food and beverage manufacturing sector to enable a low-carbon transition.[18] The purpose of the energy hotspots research was to identify the main areas of energy impact and challenges across different food and beverage manufacturing sub-sector value chains, such as baking and dairy to inform where the greatest need is for occupations to mitigate these impacts. This research further informed studies on skills required for an energy transition in the baked goods sector in the City of Ekurhuleni and the fish and seafood sector in the Table Bay area in the City of Cape Town.

In addition to these core studies, insights are also informed by two pieces of research undertaken for the International Labour Organization (ILO) on skills supply and demand for renewable energy, energy efficiency and regional energy integration in the Southern African Development Community (SADC), which included South Africa[19], and a skills needs assessment of renewable energy in Mauritius, and the circular economy in Seychelles[20].

Skills to support the just energy transition

The notion of a demand-led approach for skills dominates discussions on the energy transition. This is centred on the notion that skills shortages and mismatches between employer demand and education system supply are because of inadequate information about labour market demand.[15] The findings below highlight some of the key insights around skills supply and demand to support an energy transition.

Demand context: Skills expectation and labour market analysis

The data illustrate that core energy trends are driving changes in jobs in South Africa. The most significant trends identified are an increase in energy costs, unstable electricity supply, a drive to decarbonise economic activity and the automation and electrification of sectors. This in turn results in an emphasis on activities to reduce costs, including improved energy efficiency and optimisation, and a shift to renewable energy technologies.[5,21] These trends not only impact on the reorganisation of how energy is generated and distributed, for example, an increase in decentralised renewable energy technologies results in a need for smarter grids and grid expansion, but also require changes to existing jobs, and potential job losses due a shift away from fossil fuels, and/or a requirement for new jobs.[5]

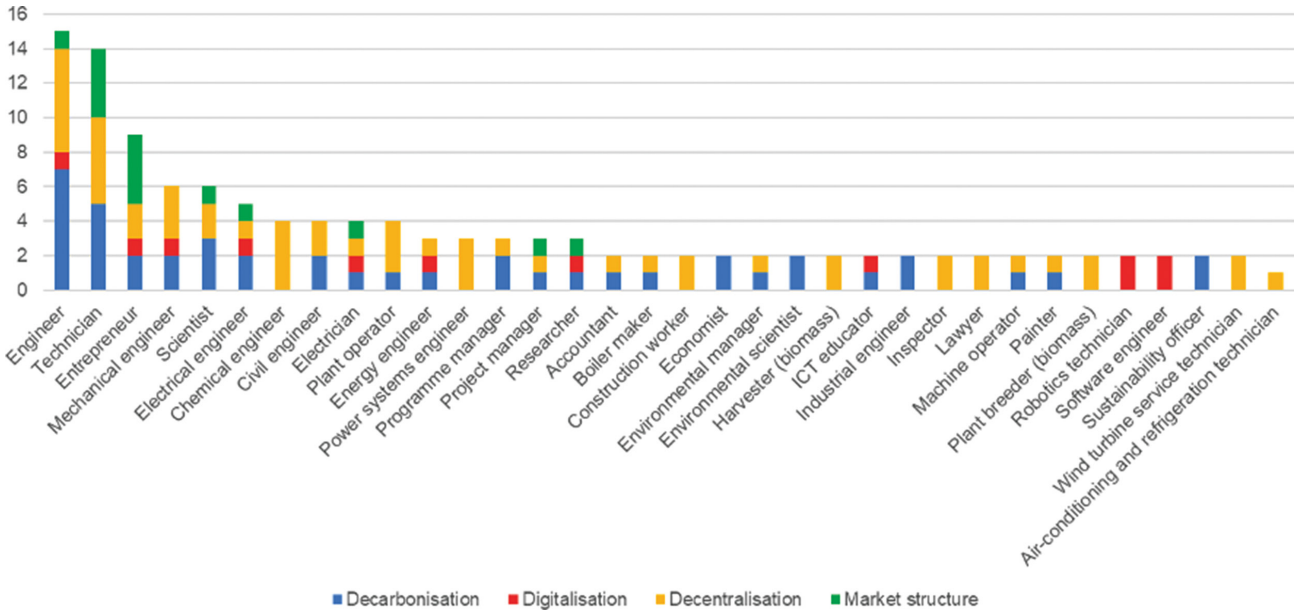
This study further suggests that in response to changes in technology and job requirements, emphasis is being placed on technical jobs and skills, as most solutions proposed in policy and by industry are techno-centric.[5] In addition, it was found that descriptions of jobs required are generalised, for example, it is common to indicate that engineers and technicians are needed, but little detail is provided on the type of engineer or artisan.[5]

When specific jobs or skills are mentioned, these again are mainly focused on technical and tend to emphasise those that are (1) likely to be lost through a shift away from fossil fuels, such as coal miners and transporters[9,22], or automation, such as electricity-sales tellers[23], (2) related to specific renewable-related technologies such as solar, wind or green hydrogen[5,17,18] or (3) responding to a critical need to maintain and repair machinery and energy-related infrastructure[5,18].

This technical emphasis is highlighted in Figure 2, which illustrates some of the core occupations identified through the development of South Africa's skills energy roadmap.[5] It highlights the main jobs cited in a review of South African energy-related policy, initiatives, research and energy intervention reports. The most prominent and commonly cited jobs are engineers (notably electrical, mechanical, civil, power systems and chemical), scientists and data professionals (such as energy specialists) and technicians (such as electricians, forepersons, and maintenance and plant managers).

What is evident is that much emphasis is placed on high-level and some intermediate jobs, with minimal mention of entry-level jobs. For example, research undertaken for the Food and Beverage Manufacturing Sector Education and Training Authority (FoodBev SETA) clearly indicates that core occupations required to mitigate energy consumption and decarbonise the sector are senior managers (such as finance and operations), and electrical, mechanical and renewable energy engineers and technicians. With technicians being further identified as those involved in, for example, maintenance of solar photovoltaic (PV) plants, air conditioning and refrigeration, diesel mechanics and machine operation.[17,18,21]

While the studies clearly illustrate an overarching need for technical jobs and skills, most research respondents did, however, acknowledge that there appears to be an adequate supply of the more 'traditional' technically qualified individuals, such as electrical engineers and electricians



Source: South African National Energy Association[5] (reproduced with permission)

Figure 2: Occupations identified through a review of energy-related documents to inform South Africa's energy skills roadmap.

(except for 'heavy' current).[18,21] However, while these more traditional technical skills are available, it is specialist knowledge and skills that are in demand, for example, in wind, biomass and green hydrogen[20,21] or where sectors are becoming less attractive to new work entrants, such as the fishing industry, in which case marine engineers are identified as a scarce, critical job.[21] Respondents suggested that while this lack of skills does not necessarily require the need for new qualifications, jobs are changing, and there is, therefore, a need for the upskilling of the current workforce to enable a JET. To echo this sentiment, Martinez-Fernandez et al.[24] affirm that as sectors and production processes transition, traditional (existing) skills of the low- to middle-skilled occupations representing entry and intermediate levels will need to be enhanced by green skills to align with emerging labour markets.

Furthermore, there were numerous examples of transforming jobs, such as chief financial officers requiring new knowledge of different renewable technologies to make informed investment decisions, or electrical engineers requiring upskilling for the design of solar PV systems.[5,21,25] This is also the case for green hydrogen – a new technology – but encompasses renewable energy occupations as well as chemical engineers that will specialise in the various processes required for the production of green hydrogen and PtX products.[5]

The studies also indicate that while a significant increase in jobs in alternative energy is expected, the type of jobs may be different. For example, construction and installation jobs will be required at the onset of renewable energy projects but less so in the operations and maintenance phase of plants.[5] Christiaensen et al.[26], in a study of the Silesia region, similarly found that the absorption of affected employees into emerging industries such as renewable energy is challenging due to various reasons such as the inability of solar PV plants to offer sustainable employment beyond the construction phase. Importantly for South Africa, this highlights that some of the skills challenges are linked to the nature of transitions and not necessarily geographic location. Additionally, those involved in renewable energy policy development are most in demand in the short term as strategies are being developed and should drop off over the next 10 years as policy is implemented.[5] The research also highlights that while energy transition jobs are required across the public and private sectors, the private sector is driving the demand for alternative energy skills (due to a response to deliver renewable energy solutions, or to provide advice to industry), while government remains focused on more traditional occupations, such as electrical engineers.[5]

This recognition of community alludes to a more holistic approach to the energy transition, and the need for more than just technical solutions, jobs and skills. From this perspective, the studies undertaken by the Centre aimed to explore the additional non-core energy jobs and skills required to enable a transition. Skills identified through this process highlighted a need for skills related to policy development, regulation, business development, procurement, environmental and social sustainability, human resources and community engagement.[5,19–21] This recognition of a broader scope of 'supporting' skills has also been acknowledged by some, such as the South African Wind Energy Association[27] and in the Just Energy Transition Investment Plan (JET-IP) 2023–2027[25].

In summary, the data drawn largely from macro-economic job projections show that the types of jobs emerging are largely technical, very focused on the transitioning energy technology within the formal sector and based largely on current models in which goods and services are produced and consumed. Not all studies are focusing equally on jobs related to enabling processes that support core energy-linked jobs (e.g. financing, procurement and regulation). Finally, the evidence shows that there are increasing emerging specialisations, which involves people moving into specialisations in existing jobs (rather than the creation of new jobs).

Supply context: Qualifications and provision

While the classification of over 230 courses identified as being offered by skills providers in the country has been slightly different for each study, in the main, they can be categorised into core energy (e.g. renewable energy, green hydrogen, energy efficiency and electric vehicles) and those supporting or enabling JET, such as social scientists, financial or legal specialists.

The research suggests that courses are offered across various skills provider types, with the majority of core-energy courses (41%) offered by private training providers and traditional universities (28%)[17,19,21] (see Figure 3).

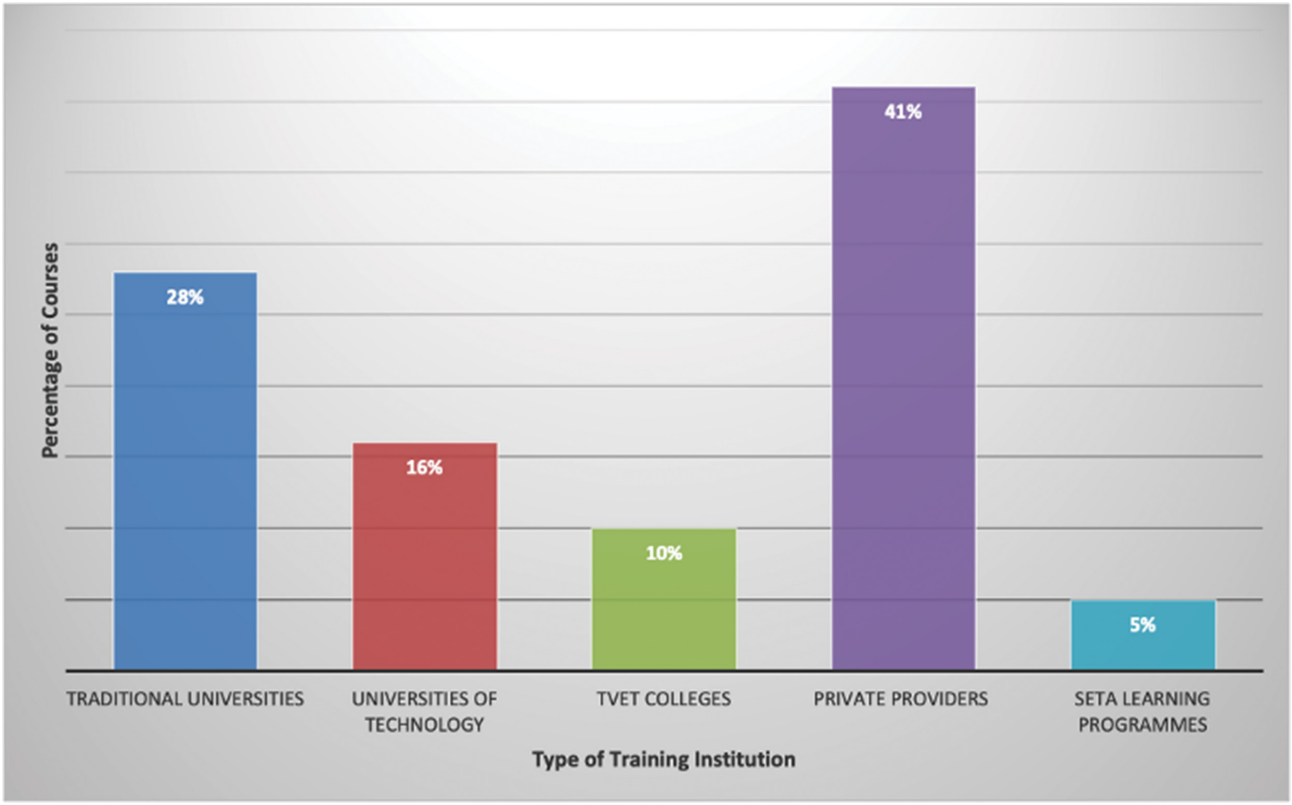


Figure 3: Percentage of core-energy courses offered across various institutions in South Africa.

Courses offered at universities tend to be informed by areas of focus of academic centres, for example, the Cape Peninsula University of Technology's South African Renewable Energy Technology Centre (SARETEC) and the University of Pretoria's Centre of New Energy Systems, which focuses on energy efficiency and demand side management. These centres tend to offer either specialist short courses or, in the case of traditional universities, postgraduate studies.[5,17,21]

Regarding Technical and Vocational Education and Training (TVET) college offerings, there is little evidence to indicate that renewable energy or energy efficiency is adequately covered. Those that are, tend to be doing so because of lecturer proactivity and interest in the field[17,21], or due to funding received to implement renewable energy programmes in partnership with, for example, Sector Education and Training Authorities (SETAs)[17,21]. This can result in an inefficient and unjust transition for individuals at entry and intermediate level. Morocco, which has reflected some success in JET, has showcased the need for involvement and collaboration of skills stakeholders from technical level to university level.[28] Further, McGrath and Powell[29], Papier[30] focusing on South Africa, and McGrath[31] focusing on India and South Africa, have supported the argument that VET institutions face challenges and have had minimal elements of green skills incorporation and sustainable development necessary for a just transition.

With reference to the course topics, this study found that most of the energy transition-related courses include various forms of engineering, science and/or technology education, biotechnology and biochemistry (see Figure 4). It is evident from the research that most courses offered target high- to intermediate-skills levels, with minimal focus on entry-level skills (such as for construction labourers for energy plants, machine operators or solar PV marketing assistants), and community learning.[5,18,21] This finding relates to the location of relevant skills provisioning, which indicates that while training may be provided in an area, it may not always be relevant to where demand is required. For example, the TVET college located in Upington in the Northern Cape, where there is a significant investment in solar PV, does not offer any certified renewable energy specific qualifications.[5]

Regarding the type of skills provisioning offered, the research suggests a propensity for short courses which are mainly offered by private providers (97%), relating to energy efficiency, management and auditing, and solar PV compliance, installation, financing and maintenance.[5,17,19,21] Universities are also responding to this demand, with at least 30% of their core energy courses offered as short courses.[5,17,19,21] It is evident that many of the short courses focus on a single job activity such as solar PV accreditation, as opposed to knowledge and skills required to fulfil the requirements of a job, such as a chemical scientist involved in green hydrogen. The research suggests this narrow focus can restrict career flexibility and progression, and vulnerability if jobs become obsolete.[5,21] While many of the short courses identified are certified, it was noted that many are not accredited and therefore not always of the quality or standard required of industry. Accreditation with bodies such as the South African Qualifications Authority (SAQA) is a lengthy process, and the urgency and high demand to provide courses means institutions are negating accreditation.[20,21] This short course culture has been highlighted as a disjointed sustainability response[32–34], suggesting a reactive, fragmented and poorly coordinated education and training landscape.

Lastly, many of the research interview respondents raised issues around the timely supply of skills and the oversupply of skills. For example, an estimated 1800 to 2200 wind construction jobs will be required each year up to 2030 if the country's Integrated Resource Plan[35] is to be realised[5,19,21]. Regarding oversupply, the research suggests that some graduates struggle to access the sector as job vacancies are limited due to the market not being ready to absorb the number of graduates being produced.[5]

So are we on track? What do the skills demand and supply data not tell us?

The findings above highlight some important insights that these studies are bringing to the fore, but in the discussion below, we try to illustrate some key issues that current approaches to researching skills are missing, all of which, we argue, are central to achieving a JET.

Across the work, from a skills perspective, there is strong evidence of an uncoordinated transition. While there are multiple studies, there is no coordination of the fragmented pieces of information. Despite the extensive and complex green/sustainable development mandate in policy, to date, no adequate coordination mechanism has been established for the national planning and development of JET skills in South Africa, which is leading to disparate and siloed skills interventions. For example, five separate studies on the hydrogen economy have been completed nationally by separate entities, focused on skills for TVET, SMMEs and manufacturing. From these studies, there is no clear indication of coordination; what emerges instead is a fragmented picture of pockets of demand with no national picture of skills demand to support the energy transition.[5,20]

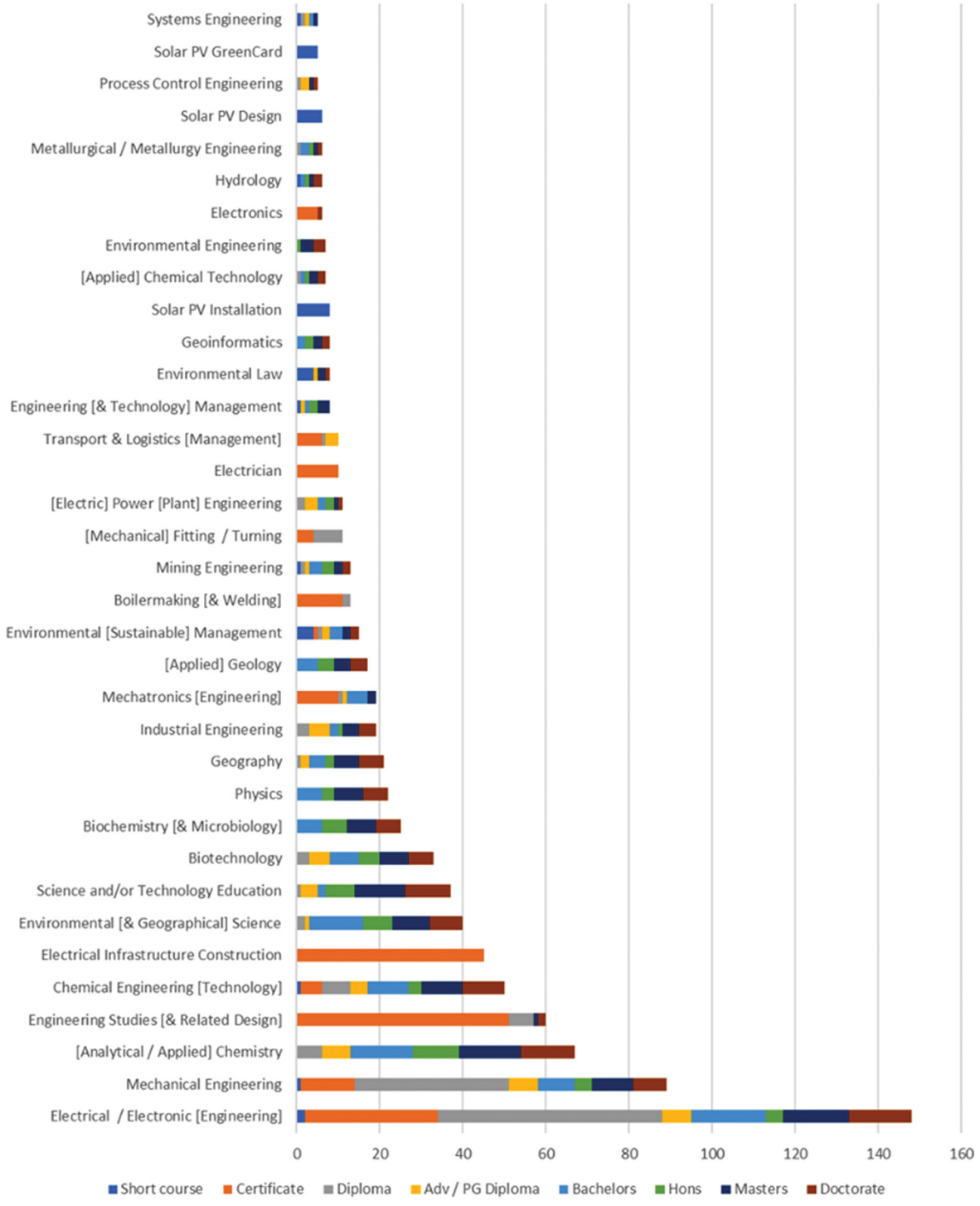
Many of the studies that have been undertaken are narrow in scope and focus on a sub-sector or technology. This reduces the transition to a technological transition and frames it within a market mindset. Furthermore, the data show the emphasis on technical jobs and for specific technologies. For example, energy efficiency was found to not receive as much attention as renewable energy. This casting of the transition as a technological one is driven with a focus on industry, building and preserving markets and inherently privileges industry. Further, it has been argued that countries like South Africa are overly reliant on energy-intensive industries and reflect patterns of mutual dependence among industry stakeholders and governments which can create a political 'lock-in' effect that is difficult to overcome.[26]

This fragmentation along technological lines perpetuates short-termism which constrains the futures perspective that a JET is aiming for. This is largely because much of the data come from employers and industry; thus, the longer-term picture is not clear from current demand data. Employer demand plays a key role in skills formation and anticipation. Although it must be used with caution, Allais[15] warns that employer needs data tend to provide limited insights into current and future skills demand trends. This approach does not provide a picture of the volatility of labour markets considering global shifts and trends, as has been noted, for example, by skills shifts in energy transitions due to climate change considerations.

With the current demand data for JET being speculative and short-termist, *ad-hoc*, fragmented and reactive, issues arise pertaining to the quality of education and training programmes delivered. The existing research outputs lack sufficient micro-level data and nuances necessary for informed educational planning. This includes the lack of detailed insights into the specific needs and challenges faced at the community and entry skills level. This deficiency limits the agility and responsiveness required to address evolving skill demands in the energy sector.[11] The reliance on speculative data and a lack of concrete insights makes it difficult to develop effective curricula and frameworks for teaching and learning processes as teaching and learning for JET demand the creation of situational conditions that reflect real-world challenges and opportunities.

Four critical issues emerge here. First, the supply-demand approach and the skills for jobs narrative inherent in the emerging findings all reflect an outlook of a neoliberal, market-led framing of the transition. This framing reduces the transformative impact needed for JET. Second, this clearly shows that with the market-led approach to skills, the sustainability ethic is being neglected, and we are not focused on disrupting the economic *status quo*. Third, the market-led analysis negates the critical role of communities as active participants in the transition, and fourth, a skill formation system that is trapped in colonial path dependency.

Consultations across these research projects have raised concerns that there are no clear existing learning pathways from the pre-tertiary to tertiary education and work-based learning. Within this context, learning pathways at entry-level into community colleges and adult learning centres are under-researched and restrict transitions into intermediate skills pathways. While TVET institutions emerge as vital conduits for equipping learners with specialised skills essential for advancing socio-economic development in a just and equitable manner, clear pathways



Source: South African National Energy Association[5] (reproduced with permission)

Figure 4: Just energy-related courses identified in 2022 with more than five offerings across the South African post-school education and training system, by qualification level.

into and from TVET are not visible. Clear learning pathways represent critical trajectories guiding individuals through educational endeavours to acquire knowledge and skills for a sustainable energy future.[36] However, the projects reveal that numerous challenges impede the effectiveness of these pathways for youth entrants. These include inadequate infrastructure, limited access to quality education for marginalised and rural communities, a skills mismatch where curricula offered by TVET institutions often fail to align with the evolving needs of the local energy sector, as well as maladjusted skills system issues.[36,37] Furthermore, the issues raised around unaccredited training and training that does not meet industry standards place further constraints on pathways. Lastly, the skill reform system remains skewed by the apartheid growth model and skill development strategies linked to massive industrialisation and the Mineral Energy Complex (MEC).[38] Under this model, the colonised population was mostly restricted to basic education and VET education, which were considered sub-par to general education.[39] This then led to entrenched poverty and inequality, which persists as the belief system[31] and continues to impact education and career pathways.

As shown above, the directionality of the energy transition has left poverty and inequality intact. It has cast itself in a neoliberal paradigm and structured itself to recreate the existing labour market. So, it is our

contention that unless a JET adopts a more radical/disruptive whole system approach, rather than the fragmented approach that is currently evident, we are on the path to an unjust energy transition.

Conclusion

Despite increasing awareness of the need for a JET, the directionality of current efforts has failed to address persistent poverty and inequality, indicating a deviation from the path towards a truly equitable future. This disconnect between rhetoric and reality underscores the urgency for a fundamental reassessment of the approach to skills development within the context of broader societal transformations. Fragmentation and disjointed efforts characterise the landscape, hindering the effective alignment of skills with emerging demands and societal needs, hence undermining the efficiency of skills development but also perpetuating disparities, leaving marginalised communities further behind. When reflecting on skills for JET, it becomes evident that incremental adjustments are insufficient to address the magnitude of the challenges ahead. Instead, a more radical and disruptive whole-system approach that looks beyond supply and demand statistics is imperative. This entails reimagining the role of institutions, fostering collaboration across sectors, and prioritising the voices of those most affected by transition processes.

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Data availability

The data supporting the results of this study are available upon request to the corresponding author.

Declarations

We have no competing interests to declare. We have no AI or LLM use to declare. Ethical considerations were maintained throughout the data collection process. This was done by obtaining informed consent from participants, ensuring anonymity and confidentiality in the interviews and the reporting. Ethical clearance certificates were obtained from the Human Research Ethics Committee (Non-Medical) at the University of the Witwatersrand with the following protocol numbers: H23/08/27 and H20/03/22. Drawing on this empirical work, this paper offers a meta-reflective 'landscape view' of the JET skills field as it is emerging.

Authors' contributions

P.R.: Conceptualisation; methodology; data collection; data analysis; validation; data curation; writing – the initial draft; writing – revisions; student supervision; project leadership; project management; funding acquisition. V.H.: Conceptualisation; methodology; data collection; data analysis; validation; data curation; writing – the initial draft; writing – revisions. W.I.J.P: Conceptualisation; methodology; data collection; data analysis; validation; data curation; writing – the initial draft; project leadership; project management; funding acquisition. N.J: Conceptualisation; methodology; data collection; data analysis; validation; data curation; writing – the initial draft; project leadership; project management. All authors read and approved the final manuscript.

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