



german
cooperation

DEUTSCHE ZUSAMMENARBEIT

Implemented by:

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Career Progression and Professional Progress of Wind Turbine Technicians in South Africa

Imprint

Commissioned by: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
South African - German Energy Programme (SAGEN)
Hatfield Gardens
333 Grosvenor Street
Pretoria 0028
South Africa
Contact: Dr Sascha Thielmann (sascha.thielmann@giz.de)

Report prepared by: AltGen Consulting
Sean Gibson
Tel.: +27(0) 21 880 2561
+27(0) 73 378 1657
E-mail: sean@altgen.co.za



Design and layout: Twaai Design

Disclaimer

This document is meant for informational purposes only. Though the accuracy and validity of information and recommendations given have been checked thoroughly, GIZ and the authors cannot be held liable for the content of this document.

Contents

Executive Summary.....	2
Part 1: Recommendations for SARETEC.....	9
Part 2: WTST 2 Entry Interviews - 14 Sept 2016.....	11
Part 3: GT & WTST 1 Follow Ups - 11 Oct 2016.....	16
Part 4: WTST 1 Exit Interviews - 20 Jan 2017.....	25
Part 5: WTST 3 Entry Interviews - 01 Mar 2017.....	37
Part 6: WTST 2 Exit Interviews - 04 May 2017.....	42
Part 7: WTST 3 Exit Interviews - 06 Oct 2017.....	54

EXECUTIVE SUMMARY

Since 2012 the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has been supporting the establishment of the South African Renewable Energy Technology Centre (SARETEC), as hosted by the Cape Peninsula University of Technology. After lengthy engagement with the Department of Higher Education and Training (DHET), as well as the Manufacturing, Engineering and Related Services Sector Education and Training Authority (MerSETA), SARETEC was constructed at a capital and initial operational cost of approximately R 110 million, a significant vote of confidence in and investment into the renewable energy sector in South Africa.

There have been several institutional and NGO actors involved in the realisation of this facility, including among others DHET, MerSETA, GIZ, SANEDI (South African National Energy Development Institute), DANIDA (The Danish International Development Agency) and GreenCape. Together with industry, they have all played an integral role in getting SARETEC up and running.

The **Wind Turbine Service Technician (WTST)** qualification is the headline qualification of SARETEC, and considerable time and effort has been invested into making SARETEC a world-class training facility and the WTST course a well-structured and appropriate qualification. Notable achievements to date have included the placement of a donated full size Nordex wind turbine in the turbine hall of the facility; sending the trainers to Germany on a “Train the Trainer” programme; and with the support of the GIZ, two groups of technicians were sent to Germany, one in 2013 (GT 1 - 11 trainees) and the second in 2014 (GT 2 - 10 trainees). In the near future, SARETEC should also have a climbable wind turbine tower on their premises.

In February 2016, SARETEC hosted the first South African based WTST course (WTST 1) and subsequent to this there

have been two more courses, WTST 2 and WTST 3. To date there have been 42 graduates from the SARETEC WTST programme, and when adding the 21 German trained WTSTs, there are 63 South Africans who have been formally trained as WTSTs.

In July of 2016, AltGen Consulting was appointed by the GIZ to “Review the career development and professional progress of 3 groups of SARETEC wind energy technician course graduates”. Integral to this is the need to test industry acceptance of the SARETEC trained WTSTs and the appropriateness of the qualification - to ensure that it meets the needs of the wind energy industry. The inference being that if the graduates are well accepted by industry, and in the best-case scenario, in high demand, then it should be apparent that the course is appropriate and serving the needs of the wind industry.

A secondary objective of the engagement is to gauge student perceptions about the value of the training course. And consequent to engaging with the students and the supervisors, the research allows the wind energy industry to create a feedback loop, where the input from supervisors and students is channelled back to SARETEC in order that the course may continuously improve.

Thus, in point form, the engagement outputs include:

- The success of the training course
- Industry acceptance
- Student acceptance / perception
- Industry feedback

Table 1: Summary of all five WTST intakes

Intake	Start Date	Sponsor	Number of Students	Gender Breakdown	In-Service Completed
GT 1	May 2013	Various	11	10 Male 1 Female	September 2013
GT 2	February 2014	Various	10	10 Male 1 Female	August 2014
WTST 1	February 2016	MerSETA	11	10 Male 1 Female	August 2016
WTST 2	August 2016	Nordex, SANEDI	18	16 Male 2 Female	April 2017
WTST 3	February 2017	DANIDA	13	6 Male 7 Female	September 2017

Method

Each of the five tranches of technicians that were trained were engaged with by AltGen. For the first two tranches, the engagement was primarily per telecon, but with the South Africa based WTST courses AltGen were able to interview all of the trainees in person, as well as most of the supervisors, on site during the in-service placement of the trainees. Each supervisor and trainee were asked a structured set of questions and completed an online survey of about ten questions. From the telecons, interviews and on-line surveys, outputs on the appropriateness of the course, industry acceptance and student perceptions were collated. Where possible (WTST 2 & 3) the students were met both before and after their respective courses, and AltGen attempted to match the initial impressions on starting the course, to the final opinions on closing off on the in-service training. After each of the five sets of interviews, a set of recommendations were collated for SARETEC.

Student Feedback

Student feedback can be divided into the direct feedback on the course content and lecturers, and broader considerations about the wind industry as well as their own continued employment. Direct course feedback is further subdivided into commentary on the course content and interaction with SARETEC.

As far as the course content is concerned, the overall feedback is good. There were some concerns raised on specific issues such as time spent on individual subjects (PLC's and general electronics were brought up by the mechanical students, and mechanical drawings were sometimes an issue for electrical students) but the overriding impression from the three SARETEC trained cohorts was one of general academic improvement. The first intake, WTST 1, was in general less positive about the quality of the lecturers, but by the time WTST 3 had taken place, the student focus had shifted and there was virtually no negativity toward the lecturers and a lot more concern was voiced about the general state of the industry. There were however a few themes that were common across the three tranches and these bear highlighting.

Foremost was that none of the lecturers had worked as a WTST or had direct experience working on turbines. It also became apparent from the engagement with the supervisors that the skillset of a WTST is primarily learnt while "on the job". This was further borne out through the engagements that took place after the tranches had completed their in-service training: In instances where the students had been exposed to intense tasks such as gearbox replacements, they were distinctly more confident and positive about the training. By contrast, there were some students who did

not get much turbine exposure, perhaps limited to one or two trips up the turbine for the duration of the training, and these students were not satisfied with the quality of their in-serv nor as confident with their own skills. Which leads directly to the next recurring theme of extending the in-service training, which was echoed by virtually all of the students.

With regards to broader wind industry considerations, as can be seen from the tables that follow, many of the WTST 1 – 3 students are from the South African Air Force or the South African Navy. During the early stages of recruitment in wind in South Africa, during 2015, one of the OEM's recruited specifically military personnel according to a predefined formula: National Diploma, preferably electrical, a few years of work experience, and a military background. The Navy, at junior levels, also does not remunerate very well, and the combination served the OEM well. The feedback that these newly employed wind turbine technicians gave to their ex-colleagues was clearly positive, since the majority of SARETECs applicants for WTST 1 – 3 were from the Navy, and to a lesser extent the Air Force, and interviews with the student were almost universally that they had heard about the wind energy industry through ex-colleagues. Bear in mind that the call for applications for WTST 2 was issued early in 2016, and there was still considerable construction activity in wind at this time. Moreover, the project winners of Bid Window Round 4 had been announced in April of 2015 with financial close expected to be toward the end of the same year. There was thus no reason to doubt the continued roll out of the renewable energy programme.

However, at the same time as WTST 2 and WTST 3 were in process it became apparent that government appetite for fresh renewables was waning, and continued delays in the announcement of the issuing of Power Purchase Agreements meant that uncertainty was creeping into the industry. The students reflected on this in their feedback during the course and were by this time doubting if resigning from full time employment in the military was a sensible decision. Even though most of the students were not paying for the courses, and some received a small stipend, they still suffered considerable financial hardship, to the extent of some of them 'bunking' classes to sell vetkoek at the train station, to afford transport. Several considered dropping out.

Fact is, that from the last two tranches, WTST 1 and WTST 2, of a total of 31 students, the majority – 17 – have not been able to secure any form of employment. Further, 4 of the 31 are on 6-month contracts, and this translates to 21 of the 31 graduates not being securely employed.

Supervisor Feedback

In general, the supervisors could be said to be very positive

about the quality of the SARETEC graduates. The WTST 3 interns were all qualified and work-ready to be able to “walk in” to the job of being a WTST, with the basic modules of Working at Heights, Fire Awareness, First Aid, and Working in Confined Spaces having been completed with an external service provider. This work-readiness is a plus to any employer, saving time and money in training new recruits. The general level of readiness of the SARETEC trained technicians was appreciated, and in most cases the work ethic of the technicians was viewed positively. Comments from the supervisors included that the interns displayed a higher level of health and safety awareness than the full time employed technicians, and that the interns were better prepared to be WTSTs than most of their current technicians were when they were initially employed.

In common with the student feedback though, all the supervisors felt that the in-serv component should be lengthened to allow the interns to receive meaningful turbine exposure.

Overall Acceptance of the WTST Course by the Wind Industry

The WTST course is becoming better known, but the two points highlighted by the supervisors above can be interpreted in another way. Firstly, the barrier to entry into becoming a WTST is low. Completing the SARETEC course and the internship, becoming a “certificated Wind Turbine Technician”, is not a legal requirement. It is only the four basic modules of First Aid, Working at Heights, Working in Confined Spaces, and Fire Awareness, that the Occupational Health and Safety Act requires to legally work on a turbine. Also, turbine manufacturers do not require their staff to have a WTST certification. At most they require the four basic Global Wind Organisation (GWO) modules, and then their own turbine specific training.

Which speaks to the second issue around industry acceptance: there is clearly no substitute for ‘on-turbine’ experience. This was borne out by the students as well as the supervisors, and by the OEMs own recruitment strategies. The more time that a WTST spends on the turbine the better, and all of the European OEMs that AltGen has engaged with, in South Africa, have their own technician trainer and a well-structured and turbine specific training program.

The combination of these two factors directly lead to the following telling comment by a student: “I would not recommend to my friends to complete the course. There is no need to complete it [the course]. You can do the legally required modules for much less money and in less time, and still get a job”.

At the end of the 18-month long engagement, AltGen

attempted to contact all graduates across the five intakes to build a “career map” of where they found themselves. Of the 63 graduates, 16 were unreachable with information on where these graduates currently are being derived and assumed from secondary sources such as class colleagues and LinkedIn profiles.

Of the 63 graduates across all five of the programs, we are reasonably certain that the following applies:

- 33 are specifically filling roles in wind
- 13 have left the wind energy industry
- 17 of are unemployed

Of the 33 that are in the wind energy industry, around 12 or so, from Eskom and Nordex, were sponsored by their current employer. What this means is that they did not have to look for jobs in wind, they were for all intents pre-employed.

When considering the two most recent tranches, WTST 2 & 3, only 13 of the 31 students who completed the training are presently gainfully employed.

Further, including the recruitment for the recently commissioned Siemens turbines for the Loeriesfontein and De Aar wind farms, there is currently close to 200 turbine technicians in South Africa of which only 33, approximately 17%, are SARETEC graduates.

Myth Busting

Myth 1: “If the REIPP had rolled out the way as was envisaged, there would not be as many unemployed SARETEC graduates”: This is only partly true.

- The SARETEC course is a long one, five months plus two months internship, for a total of seven months, there are at most two tranches per year from SARETEC. These graduates all arrive on the job market at the same time and OEMs, as with any commercial employer, only appoint when they must;
- Compounding this is the fact that since the barrier to entry into the profession is low and the professional itself is learnt “on-the-job” it is a fairly simple process to recruit a technical individual and train them;
- “On-turbine” experience is worth more than the SARETEC experience, thus if an application arrives on an employer’s desk from an individual who has direct on-turbine experience, regardless of their certifications, they will likely be chosen over and above a SARETEC graduate;
- Recruiting from engineering service suppliers is another common strategy. Whilst the OEMs and their

service suppliers may have non-compete clauses in their contracts, an engineering services company that supply’s inspection or warranty services to an IPP or an OEM will likely defer should the OEM request to appoint one of their staff. This is the shortest and most effective route to filling a vacancy – employing from one of your service providers. The candidate is already aware of the OEMs process, procedures and conditions of employment.

Myth 2: That SARETEC graduates will be absorbed by other industries.

This statement is not necessarily true for two reasons. Firstly, the qualification is not well known in industry, and secondly, the South African economy is growing at less than 2% per annum. What this means is that with unemployment already at extremely high levels in South Africa there are very few jobs to go around.

Myth 3: That SARETEC graduates are internationally mobile and can work anywhere.

AltGen undertook an exercise to test this assumption (which we believed to be true) and attempted to collate the necessary

documentation from the unemployed students from WTST 2 and 3, and of 15 odd students that we contacted, there were only four that had passports and could travel internationally. When presenting their CVs to a large OEM, there was no interest at all. The students were simply not experienced enough.

As for working into Africa, it should be made clear that in all the African countries that AltGen has worked in, where significant recruitment projects were undertaken on behalf of OEMs, the strategy was the same as in South Africa: recruit locals. There is simply no need for South African WTSTs in Africa.

“Targeted Training”

The WTST course fills a niche in the wind industry in South Africa. It is locally relevant and provides an excellent introduction into the wind industry. However, it could be adapted and refined to be more targeted. By way of example, if Bid Window Round 4 proceeds, then four of the BWR4 projects will be near Laingsburg - a depressed community, with high levels of poverty and unemployment, and the wind farms could and should have a significant, positive and long term economic impact on the area.



Figure 1: Wind Farms near Laingsburg

If all four wind farms do go ahead, then they will require no fewer than 32 WTSTs but, the OEMs are likely to bring in some skilled staff from other wind farms to get the facilities off to a smooth start. OEMs are however motivated by job creation requirements in the Implementation Agreements, to employ locally, and it is in this context that SARETEC could, in close collaboration with the OEMs, source and recruit no more than 10 or 12 of the best local technicians that are available to complete the four basic GWO certified

modules and have the OEMs agree to appoint them prior to the training starting, on the proviso that they retain right of refusal should they not be satisfied with the skill levels of the candidates.

In conclusion, while the progress that SARETEC has made is commendable, challenges remain, not the least of which is the uncertain rollout of utility scale wind in South Africa.

Table 2: GT 1 Graduates currently employed in Wind (8/11)

Graduate	Organisation	Title	Status of Employment
Mtutuzeli Loliwe	Eskom	Senior Technician	Employed
Leonard Andrews	Eskom	WTST	Employed
Alistair Jacobs	Eskom	WTST	Employed
Martin Bastian	Eskom	WTST	Employed
Etienne Frans	Engie (West Coast 1)	Operation & Maintenance Performance Engineer	Employed (was previously at Nordex)
Lowethu Mxenge	Enel Green Power	Electrical Supervisor	Employed (was previously at Nordex)
Luthando Nodada	Vestas	Service & Commissioning Engineer	Employed (was previously at Nordex)
Jonathan Venter	Nordex	Commissioner	Employed
Abar Sharriff	Obelisk	Head of Technical	Employed
John Padbury	Freelance	Consultant	Employed – left wind
Bernard Joseph	Tormin Mineral Sands	Mechanical Fitter	Employed – left wind (was at Sere)
Jacobus Bernard Vos	Family Farm	Sheep Farmer	Employed – left wind

Table 3: GT 2 Graduates currently employed in Wind (5/10)

Graduate	Organisation	Title	Status of Employment
Donegan Scheepers	Eskom	Technical Controller	Employed
Rito Sunduza	Biotherm	Plant Operator	Employed
Lamla Vusani	Biotherm	Plant Operator	Employed
Rhygin Campbell	Siemens	Quality Inspector	Employed
Felix Biehlfeld	ETA Wind	Managing Director	Employed
Sulana De Jager	Globeleq	Solar Technician	Employed
Christopher Cloete	Unknown	Unknown	Unknown
Michael Horner	Duroplastics	Mechanical Engineer	Employed
Kalin Pakraj	Durban Harbour	Operations Manager	Employed
Waydon Esterhuizen	Koeberg Nuclear Power Plant	Technologist	Employed

Table 4: WTST 1 Graduates currently employed in Wind (6/11)

Graduate	Organisation	Title	Status of Employment
Reynold Kleinsmidt	Vestas	WTST	Employed
Gavin van der Merwe	Vestas	WTST	Employed
Stanley Lange	Biotherm	Operator	Employed
Jacques Redelinhuis	Biotherm	Operator	Employed
Bekithemba Spalla	Dorper Wind Farm	Junior Engineer	Employed
Thato Manamela	Suzlon	WTST	Employed
Lwandile Jabavu	South African Airforce	Aircraft Technician	Employed
Lukhanyo Mangcaka	South African Navy	Artisan	Employed
Mpapi Seakamela	Zizwe General Services	Site Supervisor	Employed
Yandisa Soji	Zizwe General Services	Electrician	Employed

Table 5: WTST 2 Graduates currently employed in Wind (9/18)

Graduate	Organisation	Title	Status of Employment
Jacques Volkwyn	Vestas	WTST	Employed
Aluwani Matshidze	Nordex	WTST	Employed
Musawenkosi Nkomo	3Energy	WTST	Employed
Mvuzo Nkoyeni	Nordex	WTST	Employed
Yongoma Nikelo	Nordex	WTST	Employed
Oliver Matemane	Nordex	WTST	Employed
Vusimuzi Sibisi	Nordex	WTST	Employed
Msimelelo Ntshangase	Nordex	WTST	Employed
Sifiso Nyalungu	Nordex	WTST	Employed
Pedjat Macuvele	Sener/Acciona	Mechanical Project Engineer	Employed – left wind
Clayton Topkin	- Has interview with Siemens -		Unemployed
Palesa Marobe	-	-	Unemployed
Ntandazo Hlezumpondo	- Was with Nordex on 6-month, contract - terminated 10 Oct 2017 -		Unemployed
Yolisa Mbekela	-	-	Unemployed
Asemahle Mtwana	-	-	Unemployed
Daylin Oliver	-	-	Unemployed
Napo Matsoso	- Was with Nordex on 6-month contract. Ended 10 October 2017 -		Unemployed
Danny Tshandu	-	-	Unemployed

Table 6: WTST 3 Graduates currently employed in Wind (4/13)

Graduate	Organisation	Title	Status of Employment
Wynand De Kock	3Energy	WTST	Employed (6-month contract)
Motjatji Malatji	3Energy	Facility/WTST	Employed (6-month contract)
Relebohile Marumo	3Energy	Facility/WTST	Employed (6-month contract)
Elethu Mvunelo	3Energy	Facility Technician	Employed (6-month contract)
Nontsasa Gaga	-	-	Unemployed
Nokubonga Ximba	-	-	Unemployed
Sonwabo Gqokoma	-	-	Unemployed
Sicelo Gumede	-	-	Unemployed
Sabelo Mabandla	-	-	Unemployed
Lulamela Majiza	-	-	Unemployed
Apelele Tyali	-	-	Unemployed
Siphosakhe Mazibu	-	-	Unemployed
Sinesipho Pongoma	-	-	Unemployed

PART 1

Recommendations for SARETEC

In-service Training and Placement

Most of the students and the supervisors had a common view on in-service training. With routine turbine maintenance scheduled for different times of the year, exposure to the turbines can be limited to the point where over an 8-week period it can involve no more than a handful of trips up the turbine and completing a few oil-changes.

The in-service training also takes place at different types of service providers. With OEMs providing by far the bulk of O&M services they are the obvious first choice for internships, but a lack of placement possibilities has meant that interns are also placed at engineering services companies where direct turbine exposure is limited and in some case non-existent. For some of the interns this was not a problem, but for others it has meant that they have received limited or no real exposure to the turbines and for them the internship has been a loss.

Compounding this potential lack of exposure is the fact that the maintenance schedules of the operating OEMs in South Africa are not aligned which creates a disjunct between the types of training that the various SARETEC students receive.

While SARETEC does provide a logbook to the interns, which the supervisors are asked to sign off, it is not clear to what extent this feedback reaches SARETEC and if it does, how it is acted upon.

RECOMMENDATION 1

SARETEC has a 'duty of care' to the graduates and to this extent the type of placement students are allocated to could be better coordinated. The students should be placed, as far as is possible, with the type of company that best suits their skill set and future aspirations. At present, the placement providers are invited to interview the graduates and choose their preferred candidates. It is AltGen's recommendation that this process be reviewed and that, rather than the providers choosing candidates, SARETEC should proactively recommend candidates to specific types of companies - depending on where they are in their maintenance cycles.

Another recurring theme from the respondents was that the in-service placements were not arranged timeously, which made the graduates anxious and led to comments about a 'lack of transparency'. For WTST 3, one student commenced with her internship after some of the others had already

completed theirs, and she only received this placement after AltGen's intervention and appeal to an OEM. Since SARETEC considers the internship an obligatory requirement to graduate from the course, it is important to ensure that the placement of students is well coordinated and on time. For this, there is a need for open dialogue between the wind industry in South Africa and SARETEC.

RECOMMENDATION 2

Within SARETEC the coordination of the placements is the responsibility of the Administrator, and to the extent that it is administratively onerous, this is a necessity. This being said, it is AltGen's recommendation that the responsibility for sourcing placements be escalated to the Operations Manager or Lead Trainer who should be in close contact with industry and acutely aware of where the various OEMs and engineering service providers are in their processes.

Length of internship

Two months is clearly too short a period for an effective internship and this should be extended to at least three months, but, this needs to be done mindful of where the student is placed. It is of little benefit to the student to extend the in-service training if they are not receiving appropriate/relevant in-service training.

RECOMMENDATION 3

In-service training to be extended to at least three months and if possible longer.

'On-turbine' experience of lecturers and exposure to OEMs

While it has been mentioned that the students generally enjoyed the lecturers, commending some of them on the knowledge they possess, virtually all the students felt that the lecturers lacked "on-turbine" experience evidenced by responses to the student's questions sometimes being a simple, "I don't know". One student commented that a lecturer did not know where the exit hatch was on a turbine, and that in the safety briefing explanations they were not taught the correct place to clip on when exiting the turbine.

RECOMMENDATION 4

The first part of this recommendation is that every lecturer must regularly go up a turbine, even if just to maintain familiarity with the feeling of being 100m high off the ground in an enclosed space doing maintenance work. While there are obvious safety and insurance issues to overcome to make this happen, regular field trips for all the lecturers to experience real on-turbine exposure is imperative.

The second part of this recommendation is that SARETEC should employ, even on a contract basis, a Lead Technician as a lecturer. While in the recent past this may not have been possible, South Africa is quickly growing a pool of good 'on-turbine' talent, and being able to secure some of this talent to lecture at SARETEC should hopefully not be too problematic.

Student sourcing, selection and failing

It is apparent that not a single student has failed the course. With 63 graduates, SARETEC has either refined the selection process to the extent to which all the students selected are going to pass, or the passing criteria is too low. But by rights, with 63 graduates and 5 courses completed, at least a few students should have failed by now.

RECOMMENDATION 5

That the passing/failing criteria be clear and that students undertaking the course should not assume that they will pass it. By applying a set of acceptable and transparent passing criteria, SARETEC may find that there are fewer issues with placing those that do pass since fewer passing students will mean fewer placements to arrange with only top-quality graduates and that the course gains a reputation of excellence thereby creating a 'pull' from the OEMs to acquire students, as opposed to a push from SARETEC for the OEMs to take students.

PART 2 – September 2016

WTST 2 Entry Interviews

AltGen went onsite to SARETEC on 9th September 2016 to interview the WTST 2 student intake comprising of 18 students, of which 15 were sponsored by Nordex and the remaining 3 sponsored by SANEDI-GIZ. AltGen engaged with 6 groups of 3 students over a period of 30 mins, introducing the study, answering any questions they had, guiding them through the survey which they completed on their own, and asking general questions regarding their background and engagement with the course.

This report summarises the outputs of the engagement followed by a summary of the SANEDI students as well as key points for further discussion between stakeholders.

Most of the students (15) resided permanently in the Western Cape, 13 students lived in and around Cape Town, including 7 in Cape Town and an additional 6 in the surrounding areas (Tokai, Goodwood, Khayelitsha, Bellville, Eerste River and Brooklyn). Two students resided in Vredenburg and Malmesbury, while the three remaining students that resided outside of the WC come from PE, Johannesburg and Durban.

The students presented a mix of those previously employed and a few with no work experience, predominantly with a background in the military, and none of them had previous RE or Wind experience. Regarding education, a majority of the students hold a National Diploma in electrical/mechanical, with one SANEDI student with a BTech.

During interviews, the students were all very excited with some nervousness about the prospect of getting hired fulltime

in the industry following the training. AltGen discussed the many options and resources potentially available to them post their training. It was also explained that each student would have an equal chance of gaining employment depending on personal performance and availability of positions onsite during the point they graduate. AltGen showed them some resources, such as the Energy Blog REIPP map which displays the geographical spread of WFs across the country, and explained the different phases and stages of awarded projects in the country, potentially mapping the future opportunities when more WFs come on-line.

Survey Responses

Most of the students had heard about SARETEC through a colleague, who had either taken the WTST 1 course or who was applying for the course. One student reported walking past the SARETEC centre and looking up the details online out of curiosity (*Figure 2*).

From the employed students, most were military technicians in either the Airforce or Navy and one other student was an electrical installer. The others that were unemployed came from the military, telecommunication, or oil & gas industries. One selected person reported being from the wind industry, but this was a misinterpretation of the question as they reported their title as a student of SARETEC WTST programme (*Figure 3*).

Out of the 18 respondents, two faced personal obstacles

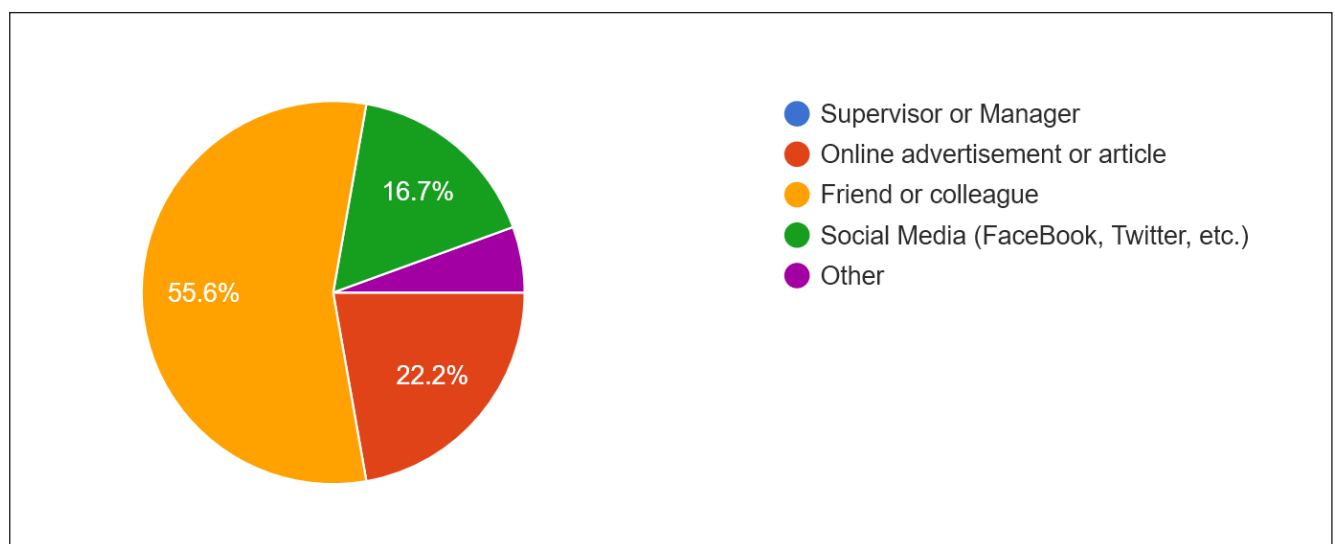


Figure 2: Graph showing how the graduates from WTST 2 heard about the course

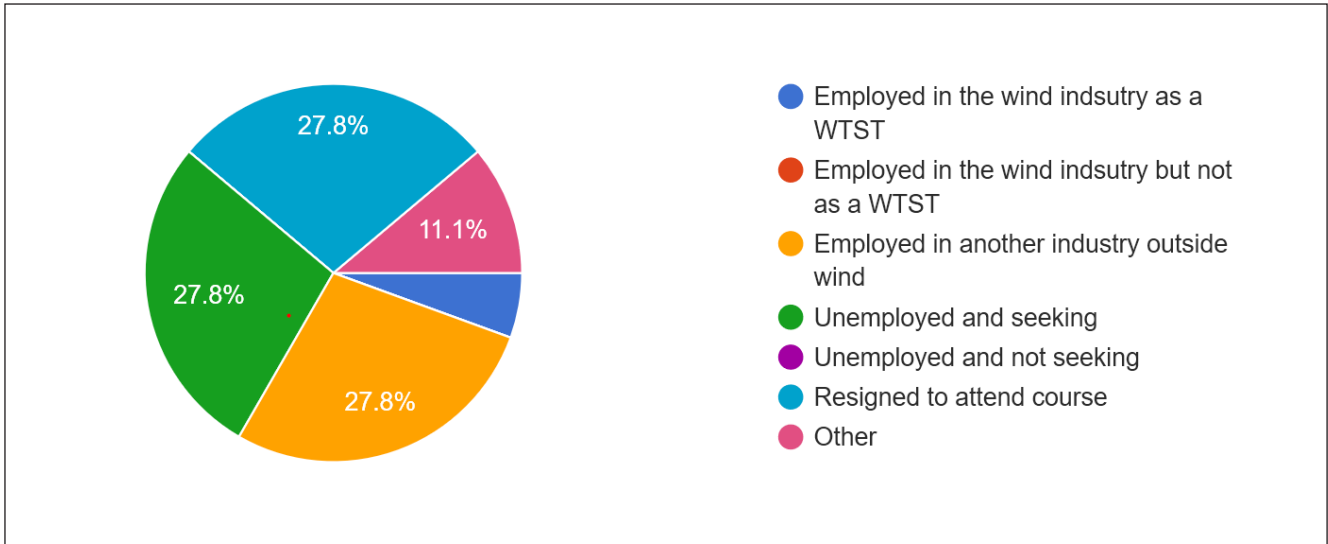


Figure 3: Employment status of the graduates prior to attending the course

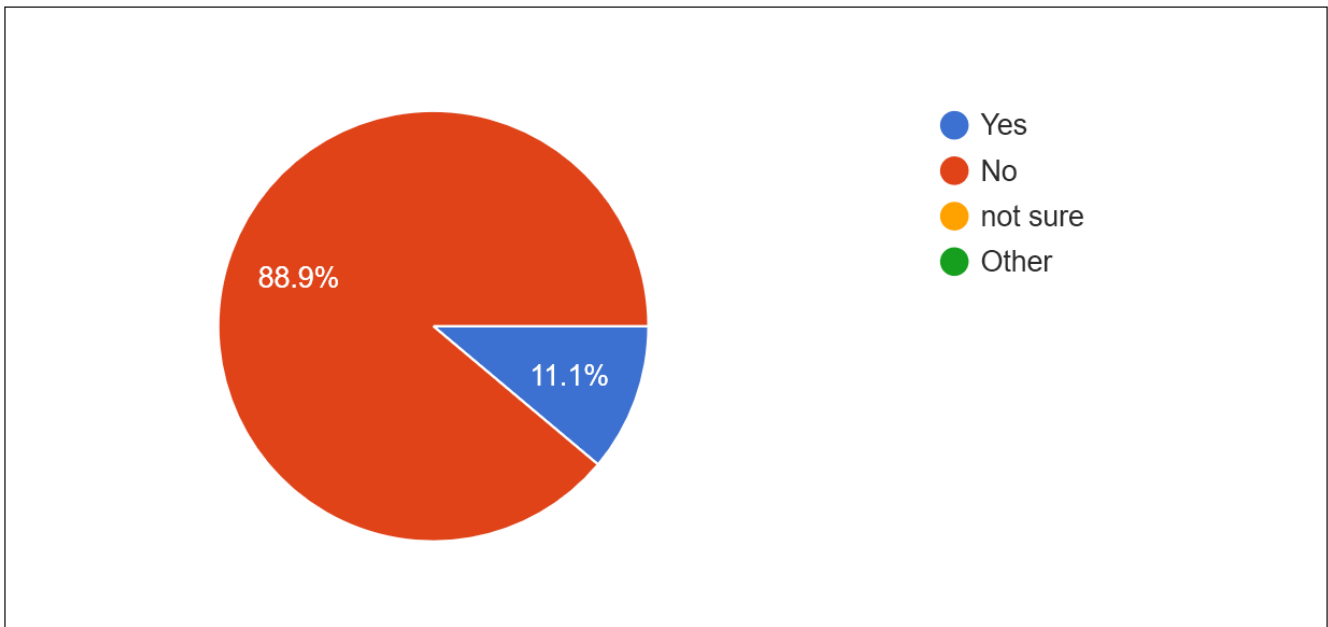


Figure 4: Number of graduates who encountered obstacles in order to enrol to the course

which was a result of having to resign from their current employment in the military. Many of the other students were able to take unpaid leave or work part-time during the 7-month programme. As most of the students had previous

experience living in rural locations, away from home, none of them said they would find it difficult living in rural locations close to site (Figure 4).

The reality of being rurally located has proven to be quite different. AltGen has engaged with many (70+) technicians on wind farms, and the rural location is repeatedly brought up as a hardship that must be endured and many of the WTSTs employed at very remote locations are not happy.

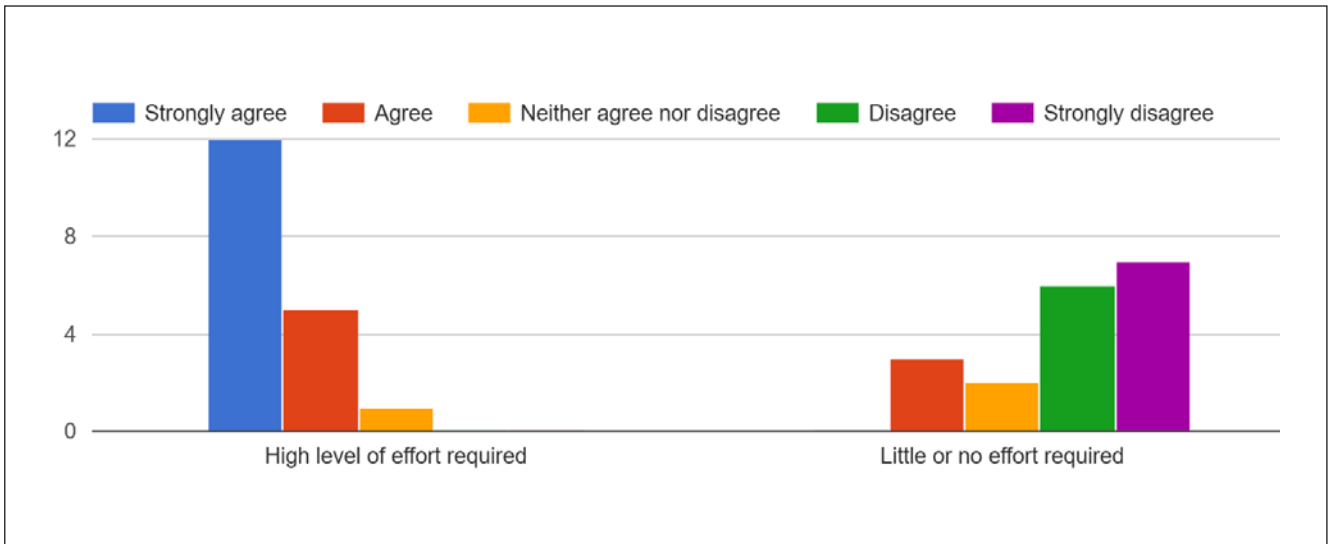


Figure 5: Expected Level of effort required to complete the course

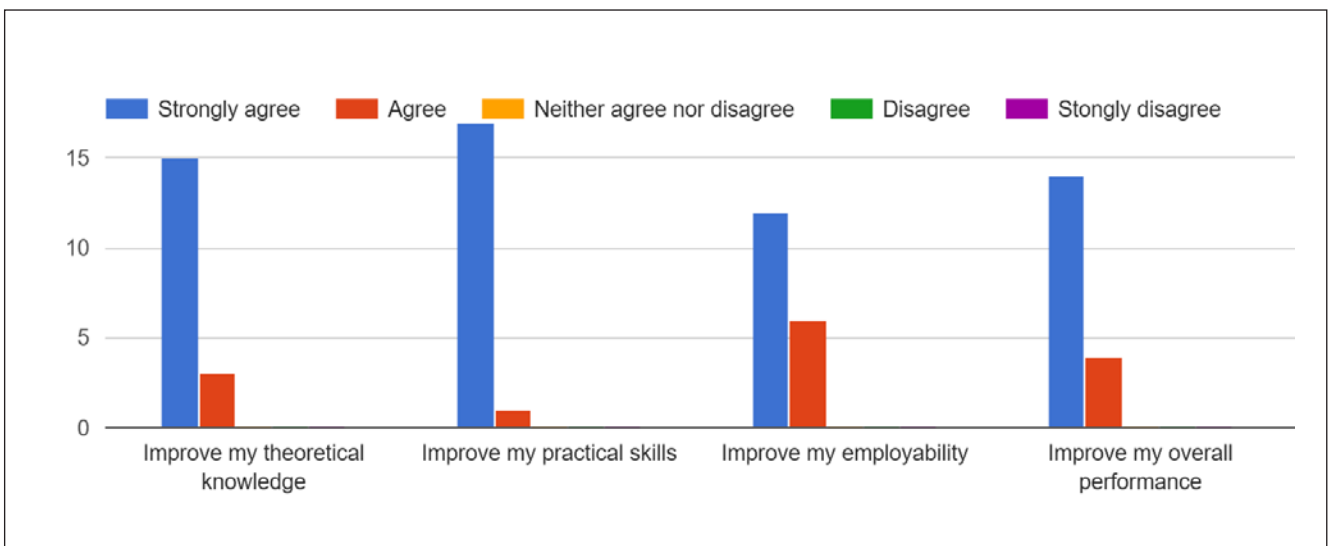


Figure 6: Anticipated value of the course

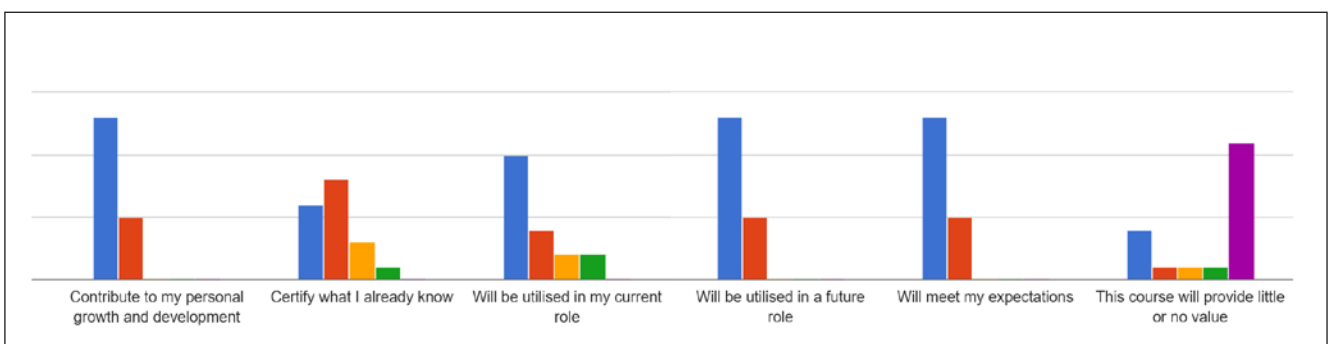


Figure 7: Anticipated value of the course

The anticipated value of the course and meeting expectations resulted in quite positive perceptions. Most students agreeing strongly and agreeing on improving theoretical knowledge,

practical skills, employability and overall performance, as well as contributing to personal growth and development.

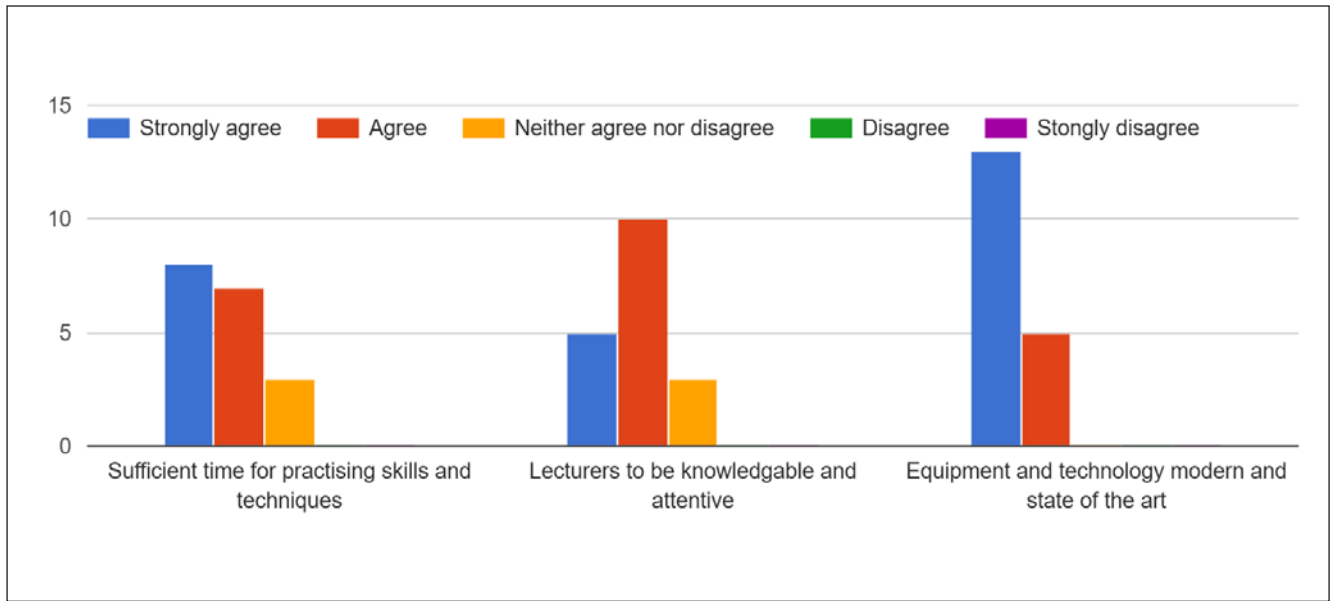


Figure 8: Anticipated course content

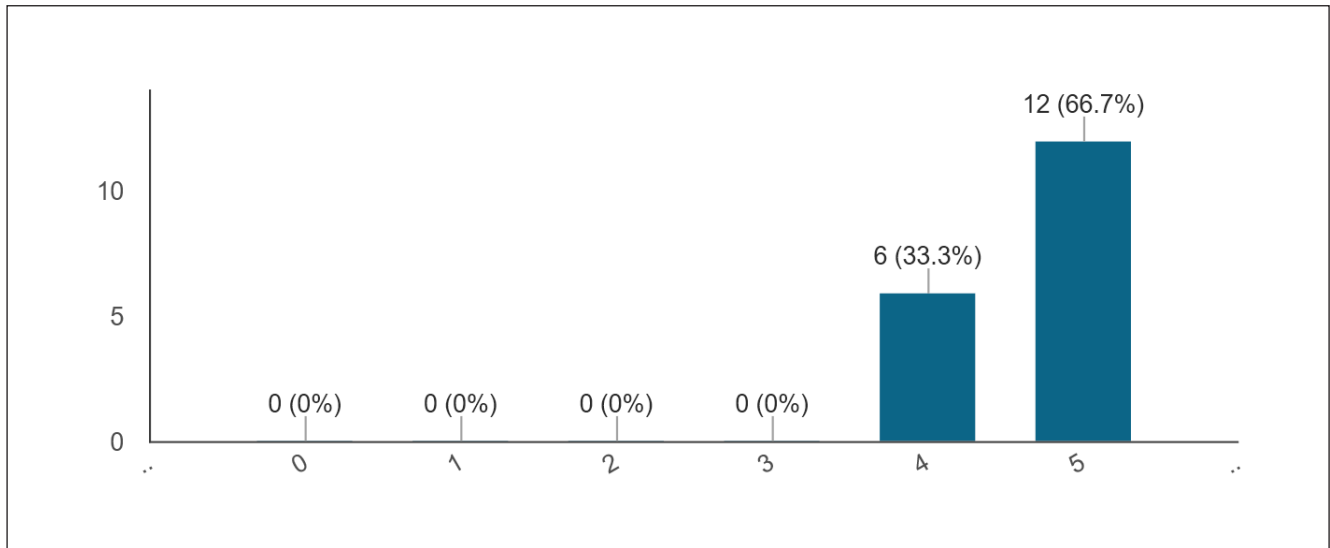


Figure 9: How the graduates anticipated the value of the course would provide them and their career

The students were 4 weeks into the course content by the time these interviews were conducted, and while perceptions may have been different from the beginning of the course, all the students reported quite positively on the quality, time allocation and knowledge of the lecturers (Figure 8).

Students had high expectations for the course and the value that it would add to their careers, as displayed above. 12 students rated the course 5/5 and 6 others 4/5 (Figure 9).

Key Points

During AltGen’s introduction to the groups, one question about employment prospects following the training was asked repeatedly. It later became apparent that those asking were generally those that had resigned to take the training opportunity. Others, while they had not resigned, were

equally not excited about trying to return to their previous positions, thus expressing the same reservations about their future, which leads to a summary of recommended possibilities being:

- **Some of the students expressed that they heard not all the students from WTST 1 had been absorbed into the industry.**
- Clear communication about employment opportunities and possible absorption into industry following in-service training;
- Support to students to find work (CV structuring, client interviews/introduction/recruitment portals – AltGen, PNET, SAWEA, etc.);
- Communication streams from industry identifying WTST positions and/or scheduled maintenance plans where increased capacity is required;

- Strategies to offer graduates to other industries;
- Communication between stakeholders;
- Communications between Nordex, AltGen and GIZ regarding in-service training and employment plan;
- Lines of communication for students during and post in-service training;
- RPL options, timelines, costs, etc for German trained students.

PART 3 – October 2016

GT 1 & 2 and WTST 1 Follow Ups

This section summarises the outputs of the first of two sets of interviews and an online survey conducted with students whom attended BZEE WTST training in Germany during 2013 and 2014. A brief comparison between past German trained and WTST 1 SARETEC trained students is included, concluding by bringing key points and suggestions forward for further discussion between stakeholders.

Engagement Method

AltGen compiled a contact sheet with information of all the students who participated in the BZEE training in Germany. The first group was made up of ten students whom attended training from 24 February – 21 May 2013 and the second group of eleven students attended their training from 06 May – 30 July 2014.

Initially, an introductory email was sent to all BZEE participants which contained a link to an online survey asking them to confirm that they received AltGen’s communication and to inform AltGen of a suitable time and date for a telephonic interview. An attachment was also added to the email in which GIZ introduced AltGen Consulting and the research.

Of twenty-one students, a sample of twelve (57%) completed the online survey and eleven (51%) of the twelve were available to participate in a semi-formal telephonic interview with AltGen Consulting.

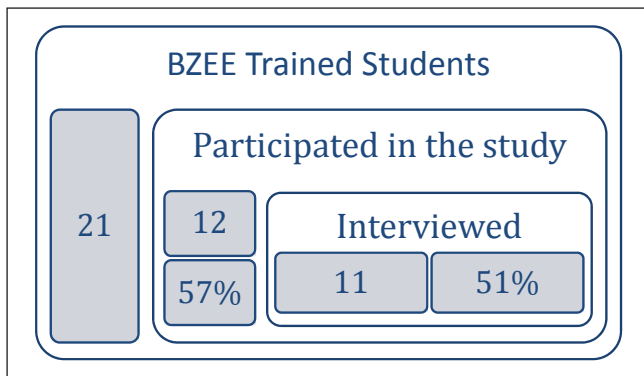


Figure 10: Breakdown of the BZEE graduates who actively took part in the study

The remaining nine (43%) students did not participate in the study, either because of their current schedules or simply due to them being uncontactable.

Of these nine, four were busy with annual maintenance on respective wind farms or other strenuous work responsibilities during the time of the engagement and therefore found it difficult to take part in the study. The remaining five students did not respond to email communication and the contact numbers available for them seemed to be deactivated or they did not respond to calls or voice messages left by the AltGen consultants.

AltGen Consulting made use of platforms like LinkedIn and the AltGen Recruitment database to search for alternative contact details.

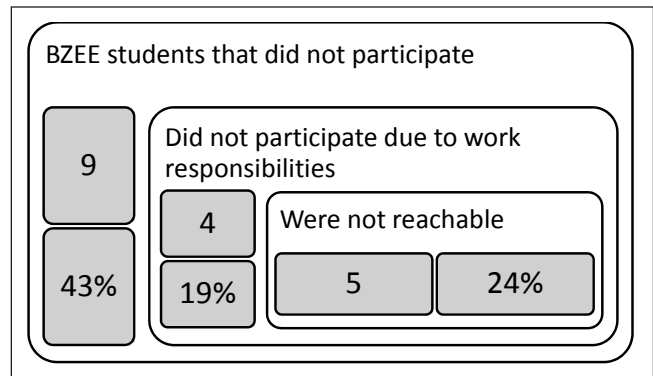


Figure 11: Breakdown of BZEE Graduates who did not take part in the study

The eleven students that participated in the study were very cooperative and happy to set aside some time for telephonic interviews and to complete the survey.

An introductory email was sent out to the participants on 08 September 2016 and telephonic interviews were conducted from 13 September until 29 September 2016 at times that were convenient for the students. It was estimated that it would take approximately twenty minutes for a student to complete the survey. The duration of telephonic interviews lasted between fifteen and forty minutes depending on how engaging the student was and how much information they were willing to share.

As the studymatured and a dialog between AltGen Consulting and GIZ opened, more questions for the students started to organically emerge. These new questions were added to the survey after a few students had already completed the survey, but they were included in the telephonic interviews

for all those taking part. The new questions were as follows:

1. As part of the study of WTST skills in SA, AltGen Consulting is conducting a salary survey to benchmark the salaries in the wind industry. If you feel comfortable, please could you share your current cost to company and indicate any benefits?
2. Are you interested in international work opportunities outside of South Africa if they became available?

Demographic of Students

Of the candidates who took part in the BZEE training, the eldest was 49 years old and the youngest was 21. With one female in the group, the remaining 20 were male and the sample was made up of varied races (White, Black, Coloured). The absence of females in the candidate pool was attributed to the gender gap in the industries of mechanical and electrical technicians (StatsSA, 2013). In terms of geographical distribution, the students resided in the Western Cape, Eastern Cape and Northern Cape provinces of South Africa (Figure 12).

Education Background of Students

Varied levels of qualification, [N levels (3), National Diploma (4), Bachelor of Technology (3), Bachelor of Engineering (1), Postgraduate Diploma in Engineering (1), Master of Engineering (1), Matric and other short courses (1) and Unknown (7)] (Figure 13).

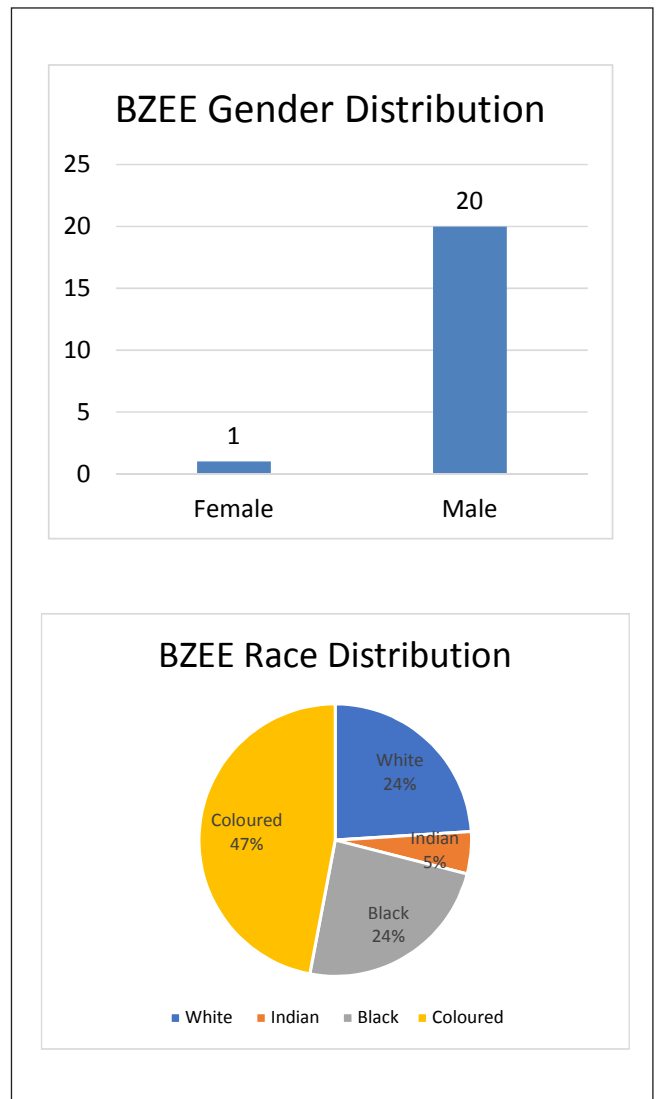


Figure 12: Gender (top) and Race (bottom) distribution for both GT 1 and 2

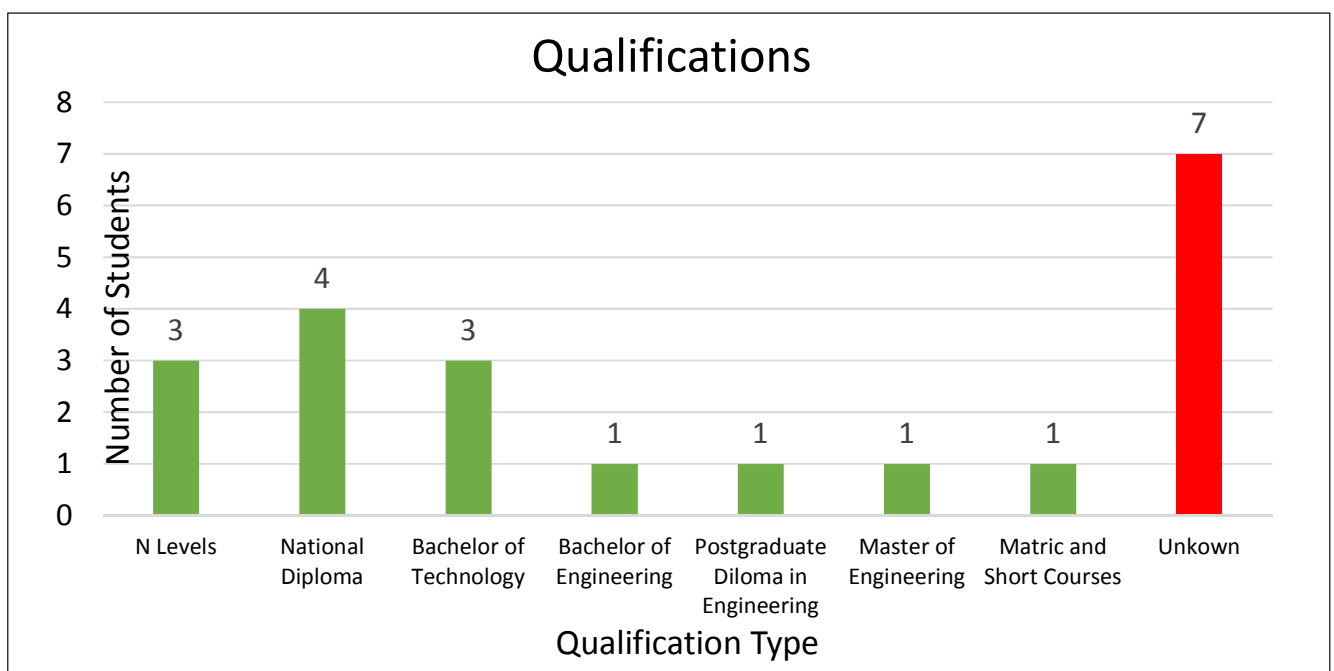


Figure 13: Education backgrounds of the GT graduates

Professional Background

Below is a list of known employers with whom the students were employed with at the time of the German training:

- Nordex 
- BioTherm 
- Eskom 
- Wind Prospect Africa 
- Obelisk 
- Unemployed

Online Survey Responses

Eleven out of twelve students (91.7%) stated that they heard about the course through a supervisor or manager, and four of them were sent on the training shortly after being employed by Nordex. One of the students had checked the box “other” and later explained that he came across the course on *Green Talent* and decided to pursue it as he was looking to make a career move at the time (Figure 14).

The majority (eleven from twelve) of students did not face personal or professional obstacles to enrol in or attend the course as they were sent to the training by their employers. One student indicated that they faced challenges and motivated this answer by stating that they had to pay for the course themselves as their employer didn't send them on the course (Figure 15).

One student indicated disagreement with the statement “High level of effort required” and cleared this up during their telephonic interview by stating that it was not a strenuous course, but a good introductory course (Figure 16).

The feedback on the course content was generally positive and although most students felt that the lecturers were knowledgeable and attentive, some students mentioned that there was a language barrier at times with two of the lecturers. A student also mentioned that one set of notes was in German but fortunately one of the students in the intake was fluent in German and would help translate when the others did not understand.

One student indicated that they strongly disagreed with the statement “Equipment and technology are modern and state of the art”. This student was employed as a WTST by Vestas at the time and had a good grasp on the latest turbine technologies (Figure 17).

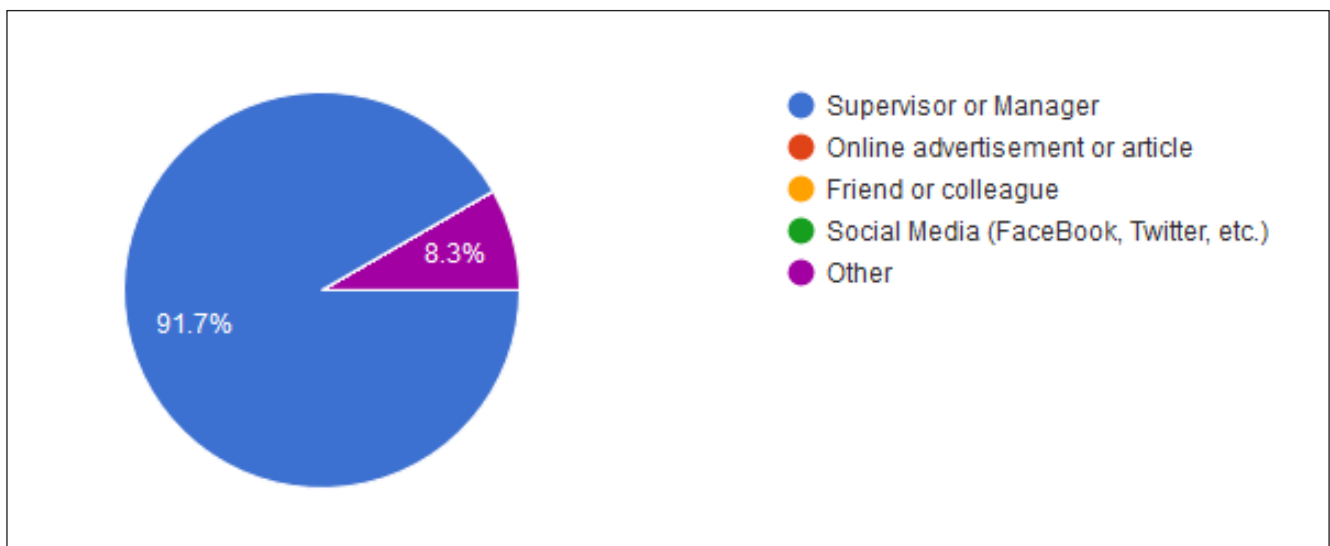


Figure 14: Graphic showing how the graduates heard about the course

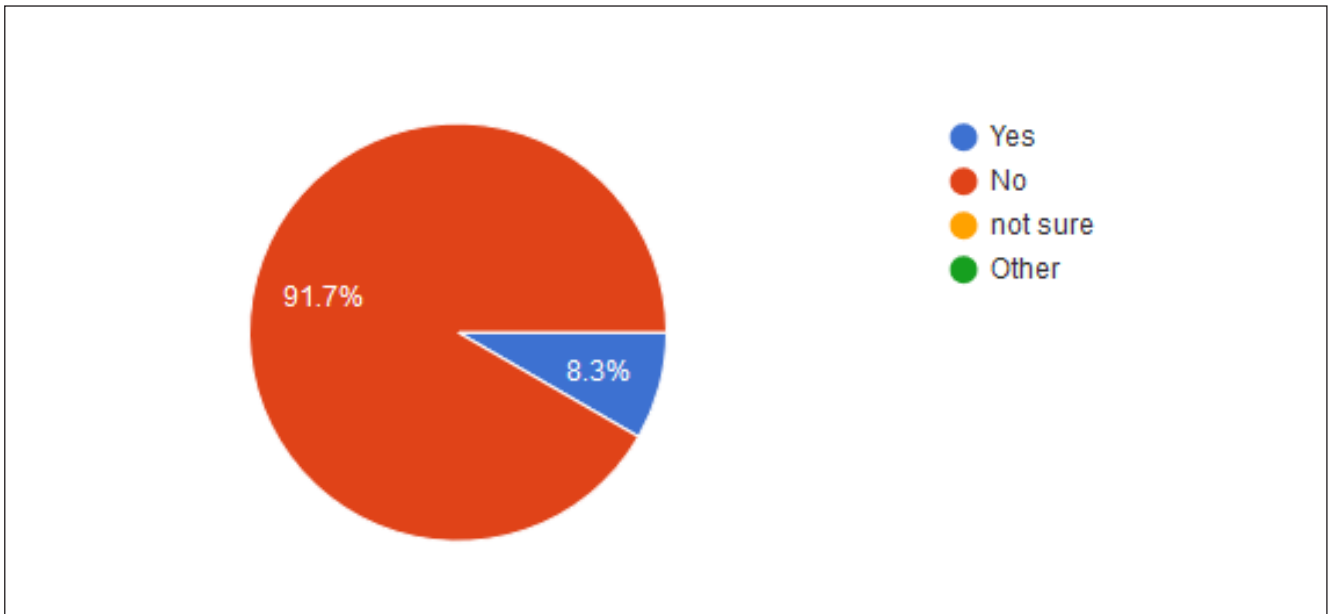


Figure 15: Percentage of graduates who encountered obstacles when trying to enrol or attend the course

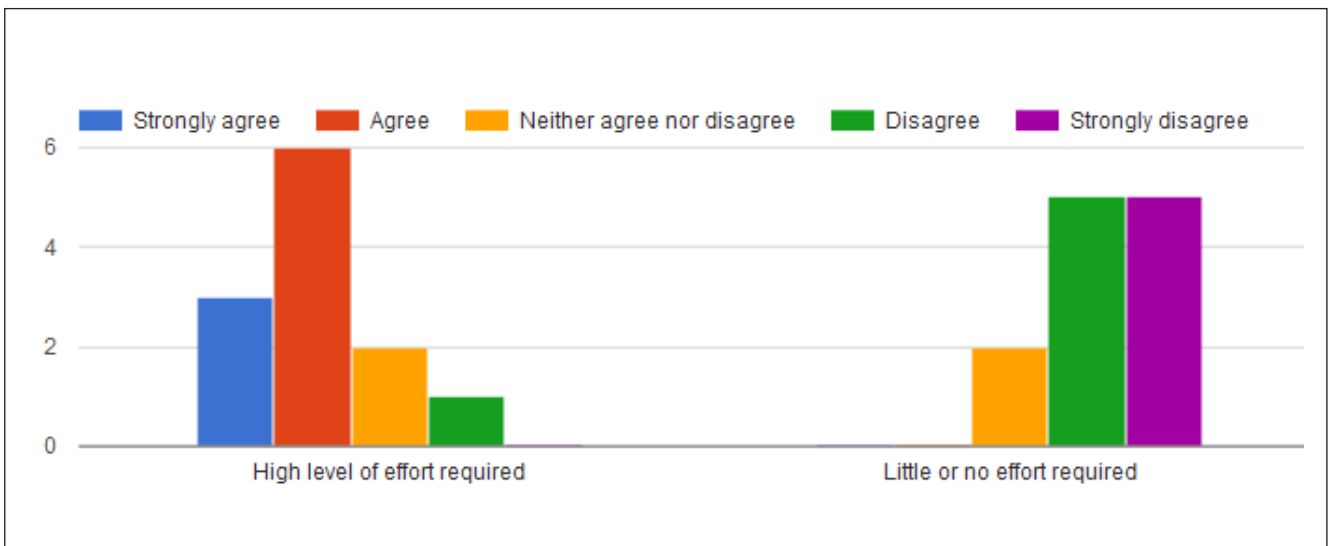


Figure 16: Level of effort required to complete the WTST course

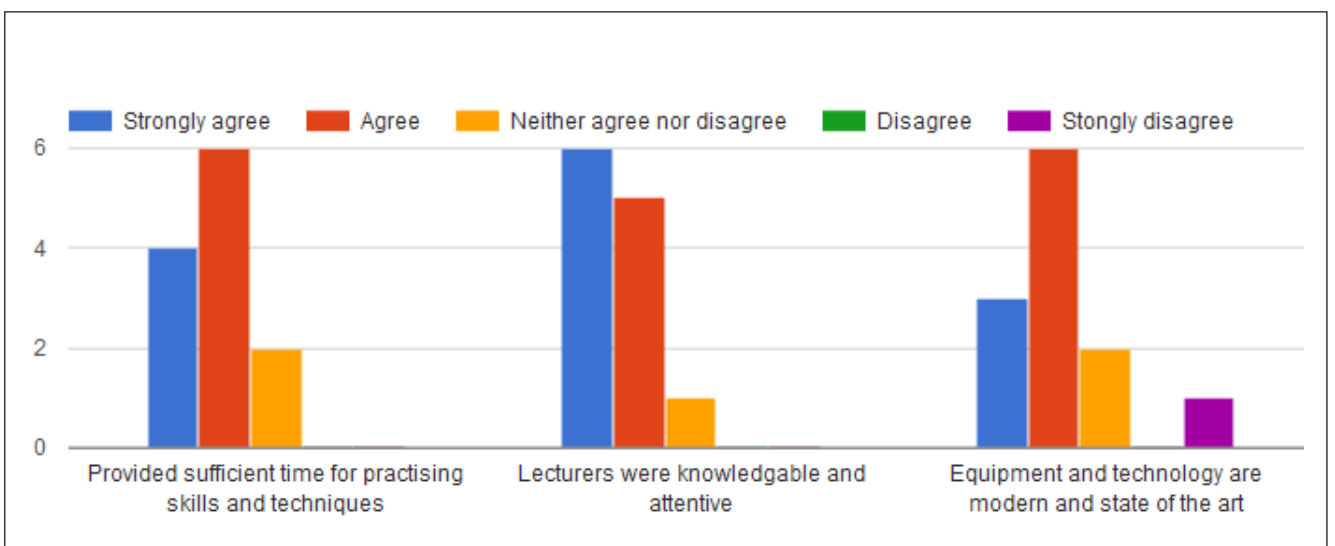


Figure 17: Reflections on the course content

The students indicated that the course had significant value for their careers. One student stated that, although he never worked as a technician after returning from the training, he used the skills that he had acquired regularly during other wind farm activities. An example of this was when he had to assist with repairing a blade. Two of the students who were employed by BioTherm as plant operators at the time had not had the chance to work on turbines as the owners' employees are not permitted to work on OEM's turbines. Both students voiced their frustration with the situation as they were led to believe that they would fill the role of WTST once they return from the training in German. Furthermore, learners felt that they had gained the following from the course:

- Good overview of electrical and mechanical skills
- In-depth understanding of wind turbines
- Practical safety awareness and knowledge

- Good balance between practical and theoretical component

All the students who completed the survey indicated that they would recommend the course to someone else. It was deduced that this course recommendation directly correlates with to the courses value. The students indicated that they would recommend the course to mechanical and electrical engineering students, recent graduates, working WTSTs and anyone who is wanting to enter the wind industry (Figure 18).

From the graphic above it is evident that most of the students were working in the Wind Industry (83%). However, only 16.7%, or two, of the twelve students who took part in the study are working as turbine technicians. Eight of the students were working in the wind industry, but not as turbine technicians. The roles that they occupied included Plant Operator, Electrical Supervisor, Head of Technical, Quality Inspector, Operations and Maintenance Supervisor and Commissioning Engineer.

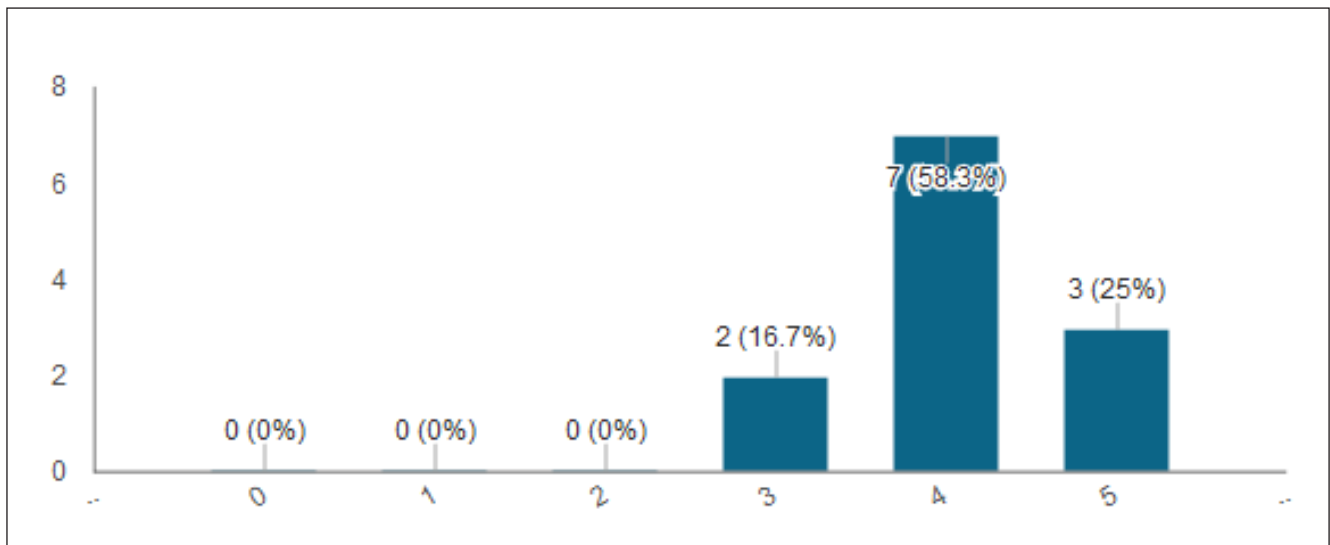


Figure 18: How the graduates rated the value gained in their careers from the course

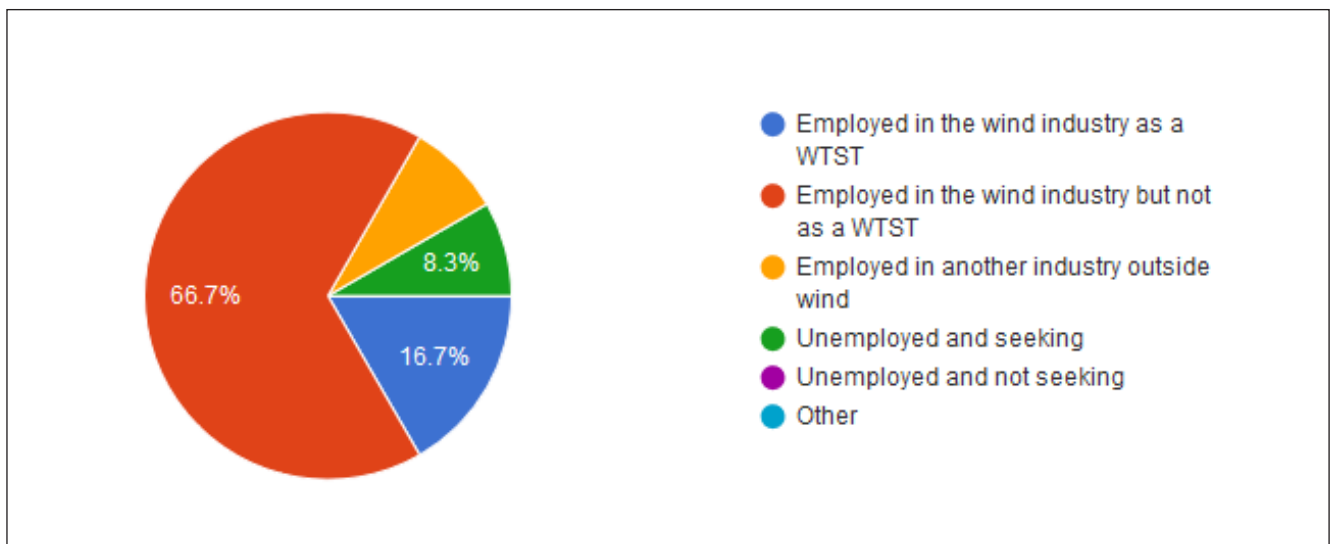


Figure 19: Employment status of the graduates prior to doing the course

One student indicated that he is not employed in the wind industry and elaborated on this during the telephonic interview by stating that he has family responsibilities in Cape Town and therefore could no longer stay on at the rurally located Sere Wind Farm. Since there are no wind farms in Cape Town, Eskom offered him a position at the Koeberg Nuclear Power Plant in Cape Town. He did state that should an opportunity in the wind industry become available in Cape Town, that he would be very interested in getting back onto the industry.

The last student indicated that he was unemployed and seeking. This student had extensive experience working in the wind industry for an OEM, Owners and during the construction phase. This student was engaging with AltGen Recruitment throughout 2016 as he was offered a role by a large OEM. He turned down this offer and as his attention is needed on the family farm. Therefore, we can conclude that this person should have rather selected the “other” option, as he was not currently “seeking” a position in the wind industry (Figure 19).

One student indicated that it took him more than a year to find employment in the wind industry. During the telephonic interview he stated that he believed this was

due to the German qualification not being recognised in South Africa and the South African Qualifications Authority (SAQA), as well as them not possessing prior experience in the wind industry. This student was sent on the training by Eskom due to their postgraduate studies being centred around RE and Eskom believed the training would be valuable for them. However, this person wasn't sent on the training with the intent of becoming a turbine technician. The student approached AltGen for assistance and advice for entering the RE market and was placed at Siemens in June 2016.

The student who indicated that he was employed immediately following the course is the same student who funded his own studies. He started applying for many opportunities in the wind industry during the period he spent in Germany (Figure 20).

Four of the students were not working in the wind industry. These students included those employed by Eskom and one other student who was employed in the mining sector. One third indicated that they were already employed as a WTST before the training - these students were employed by Nordex at the time (Figure 21).

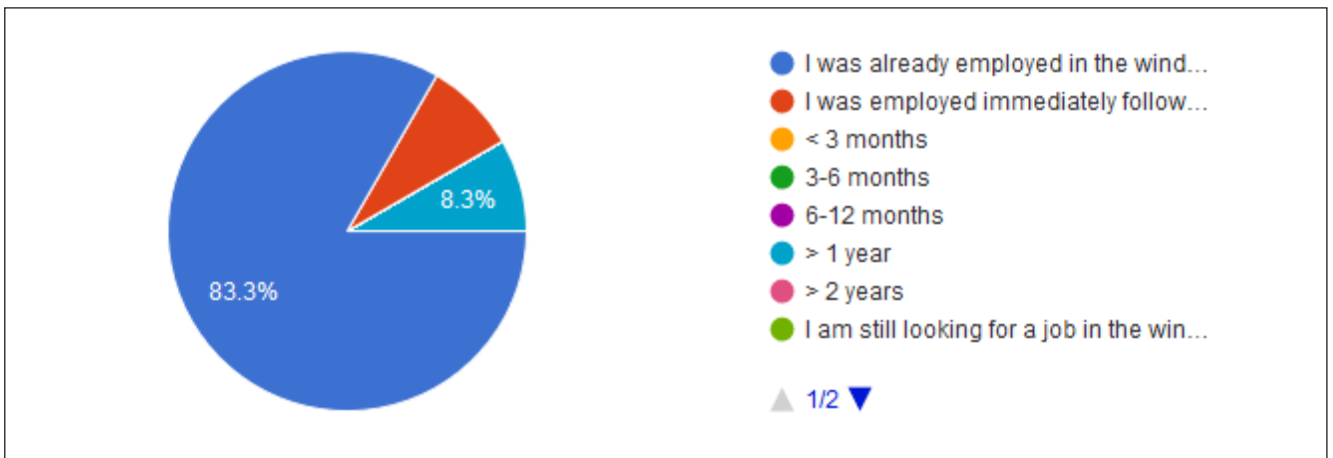


Figure 20: How the graduates rated the value gained in their careers from the course

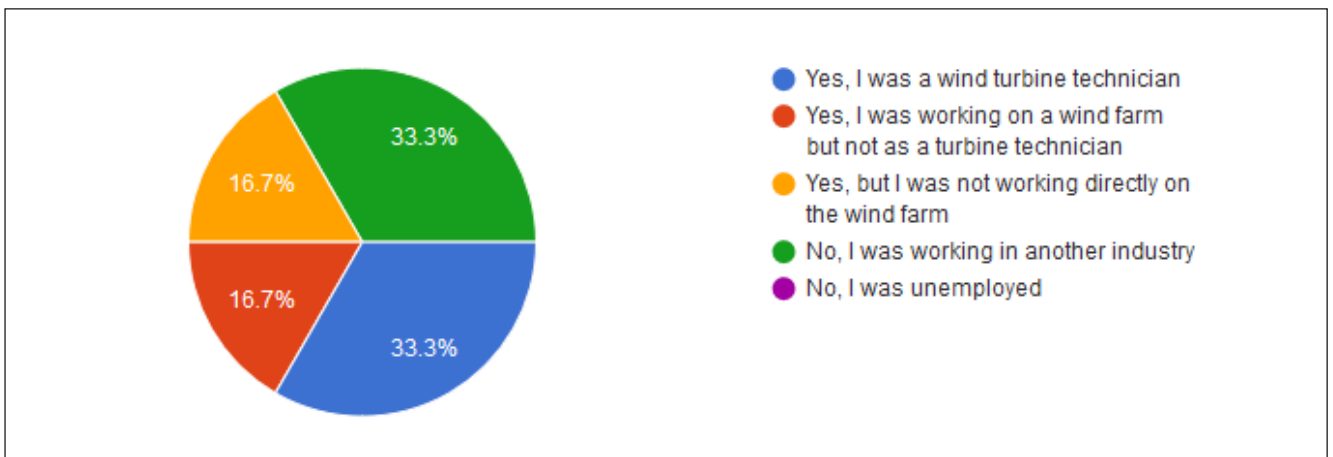


Figure 21: How the graduates rated the value gained in their careers from the course

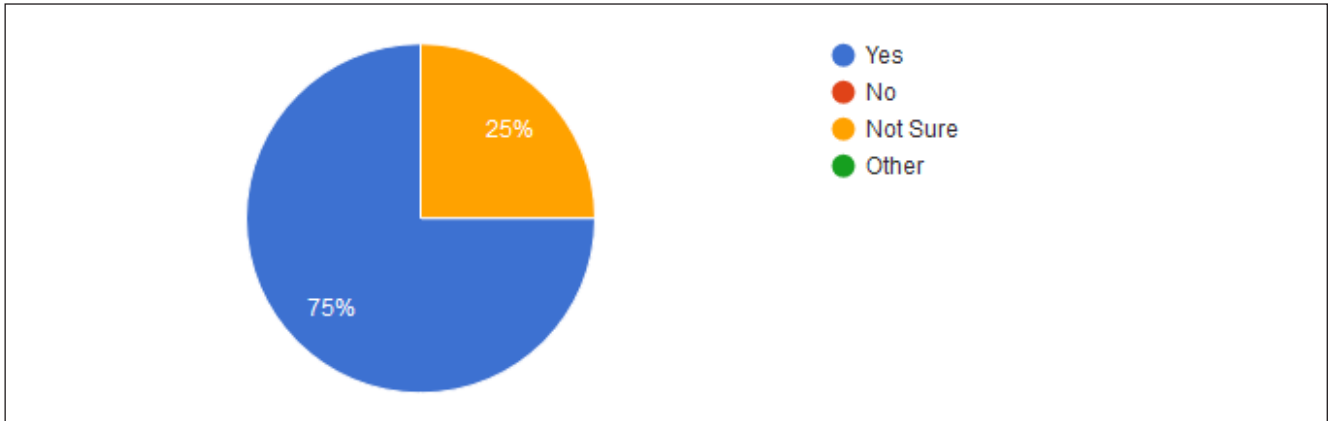


Figure 22: Number of graduates interested in an RPL option on completion of the WTST qualification

It is important to note that only eight out of the twelve students completed this question and two students checked the “not sure” box. During the telephonic interviews, it became apparent that the students did not understand the acronyms used in the question. After explaining the “Requirement for Prior Learning” (RPL), many questions were raised by the students including:

- How long will it take them to complete the qualification?
- How much will it cost?
- Will they have to be based at SARETEC?
- When will they receive information on the RPL from SARETEC? and
- Will the RPL qualification be GWO certified?

One student voiced that he would not be interested in the RPL as he no longer works as a Turbine technician (Figure 22).

This question was only added to the survey following a conversation between AltGen and GIZ about international opportunities, and as a result only three students completed this question in the survey. The question was however posed to all the students during the telephonic interviews and it was found that eight students were interested in international opportunities, while one was unsure if they were interested and two were not interested due to family responsibilities in South Africa. It was found that many of the students were specifically interested in working in Germany as they enjoyed the international exposure that they received during the training there (Figure 23).

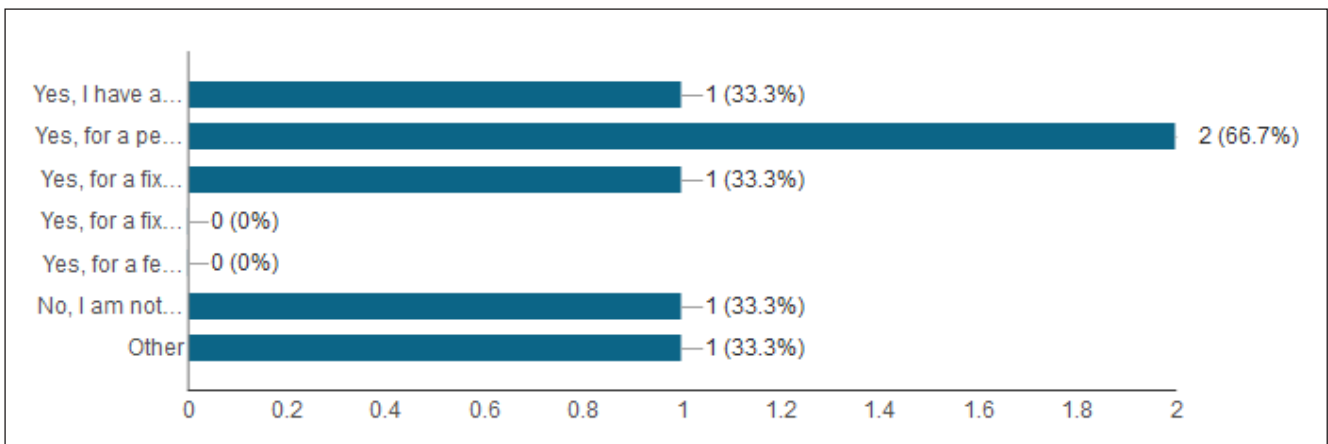


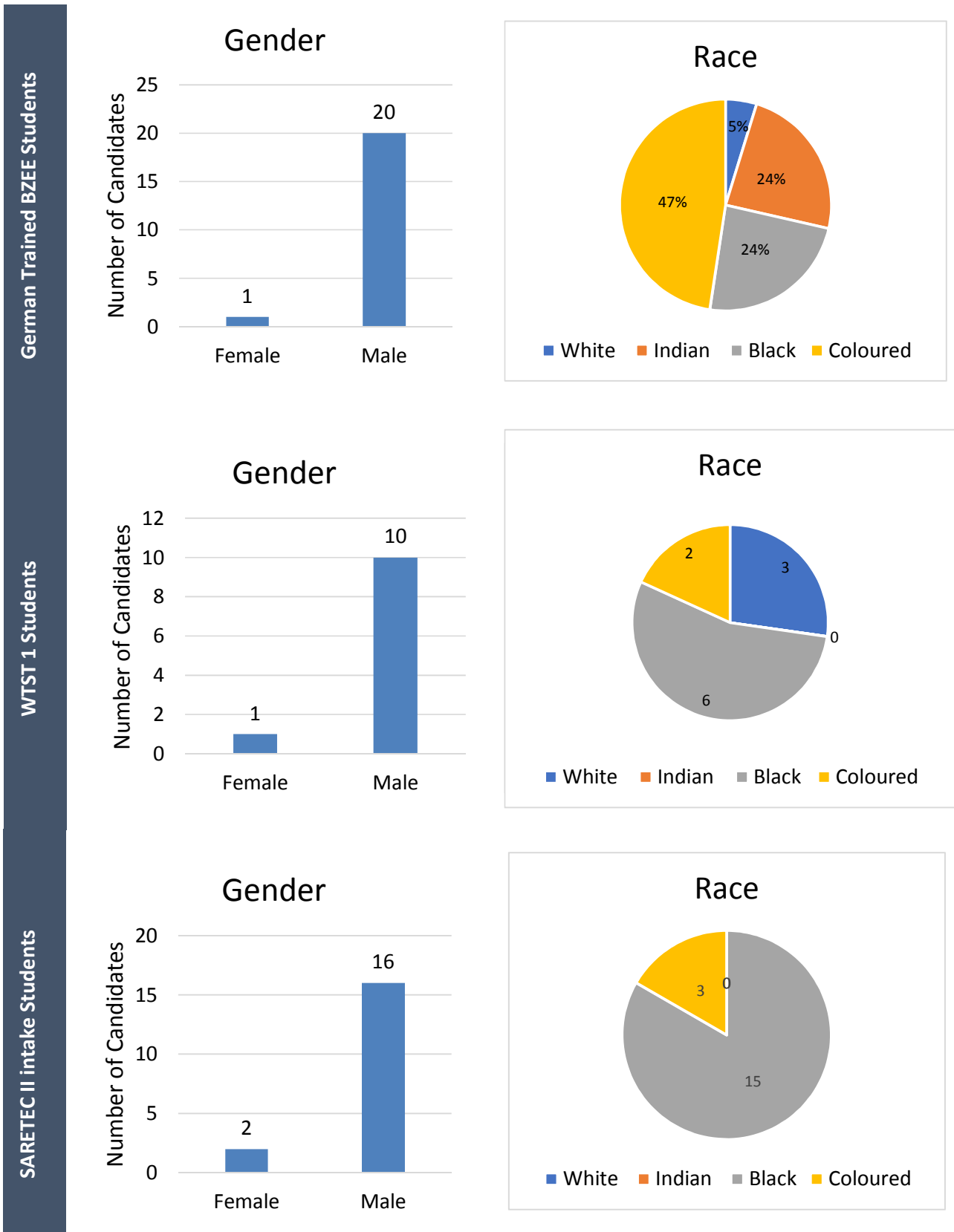
Figure 23: Number of interested in work opportunities outside of South Africa if they became available

The question was raised in later intakes, and then actively followed up on as a project by AltGen. A few interesting findings were made that included that the international OEM’s were very selective when employing from out of their country of origin and would not look at ‘students’ – they would only consider WTSTs with considerable experience.

Comparative Analysis

A comparative demographic analysis below investigates three student groups: the BZEE trained groups and WTST 1.

Demographic Comparison



From the table above, one can see that the number of females participating in the training courses are significantly lower than males.

By this time, a total of 48 students had completed or were in the process of completing the WTST training in the three groups. From the data above the racial distribution includes: 26 Black students, 13 Coloured students, 8 White students and 1 Indian student.

Key Points

All the students interviewed provided feedback on possible ways to improve the course. Their suggestions included:

- Separate the class based on their academic background to save time and allow students to maximise their learning in the course. Group students as electrical, mechanical and electronic. This way the students with experience in a certain field will not have to sit through it again;
- More time needs to be spent on understanding SCADA systems as SCADA is an important tool on the wind farms¹;
- A subject such as “Wind Economics” should be introduced to the course content, providing WTSTs a deeper and holistic understanding of the wind turbine in the whole wind farm eco-system, such as, a better idea of how much the turbines cost that they are working on, as well as how much income (R/kWh) is being generated by a turbine and how a WTST’s performance feeds into wind farm performance outside technical maintenance. The understanding of the economics linked to wind farms will drive the WTST to work more diligently on repairing turbines due to them being aware of the loss generated during a turbines downtime²;
- More females should be encouraged to participate in the course³;
- More time should be spent on electrical fault-finding;
- A module should be added that will introduce the students to “work ethic” in the wind industry;
- Ensure that technology is state of the art;

- Students need to be exposed to the practical part of working in a turbine and at heights.
 - AltGen can assist with this communication strategy and facilitation between GIZ and SARETEC.

During interviews, previous students were asked to elaborate on their next career move. As stated previously, one student indicated that he would continue farming on the family farm and had no intention of returning to the wind industry anytime soon, and another stated that family responsibilities are prohibiting him from working elsewhere than Cape Town.

The rest of the students were all planning to remain in the wind industry, taking on management and training positions, and becoming more involved during commissioning. The students who were employed as Plant Operators at the time were desperately looking to work as WTSTs. Although most students wanted to stay in the RE industry, a few concerns about the RE industry in South Africa were voiced as many of the students were nervous about the effects of Eskom’s reluctance to sign PPAs, the expedited bid window round announcements being delayed and the rise of nuclear in South Africa⁴.

The RPL process was never followed up on by SARETEC or the students. Whilst SAQA has formalised the qualification of Wind Turbine Service Technician, there is no legal requirement for OEM’s to employ only formally registered WTSTs. The only legal requirement is that those individuals that work in the turbines have the necessary H&S and other basic certifications according to the OSH Act. This makes the WTST qualification somewhat redundant.

When AltGen started reaching out to the students trained in Germany, a few of the students were quite surprised as no one had followed up with them after their training previously. One student even noted that they thought GIZ had forgotten about them. The lack of regular follow up may have been the reason for some of the students not responding to AltGen’s communications, as well as the outdated contact information which was no longer in use. It is likely that the follow-up surveys and interviews will strengthen AltGen’s relationship with the BZEE WTST, which in turn would possibly allow for information to be more easily gathered in the future, therefore bi-annual follow ups were recommended⁵.

¹ This theme was repeated throughout the courses

² This excellent suggestion was not repeated by later course participants

³ WTST 3 was majority females, and this created another, unique, set of challenges.

⁴ This theme continued through the engagement.

⁵ Subsequent discussions with GIZ revealed that these students had been contacted previously

PART 4 – January 2017

WTST 1 Exit Interviews

Engagement Method

The group was made up of eleven students who attended the training between **February and August 2016** and since AltGen was previously active in evaluating the WTST 1 programme for MerSETA, the students were all familiar with the engagement and there was no need to make introductions as was done with the German trained students. Rather, an email was sent to the WTST 1 students with a link to an online survey explaining the continued engagement by GIZ to track their career progress following the training. The email also asked the students to confirm that they had received AltGen’s communication and to inform AltGen of a suitable time and date for a telephonic interview.

Of the eleven students, a sample of eight completed the online survey and a sample of nine were available to participate in a semi-formal telephonic interview. One student indicated during the telephonic interview that they had trouble accessing the online survey and requested a PDF version, the completed PDF was not returned to AltGen.

Two students did not respond to the initial email or complete an interview or survey, Miss De Jager and Mr Van der Merwe, both of whom are currently working in the renewable energy sector. Miss De Jager is working as a PV Technician and Mr Van der Merwe was absorbed into Vestas as a WTST, where he was completing his in-service placement for his SARETEC certificate.

Seven of the eleven students were thus employed in the renewable energy industry, **6 directly utilising the WTST specific training within the wind industry in South Africa. By the time of finalisation of the study in October 2017, this was still the case.**

As the study matured the topic of salary in the wind industry was introduced to the questionnaire, however, the topic became more sensitive with the students and WTSTs working on-site. Therefore, questions relating to salary were posed with great caution and treated with confidentiality, individual salaries were therefore not included in this document and rather aggregated in an overall analysis.

Demographic

Of the candidates that completed the WTST 1 programme, the eldest was 33 years old and the youngest was 23. With one of the WTST 1 group being female, the remaining 10 are male and most candidates are Black African, as can be seen in the figure below. The absence of females in the candidate pool was a result of limited female applications/nominations⁶ and this was broadly attributed to the gender gap in the industries of mechanical and electrical technicians.

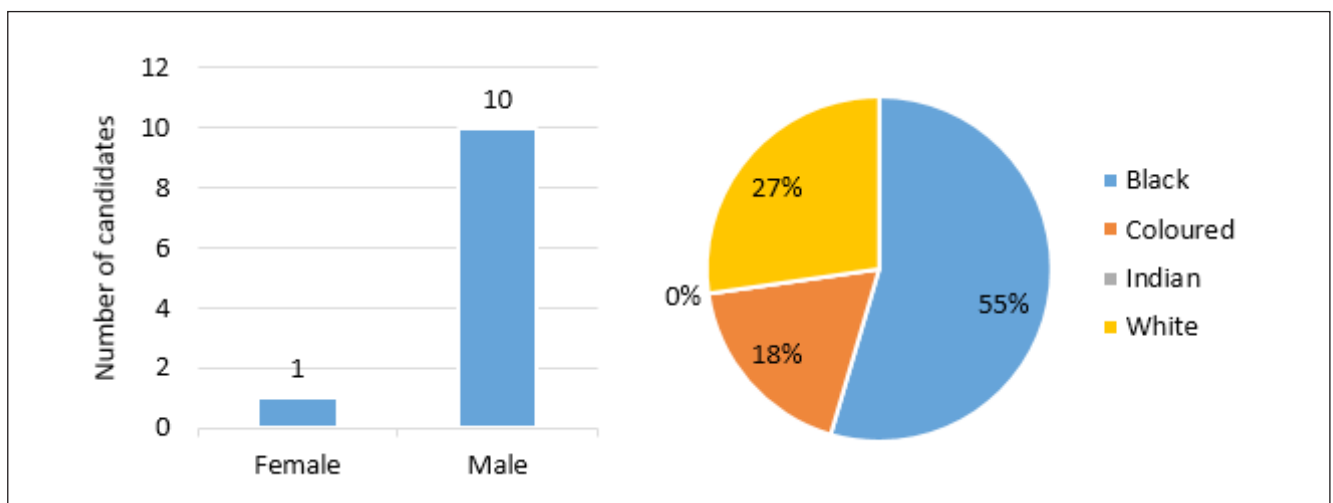


Figure 25: Gender profile (left) and demographic profile (right)

⁶ More females applied and were selected into the second SARETEC intake, which is expected to increase each year as the RE industry and SARETEC become more established.

Educational Background

Of the learners, 9 held a National Diploma (NDip) or an NQF certification between Level 2 and Level 6, and 2 of the candidates had, or were in the process of, earning a Bachelor of Technology (BTech). Given that the course contains strong elements of both mechanical and electrical knowledge,

incorporating students from both spheres enhanced internal learning effectiveness between students and trainers. It further provided a method for both the internal and external assessors to measure the effectivity of the training and teaching aids by comparing the understanding of a learner who has little knowledge on a topic, to a learner who already has knowledge on a particular topic.

Table 7: Educational background of the WTST 1 graduates

Qualification/ certification	Learner											TOTAL
	Sulanna de Jager	Lwandile Jabavu	Reynold Kleinsmidt	Stanley Lange	Thato Manamela	Lukhanyo Mangcaka	Jaques Redelinghuys	Mpapi Seakamela	Yandisa Soji	Bekithemba James Spalla	Gavin Van der Merwe	
Completed the 1 st survey	o	✓	✓	✓	✓	✓	✓	✓	✓	o	o	8
Completed the 1 st interview	o	✓	✓	✓	✓	✓	✓	✓	✓	✓	o	9
Background*	M/E	M	M	E	M/E	E	E		E		M	
BTech	X	X	X	X	X	X	X	X	X	X	X	2
NDip	X	X	X	X	X	X	X	X	X	X	X	5
N6	X	X	X	X	X	X	X	X	X	X	X	3
N4	X	X	X	X	X	X	X	X	X	X	X	1
N3	X	X	X	X	X	X	X	X	X	X	X	1
N2	X	X	X	X	X	X	X	X	X	X	X	1
Fall arrest technician	X	X	X	X	X	X	X	X	X	X	X	6
First Aid/ Emergency Care	X	X	X	X	X	X	X	X	X	X	X	8
Fire fighting	X	X	X	X	X	X	X	X	X	X	X	5
Electronic fitting/ installation	X	X	X	X	X	X	X	X	X	X	X	4
Mechanical fitting/ installation	X	X	X	X	X	X	X	X	X	X	X	4
Health and safety	X	X	X	X	X	X	X	X	X	X	X	4
Other RE course or training	X	X	X	X	X	X	X	X	X	X	X	2
Military	X	X	X	X	X	X	X	X	X	X	X	2
TOTAL	5	3	2	7	5	5	4	4	3	6	4	

*Where M refers to Mechanical, E refers to Electrical, M/E refers to Mechatronik and a blank refers to other

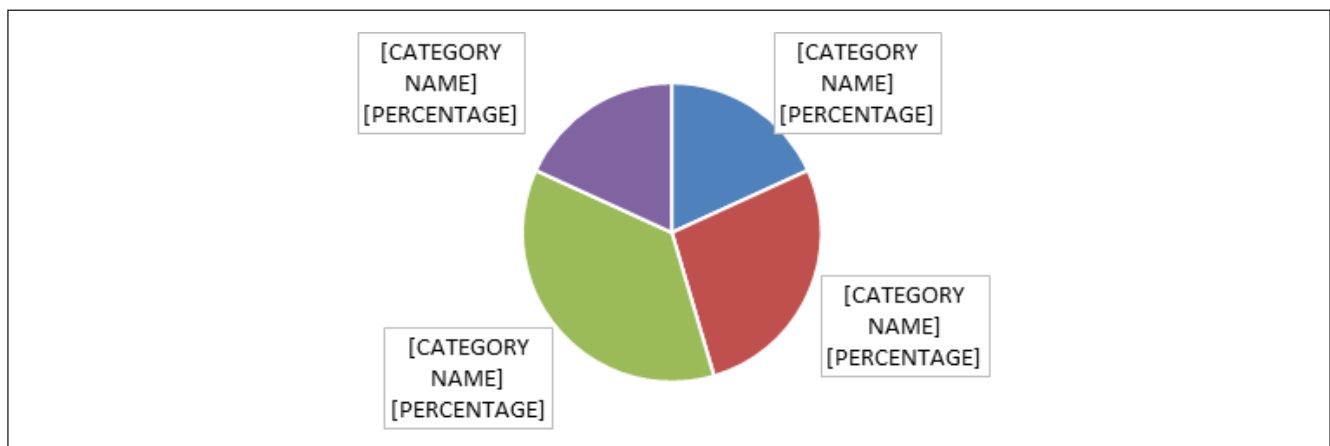


Figure 26: Educational backgrounds of the graduates

Engagement Method

The eleven candidates came from the following list of companies or work areas, providing a diverse group directly from the wind industry as well as other technical industries:

- Globeleq (Independent Power Producer)
- South African Air Force
- BioTherm Energy (Independent Power Producer)
- South African Navy
- Zizwe General Services
- Centre for Renewable and Sustainable Energy Studies (University)

- To improve my skills, knowledge and career;
- I have always wanted to get into the renewable energy sector;
- It was the only way to get into the industry;
- To improve at my work, further my studies and to help people understand green energy better.

Through previous engagements, a few WTST 1 students mentioned that they had been applying for positions in the industry prior to taking the SARETEC course and were unsuccessful. They therefore saw the course as a gateway into the RE industry. However, of these, some of the students felt they were already qualified to do the job but required the additional certificate or network to be accepted into a permanent position.

Online Survey Responses

The motivation for the WTST 1 students to take the course included:

- It's a new and challenging field;
- To be certified as a WTST and work around the world;
- To understand how a wind farm operated and because it is an environmentally friendly technology;

Most students (five) did not face any personal or professional obstacles to enrol in or attend the course. Two students indicated that they were uncertain if they faced any challenges and one student indicated that they did face obstacles and elaborated on this by stating that he went through the programme as a private person and still had to work weekends and some afternoons in order to sustain himself. A common theme was that most of the students who went through the training found it very difficult to take time off or coordinate their work responsibilities⁷ (Figure 27).

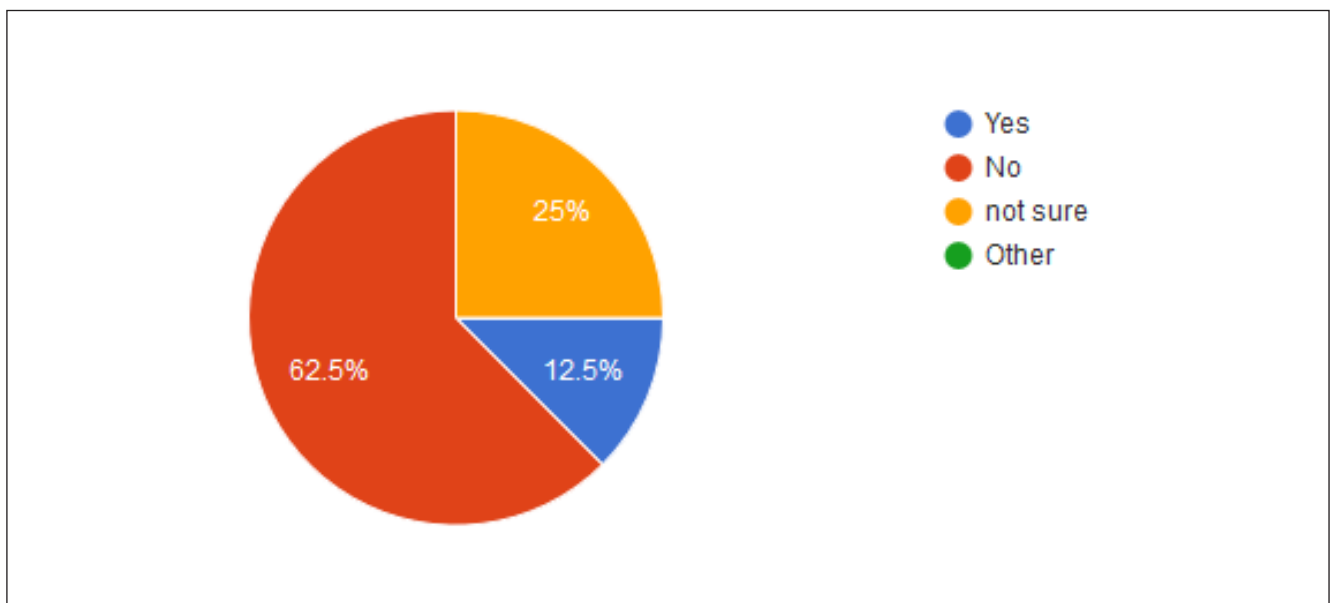


Figure 27: Personal or Professional obstacles faced by the graduates to enrol the course

⁷ It's worth noting, that several accepted applicants withdrew from the program due to company obligations, logistical and/or calendar issues, including two candidates from the WE field. The withdrawn applicants were from the following companies: Eskom, Obelisk Energy and Cookhouse Windfarm.

Seven of the eight students agreed with the statement “High level of effort required to complete the WTST training”. The fact that the majority felt this way, shows that the course was challenging for the students and contradicts the student’s feelings that they have the required skills to be a WTST before enrolling in the SARETEC course. One student indicated that the course required little or no effort (Figure 28).

indicated that more time should be provided for practicing skills and techniques, and reiterated their feelings by stating that too much time was spent on irrelevant theory. Students indicated that the lecturing staff of SARETEC could be improved by employing lecturers or inviting more presenters that have practical experience working as WTST or on a wind farm. Lastly the equipment can be improved by having a working turbine on-site or a turbine simulation (Figure 29).

From the evaluation feedback, it appears that most students were happy with the time provided for practicing skills and techniques, the lecturers and the equipment. Two students

Although the feedback regarding the value of the course was positive, the value is rated lower in this group of students

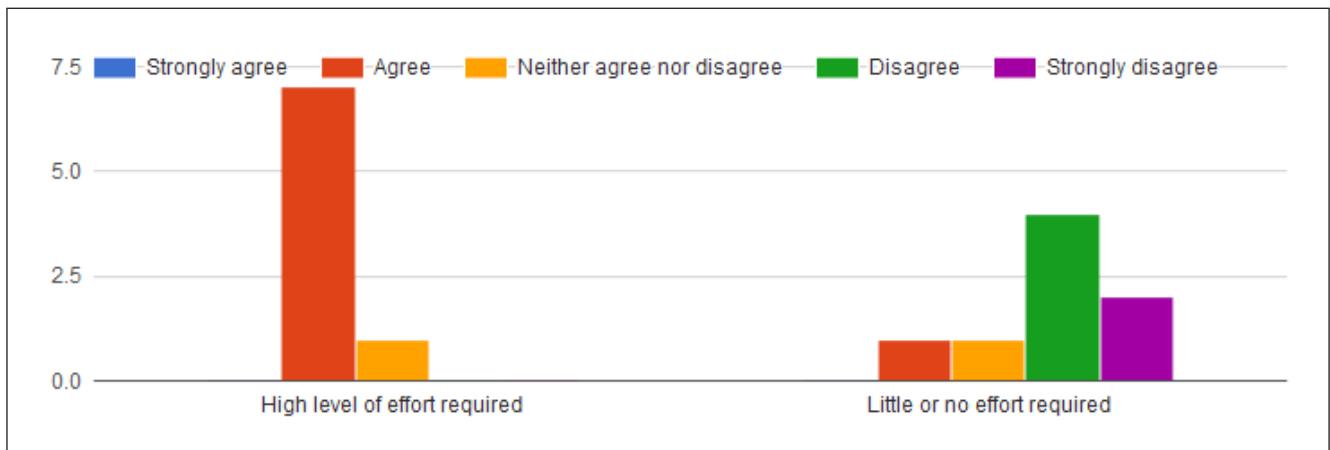


Figure 28: Level of effort required to complete the WTST

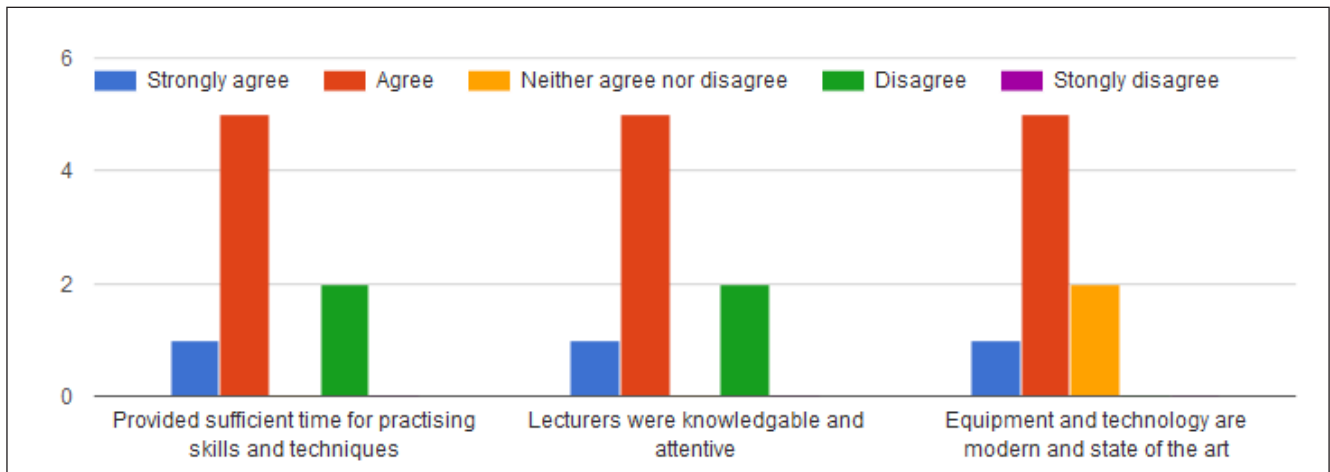


Figure 29: Reflections on the course content

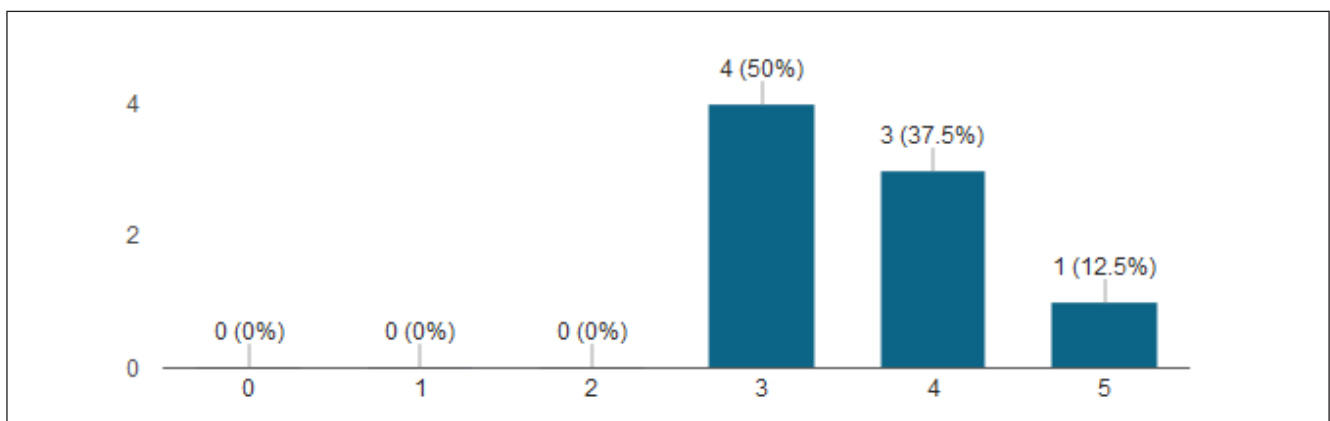


Figure 30: Rating from the graduates of the value that the course has provided to their career

than what was indicated by the BZEE German trained students. The difference in the two groups can be attributed to only receiving 8/11 responses from this survey and the shorter time frame since completing the course to reflect on the value the training has had on their careers (Figure 30).

The WTST 1 students felt that they gained the following skills from the course:

- Mechanical skills
- Understanding safety procedures
- Electrical skills
- Better understanding of hydraulics and PLCs
- Fault-finding
- Reporting
- Troubleshooting
- Professional conduct

All the students who completed the survey indicated that they would recommend the course to someone else and one can deduce that these recommendations directly correlate with the value they see the course offering. The students indicated that they would recommend the course to friends, colleagues and specifically anyone who is looking to get into the wind industry.

Four (50%) of the students indicated that they were still looking for a job in the wind industry. Two of these students were tied into contracts that would only render them available to take up employment in the wind industry from April 2017. The other two students were employed by the South African Defence Force (Airforce and Navy) and are actively seeking to make a career move (Figure 31).

During the telephonic interviews, it was found that the students did not know where to look for technician job opportunities and stated that their lack of experience, as well as not holding a certificate from SARETEC, made it difficult to find employment in a competitive industry. AltGen and SARETEC assisted these 4 students in finding employment as technicians by compiling their CVs and distributing them to various owners and OEMs. One student was “unemployed”

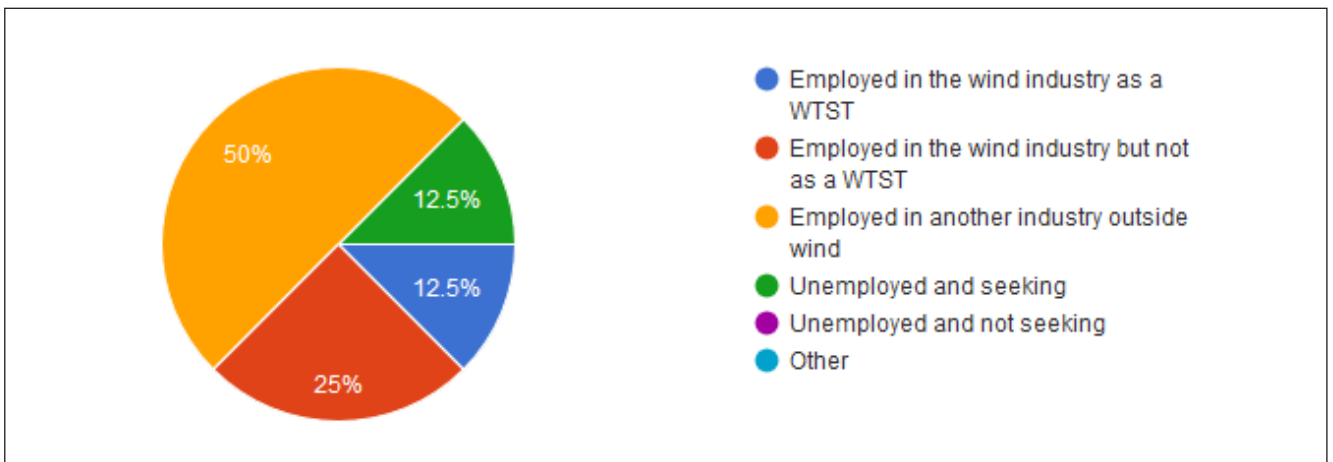


Figure 31: Rating from the graduates of the value that the course has provided to their career

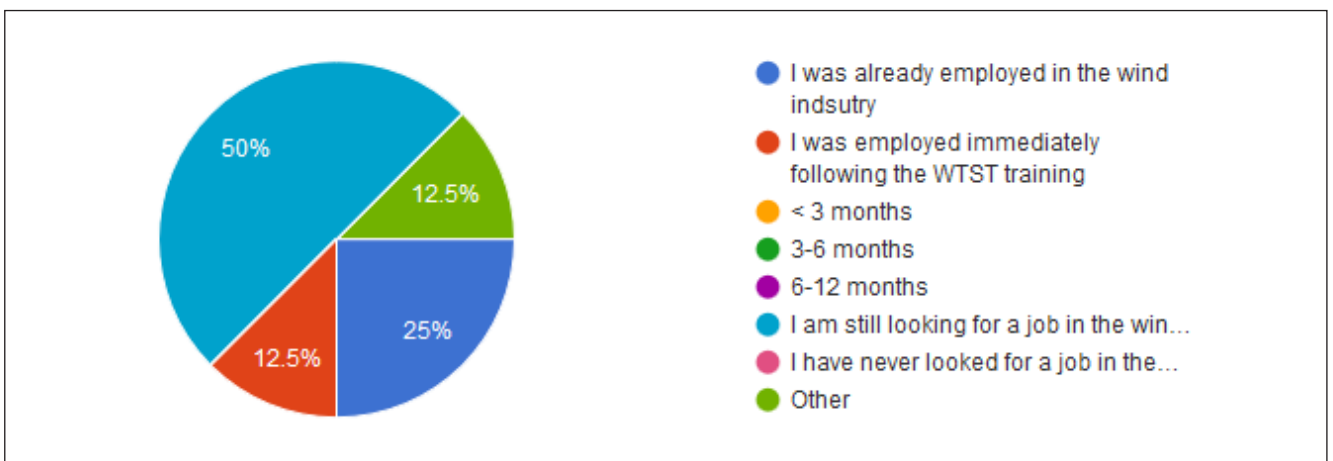


Figure 32: Rating from the graduates of the value that the course has provided to their career

when they completed the survey, but was employed by an OEM the following week when conducting the telephonic interview - this student selected the “other” option and should be recorded as < 3 months.

One student was employed directly after his in-service training as he impressed the employer during the in-service training period. Two students indicated that they were employed in the wind industry but not as a WTST. These students were Control Room Operators with BioTherm Energy, and were hopeful that they would soon become WTSTs once, contractually, they were able to work on the turbines and the warranties had expired.

All eight students had indicated intentions to stay in the wind industry and that they aspired to become WTST specialists, Plant Mangers, Wind Energy Facility Supervisors and Senior WTSTs. The other three that did not respond to the survey were all currently holding positions in the renewable energy operations sector, two of which were working directly in wind and the other in PV.

At the time of conclusion of this study, being October 2017, one year had passed since WTST 1, and all the Control Room Operators as taken on board by Biotherm, were still employed as such.

Table 6: WTST 3 Graduates currently employed in Wind (4/13)

Surname	First Names	Dem.	Age*	In service placement	Absorbed into industry ⁸	Designation after SARETEC qualification	Organisation after SARETEC qualification
De Jager	Sulana	WF	30	Acciona - Gouda Wind Farm	Y	SCADA data management	Globeleq
Jabavu	Lwandile	BM	29	Vestas - Hopefield	N	Aircraft Technician	SA Air force
Kleinsmidt	Reynold	CM	23	Vestas - WC1	Y	WTST	Vestas
Lange	Stanley	CM	29	BioTherm Caledon	Y	Wind Turbine Installation and Assembly Technician	BioTherm Energy
Manamela	Thato	BM	24	Cookhouse	Y	WTST	Suzlon
Mangcaka	Lukhanyo	BM	23	Vestas - Hopefield	N	Maintenance Artisan	SA Navy
Redelinghuys	Jacques	WM	31	BioTherm Caledon	Y	Operator	Biotherm Energy
Seakamela	Mpapi	BM	31	Acciona - Gouda Wind Farm	N	Electrical Assistant	Zizwe General Services
Soji	Yandisa	BM	33	Cookhouse	N	Electrician/Project Manager	Zizwe General Services
Spalla	Bekithemba	BM	29	Dorper	Y	Operations and Reliability Technician	Dorper Wind Farm
Van der Merwe	Gavin	WM	32	Vestas - WC1	Y	WTST	Vestas

*Age at time of training

CM – Coloured Male; BM – Black Male; WM – White Male; WF – White Female

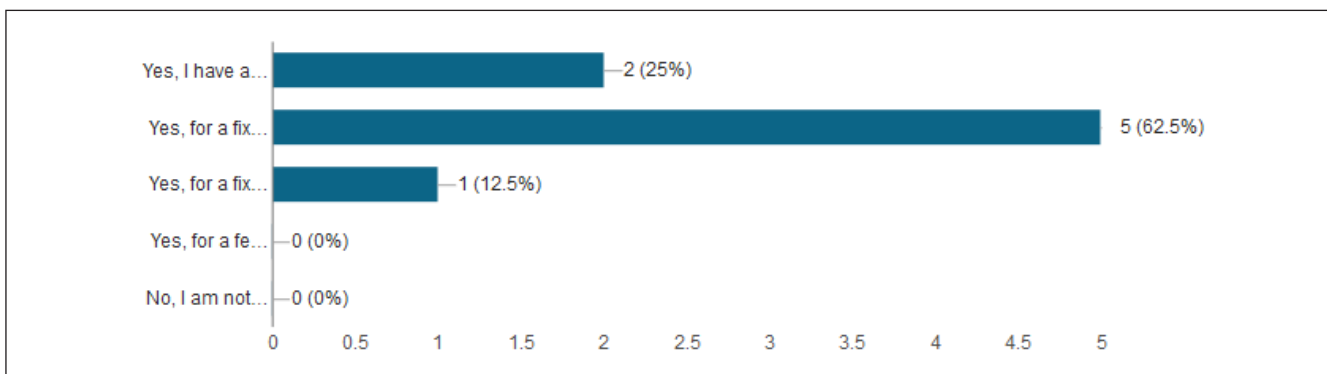


Figure 33: Number of graduates interested in seeking work opportunities outside of South Africa if they became available

⁸ Industry refers to the renewable energy industry

All the students were interested in international opportunities, two of which confirmed applying for international opportunities since graduating from the programme. Five of the students were comfortable with a one to two-year contract and the final student was looking for only permanent positions. One student wanted to know if AltGen could confirm that their qualification would be internationally recognised (Figure 33).

Student Questionnaire Responses

The following table lists the responses of the learners to a follow up questionnaire sent in the second last week of on-site placements – nine of the eleven students responded. From this table, all learners were pleased with the training received at SARETEC and shared some improvements for future intakes.

The trainees had a range of responses on the most useful courses (depending on the backgrounds of the students) and provided recommendations that aligned with previous

observations: more exposure to live turbines and working at heights before placement; for the SARETEC trainers to have more applicable turbine and wind energy experience; and improvement on the logbook design. Re-iterated by both students and on-site supervisors was the desire to extend the in-service placement (from 2 months to 4 or 6 months) to ensure the trainees receive more practical exposure and prepare them effectively for the work environment.

Most of the students were satisfied with their in-service placement and desired to be absorbed into the team or to work in wind energy somewhere else. These observations reassured the opinions founded by AltGen and were noted by SARETEC for adjusting the future WTST programmes.

A few negative responses from students, who requested to remain anonymous, were mostly a result of communication. Staff and lecturers were perceived as being “discriminatory” by some students during feedback sessions or they felt they were not provided a communication platform in which they could communicate openly or where they could be heard.

Questionnaire for trainees on-site [LM: Lukhanyo Mangcaka, YS: Yandisa Soji, SL: Stanley Lange, SdJ: Sulanna de Jager, JS: James Spalla, MS: Mpapi Seakamela, RK: Reynold Kleinsmidt, JR: Jacques Redelinghuys, GV: Gavin Van der Merwe]

Question	Students Responses
<p>What have you learned specifically at SARETEC that has been useful in your in-service placement?</p>	<p>LM: Safety first, electrical circuits based on starters, contractors and motors and lubrication</p> <p>YS: Almost everything has been helpful except the environmental and Eskom external course</p> <p>SL: Refreshed on safety, details and issues of the turbine, following instructions, and being aware of potential risks</p> <p>SdJ: Torque & Tension, Rigging</p> <p>JS: Mechanical and electrical operation of components, methods of troubleshooting the PLCs</p> <p>MS: Fault finding, torque & tension</p> <p>RK: Electrical modules and practical's (reading schematics, use of electrical measuring devices, fault findings)</p> <p>JR: Logging and record keeping, hydraulics, PLCs</p> <p>GV: The use of hand signals and basic rigging/sliding. The importance of work planning and tool selection.</p>
<p>What can be adjusted about the in-service placement that would maximize your learning capabilities?</p> <p>(What would you change if you had the opportunity?)</p>	<p>LM: At least 6 months' in-service placement</p> <p>YS: No contracts on farm with wild animals. Prefer if SARETEC would deal with all student placements the same.</p> <p>SL: Proper agreements made to ensure trainee can work on the turbine, also ensure that there is maintenance being performed in the time frame.</p> <p>SdJ: Feedback structure is not user friendly, would prefer a task specific log book than week specific</p> <p>JS: technicalities of being employed by the OEM vs the clients' representatives should be explained and incorporated in the training</p> <p>MS: More time – they have not been able to inspect a gear box or generator</p> <p>RK: Would not change anything – very happy with placement</p> <p>JR: The logbook should be tracked in terms of hours of work – with a set number of hours required to pass the course.</p> <p>GV: Personally, I wouldn't change anything. This two-month period has been great. I had access to technical documents and service instructions, which made the job easier. My colleagues have also been very helpful, occasionally stepping back and letting me take the lead.</p>

Question	Students Responses
<p>Would you recommend the course?</p> <p>If yes, who would you recommend it to?</p>	<p>LM: Yes, any artisan. Colleague is attending the next course.</p> <p>YS: Yes, to current colleagues and friends</p> <p>SL: Yes, to anyone with a mechanical/electrical background that is interested in renewable energy</p> <p>SdJ: Yes, to people that have completed an N4/5/6 in mechanics or electrical</p> <p>JS: Yes, to people with a college background in mechanical or electrical</p> <p>MS: Yes, to technician assistants to enable them to gain experience</p> <p>RK: Definitely, has already got friends applying</p> <p>JR: Yes – have already recommended it to 2 friends.</p> <p>GV: Yes, the course exposes students to a lot of important stuff found nearly everywhere in industry, viz. motors, pumps, cooling systems, power electronics, PLCs etc. It may not get them a job in a wind turbine, but they should find what they have learned useful in many other work settings.</p>
<p>Has the course overall, prepared you sufficiently for a career as a WTST?</p> <p>What would you like more exposure to, to ensure you are comfortable working on site?</p>	<p>LM: Yes, modules were very helpful. Only improvement would be a technician as a lecturer.</p> <p>YS: More on operation of turbine and less theory</p> <p>SL: Trainers more experienced in wind energy, more focus on turbine components and the allocation of a textbook to trainees.</p> <p>SdJ: Yes, more fault finding on electronic components such as Stator discrepancies, switch gear, MV and HV, conversions between AC and DC.</p> <p>JS: Yes, equipped with abilities.</p> <p>MS: Yes, had appropriate exposure to general maintenance</p> <p>RK: Yes</p> <p>JR: The components should be integrated to learn efficiently – as it is in a turbine.</p>

Table 9: High-level salary survey of Wind Industry Technicians

Company	Title	Age	Qualification	Relevant experience	Annual Salary (ZAR)
Company 1	Wind Turbine Service Engineer	28	Diploma, BZEE Training	3 years, 7 months	300-350k
	Technical Team Lead	27	Diploma	2 years, 6 months	300-350k
	Service Technician	28	Diploma	10 months	200-250k
	Service Technician	29	N5 - Certificate	2 years, 2 months	200-250k
	Service Technician	30	Diploma	2 years, 2 months	200-250k
	Service Technician	27	B Tech	5 months	250-300k
	Service Technician	31	Diploma	1 year, 6 months	250-300k
	Scheduler	34	Diploma	3 years, 6 months	250-300k
	Service Technician	42	Diploma	2 years, 9 months	300-350k
	Service Technician	27	N6 - Certificate	1 year	250-300k
	Service Technician	30	Diploma	2 years	350-400k
	Service Technician	31	Diploma	10 months	250-300k
	Service Technician	24	Diploma	10 months	250-300k
Company 2	Service Technician	37	N3 - Certificate	2 years, 6 months	500-600k
	Lead Technician	26	B Eng	3 years, 6 months	500-600k
	Service Technician	38	Diploma	1 year, 11 months	200-250k
Company 3	Turbine Technician	25	Diploma	2 years, 3 months	450-500k
	Electrical Technician	28	Diploma	2 years, 7 months	450-500k

Company	Title	Age	Qualification	Relevant experience	Annual Salary (ZAR)
Company 4	Senior Technician	42	B Tech	3 years, 6 months	350-400k
Company 5	Team Leader	31	Diploma	2 years, 6 months	200-250k
	Maintenance Tech	24	Diploma	2 years, 11 months	200-250k
	Team Leader	27	N4 - Certificate	2 years, 3 months	250-300k
	Turbine Service Technician	30	Diploma	10 months	100-150k
	Turbine Service Technician	29	B Tech	2 years, 2 months	300-350k
Company 6	OMS Technician	26	Diploma	2 years, 6 months	350-400k
	OMS Technician	29	Diploma	2 years, 5 months	300-350k
	Service Technician	30	Diploma	2 years, 5 months	350-400k
	Service Technician	31	N6 - Certificate	2 years, 6 months	350-400k
	Trainee Technician	23	Diploma	1 year, 6 months	100-150k
	OMS Technician	30	Diploma	2 years, 5 months	350-400k
	Service Technician	32	Diploma	2 years, 5 months	450-500k
Company 7	Intern Technician	25	Diploma	1 year	100-150k
	Intern Technician	31	Diploma	11 months	100-150k
Company 8	Turbine Technician	32	N6 - Certificate	3 years, 5 months	450-500k

Key Points

During the study the sensitivity of remuneration in the wind industry became apparent as a group of WTSTs threatened to strike because of the perceived low salaries when compared to other technicians working for other companies.

Calculating an average from the survey and interview feedback, at the time of the study, an entry level WTST earned around R250k per annum excluding benefits.

Introducing career and industry guidance could be helpful for students to effectively integrate into the wind industry⁹. Many of the students were not familiar with RE and did not know where to look for employment in the wind industry. Furthermore, many of the younger students had never been for a job interview nor submit a professional curriculum vitae (CV). Coaching students to prepare for interviews and assisting in structuring CV formats would improve their employability as well as provide a basic understanding of the greater wind industry and their role within it.

Students provided feedback on possible ways to improve the outcome and operational aspects of the course with the following suggestions:

- Increase the practical exposure to the industry such as more fieldtrips to wind farms, presentations, and engagements with other industry players;
- Additional time allocated to practical training;
- Larger focus on electronic content, especially for students with a mechanical background;
- Provide a working wind turbine simulation to practise fault-finding and SCADA control;
- Extend the in-service training period to maximise practical exposure;
- Address perceived communication and operational support issues within SARETEC.

SARETEC and GIZ to maintain consistent and open lines of communication with students: many students contacted AltGen to find out when their graduation ceremony would be taking place and when they could expect to receive their qualification certificates. It seems (to AltGen) that not all the students were feeling confident joining the new industry and make sacrifices to change careers. They also expressed that they did not have a primary contact person within SARETEC whom they had consistent access to or felt comfortable with. AltGen recommends half-yearly follow-ups with the

⁹ Career guidance and support is needed for students especially if they are not absorbed following the SARETEC in-service training but would be beneficial for all students.

students going forward after completion of the training and more regularly during their training. This may involve a dedicated person to engage with each student individually, and to report back to relevant parties.

The following positives and negatives were deduced from the engagement with WTST 1 students as well as some IPPs and OEMs:

Positive Outcomes

- 5 of the students were offered immediate employment following in-service training
- 7 of the students are employed in the renewable energy industry after completion of the course (two students were required to fulfil a current employment contract and could not accept other employment as a WTST);
- Current employers reported that students were well prepared on all theory and one employer reported that the SARETEC students were outperforming current and more experienced WTST;
- Students had a practical understanding of safety procedures and conducted work up to the satisfaction of employers;
- The in-service training provided a respectable platform for students to gain practical experience and possible employment opportunities;
- In-service training had supported IPPs and OEMs in terms of providing extra support rather than being a burden or adding extra workload;
- The course has a good balance of electrical and mechanical skills perceived from both the students and employers;
- Every student (who responded) in the programme recommended the course after completion;
- The course provides a platform for South African WTSTs to connect with one another and create a network.

Negative Outcomes

- More time for practical work is required for students to feel comfortable with going into the field;
- Unrealistic expectations of salary and employment opportunities were set;
- Staff and lecturers were perceived as being “discriminatory” by some students;
- Communication channels were not clear during the training;
- Students felt that they did not receive career advice or support following their training;
- The in-service training is too short;
- There was a lack of communication between SARETEC management and students;
- Students felt like their voice and opinion did not matter at times or their feedback was not taken into consideration;
- Students voiced their frustration with the delay in their graduation as they believe that the lack of material evidence, that they completed the course, was preventing them from being employed as WTSTs.

Next Steps

AltGen Consulting partnered with SARETEC to assist four students who had not been absorbed into industry with finding employment as a WTST. Extensive engagement took place to interview the students and set up candidate's CVs which were distributed to potential employers/OEMs.

WTST 1 Students Summary (pre-SARETEC training)

MerSETA WTST 1 Student background before SARETEC training

STUDENT PREVIOUS WORK EXPERIENCE	
Name	Sulanna De Jager
Demographic	White female, 30
Employed prior to training	Globeleq
Education	NDip Mechatronics, BTech Mechatronics
Work experience	6 years at Gaddis Harvesting (USA): Operation/maintenance heavy machinery 6 months at Macadams International: internship, mechanical assembly, integrated design and programming, project management, technical reporting 7 months at Globeleq, internship: design (solar), SCADA data management
WE experience	SCADA, solar design
Name	Lwandile Jabavu
Demographic	Black male, 29
Employed prior to training	SA Air Force
Education	NDip Mechanical Engineering
Years' work experience	5 years: Aviation sector, qualified aircraft technician
WE experience	No
Name	Reynold Kleinsmidt
Demographic	Coloured male, 23
Employed prior to training	Student
Education	NDip Mechanical Engineering, BTech ME
Years' work experience	1 year electrical and machines laboratory internship: technical work, wind turbine laminations, magnets for wind turbines, floor plans, assisting with 15kW turbine assembly, maintenance thereof Holiday work: fixing of machines, electrical work
WE experience	Assembly of 15kW turbine at University of Stellenbosch
Name	Stanley Lange
Demographic	Coloured male, 29
Employed prior to training	BioTherm Energy
Education	N3 Electrical, N6 Building studies
Years' work experience	7 years: construction supervisor, lecturer at Northlink, Wind turbine installation and assembly, O&M at BioTherm
WE experience	Maintenance and operation (BioTherm), installation and assembly (Cape Africa Renewable Energy Services)
Name	Thato Manamela
Demographic	Black male, 24
Employed prior to training	Globeleq
Education	NDip Mechatronics Engineering
Years' work experience	1 year: Intern at Festo Didactic, commissioning, orders management, quotations/procurement 1 year: Operations Intern at Globeleq, assisting plant manager, procurement, admin, maintenance and inspection, execution
WE experience	Operations Intern at Globeleq since April 2015
Name	Mangcaka Lukhanyo
Demographic	Black male, 23
Employed prior to training	SA Navy
Education	N6 Electrical Engineering

Years' work experience	1 year at Telkom SA: installer 2 years at SA Navy: assisting servicing of electrical/mechanical components (generators) 1.5 years at SA Navy: artisan/maintenance/operation of communication systems (radio)
WE experience	No
Name	Jacques Redelinghuys
Demographic	White male, 31
Employed prior to training	BioTherm Energy
Education	N4 Electrical, N4 Chemical Electrical
Years' work experience	3 years at PetroSA: electrical artisan, installation & maintenance 6 years at BioTherm: electro mechanical technician, O&M, chemical supervisor, wind turbine technician
WE experience	O&M of Klipheuwel WF, SCADA
Name	Mpapi Seakamela
Demographic	Black male, 31
Employed prior to training	Zizwe General Services
Education	Health and Safety
Years' work experience	Electrical assistant, installation, construction, fault finding, cable jointing
WE experience	No
Name	Yandisa Soji
Demographic	Black male, 33
Employed prior to training	Zizwe General Services
Education	National Certificate N6 (Engineering Studies), Roodepoort South West College
Years' work experience	8 years at Zizwe: electrician
WE experience	No
Name	Bekithemba Spalla
Demographic	Black male, 29
Employed prior to training	Dorper Wind Farm
Education	
Years' work experience	4 years at Shoprite: Money Market Clerk, bookings, lotto etc. 1 year at CONCO: assistant substation erector, excavator, brick layer 1 year at Cokisa Consulting: supervisor, reporting to PM, inspection of landfill site 1.5 years at Dorper: Junior Engineer, Health and safety representative, reporting for NERSA and DOE, maintenance and servicing of turbines, general O&M, data analysis
WE experience	Generator checks, data analysis, maintenance checks, report writing
Name	Gavin van der Merwe
Demographic	White male, 32
Employed prior to training	CRSES
Education	NDip Mechanical Engineering
Years' work experience	9 years: technician, scaffolder, waitron, technical assistant and assembly of electrical devices (fetal heart rate monitors), research assistant 2 years laboratory assistant at Solar Thermal Energy Research Group: safety, maintenance and operation, troubleshooting mech/elec systems, thermal testing, calibration of instruments, insulation work, testing motors, technical calculations
WE experience	(solar experience) Wind Energy course Renewable Energy Finance course

PART 5 – March 2017

WTST 3 Entry Interviews

On the 27th February 2017, AltGen Consulting visited SARETEC and conducted interviews with 13 students enrolled in the WTST 3 course. AltGen had originally anticipated interviewing 14 students; however, one student exited the course on Friday the 24th February for personal reasons. For the interview process, AltGen interviewed the students individually to extract deeper input from each student¹⁰. Students completed a new student intake survey and, upon completion, participated in a semi-structured informal interview with AltGen consultants to elaborate on certain survey answers and other qualitative questions. The interview questions were centred around the students' engagement with the course (so far), expectations, difficulties and enjoyable aspects, and general impressions.

Survey Responses

Of the 13 students interviewed, 9 of them were from the South African Navy, and all 9 of these students resigned from their positions in the Navy to complete the course. The reason behind this influx of Navy employees is firstly due to OEMs that had previously approached potential candidates in the Navy and offered them training and employment in the wind industry; and secondly, due to liaison between the current students and the second intake students who gave positive referrals of the SARETEC course. Those who had been employed in the wind industry communicated with individuals still enrolled in the Navy and encouraged them to follow suit, which resulted in the observed high level of interest and enrolment of Navy personnel.

All students interviewed reported that while the course was intensive and challenging at times, they coped and were determined to learn the content. The formation of informal student groups for technical support was emphasised by many respondents. Students with mechanical backgrounds expressed appreciation for the support received from students with an electrical background during the course, and vice versa. Students also felt that both the lecturers and operational team were very supportive and knowledgeable.

The students all anticipated a high value to be obtained from the course, by offering them new skills in a new, upcoming industry. There was a prevailing nervousness from the students regarding their employment on completion of

the course; due to the delays in construction arising from Eskom's delay to sign Power Purchase Agreements (PPAs), which had been awarded almost two years prior, during 2015. Most students (all but one) expressed a willingness to travel abroad after completing the course, should the South African industry fail to absorb them. This included students with small children and/or dependents. However, it is suggested that students are consistently informed of the broader industry, opportunities, as well as their willingness to travel overseas to mitigate changes in personal circumstance.

Lastly, it should be noted that none of these students were working outside of the course and as such they were experiencing financial constraints. The higher rent in Cape Town, compared to their previous locations, and lack of a stable income had caused the students to have to ration their finances considerably. All the students effectively resigned to take the course and therefore took a major risk by relocating and participating.

The survey was the same as the survey issued to the 2nd intake students of 2016, with a few amendments. These amendments were as follows:

- Provision was made for students who are unemployed and completing their SARETEC qualifications as an 'Employment Status' option;
- Addition of a field for individuals who believe they are already competent to work in the wind industry but are using the SARETEC course as a gateway into the industry under 'Anticipated Value of Course' field;
- Examples given for professional and personal obstacles to eliminate confusion under the professional/personal obstacles question;
- Addition of the appropriateness of the theoretical and practicality split of the course content under the 'Anticipated Course Content' question

¹⁰ During the second intake survey it was found that students interviewed in groups were less communicative and in some cases students were dominated by others in the group which limited the feedback obtained from each student.

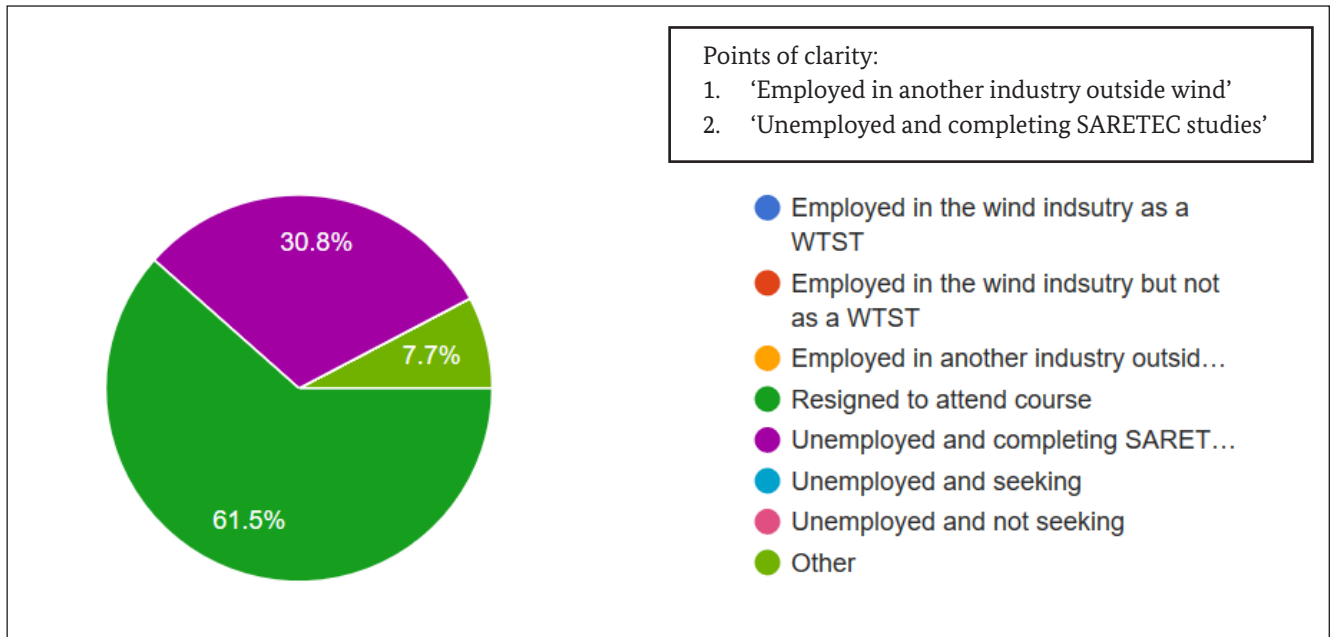


Figure 35: Employment Status of the graduates prior to enrolling in the course

Most students were introduced to the course via current students (completing the final month of their SARETEC in-service training) or WTSTs who are employed in the wind industry. The students had heard anecdotal stories from those involved in the industry which made working in the wind industry seem more appealing than their current positions. The students perceived the wind industry as a burgeoning market that was going to provide them with room for growth and better prospects.

The students appeared to experience some confusion with the options in the question below, as two of the questions were somewhat redundant:

1. Resigned to attend the course
2. Unemployed and completing SARETEC studies.

The redundancy is a result of previous students writing in an additional option that states they are unemployed and currently undertaking SARETEC studies, and was therefore added to the survey.

All but one student had resigned from their previous positions to take the course at SARETEC. This included the 9 respondents from the Navy, one from the South African Air Force, one from Telkom, and one from Bidvest. The student who marked 'Other' effectively resigned from their previous role and took a severance package from the company which was used to fund this training.

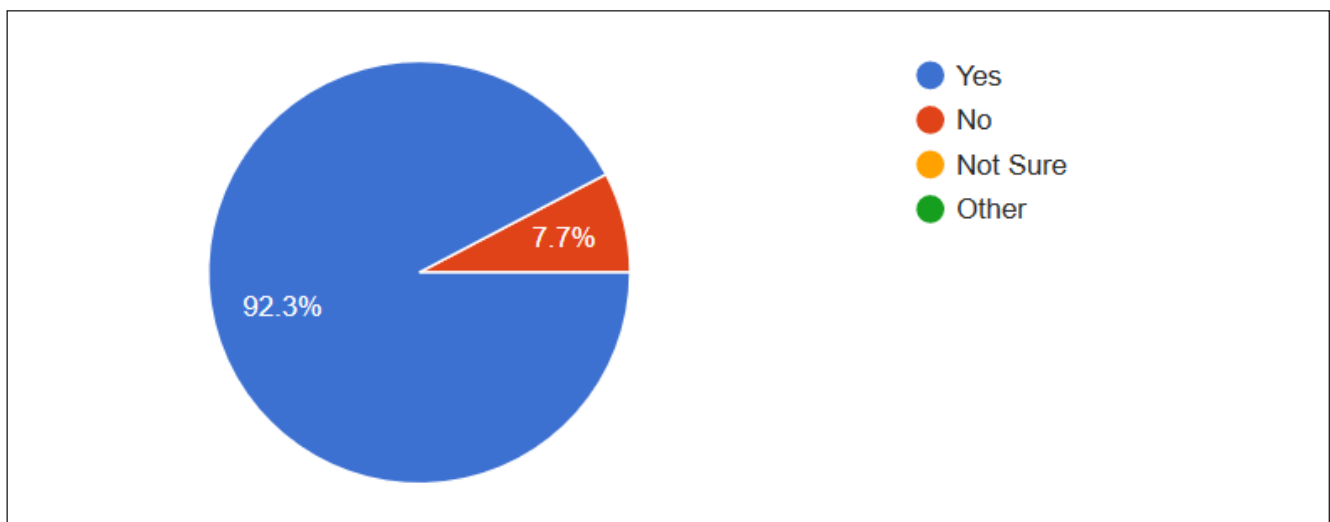


Figure 36: Number personal or professional obstacles faced by the graduates in order to enrol or attend the course

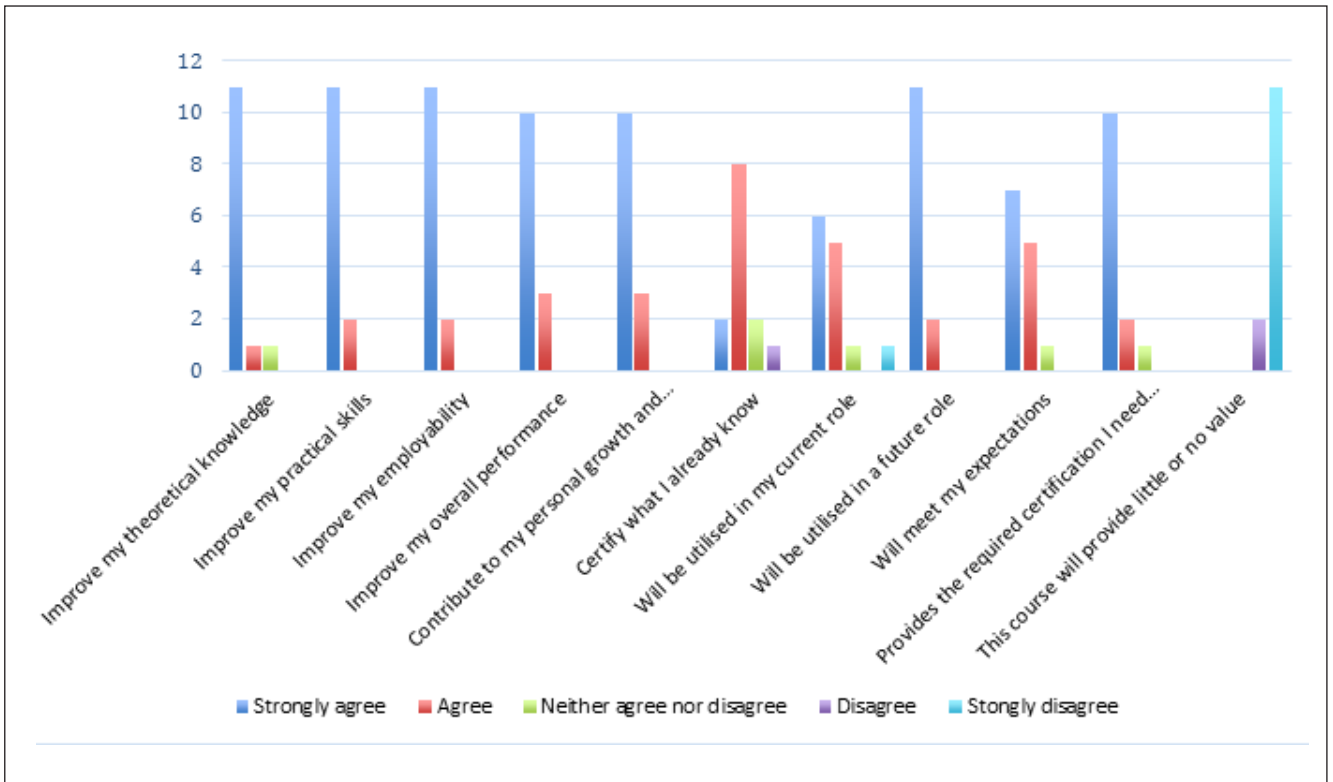


Figure 37: Anticipated value of the course

Only one out of the 13 students had not experienced a personal or professional obstacle when enrolling or attending the SARETEC WTST course. Of the 12 students who had experienced some form of obstacle, 10 of them reported a financial obstacle, one family-related obstacle (due to the family residing in the Eastern Cape), and one citing a ‘new environment’ as an obstacle. 8 of the 13 students were originally from the Eastern Cape, and 4 from KwaZulu-Natal; however, many were already living in the Cape Town area prior to the course due to work (Figure 36).

There was a resounding sentiment that the students perceive the course as valuable and a means to enhance their skills. All the students agreed that the certification would be used in their future roles, which highlights their anticipation to be absorbed into the wind industry in the future. The addition of the section “Provides the required certification I need to enter the RE industry” received agreement from most of the students (12). This illustrates the confidence that the students have in the reputation of SARETEC in the industry (Figure 37).

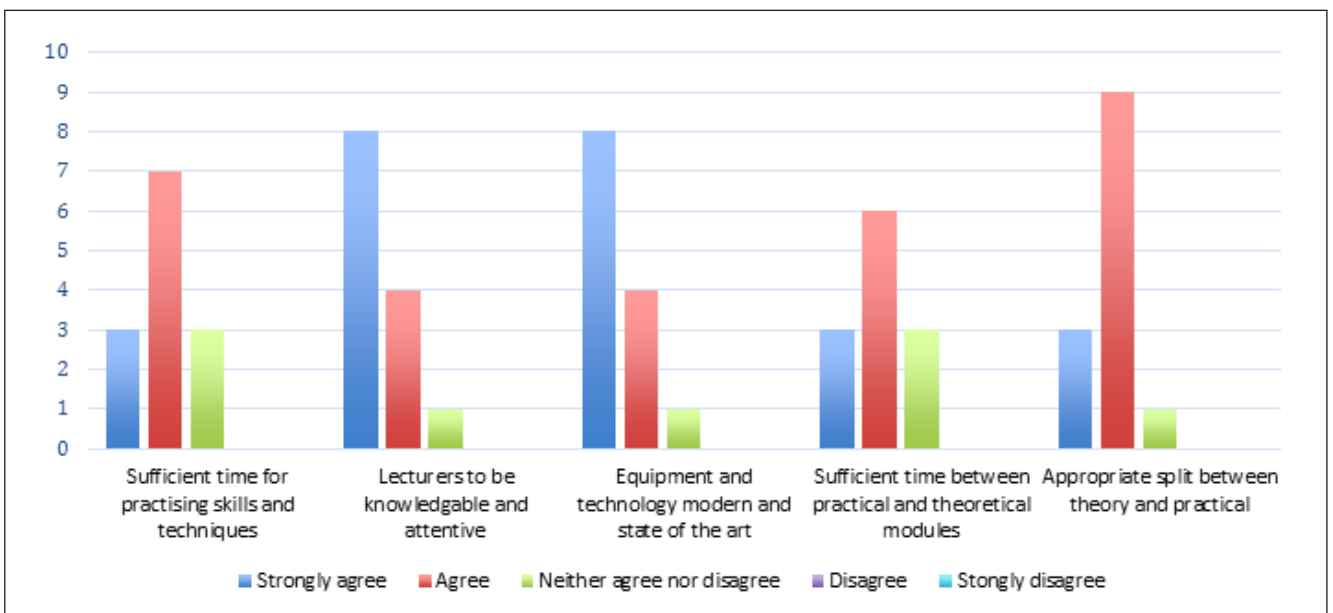


Figure 38: Anticipated course content

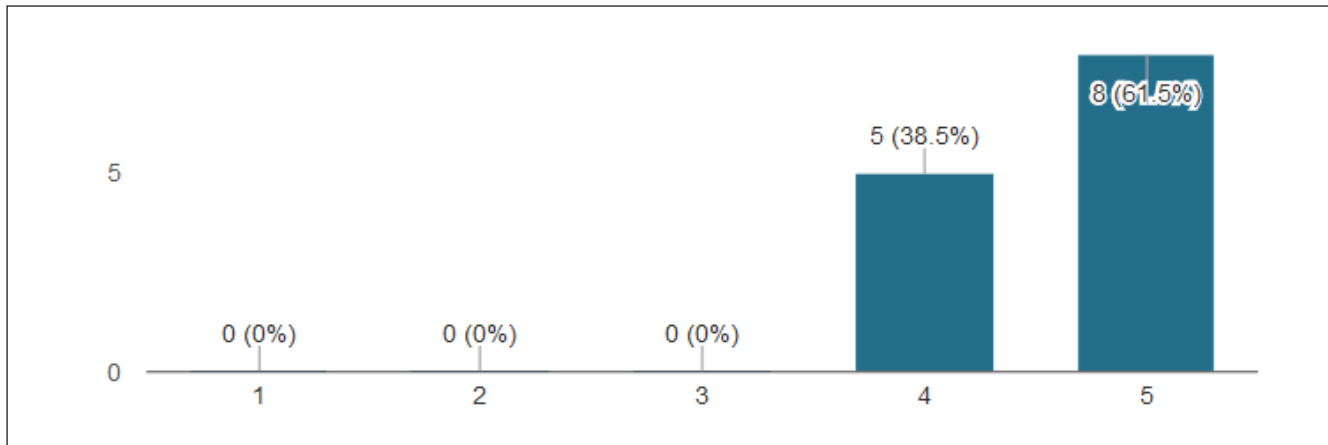


Figure 39: Anticipated value that the course will provide their careers

The students noted that while there was sufficient time to practice and learn the skills required in the course, there is time pressure to perform and to absorb the required information over a shorter period. Students were also aware that they were only three weeks into the schedule and many expressed uncertainties in their ability to succeed. Some students found it difficult to manage their time considering the quick pace at which new theory is introduced to the students. Students would have to spend the day learning theory on one topic whilst studying for an exam on another topic in their own time, creating an overlap in the modules. The challenge for the students was reportedly the time management and the concurrent assimilation of information from these modules.

This course requires strict time management and the coursework is intensive. Operations and management confirmed that the course work delivered is condensed into a 5-month programme, something that would normally be delivered over a one-year period for an equivalent N5 certificate. To date, there had been five tests, on average two tests per week, which had necessitated studying at night and/or on weekends.

On average, the students were impressed with the facilities and the teaching standards and the instructors and lecturers were found to be knowledgeable, informed, accommodating and supportive. There were no complaints or suggestions for improvement. All of the students interviewed anticipated the value of the course to be high or very high and the qualification is viewed as a vehicle through which they could enter the renewable energy industry in South Africa. The course is proving to be challenging but rewarding, according to the students. Overall, students reported experiencing great value in the technical skills set that they will learn in this course.

Key Points

There was a sense of anxiety expressed by the students regarding the status of the industry and lack of new projects being connected to the grid when they are expected to graduate from the course. Eskom's delay in signing the PPAs with bidders had stalled project implementation and limited the ability of the industry to absorb the graduates.

Students were enquiring about the securing on-site training as it had been reported that certain wind farms were not willing to take in the students for their practical component, which was communicated through their personal and professional networks.

AltGen informed students about the status of the South African wind industry as well as the aspects of the global industry, and showed them the South African Wind Energy Association website, including the membership and annual Windaba conference.

Students were also informed about the 'Energy Blog' (www.energy.org.za), which can be used as a tool for insight into the South African wind industry and specifically about wind farms in their geographical location. Students were shown how to navigate the RE projects database and how to use the mapping tool. Bid Window Round 4 (BWR4) wind farms were isolated and illustrated to the students to show where, provided Eskom signs the PPAs, future wind projects are located and where the students might find employment opportunities in future. The figure below demonstrates the BWR4 wind projects as dark blue pins on the map.

The figure following illustrates the expansion of the global wind farm industry and thus the demand for WTSTs on a global scale and the students' position within a larger market. The students showed interest in working abroad, except for one student who had family commitments in the country and was not currently able to emigrate.



Figure 40: REIPP BWR4 IPPs (Source: ww.energy.org.za)

Figure 41 illustrates the expansion of the global wind farm industry and thus the demand for WTSTs on a global scale and the students' position within a larger market. The

students showed interest in working abroad, except for one student who had family commitments in the country and was not currently able to emigrate.

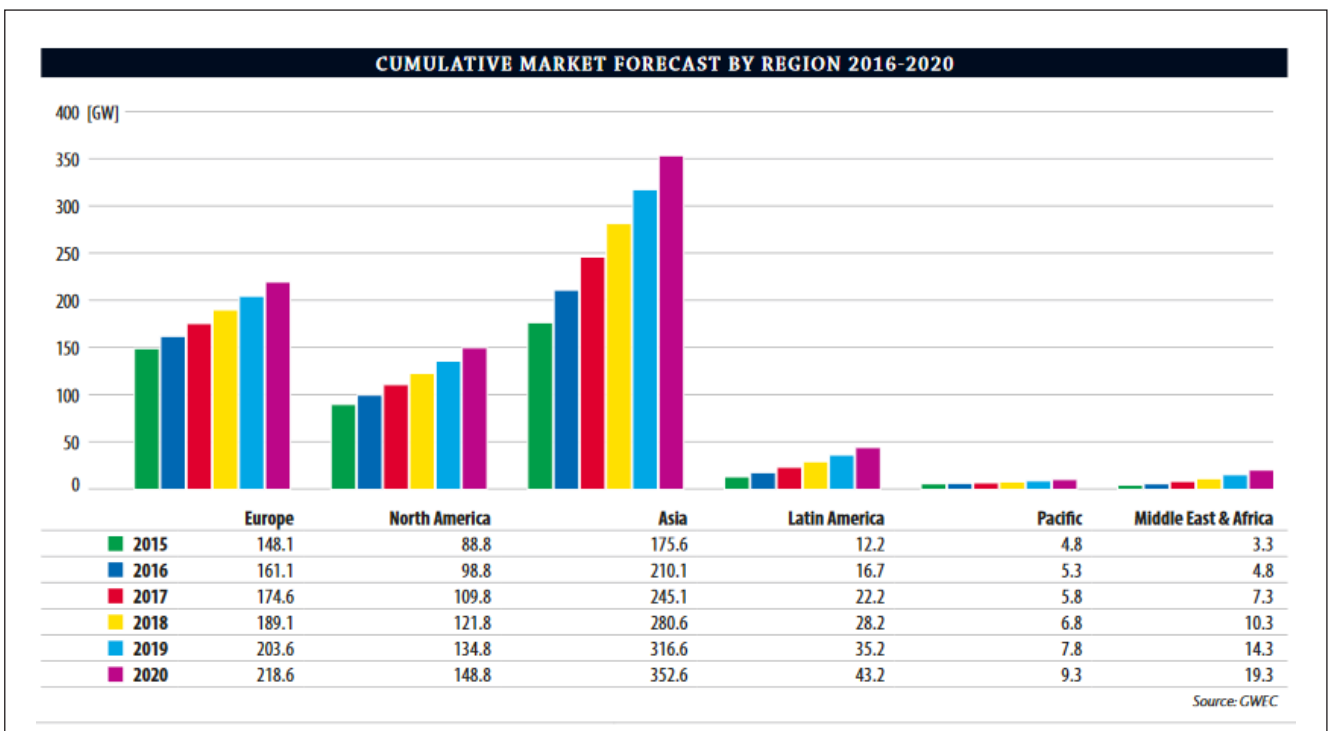


Figure 41: Global Wind Capacity Forecast to 2020 (Source: GWEC 2015 Wind Energy Report, pg. 23)

PART 6 – May 2017

WTST 2 Exit Interviews

This section summarises the outputs of in-person interviews and surveys conducted with the second intake of SARETEC trained students – WTST 2, but it also followed up on where the prior training tranches find themselves in their careers (GT 1, GT 2, and WTST 1).

Status of WTST 2

As of 28 April 2017, from the group of 18 graduates of WTST 2, seven had been offered permanent positions, five by Nordex and two by 3Energy. An additional four had been offered six-month contracts by Nordex. According to the definitions used by the Department of Energy, a six-month contract is equal to half a person year (a full-time job for one person for one year) and is therefore not a permanent placement in the wind industry. The remaining seven graduates had not been offered placements since completing their in-service training, and remained unemployed. One graduate registered for a BTech in Cape Town and refused the six-month contract in favour of pursuing studying.

There was a sense of anxiety and concern from the 10 graduates who were interviewed in-person and who were, at the time of interviewing (27 March - 30 March 2017), not offered either a permanent position or a fixed term contract at their respective facilities. There were still six graduates actively seeking employment in the wind industry. The résumés of these graduates were forwarded to potential employers in the AltGen network to aid their prospects for employment.

Engagement Method WTST 2

AltGen arranged to meet with 16 out of the 18 graduates in person. These graduates were divided between the Gibson Bay Wind Farm (4), Kouga Wind Farm (1), Amakhala Wind Farm (3), Cookhouse Wind Farm (3), Dassiesklip Wind Farm (2), and Gouda Wind Farm (3). The remaining two graduates were reached telephonically and completed the survey online and have, thus have been included in these results.

The 16 graduates interviewed and surveyed in-person were done so using a semi-structured set of questions. The graduates were interviewed individually by two AltGen consultants and conversations were recorded on a voice

recorder and transcribed later. The data acquired from the interactions was qualitative in nature. Graduates were requested to complete a survey, either in-person or online, to add further value to the findings.

The survey was completed in-person (hardcopy) by 11 of the graduates, while the remaining seven completed an online version. Additionally, a telephonic call was made to two graduates at the Dorper Wind Farm in the Eastern Cape, as face-to-face interaction was not possible given the location and availability of these graduates.

Supervisors were also interviewed during the site visits and were questioned on the performance, capabilities and quality of the graduates during their in-service training. The supervisors were given a hard copy survey to complete, after which they were interviewed using semi-structured questions. A total of eight supervisors were questioned and their responses have been included in the report.

WTST 2 Graduate Feedback

Demographic

The demographic composition of the WTST 2 graduates could be said to be somewhat demographically representative of the country. Of the 18 graduates, three were coloured, and 15 were black. This is representative of the country as a whole; however, only two of the graduates were female. This is in contrast with the WTST 3 graduate intake where 7 of the 13 graduates (54%) were females. This represents an interesting new angle to be taken into consideration in WTST 3 – the uptake of female graduates by industry.

Educational Background

In terms of NQF levels, the graduates in the second intake (WTST 2) had on average a higher level of education than the WTST 1 graduates. The figures following illustrate the NQF levels achieved by the graduates, showing that 94% of the graduates had a NQF level of five or above, and the remaining graduate had a NQF level four qualification. In the WTST 1 intake, three of the 11 graduates had a NQF level four or less. The graduates are, as expected, from predominantly mechanical and electrical engineering streams, with only

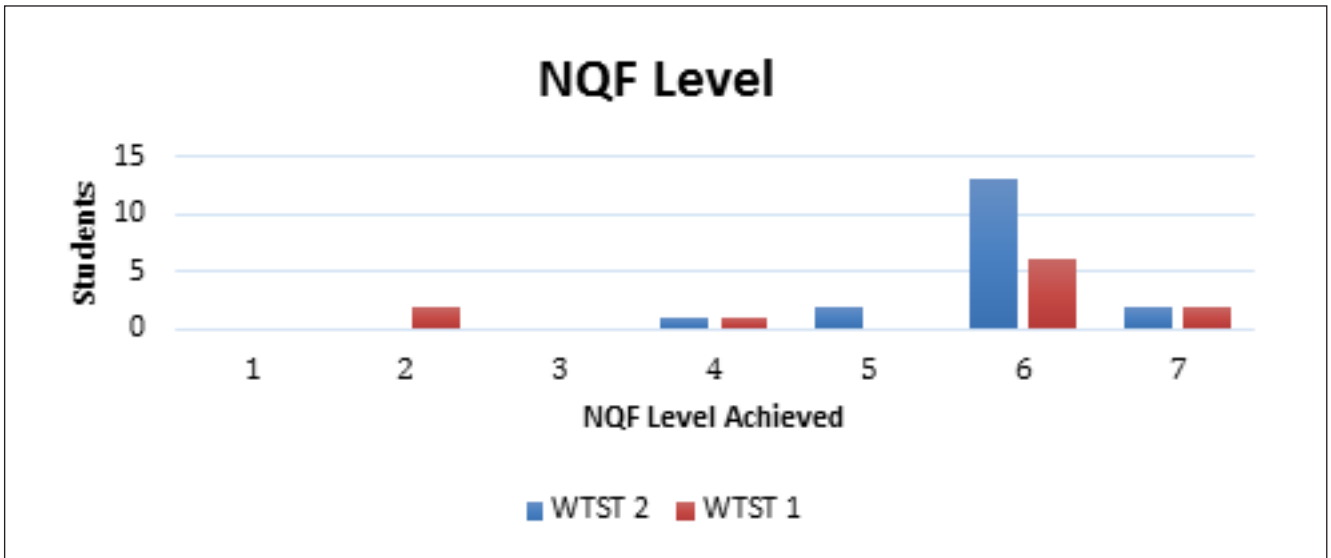


Figure 42: Graduates’ NQF level achieved

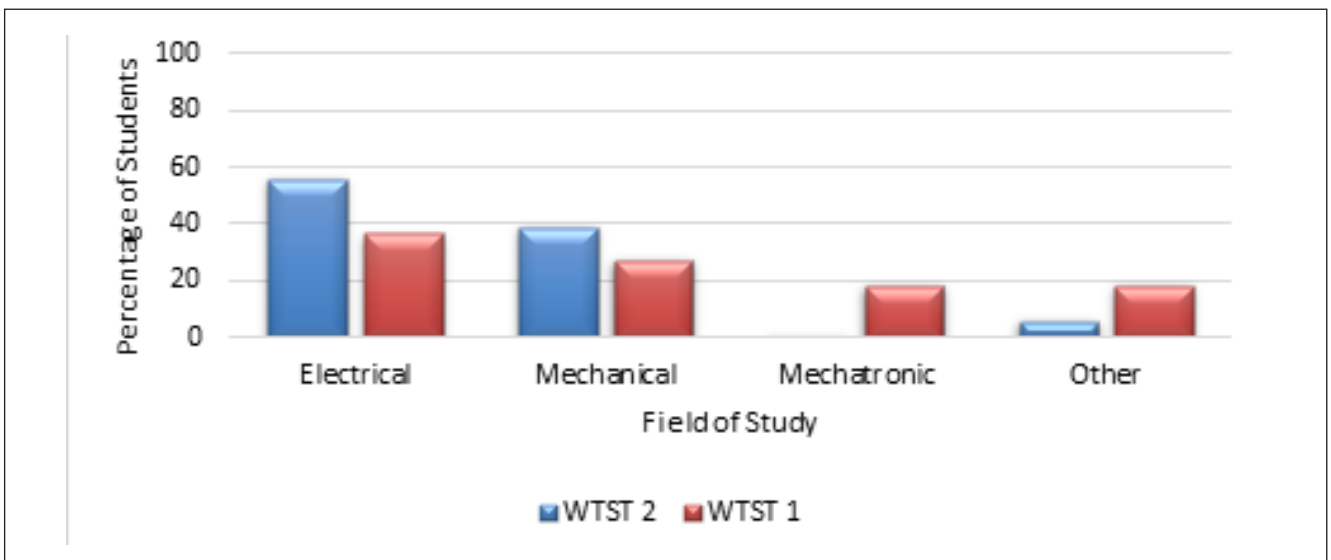


Figure 43: WTST 2 and WTST 1 graduates’ fields of study

one indicating otherwise. Interestingly, none of the WTST graduates came from a mechatronic background. WTST 2 graduates came from less diverse backgrounds than the WTST 1 graduates. The SARETEC course, from the graduate’s feedback, seemed to have more focus on electrical modules, which necessitated that the mechanical graduates to seek advice from the electrical graduates during the course. Fortunately, there seemed to be a notable amount of cooperation and knowledge-sharing between the graduates during the course.

Professional Background

The WTST 2 graduates had commonalities in their professional experience when entering the course. The reason for this was due to referrals given by the WTST 1 graduates who were themselves from these organisations. The South African Navy employed 6 of the graduates previously and 4 graduates came from the South African Air Force - the remaining graduates came from a variety of companies. There was a variety in terms of work experience in this group, with 3 of the graduates coming from internships or directly from previous courses. Common to 8 of the graduates was previous experience as either a technician (mechanical) or a mechanic.

Table10: Previous positions and organisations of the WYTST 2 graduates

Surname	Name	Title	Organisation
Topkin	Clayton	Regional Coordinator	EM Software & Systems
Marobe	Palesa	Radio Radar Technician	SA Navy
Volkwyn	Jacques	In-service Training	Unique Hydrad Oil and Gas
Matshidze	Aluwani Advocate	Engineering Officer	SA Navy
Hlezupondo	Ntandazo	Mechanical Technician	SA Navy
Mbekela	Yolisa	Maintenance Technician	Pepsi
Mtwa	Asemahle	In-service Training	Reutech Stellenbosch
Mucavele	Pedjat Frederick	Technician	W-Tech Manufacturing
Oliver	Daylin Brain Carl	Student	Northlink College
Patrick	Matsoso Napo	Installer	SME
Nkomo	Musawenkosi	Naval Officer	SA Navy
Tshandu	Danny Zuko	Aircraft Instrumentation Mechanic	SA Air force
Nyalungu	Sifiso Desmond	Aircraft Mechanic	SA Navy
Nkonyeni	Mvuzo Athenkosi	Aircraft Mechanic	SA Air force
Nikelo	Yongama	Submarine Technician	SA Defence Force
Matemane	Oliver	Aircraft Electrician	SA Air force
Ntshngase	Msimelelo	Maintenance Apprentice	Bokomo Weetbix
Sibisi	Vusumuzi	Aircraft Electrician	SA Air force

The impression from the graduates regarding the course was positive overall. Those with a mechanical background found the exposure to electrical training valuable, while the graduates with an electrical background seemed to enjoy the mechanical exposure. The value attributed to the combination of mechanical and electrical modules was a recurring theme from the graduates, with 8 of the graduates reporting that the most valuable or enjoyable aspect of the course was the dual exposure to mechanical and electrical training. The skills that are taught at SARETEC were thought to be transferrable and applicable to many industries including the automotive, oil & gas, and manufacturing sectors, which the graduates saw as a valuable outcome of doing the course. One graduate stated that the course “opens more opportunities for you, [the course] doesn’t just restrict you to renewables and wind turbines”.

13 of the graduates would recommend the course, although 4 did so with caution. The graduates who recommended the course with caution noted that employment in the wind industry upon completion is not certain and is a risk that must be considered by the individual prior to the course. One graduate had already recommended the course to 4 friends and colleagues who had applied for the next intake. There were 2 graduates who were unsure if they would

recommend the course.

The remaining 2 graduates would not recommend the course. One said that the course is better suited to young people who are unemployed, to expand their skillset, as older people will not be able to work too long on the turbines due to the physically demanding nature of the job. The other graduate cited their reason for not recommending the course as being able to enter the wind industry as a wind turbine service technician through on-the-job training and apprenticeships without having to do the SARETEC course. This graduate further stated that SARETEC was producing too many technicians for the industry to absorb, a recurring theme which was seconded by several of the other graduates. There seemed to be a bit of difficulty experienced by the graduates when completing this section. Some completed only one question and some both, hence the results not adding up to 18 for each question; however, the course did require a considerable amount of effort to complete.

Only one graduate would have preferred the course to be lengthened due to the course intensity and the amount of information the graduates had to absorb. People who have not been in academia for a considerable amount of time and are not familiar with processing substantial amounts

of information in a brief period may require more effort to complete the course. This was echoed by the graduates who were not recent graduates when enrolling for the SARETEC course.

Course Value and Quality

The recurring theme from the graduates was that the course content was relevant and that the skills learnt were valuable in industry. The course seems to contribute significantly to ‘personal growth and development’. Interestingly, 89% responded that the course ‘improved [their] employability’, even though (at the time of interviewing) less than 40% received placement in the wind industry. **This speaks to the perception of the transferability** of the training received from SARETEC that empowers their students in electrical and mechanical skills and makes them valuable human resources in the engineering industry.

This further emphasizes the value derived from the course, highlighting an overall course value rating of 81%. In terms of teaching and content quality, the SARETEC course received an overall score of 72% from the WTST 2 graduates. Individual consultation revealed that the reason for the lower score in this metric was due to the teaching quality and not the course content.

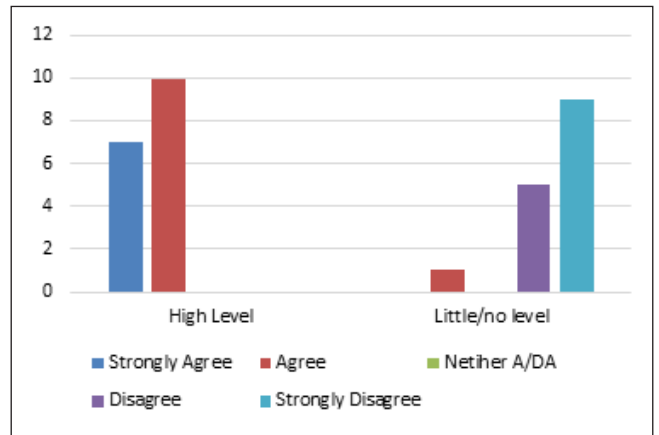


Figure 44: Effort level required

Lecturers

Nine graduates commented on the inexperience of certain lecturers regarding the practical components of the course. “Some of the lecturers had no experience on the turbines” and as a result were “clueless sometimes”, especially during practical’s. It was noted, however, that the lecturers were eager to learn and were “growing with each course”. The graduates commended the lecturers for their work during the theory components, and only had problems with the teaching quality during practical’s.

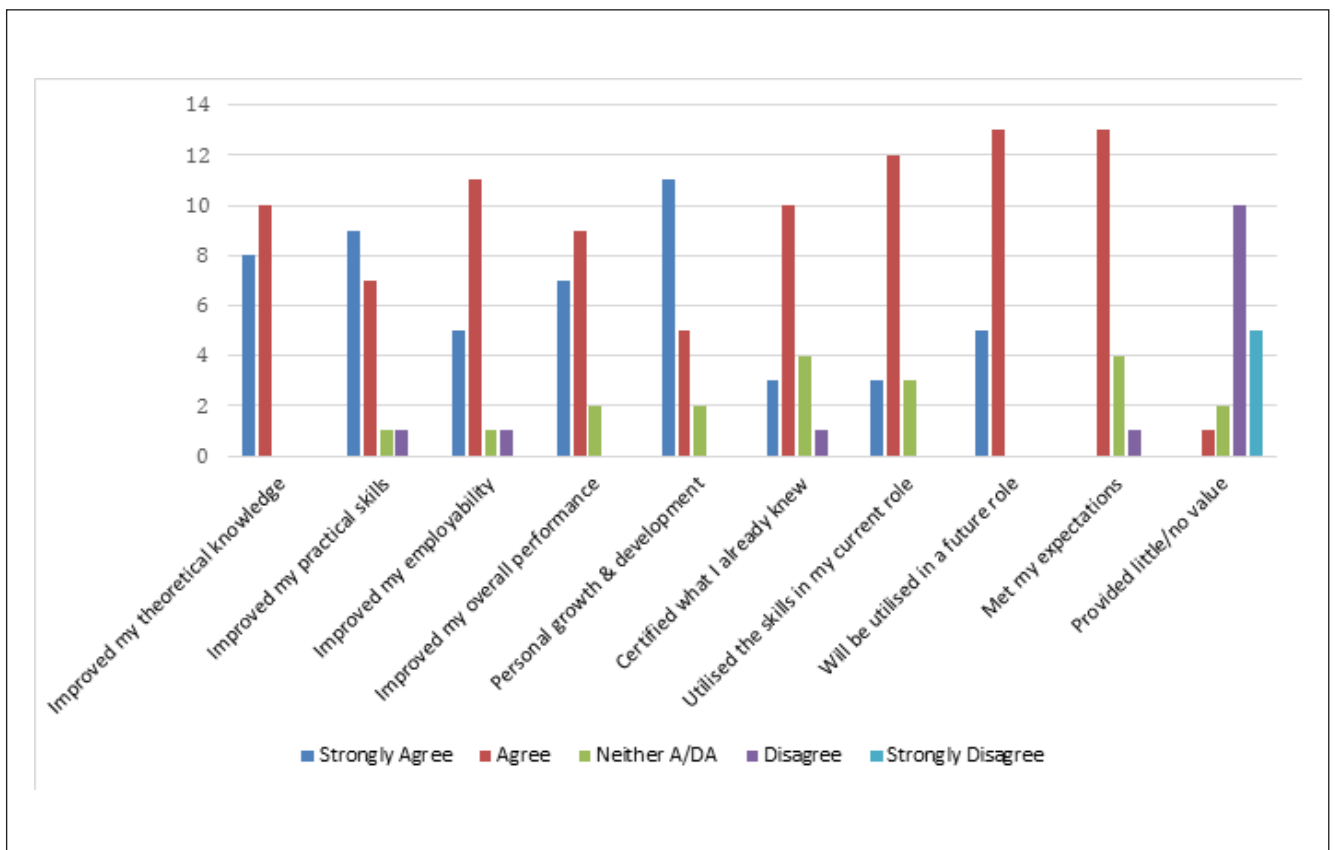


Figure 45: Value of the course

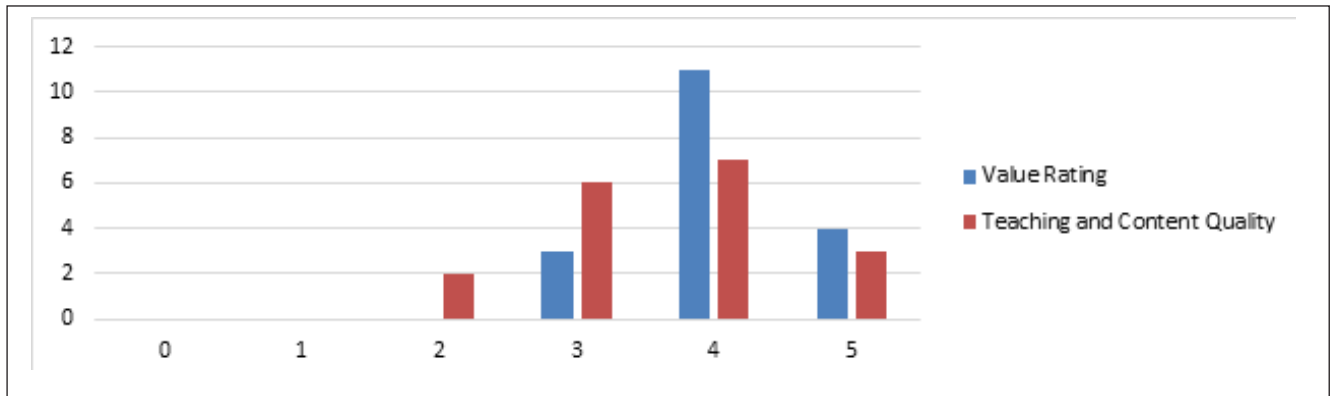


Figure 44: Value and quality of the course

Many of the graduates commented that they sincerely appreciated the days which outside experts were brought in, in the case of WTST 2 there were two outside experts used – Pravesh Tavarria from Nordex and Etienne Frans of the West Coast One Wind Farm which uses Vestas turbines.

One supervisor commented that one “cannot put [a graduate] in the field for two months and expect them to be ready” and another commented that “after a year [he] would gladly sign them off as wind turbine service technicians”. This shows that both industry, derived from supervisor feedback, and graduates recommend lengthening the in-service training and practical exposure in the course.

Time Allocations

Two graduates commented that the course could be shortened, particularly the theory component, while one graduate recommended the course be lengthened to allow more time to be given to the mechanical modules. This shows that, on the par, students were satisfied with the theoretical components, including the assessments and examinations.

Travel Availability

All the WTST 2 graduates were willing to travel abroad. Results could total more than 18 as respondents were able to enter more than one choice when answering this question. One graduate did, however, mention that they struggled with the rural settings of the Eastern Cape wind farms, and would prefer to be working in a more populous area. Four of the technical supervisors commented that, with experience, the graduates would be internationally transferrable. One

Importantly, of the eight supervisors consulted, five stated that the in-service training component needed to be extended.

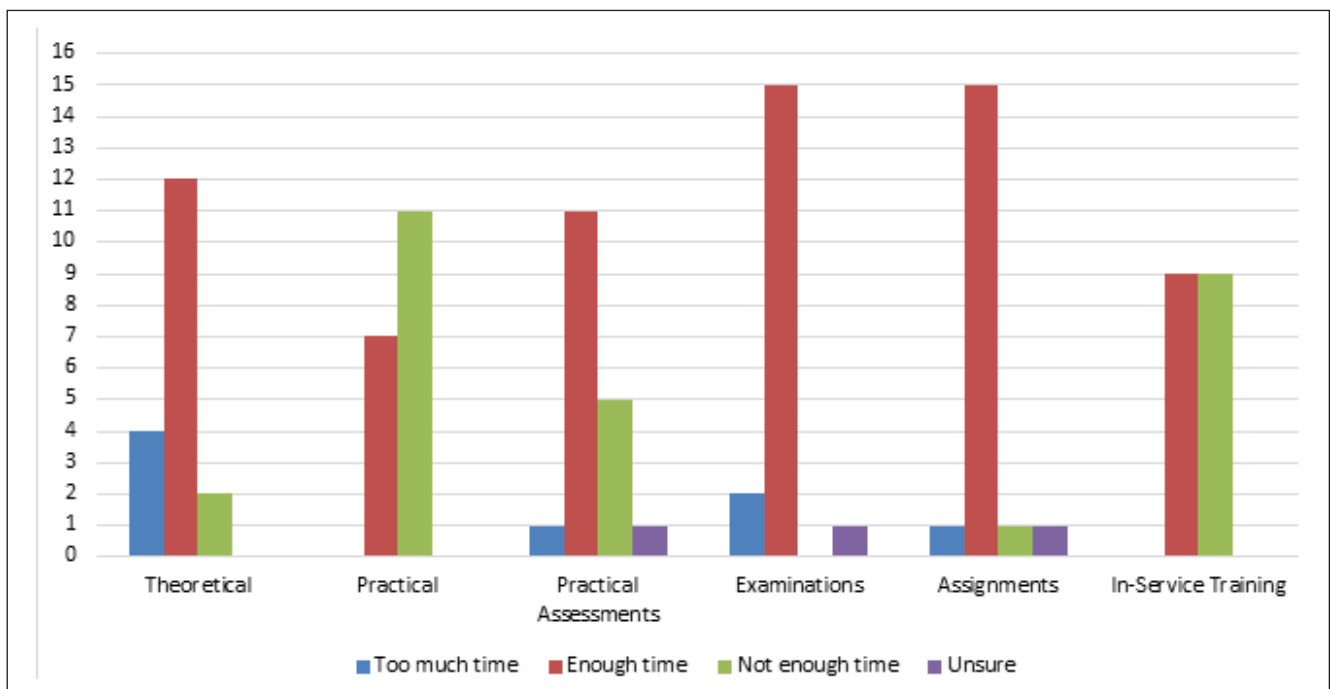


Figure 44: Value and quality of the course

supervisor, who was trained overseas, reported that the quality of work done by the graduates was “on par with anybody trained overseas”.

Suggestions for Improvement

The graduates gained a significant amount of value from the course and the consensus from the respondents was that the SARETEC WTST programme is “a good course”. The graduates were requested to provide suggestions for improving the course during the interactions, as per the following.

Perceived Direct ‘On-Turbine’ Experience of the Lecturers

As mentioned previously, the perceived ‘on-turbine’ inexperience of certain lecturers was a commonly raised issue from these graduates; however, this issue will be resolved in time as the lecturers become more comfortable and familiar with the facility and the students. The students noted that during practical’s the lecturers themselves were sometimes unable to identify the necessary components on the turbine. This caused concern that the lecturers had not yet worked on a turbine and were thus instructing students on a topic they are not yet experienced or familiar with.

Timeous ‘In-Service’ Training Placements

Another recurring problem amongst the respondents was that the in-service training placements were not available timeously and this made the graduates anxious. Two of the graduates took the in-service placement into their own hands and contacted employers directly to secure the required internship. To unpack this further AltGen would

need to know which OEM’s and services providers were contacted at which stages of the placement process.

Length of In-Service Training

Also related to the in-service training, the duration of this component was found, by both the graduates and the supervisors, to be too short. Some of the wind farms surveyed, conducted more intense routine maintenance on the wind turbines twice annually and, during these times, the students were given the opportunity to gain valuable experience on the turbines. Trying to coordinate the in-service training with the wind farm maintenance schedules would ensure students get direct exposure to the annual routine maintenance requirements of the wind turbines; however, the maintenance period does restrict the students to predominantly mechanical work, as graduates will not be given fault-finding and troubleshooting exposure during these periods. It thus makes sense for the length of the in-service training to be extended to allow some exposure to maintenance but also allow additional time for exposure to other turbine operations.

Industry Coordination

The maintenance schedules of the operating OEMs in South Africa are not aligned, and this creates a disjuncture between SARETEC students’ in-service training period and the various OEM’s maintenance schedules. Opening the dialogue between the wind industry in South Africa and SARETEC is pivotal going forward to coordinate in-service training placements, industry’s WTST absorption capacity, and to create and maintain goodwill between SARETEC and important industry players - who would be needed to support and absorb SARETEC graduates.

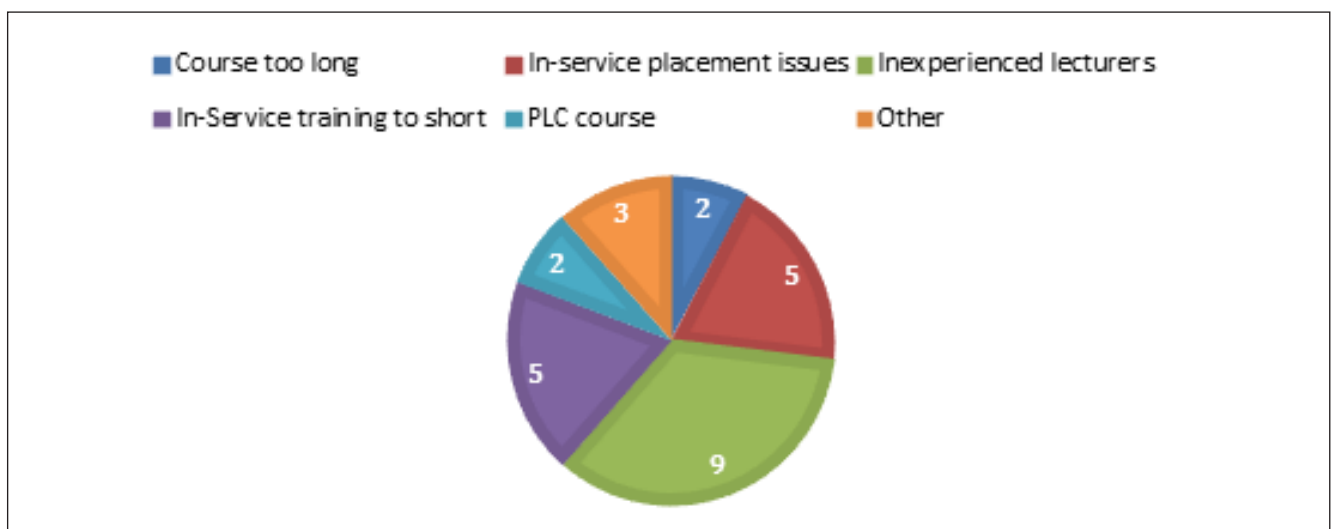


Figure 48: Course issues and areas for improvement

Absorption into Industry

The end of the in-service training period proved to be a stressful time for these graduates. The in-service training component was scheduled to reach completion on the 7th April 2017, and by the end of their in-service, only seven of 16 job seeking WTSTs had received offers to continue working.

- two of the WTSTs were already employed by Nordex before the end of the course
- seven were given 6-month contracts
- two were offered roles with 3Energy
- one was offered a role with Vestas (September 2017)

At the time of the completion of this study, five months later, two of the graduates who were on the 6-month contract were not employed by Nordex, bringing the total unemployed number to eight.

This caused anxiety in the graduates. There was a great deal of comradery between the graduates, who were all sharing information on possible employment opportunities and working to ensure everyone was offered a permanent position. One of the graduates who was offered a permanent position stated that “getting an offer was not something to celebrate because it demotivated the rest of the team”. Similarly, another graduate commented that being offered a permanent placement didn’t mean that they were better than the others, and that all were capable.

Post-graduation a further seven graduates were offered **six-month contracts** with Nordex, taking the number of graduates that received employment contracts to 12 or 67%; however, one graduate declined the offer to pursue their studies in Cape Town. Therefore, 11 WTST 2 graduates have signed employment contracts in the wind industry to date.

The seven graduates with six-month contracts could be classified as ‘partially employed’ according to the REIPPPP, which defines a job as a person year or 12 months of continuous employment, therefore these graduates can be considered as 50% employed, bringing the official statistic for Monitoring & Evaluation purposes of employed WTST 2 graduates to nine or 50%.

There were seven students who did not sign contracts with companies in the wind industry. The reason for the one graduate not signing, as mentioned above, was to pursue their further studies in Cape Town. In the time since the in-service training was concluded (7 April 2017) of the seven that were absorbed by Nordex, two graduates became unemployed due to the contracts not being renewed. Thus,

of the 18, as it stands, nine WTST 2 graduates were employed fulltime in the wind industry, one had since moved to work on a Concentrated Solar Power (CSP) plant, leaving eight of the graduates unemployed. The eight who were unemployed would like, as a top priority, to find employment in the wind industry, and had actively been trying to find work therein, but with no success to date.

Potential for Employment

If one looks at the REIPPPP holistically, there were two projects that could potentially absorb the WTST 2 graduates who had not yet been offered permanent placements to date. These were the Loeriesfontein 2 Wind Farm and the Khobab Wind Farm, both using Siemens turbines, and were expected to be completed in December 2017. Siemens confirmed that, in the coming three months, the company would require 10 WTSTs on their facilities. AltGen had connected the WTST 2 graduates with potential employers in the industry, and Siemens was one such employer that had been made aware of the availability of these recent graduates. Further engagement on this topic would need to be done to ensure that, as far as possible, the graduates received employment offers in the South African wind industry.

Vestas, at the time of writing, had one position open for a wind technician at the Noblesfontein Wind Farm. A second recently commissioned Vestas facility, Nojoli wind farm, connected in early October 2016, was fully staffed and couldn’t accept the WTST 2 graduates on the wind farm at the time.

It must also be borne in mind that the OEM’s have numerous sources of WTST’s, including 2nd tier service providers and direct applicants from other industries and SARETEC is not necessarily the first choice of supply of new WTSTs.

Unless the delays plaguing the Bid Window Rounds (BWR) 4 and 4.5 projects were resolved promptly, the capacity of the wind industry to absorb all the SARETEC graduates, including those expecting to graduate in August 2017, was limited. Even if these anticipated projects were signed-off immediately, there was still an 18-month lead time before WTSTs were needed on site. The problem being that instead of a staggered and steady demand for WTSTs, South Africa experienced limited wind energy development in 2016 and developments in 2017 remain uncertain. Should the BWR 4 and 4.5 wind projects reach financial close, approximately 18 months after construction begins there will be an increase demand for WTSTs which makes supply of WTSTs from SARETEC difficult to coordinate without having graduates who are unemployed for extensive periods of time during construction.

Supervisor Feedback

The engagements with the eight supervisors highlighted that the students, having completed the theoretical and practical components of the course, were capable technicians and able to execute the duties and responsibilities given to them by their superiors. Overall, the supervisors were impressed with the close adherence by the students to safety procedures when working on the turbines. When asked if there were any deficiencies or behaviours exhibited by the students that worried or bothered the supervisors, all of them responded that the training was not deficient in any area and that SARETEC had prepared them adequately.

The only wind farm in which a supervisor was not reached at the time of reporting was the Dorper Wind Farm in the Eastern Cape. The location of this wind farm is remote and there was not sufficient time during the Eastern Cape site visits to reach this facility. In some cases, notably the Amakhala Wind Farm and the Dassiesklip Wind Farm, two supervisors were engaged. In these cases, one supervisor worked closely on the technical aspects of the job, while the other performed a general supervisory role, focusing on safety and human resource management. These supervisors could not comment on the technical performance of the students, which is why the quantitative results below might not always sum to eight.

Graduate Expectations

Most supervisors had moderate expectations of the students, due to the very practical nature of the job which requires

hands-on experience in order to become competent. In time, and as SARETEC's reputation grows, supervisors should start to become more expectant of students as the course yields more industry acceptance and prestige (Figure 49).

Graduate Performance and Capabilities

The figure below, does not tally to eight for each of the questions due to the two supervisors who could not comment on the technical performance of the students. It is also important to note that the 'Less Satisfied' response for 'Mechanical Skills', 'Safety Procedures', and 'Working at Height' was due to the supervisor's adjudication of these functions at the beginning of the in-service training. The supervisor noted in the post-survey engagement that on completion of the in-service training, the graduates were performing these functions satisfactorily (Figure 50)

The overall performance of the students, according to their supervisors, was satisfactory, which echoes the comment by one supervisor that the students "were effective" and knowledgeable. One supervisor commented that, the students "knew more than [he] knew when he started working on the turbines". A benefit that SARETEC offers OEMs in South Africa is therefore that the graduates require a shorter induction period at the wind farms as they are familiar with the turbine terminology, have competence in mechanical and electrical engineering, and have pre-obtained the necessary certifications, such as Working at Heights and Medical Aid. This reduces the time and investment required by the OEMs to bring new technicians up to the desired level of competence.

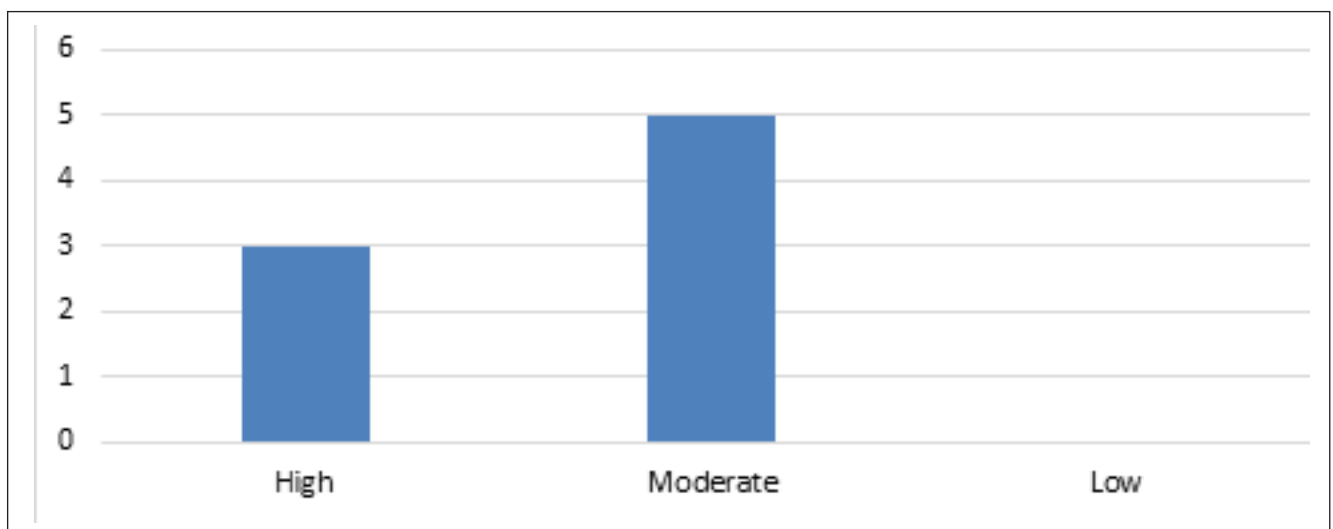


Figure 49: Supervisor expectations of students before the in-service training

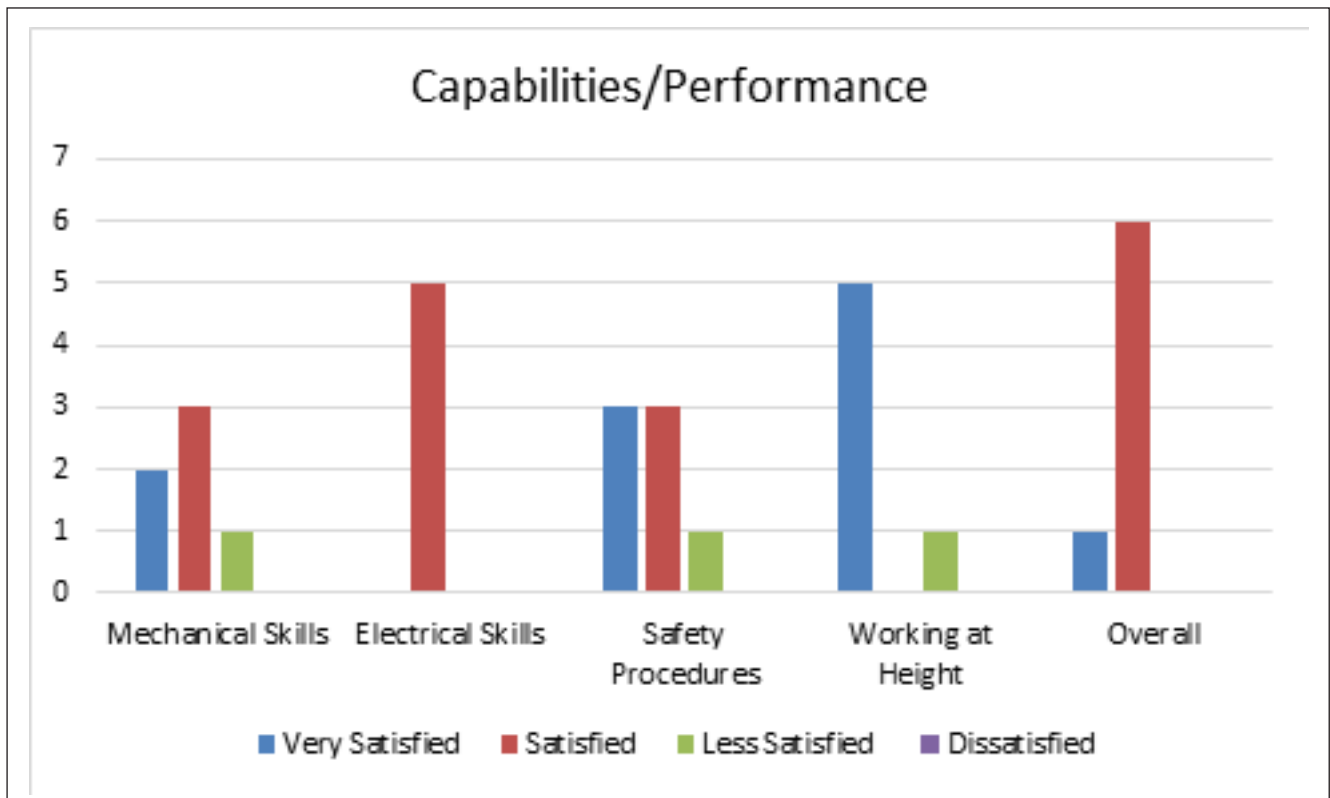


Figure 50: Supervisors’ impression of student performances on-site

Course Appropriateness

In general, the supervisors found the course to be ‘appropriate’ with 5 of the supervisors commenting that to be fully competent the students needed more turbine-specific experience. This can only be obtained on-site. That said, 100% of the supervisors recommended the course. This is a testimony to the quality of the knowledge and skills provided to the graduates and their attitudes on-site. There is room for improvement but given the youth of the facility “SARETEC is brilliant”.

Suggestions for Improvement

Lengthen In-Service Training

The theory offered by SARETEC lays a good foundation for the graduates, **but the hands-on experience is the most vital element**. As mentioned in the section earlier, providing the students with more practical experience is the overarching suggestion from the supervisors. Extending the duration of the in-service training was an effective method of increasing this exposure. The consensus from supervisors and the

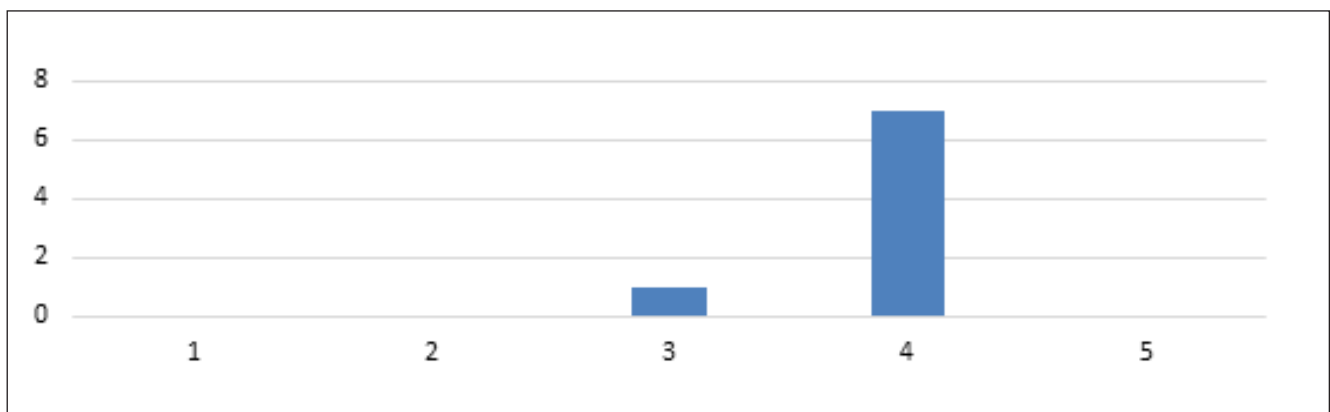


Figure 51: Appropriateness of the SARETEC course, as rated by the supervisors

graduates was to lengthen the in-service training component to at least six months. This would ensure students are given exposure to maintenance procedures (which generally occur twice yearly) and additional experience with troubleshooting and fault-finding, which the graduates are only exposed to outside of the maintenance period.

Turbine-Specific Training

Turbine-specific training, in the form of PLCs and software training, was suggested by three supervisors for furthering the performance of the graduates. A supervisor, who happened to be involved in the design of the SARETEC WTST programme, suggested that ideally SARETEC should have an operational nacelle at the facility. This will allow students to do fault-finding and troubleshooting training using turbine-specific software during the course. Outsourcing PLC training was suggested by one of the graduates as an effective means to give the students exposure to turbine-specific software.

German-Trained and WTST 1 Graduate Feedback

Imperative to the study was to trace where the previously trained candidates currently find themselves. AltGen Consulting therefore followed up with graduates from WTST 1 as well as and the two prior groups of German-trained students (GT 1 and GT 2) to establish where their career paths

have led them upon completion of their respective courses. Out of the collective 32 graduates of all the three intakes, 10 students were not reachable, due to phone number changes, relocation and other.

Professional Development

The high-level findings to date are that of the 32 graduates, 17 of them are still employed within the renewable energy industry with 16 working within the wind sector. Of the remaining fifteen, 5 are confirmed no longer working within the industry.

All five graduates who are not in renewable energy highlighted that, although they thought the skills learnt on the WTST course were transferable into other industries, none of them were using any of their training in their current roles. From the above graduates, Lwandile, Waydon and Lukhanyo were all previously employed by their current employers and have since returned to their positions or moved to different departments when / if they could not secure permanent employment following the in-service training. Although, Waydon was seconded onto the Sere Wind Farm for two years, there were irreconcilable differences between himself and his colleagues, making the working environment an unpleasant one and thus he was moved to a different department, namely the Koeberg Nuclear Power Station.

Table11: Current positions of graduates who are confirmed to have left the RE industry altogether

Graduate	Start date	Title	Organisation	Intake
Waydon Esterhuizen	October 2015	Technologist	Koeberg Nuclear Power Station	GT1
Lwandile Jabavu	August 2009	Aircraft Technician	South African Airforce	WTST 1
Jacobus Vos	June 2014	Sheep Farmer	Self Employed	GT2
Kalin Pakraj	January 2014	Operations Manager	Durban Harbour	GT1
Lukhanyo Mangcaka	July 2006	Electronics Artisan	South African Navy	WTST 1

Table12: Graduates who currently fill roles within the Renewable Energy industry

Graduate	Start date	Title	Organisation	Intake
Allistair Jacobs	February 2014	Technician	Eskom (Sere)	GT1
Lamla Vusani	January 2014	Plant Operator	Biotherm Energy (Dassiesklip)	GT1
Rito Sunduza	December 2013	Plant Operator	Biotherm Energy (Dassiesklip)	GT1
Rhygin Campbell	July 2016	Quality Inspector	Siemens (Loriesfontein)	GT1
Jonathan Venter	May 2013	Commissioning Technician	Nordex	GT2

Graduate	Start date	Title	Organisation	Intake
Shariff Abrar	January 2012	Head of Technical	Obelisk	GT2
Luthando Nodada	September 2014	Service Technician	Vestas	GT2
John Padbury	May 2016	Consultant	Freelance	GT2
Elliot Loliwe	February 2013	Senior Technician	Eskom (Sere)	GT2
Lolwethu Mxenge	January 2016	Assistant Supervisor	Enel Green Power	GT2
Etienne Frans	April 2015	Performance Engineer	West Coast 1	GT2
Bastian Martin	February 2013	Mechanical Artisan	Eskom (Sere)	GT2
Leonard Andrews	February 2013	Technical Operator	Eskom (Sere)	GT2
Thato Manamela	September 2016	Service Technician	Suzlon (Cookhouse)	WTST 1
Reynold Kliensmidt	September 2016	Service Technician	Vestas (Hopefield)	WTST 1
Sulana De Jager	March 2015	Solar Technician	Globeleq	WTST 1
Gavin van der Merwe	September 2016	Service Technician	Vestas (Hopefield)	WTST 1

Unlike the graduates from the more recent intake (WTST 2) discussed in previous sections, it is important that note that of the above 17 graduates, 12 of them were already employed by their current employers and all voiced clear intention to grow further into roles within the respective organisations. This ultimately could mean that working within the industry proved to be beneficial in terms of ensuring secure employment upon the completion of the course. However,

it could also hinder openings within the wind sector on existing wind farms, further hampering the need for newly qualified technicians.

The following table depicts the assumed employment status of graduates who were not reachable by phone. The information below is based on an AltGen follow-up completed in September 2016.

Table13: Graduates from intakes GT1, GT2 and WTST 1 (WTST 1) unreachable by phone

Graduate	Title	Organisation	Intake
Donegan Scheepers	Technical Controller	Eskom Holdings	GT1
Denver Cloete	Technical Controller	Eskom Holdings	GT1
Felix Biehlefeld	Mechanical Engineer	Rechnungsbegleichung in Deutschland	GT1
Michael Horner	Mechanical Engineer	Duroplastics	GT1
Bernard Joseph	Service Technician	Eskom (Sere)	GT2
Stanley Lange	Wind Turbine Installation Technician	Biotherm Energy	WTST 1
Jacque Redelinhuis	Maintenance Artisan	South African Navy	WTST 1
Mpapi Seakamela	Operator	Biotherm Energy	WTST 1
Yandisa Soji	Electrician	Zizwe General Services	WTST 1
Bekithemba Spalla	Junior Engineer	Dorper Wind Farm	WTST 1

Conclusion

Having spoken to all the above-mentioned alumni, there is a general consensus that all (GT1, GT2, WTST 1 and WTST 2) graduates are pleased with the course outcomes, and overall experience gained from the in-service training. All graduates, both currently employed and unemployed would like to build a career within sector. Previously discussed in the sections above, past graduate groups (GT1, GT2 and WTST 1) provided a great deal of positive feedback with regard to the course and their employment status.

This presented both positive and negative key points - such as being able to imagine the prospects of international work and travel as well as growing into Plant or Operations

Managers within the sector as the industry matures in South Africa. The WTST 2 graduates, however, highlighted their concerns regarding the uncertainty of the Renewable Energy industry in-country and this has been one of the main drivers urging them to explore opportunities elsewhere. This could also reflect what is currently happening in industry regarding unsigned PPAs with five graduates from an intake of 18 being unemployed, resulting in 28% unemployment in this group.

The GT1, GT2, and WTST 1 graduates are all pleased with the way in which their careers have evolved - and would like to still be informed of any future training SARETEC may conduct.

PART 7 – October 2017

WTST 3 Exit Interviews

Intake	Start Date	Sponsor	Number of Students	Gender Breakdown	In-Service Completed
GT 1	May 2013	Various	11	10 Male 1 Female	September 2013
GT 2	February 2014	Various	11	10 Male 1 Female	August 2014
WTST 1	February 2016	MerSETA	11	10 Male 1 Female	August 2016
WTST 2	August 2016	Nordex, SANEDI	18	16 Male 2 Female	April 2017
WTST 3	February 2017	DANIDA	13	6 Male 7 Female	September 2017

WTST 3 Course Feedback

The academic component of WTST 3 took place over the period February to June 2017 and as of the 31st September 2017 the WTST 3 students had either just completed or were part of the way through their internships at the OEM's / engineering services providers.

Engagement Method

AltGen arranged to meet with 11 of the 13 students of WTST 3 for in-person interviews, the other two students were interviewed telephonically [Nontsasa and Nokubonga]. After these meetings and calls, a survey was completed online by all the graduates to further support the qualitative data collated in the interviews. The supervisors were also interviewed during the site visits, and they were sent the online survey to complete. A total of six supervisors were questioned on the overall performance, capabilities and quality of the graduates in the in-service training.

Demographic

Male / Female

For WTST 3, and for the first time in all the courses, most of the candidates were female, 7 / 13 students or 54%. This represents a significant increase in the numbers of female students on a single course. Prior to WTST 3, there have been a total of 5 female graduates and when adding the 7 females from WTST 3 the total is now 12 female graduates from a total of 63 students. At this point 20% of all graduates are female.

It is important to note that there are very few female wind turbine technicians in South Africa. Investigations by AltGen found one female technician employed by Vestas, one by Nordex, one by Acciona, and one employed on a fixed term contract with 3Energy, a total of four females of an approximate 170 - 200 technicians in industry. The South African wind industry is not catering for females and this creates the very real concern that the females that are graduating from SARETEC have limited prospects of employment.

In common with WTST 2, the female candidates have confirmed that a few gender issues have arisen.

- Ablutions are not always readily accessible, and constantly being on site and not having ready access to a toilet is a challenge.
- Physically demanding: some of the tools and parts are very heavy, and although they try hard they are sometimes not strong enough to handle the tools with ease and at times have needed assistance with some of the heavy lifting.
- Access to separate facilities such as changing rooms: showers (if there are), change rooms and toilets are all shared, and this not convenient.

Elethu Mvunelo, a female graduate of WTST 3, has been absorbed into the engineering services company (facilities management) 3Energy and she stated that she has found that completing the SARETEC course and then being employed by a facilities management firm was the perfect combination for her. She understood the technical workings

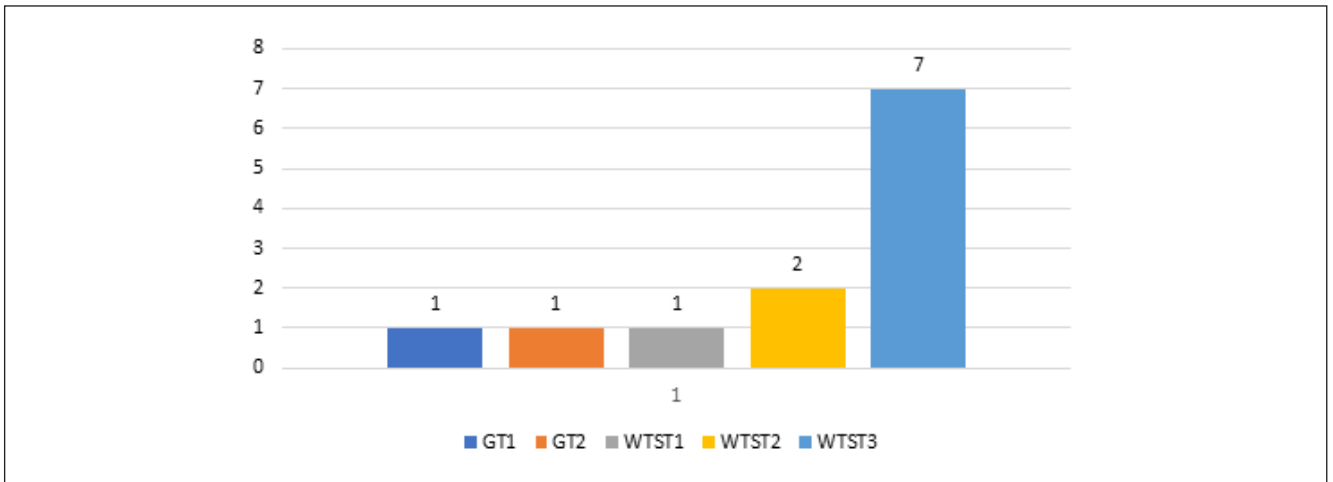


Figure 52: Number of females across all five programmes

of the turbines, and was able to utilise this knowledge when analysing SCADA outputs and technical reports produced by the OEM (Nordex).

of majority black students and one white as depicted in the demographic profile figure (Figure 53).

Racial Composition

The white student was the only one who was not sponsored – he paid for himself through accepting a retrenchment package from his previous employer.

For WTST 3 the racial composition of the group consisted

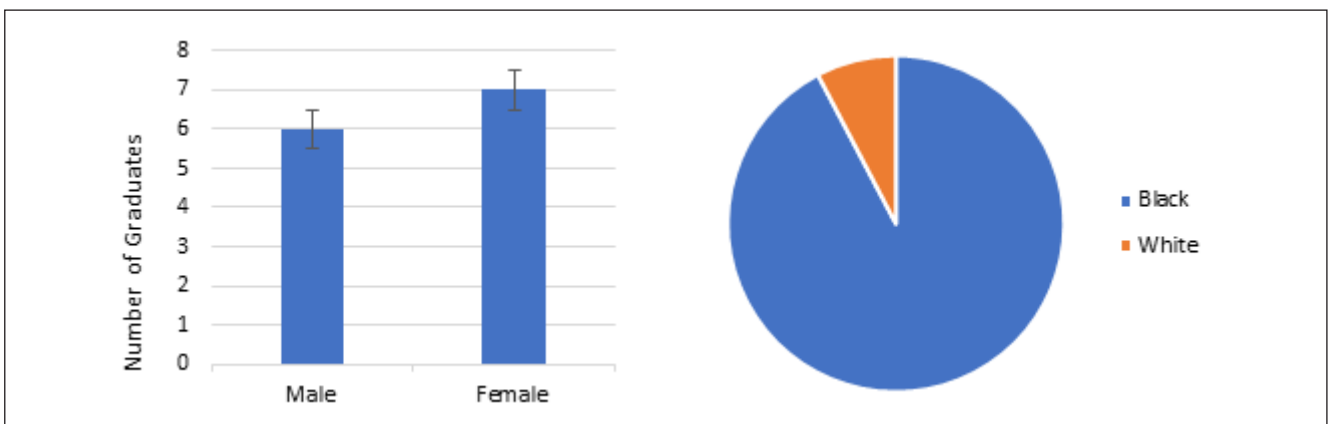


Figure 53: Gender profile (left) and demographic profile (right)

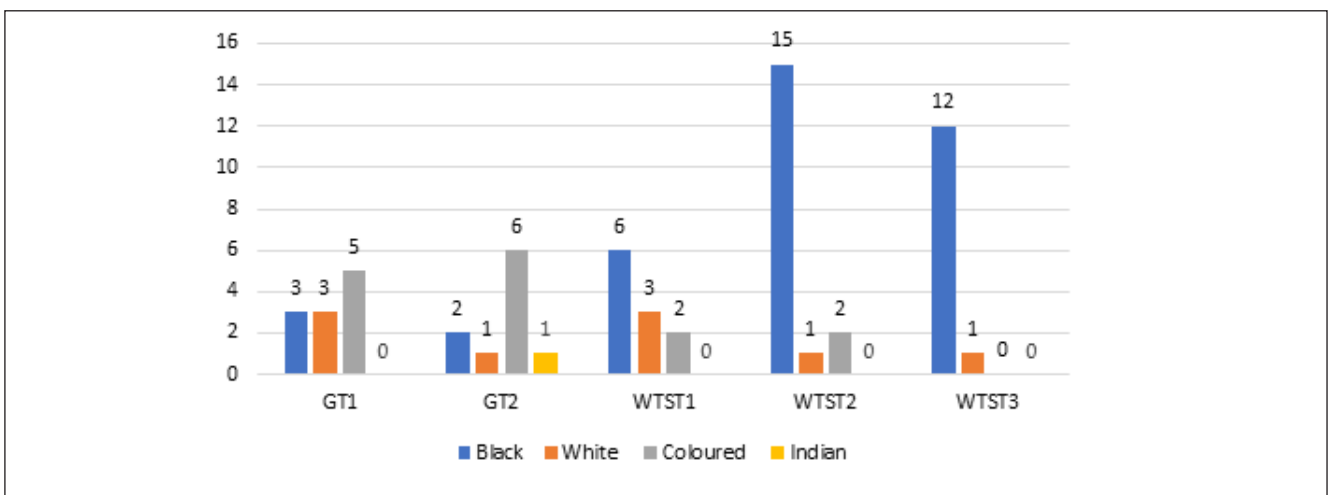


Figure 54: Racial Composition across all programmes (GT1 to WTST3)

Table14: Summary of the qualification levels and field of study of the WTST 3 intake

		Wynand De Cock	Elethu Mvunelo	Motjatji Malatji	Nokubonga Ximba	Lulamela Majiza	Sicelo Gumede	Sonwabo Gqokoma	Sabelo Mabandla	Relebohile Marumo	Sinesipho Pongoma	Apele Tyali	Siphosakhe Mazibu	Nontsasa Gaga	
Qualification		Electrical							Mechanical						
National Diploma	NQF 6	Elec	Elec	Elec	Elec	Elec	Elec		Mech	Mech	Mech	Mech	Mech	Mech	12
Trade Test Certificate	NQF 4						Elec								1

Educational Background

Of the 13 students, 12 hold National Diplomas (NQF Level 6), of these, half were mechanical and half electrical. One student held a National Certificate in Electrical Engineering, equivalent of an NQF Level 2. With almost 70% of the group in this intake coming from the South African National Defence Force (SANDF), the overall educational background was not as diversified in terms of NQF levels as has been the case with previous groups. According to the student's feedback on the course, the mix of mechanical and electrical was beneficial to them, they often helped each other out in the various areas of specialisation.

Professional Background

The WTST 3 intake saw an increase in the number of students coming from the South African National Defence Force with 8 of the 13 students resigning from positions in the Navy and one from the Airforce. This was due to referrals from ex-colleagues who were part of the previous WTST intakes and some of whom were now employed as turbine technicians.

One of the candidates has a telecoms background and the remaining two were unemployed due to recent retrenchments attributed to the downsizing of the companies they were employed by. Interestingly, both of these companies are affiliated to the wind industry: *DCD Wind Towers*, a wind turbine tower manufacturer, and *Adventure Power* a medium scale wind turbine manufacturer based in East London.

Table15: Previous positions and organizations of the WTST 3 graduates

Surname	Name	Title	Organisation
De Kock	Wynand	Technician	Telkom
Pongoma	Sinesipho	Engine Room Attendant	South African Navy
Majiza	Lulamela	Electrical Technician	South African Navy
Tyali	Apelele	Engine Room Attendant	South African Navy
Gaga	Nontsasa	Engineering Officer	South African Navy
Mazibu	Siphosakhe	Engine Room Attendant	South African Navy
Marumo	Relebohile	Technician	Adventure Power
Gqokoma	Usher Sonwabo	Artisan	DCD Towers
Mabandla	Sabelo	Aircraft Technician	South African Airforce
Ximba	Nokubonga	Engine Room Attendant	South African Navy
Malatji	Motjatji	Electrician	South African Navy
Gumede	Sicelo Thamsanqa	Submarine Electrical Technician	South African Navy
Mvunelo	Elethu	Technician	South African Navy

Overall Course Impression

The overall impression received from the students regarding the course was positive. They generally found that having a mixed class of mechanical and electrical backgrounds was the most valuable aspect of the training, with some of the students mentioning that they enjoyed having to help one another understand what that the course required from them.

Some of the students voiced concern about the fact that there was no guarantee of a job after the course. This is probably an indication of the level of anxiety they were experiencing about potential employment, but it is counter-balanced by a general positivity in the online feedback that reflected that most of the students felt that the disruption in employment in the wind industry is temporary, and they thus had no regrets about most of them having resigned from full-time jobs. This may of course change if unemployment continues. All the students mentioned that they would recommend the course if they had not already done so.

One student stated that, “attending this course was indeed one of the best decisions I have made in my life”. He did highlight that he found it strange that no-one seemed to fail the course, and he questioned the true understanding of the graduates prior to being on-site for their in- service training.

In his mind, the qualification seemed based on attendance rather than competence, and he voiced that this may have an impact on the qualification’s long-term reputation. In terms of effort level required, both WTST 2 and WTST 3 had an evenly split opinion between strongly agree and agree. The effort levels required to complete the course can therefore be summarised to be consistently high. This cannot however be taken to mean that they are entirely appropriate, since not a single graduate of the 3 tranches has failed.

There was consensus among the students that the course content was valuable to them, with a recurring theme being that the course improved their general employability. This illustrates that participants feel that the course has a holistic skills development function rather than just being preparation to be a wind turbine technician. As with WTST 2, although the students were all employed prior to attending WTST 3 and prospects of employment are currently limited, most of them still found the experience worthwhile.

Another area that was ranked highly by the students was the fact that their theoretical knowledge improved from attending the course. This may have been due to the mixed discipline classroom setting - reiterating the opportunity to learn over and above their area of knowledge and competence.

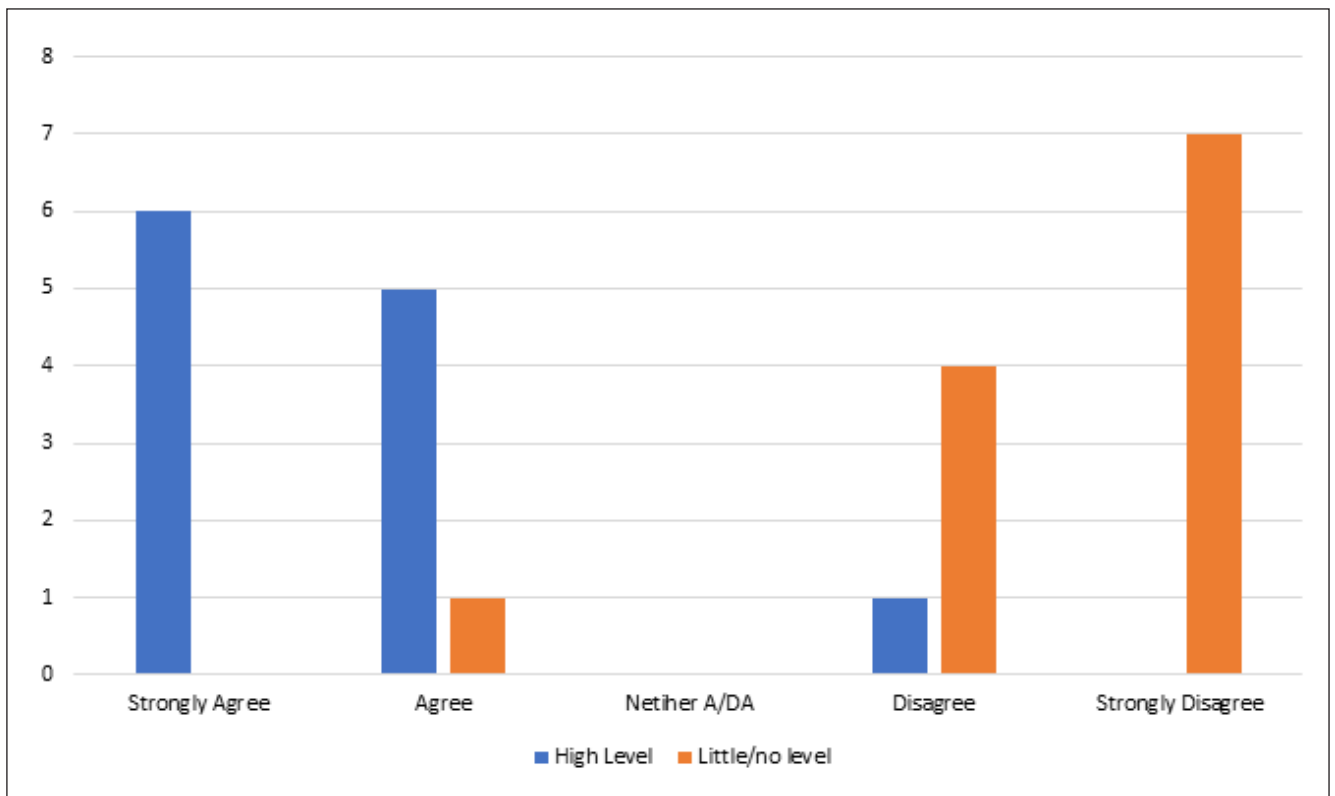


Figure 55: Effort level required

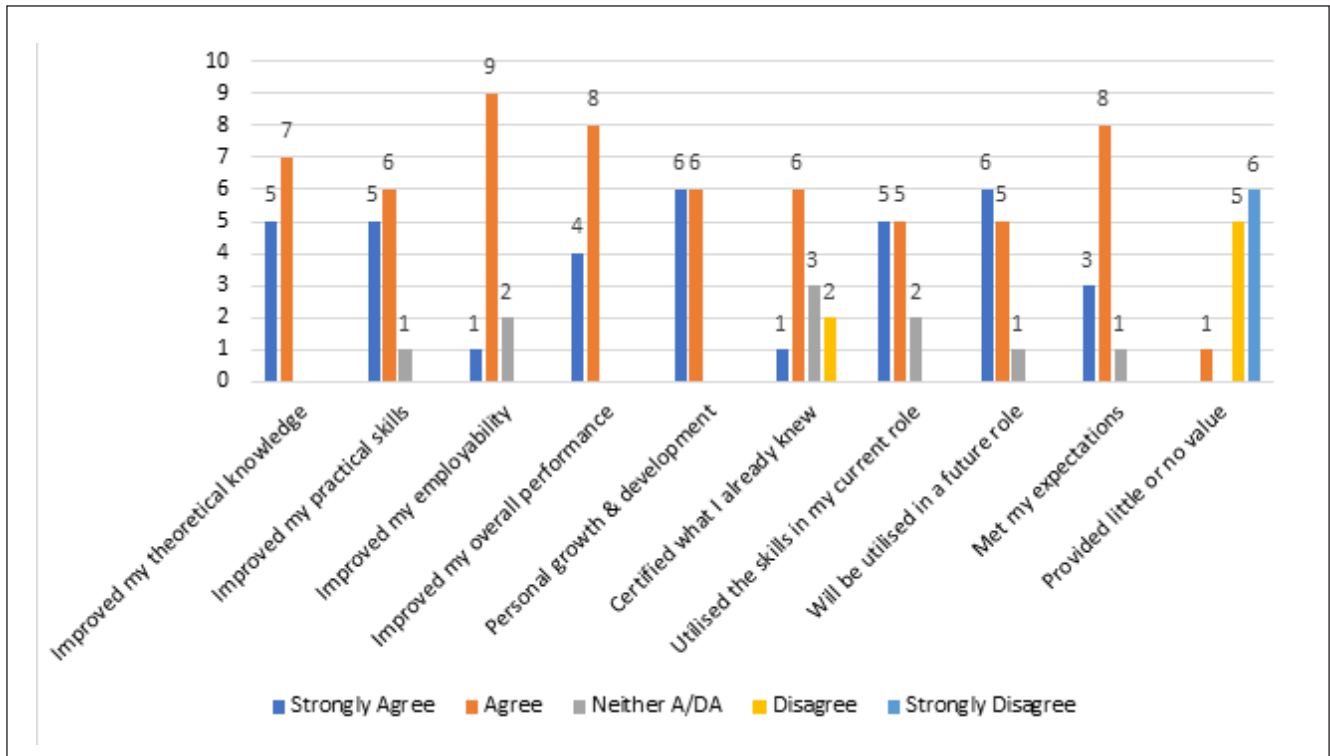


Figure 56: Value obtained from the course

Lecturers

From the survey responses of WTST 3, none of the students had negative comments about the lecturers. This contrasts somewhat with WTST 2, where comments previously shared included that lecturers were “sometimes clueless” or “seemed to have no experience on the turbines”

There was a slight difference in the results of the online survey and the in-person interactions, where online the students commended the lecturers on how well versed they were on the topics of discussion whereas in-person some dissatisfaction was shared, with students highlighting that at times lecturers did not have the answers they required, and with a class of mixed disciplines, explaining subject specific details could sometimes take longer. One student made an example of how some of the electrical students struggled with the mechanical drawings, and the lecturer could not help them in a way that they would understand.

Suggestions from WTST 3 Students

Extended Engagement with Lead Technicians and Trainers as Guest Lecturers

Parvesh Tavaría, the Technical Trainer from Nordex, and Etienne Frans, a Technical Supervisor employed by Aurora Wind Power who was working on the West Coast One Wind Farm, have both lectured across all three of the SARETEC intakes, and were regularly listed as the trainee’s favourite

lecturers. But the time that they spent with the students seems limited and the students universally requested more exposure to these individuals.

Martial Giraneza was specifically named as one of the preferred lecturers, with one student commenting on the patience Martial has with students, offering his time after hours when they needed assistance on the course work. It is unfortunate that Martial was on a fixed term contract with SARETEC and this has subsequently come to an end. He left SARETEC in July 2017.

Time allocation and extended in-service training

A clear majority of the students in this intake said that they felt the time allocated across the course components was adequate, and as depicted above three students considered that the in-service aspect of the course could have been extended to gain more exposure to various tasks on site. All six of the supervisors echoed the same, adding that exposure on site is dependent on the maintenance schedule of the facility. Two of the interns on West Coast One mentioned how they were privileged to be involved in a gearbox exchange - highlighting that had it not been for this rare occasion they would not have had that much exposure to the turbine itself, and the experience gained from that was highly beneficial. The same occurred at the Kouga Wind Farm with the WTST 2 course, where multiple gearbox changes occurred during the internship and the students felt they gained considerable exposure from this.

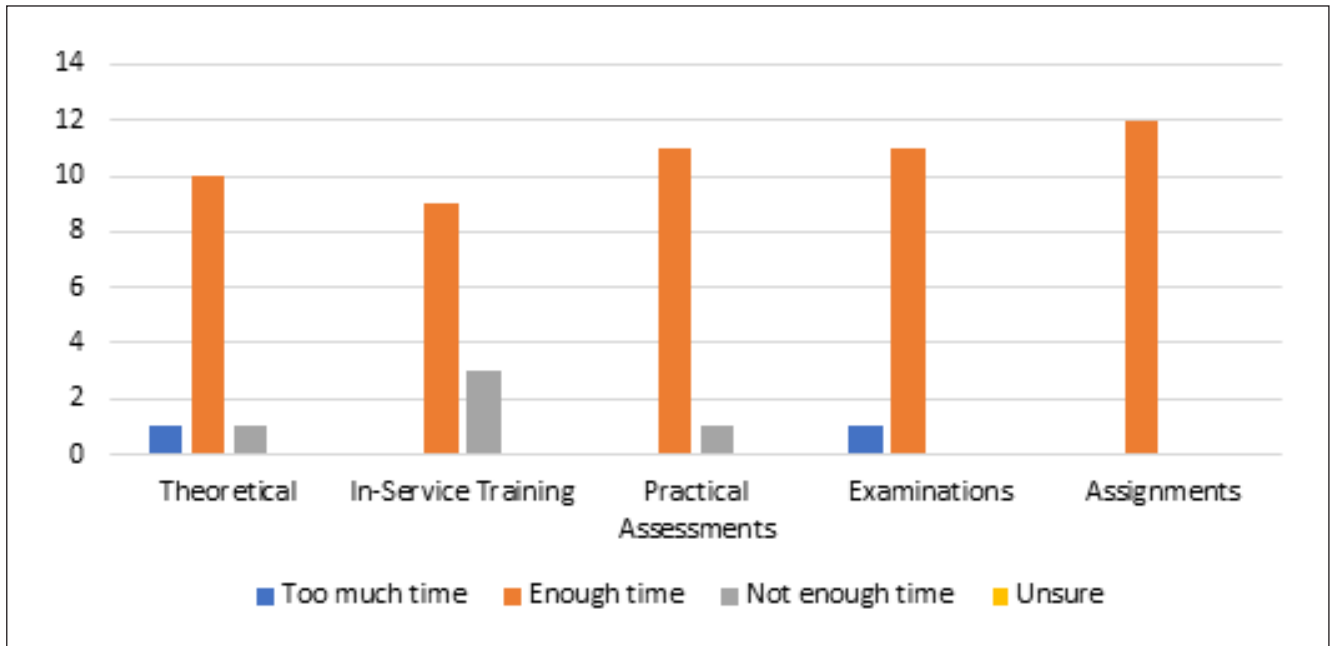


Figure 57: Breakdown of the amount of time allocated to each of the course components

Better Collaboration with Industry on In-Service Training

Another recurring theme was that there was a disconnect between SARETEC and industry in terms of securing internships, as well as when the internships take place in relation to the maintenance schedules. A few of the interns felt that they received minimal exposure to real maintenance issues, spending most of their time doing oil changes, and there were also comments made that there should be better collaboration between SARETEC and industry on the types of internships available.

Completing the internship with an engineering services company such as 3Energy meant that one of the students could not go up the turbine at all for the duration of his internship. 3Energy's maintenance contracts can take different forms, and while some of them may involve full maintenance, on others they are not allowed to go up the turbines, and this student was very disappointed that for the duration of his internship he would not be doing any hands-on work at all, which defeats the object of the internship.

One of the supervisors suggested SARETEC could coordinate the internships to coincide with the OEM's annual maintenance during which time he felt the students would receive the most exposure, but this is of course organisationally challenging and imply excellent coordination between SARETEC and industry.

Provision of Accommodation During the Course

Although given a monthly stipend of around R 2 500, some of the student highlighted the difficulty that they have encountered paying for accommodation and meals while studying. Two of the students mentioned how they would miss classes to sell 'vetkoek' at the taxi rank to earn money which could be used for transportation. A suggestion to consider housing the students in the CPUT residences was offered as a possible solution.

Travel Availability

Of the 13 students in this group, 11 of them were willing to travel abroad, with nine of them very specific, that should such an opportunity arise, they would want this to be a fixed contract for a duration of one or two years. Four students indicated that they had already been applying for opportunities as turbine techs overseas, with no responses yet. There were only two with no intention or interest in the international working environment.



Figure 58: Willingness to travel

Internships

From the previous reports it can be recalled that the students from WTST 1 and 2 had difficulty securing internship placements; from the feedback interviews of WTST 2: “Another recurring problem amongst the respondents was that the in-service training placements were not available timeously and this made the graduates anxious. Two of the graduates took the in-service placement into their own hands and contacted employers directly to secure the required internship”.

With WTST 3 it was once again a struggle to arrange where the students would be placed, result being anxiety,

uncertainty and students starting their in-service training at widely different times. The first technicians started their internships on 19th of June 2017, and the last technician commenced their internship on the 28th August 2017, after waiting at home in the Eastern Cape for two months to secure a place. By this time several classmates had already or were about to complete their internships. With a total of 13 interns, the following employers assisted:

1. 3Energy committed early to taking four of the interns, and these students took up their places immediately on completing the academic curriculum of the course.
2. SARETEC arranged that Eskom accepted three students

Table16: Summary of the WTST3 in service placement

Surname	First name	Placement Company	Wind Farm	Start date of in-service
De Kock	Wynand	3Energy	Jeffery’s Bay Wind Farm	19 th June 2017
Mvunelo	Elethu	3Energy		19 th June 2017
Malatji	Motjatji	3Energy	Amakhala Emoyeni Wind Farm	19 th June 2017
Marumo	Relebohile	3Energy		19 th June 2017
Gqokoma	Sonwabo	Eskom	Sere Wind Energy Facility	17 th July 2017
Majiza	Lulamela	Eskom		17 th July 2017
Gumede	Sicelo	Eskom		17 th July 2017
Mabandla	Sabelo	Vestas	West Coast 1 Wind Farm	3 rd July 2017
Pongoma	Sinesipho	Vestas		3 rd July 2017
Mazibu	Siphosakhe	Vestas		3 rd July 2017
Tyali	Aphelele	Vestas		3 rd July 2017
Ximba	Nokubonga	Biotherm Energy	Dassiesklip Wind Energy Facility	21 st August 2017
Gaga	Nontsatsa	Vestas	Grassridge Wind Farm	28 th August 2017

for work placement, and these interns started with Eskom on the 17th July 2017 to the 15th September 2017 after the completion of the academic engagement which took place from February 2017 to August 2017.

3. A further four students were accepted by Vestas, completing their internships over August and September 2017.

The final two students took longer to place, eventually being absorbed by:

4. Dassiesklip Wind Energy Facility, Nokubonga Ximba started with her in service training on the 21st August 2017.
5. Nontsansa Gaga, with Vestas commencing on the 28th August 2017. To facilitate the acceptance of the final student, Ms Gaga, AltGen agreed to pay her a stipend (R 5 000), and Vestas provided the training and internship facilities.

Supervisor Feedback

The engagement with the six supervisors highlighted that they saw good value in utilising SARETEC graduates. Supervisors were impressed with the graduate’s ability to apply their theoretical knowledge, and at how the students implemented safety procedures when working on the turbines. One student was said to be continuously correcting the regular technician’s own safety procedures. The supervisors also mentioned how eager and willing the students were to learn, and they had no doubt that the students would be able to handle a full-time job as a wind turbine service technician.

The Site Manager of Sere Wind farm mentioned that it is useful to know that there is a ready pool of graduates that is fully certified to draw from. Specifically, worth mentioning is that all the supervisors said that the internship was too short.

Supervisor Expectations

The supervisors had on average, moderate expectations for the students, with two highlighting that they had low expectations when the students started the in-service training. One of these supervisors said that he based his expectations on [non-SARETEC] technicians he has had to train in the past where he found that it took a long time for trainees to grasp the technicalities of the job but he found that the SARETEC graduates were well ahead of others that he had trained. Other supervisors stated that their moderate expectations were due to the practical nature of the job since it requires considerable hands-on experience to become competent.

Graduate Performance and Capabilities

The overall performance of the interns was found to be satisfactory, with supervisors commenting that some of them were eager to learn and therefore highly teachable. One supervisor highlighted that employing a student who has just completed the SARETEC course would be beneficial to the OEM as **the graduate comes with all of the GWO certifications**. This would enable the OEMs to provide shorter induction courses and spend less money and time getting the technicians certified and ‘work ready’.

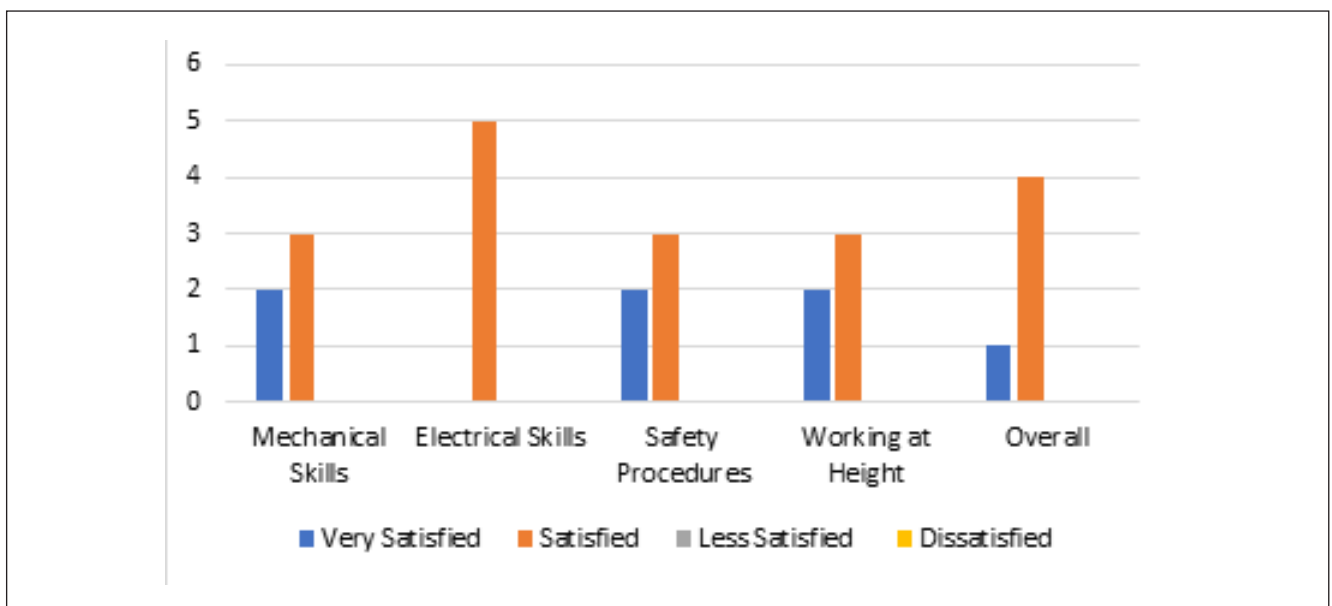


Figure 59: Supervisors’ impression of student’s performance onsite

Course Appropriateness

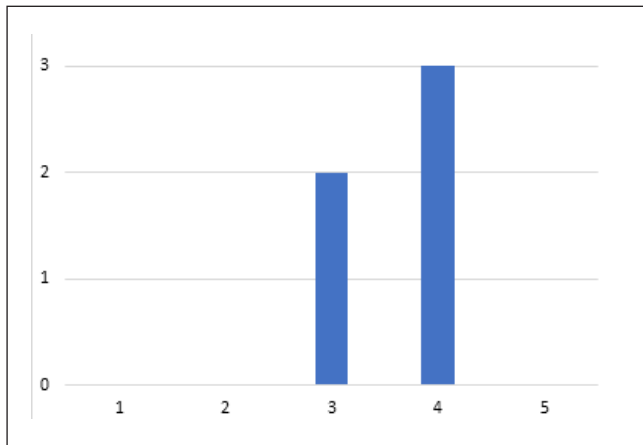


Figure 60: Appropriateness of the SARETEC course, as rated by the supervisors

Very similar to the supervisors of interns from the previous intakes, WTST 3 supervisors found the course to be 'appropriate'.

Frank Galant, Site Supervisor on Sere Wind Farm, added to this by highlighting the importance of optimising what SARETEC had to offer, suggesting that there should be more engagement with industry. According to Frank he feels that industry has not fully bought into SARETEC's programmes.

Status of Technicians

Employment

In common with WTST 2, which completed in April 2017, WTST 3 have struggled to secure employment. Recall from the WTST 2 engagement: "By the last week of their in-service, only 7 of the 18 had received offers to continue working as WTSTs on a six months contract at Nordex". For the purposes of the WTST 2 report they were classified as 'partially employed'.


Of these seven graduates, five have subsequently had their contracts converted to permanent. Unfortunately, the remaining two short-term contracts expired on the 10th of October 2017, after which these graduates were unemployed.

Two more of the WTST 2 students were employed by 3Energy, with one of these having recently moved to Kathu after being employed by Sener/Acciona on the Kathu Concentrated Solar Power Plant (CSP), where he fills the role of Mechanical Project Engineer.

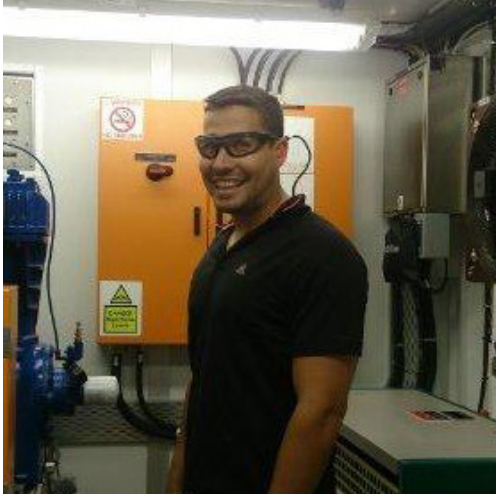



Figure 61: WTST 2 graduating on Global Wind Day - 12 August 2017¹¹


¹¹ Of the original 18 graduates from this course, at the time of writing in October 2017, 11 are unemployed.


Name	
Clayton Topkin	
Qualification	
NDip: Electronic	
In-Service Training	
Cookhouse	
Previous Occupation	
Regional Coordinator	
Course Reflections	Course Recommendation
Enjoyed mechanical lectures and practical skills most; valued the mechanical expertise offered by the course. Disliked the time allocated to theoretical component. The course met his expectations.	Yes, offers valuable skills and knowledge.
Suggestions for Improvement	Further Education/Training
Shorten the duration of the training, could have been completed in much shorter time. Also need more external people addressing the students (with industry experience).	More courses pertaining to wind turbine engineering; furthering ECSA accreditation.
Next Steps	Permanent Contract
Become a wind turbine service technician.	No.
Additional	
<ul style="list-style-type: none"> • Worked for 8 years after completing studies in 2006 • Has applied to Siemens, Vestas & Acciona. 	


Name	
Palesa Marobe	
Qualification	
N5: Electrical	
In-Service Training	
Gouda Wind Farm	
Previous Occupation	
Radio Radar Technician	
Course Reflections	Course Recommendation
<p>Palesa loved the overall experience on the course, she reckons she has gained a variety of skills beyond her trade of electronics. She came into the course with the hopes of easily finding employment within the wind industry following her in-service training, she is now experiencing that this is not the case. She loved the lecturers but felt there was a gap between those who taught them on campus and onsite. The trainers on campus lacked the practical experience. Etienne from Vestas (Guest Lecturer) was one she enjoyed the most as he spoke from his practical experience.</p>	<p>Palesa found out about this course through Mangcaka who was also in the Navy from the first intake. She would not recommend the course to anyone, and especially not if they will be paying for the course themselves. Reason being that she noticed one can become a successful WTST without having gone through the SARETEC training. She also mentioned that the Gouda plant has 46 turbines being serviced by eight technicians and there is no need to employ more - thus feeling that the training was producing too many technicians in relation to what is required by the individual sites.</p>
Suggestions for Improvement	Further Education/Training
<p>Avenues of communicating regarding the details of the in- service training i.e. accommodation. Placements for the in-service training are not clear and can be improved. Although, the course is well structured and the theory is well covered.</p>	<p>Further develop her career within the wind industry.</p>
Next Steps	Permanent Contract
<p>She has been looking at job portals and is feeling a bit anxious as she has not seen any post of this kind (WTST) being advertised - She may therefore consider going back to the Navy.</p>	<p>Currently unemployed.</p>
Additional	


Name	
Jacques Volkwyn	
Qualification	
Btech: Mechanical	
In-Service Training	
Cookhouse	
Previous Occupation	
Junior Projects Engineer	
Course Reflections	Course Recommendation
Most valuable component was the practical exercises and electrical problem solving. The course met his expectations and he enjoyed practical assignments and additional courses, but didn't enjoy group projects. Etienne (external) was a great addition to the course.	Yes, to mechanical colleagues.
Suggestions for Improvement	Further Education/Training
Do not leave in-service training placements to the last minute. SARETEC could make better use of time during the course. The trainers need to be better prepared for practicals and paperwork- recommend getting someone in who has wind turbine experience.	Electrical engineering; offshore survival; rope access & HV regulations.
Next Steps	Permanent Contract
Wants to secure employment as a WTST in South Africa and continue career in the wind industry for the next five years.	No.
Additional	
SANEDI sponsored and also received stipend for the duration of the course.	


Name	
Aluwani Matshidze	
Qualification	
NDip: Electrical	
In-Service Training	
Dorper	
Previous Occupation	
Engineering Officer	
Course Reflections	Course Recommendation
<p>“It is a good programme” and a good introduction to the wind industry. He enjoyed the mechanical components, especially bolting and torqueing. He didn’t come in with much expectation, just wanted to broaden skills and expand knowledge. Disliked the inexperience of certain lecturers explaining power electronics, it seemed they had no practical experience. The course helped a lot with the in-service training, especially the prioritization of safety processes and procedures.</p>	<p>Yes, to anyone. “I really appreciate the chance I have been given”.</p>
Suggestions for Improvement	Further Education/Training
<p>Bringing in a technician or someone who knows the systems to teach certain practical components, such as the power electronics; however, “the lecturers are growing with each and every course”. The time allocated to the course is not enough, was only introduced to mechanical but not proficient yet. Furthermore, in-service training should be five months to give sufficient exposure.</p>	<p>Combination of PLC and turbine functioning/programming training; wants to be more involved in SCADA to improve troubleshooting knowledge.</p>
Next Steps	Permanent Contract
<p>For now, gathering information and growing in the industry; everyday there is something learnt and “the environment is nice”. “I see myself growing in this industry”; he wants to become lead technician and occasionally return to SARETEC to give lectures and pass on industry knowledge.</p>	<p>Yes.</p>
Additional	
<p>Supervisors expected the students to know certain things that they wouldn’t expect other technicians to know, because of the SARETEC course; “People trust us to do some of the work because we are from SARETEC”; skills are transferrable to other industries.</p>	


Name	
Ntandazo Hlezupondo	
Qualification	
Btech: Mechanical	
In-Service Training	
Gibson Bay	
Previous Occupation	
Mechanical Technician	
Course Reflections	Course Recommendation
Transferrable skills acquired at SARETEC gave him excellent value from the course. Believes chances of finding employment increased due to the mechanical and electrical exposure. The course was not difficult, only the electrical and power electronics practical work, although these were still manageable. He “learned a lot from the guys (colleagues)” and SARETEC tried to run the course as best as possible.	N/A.
Suggestions for Improvement	Further Education/Training
Try to employ lecturers from industry (with experience) as “they were clueless sometimes”; not happy about the lecturer standard.	Plans to do MTech under renewable energy, but need three years’ experience; if employed as a WTST will look to pursue Masters.
Next Steps	Permanent Contract
Wants to remain in wind (renewables), as he is enjoying the in-service training. At least go into something with mechanical, electrical and power electronics. Confident to find a job due to background and SARETEC training. Planning six years as a WTST.	No, no job lined up after in-service training; willing to work abroad.
Additional	
<ul style="list-style-type: none"> • R4000 stipend during previous in-service training; however, Nordex stipend during course was R7000, and provided accommodation. • The course is expensive for what you get, if he had paid R70000 in own capacity, he would not be satisfied with the course at all. He has one child and five years’ experience as technician. 	

Name	
Yolisa Mbekela	
Qualification	
NDip: Mechanical	
In-Service Training	
Gouda (Acciona)	
Previous Occupation	
Maintenance Technician	
Course Reflections	Course Recommendation
<p>Yolisa found that the training was good, coming from a mechanical background, he enjoyed learning about the electrical discipline. The quality of training he referred to as “world class” as the skills are applicable to other industries. He found that the SARATEC course was well rounded, however Yolisa questions the necessity of the course with specific reference to becoming a service technician - he said that a lot of technicians on site are employed as service technicians without having done the course. Yolisa’s expectation was that upon completion of the SARATEC course, he would be at an advantage to secure employment and is therefore disappointed that has not been the case.</p>	<p>Yolisa says he would find it hard to recommend the course to someone, as it calls for people who already are in industry - If he was to recommend it would be to unemployed youth to develop a skillset and not risk leaving their job without certainty of employment after the course. He thinks, as an older profile, he would not be able to go into the turbine for very long, thus thinking a younger profile will work. Reflecting on the five students that Nordex employed – they were initially involved from the construction of the wind farms they are currently employed at, giving them an advantage.</p>
Suggestions for Improvement	Further Education/Training
<p>SARETEC should be more transparent by notifying candidates that “you enter the course at your own risk” so that one is aware that employment is not guaranteed. He suggests that someone from SARETEC should visit the farms and speak to the site managers in order to clarify the learning areas when students are completing the in-service training component. Yolisa found himself telling the site manager what the students needed exposure to for their in-service training.</p>	<p>MTech Mechanical Engineering.</p>
Next Steps	Permanent Contract
<p>No plans, he has completed his in-service training and is currently unemployed. They have been informed by Acciona that they will not be absorbed into permanent roles, as the wind farm is fully staffed. He would like to be absorbed by the OEMs or build a career in health and safety.</p>	<p>Currently unemployed.</p>
Additional	
<p>He is starting to apply for jobs outside of the wind industry. He was one of the Nordex sponsored student and was not absorbed and is disappointed to see that after the training he is unemployed.</p>	

Name	
Asemahle Mtwa	
Qualification	
NDip: Electrical	
In-Service Training	
Amakhala	
Previous Occupation	
In-Service (Reutech)	
Course Reflections	Course Recommendation
Did SARETEC course because she thought it would improve her skillset and contribute to skills development; allowing a break through into the industry. She noted that it is “not that easy to get into this industry... SARETEC is one of the easiest ways into the industry”. The time allocations were alright and she was “happy with the 5-month course, but maybe because I am used to the pressure”. The course gave her got transferable skills, noting that “everything learnt here can be used in other industries”.	Yes, would recommend because it gives broad skills and expands knowledge.
Suggestions for Improvement	Further Education/Training
The main hiccups are 1) time: can be shortened; 2) “lecturers are not well trained”, one cannot tell someone about a turbine if they have never been inside; 3) make the PLC an external course, most companies use PLC from Siemens; therefore, found the internal PLC course didn’t help very much.	Btech: Electrical full-time. Going straight after the in-service training to complete these studies and is willing to do via correspondence if work opportunities arise.
Next Steps	Permanent Contract
Not looking for a job on wind farms immediately; “Right now I want to study”; Use my energy now to get what I want; get Btech and then work; want to get into renewables but not necessarily wind, more solar PV; Want to go into PV design for utility scale (ideally); if offered a job on the wind farms, would take it; happy to travel around SA.	No. Turned down six month offer at Nordex to pursue studies.
Additional	
<p>Graduated in 2015, then did in-service and SARETEC afterwards. She was looking for employment before SARETEC, to no avail.</p> <ul style="list-style-type: none"> • Struggles with rural setting in Eastern Cape and wants to go to a more populated area. • SARETEC made it clear that jobs were not guaranteed, “They told us that they are not promising any jobs”. If Nxuba farm went ahead, everyone would be employed. • She is confident in abilities since attending the course; but commented that “it is a very difficult job, for a woman it’s not an ideal working place, that’s why I am looking more into PV. 	


Name		
Pedjat Mucavele		
Qualification		
NDip: Mechanical		
In-Service Training		
Dassiesklip		
Previous Occupation		
Technician		
Course Reflections	Course Recommendation	
<p>He loved the course, and felt that he learnt more at SARETEC than he is currently doing on site - attributing this to the fact that he is employed under a subcontractor and not the direct OEM. Coming from a mechanical background, he loved being introduced to the electrical side of the course. He loved how confident he was when he got on site from having no prior knowledge of Wind Turbines and how they operate.</p>	<p>He would recommend the course - with caution of how easy is that person going to find employment because of the uncertainty in renewables in South Africa.</p>	
Suggestions for Improvement	Further Education/Training	
<p>Due to the duration of the course, Pedjat felt that the course can be structured with more practical in relation to theory - Theory can be left to the introduction. Otherwise make it a yearlong course.</p>	<p>Currently pursuing his BTech in Electronics at CPUT.</p>	
Next Steps	Permanent Contract	
<p>Continue working as a WTST for 3Energy after the probation period is completed.</p>	<p>Pedjat is currently employed by 3E but he is on probation for six months</p>	
Additional		
<p>Pedjat was recently approached by a recruiter in the UK via LinkedIn offering him a job on a wind farm in Germany on the basis that he can organise his visa - however he struggled to get his visa application in order.</p>		


Name	
Daylin Oliver	
Qualification	
N5: Electrical	
In-Service Training	
Cookhouse	
Previous Occupation	
Student	
Course Reflections	Course Recommendation
<p>The course met expectations, and the facilities were excellent. The short courses throughout were the most valuable, and he particularly enjoyed the fault-finding components. Didn't find the electrical work too difficult, but found the student protests disturbing.</p>	<p>Yes, knows friends who would be very interested.</p>
Suggestions for Improvement	Further Education/Training
<p>SARETEC need to improve the organisation in terms of in-service training. Finding employment after the in-service training is a problem; believes SARETEC took in too many students.</p>	<p>Wants to obtain a Btech Electrical.</p>
Next Steps	Permanent Contract
<p>Looking for employment in the wind industry in Western Cape.</p>	<p>No.</p>
Additional	
<ul style="list-style-type: none"> • Sponsored by SANEDI. • Full-time employment was not expected but was certainly hoped for. 	


Name	
Matsoso Patrick	
Qualification	
NDip: Electrical	
In-Service Training	
Amakhala	
Previous Occupation	
Installer	
Course Reflections	Course Recommendation
<p>The course was valuable and he gained a lot of skills; however, he would have liked more exposure to generators and fault finding. Enjoyed the fault finding and practical's but found that the course was too short overall, although the theory component was sufficient. The only thing taught and not applied on-site was repairs, as Nordex did not allow students to do repairs (sub-contracted out). SARETEC did not communicate well at the end of the course. There were delays in the final assessment (exam) but the delay was not communicated and students had to pay for unnecessary accommodation because of the miscommunication. Furthermore, a few students had to find their own in-service placement, which was supposed to be SARETEC's responsibility.</p>	<p>Yes, but with caution. Only do it to expand skillset and gain transferrable skills. Be prepared to not be employed in the wind industry.</p>
Suggestions for Improvement	Further Education/Training
<p>Some trainers did not have adequate industry experience; however, they were willing to grow their knowledge so this is not a major concern. He would have liked more than two months in-service training as this is not enough time to gain experience, "turbines are complicated machines... and need more time to learn". Six months in-service training would be ideal. Lastly, SARETEC should start communicating and arranging the in-service placement at the intake of the students to prevent the issues experienced by some students.</p>	<p>Intends on getting his Btech, but wants to work and study by correspondence.</p>
Next Steps	Permanent Contract
<p>Would like to stay in the wind industry but not going to wait for the opportunities because graduates have the skills to go to many industries. Has started applying to various positions, reason being that he can then come back to wind once positions are available.</p>	<p>Six-month contract with Nordex.</p>


Additional


- Intrigued by wind energy and chance to learn more on mechanical side but there are not many job opportunities in SA. Worried that overseas spaces might be limited as opportunities have already been taken. Feels he would need more experience before feeling confident enough to work abroad but expected to get a job on completion of in-service training.
- Wind Farms do maintenance every six months, but the problem is that maintenance takes up all the time, giving no exposure to other work e.g. fault finding.
- Eskom is a threat to the wind industry
- Found guest lecturers more relevant than theory lectures


Name		
Musawenkosi Nkomo (Musa)		
Qualification		
NDip: Electrical		
In-Service Training		
Dassiesklip		
Previous Occupation		
Naval Officer		
Course Reflections	Course Recommendation	
<p>Musa found that the course was very useful. Lucky to have arrived on site during the yearly maintenance; therefore, has been able to use everything he has learned on the course. Noted that the Sinovel turbine is completely different to Nordex turbine on campus, which took some adjustment. There were slight interruptions with the #FeesMustFall protests of which SARATEC made plans to ensure all students received the much-needed time.</p>	<p>Yes, he would recommend the course.</p>	
Suggestions for Improvement	Further Education/Training	
<p>It seemed there was no plan as to where students will be placed for their in-service training -Musa's understanding was that all students will be placed somewhere in order to complete the course; however, we have had to apply directly to the 3Energy as well as find our own accommodation in the area. Better organisation of students is needed. Enough time allocated for theory.</p>	<p>N/A</p>	
Next Steps	Permanent Contract	
<p>He is hoping to further build a career within the renewable energy sector possibly even looking at opportunities in Solar PV.</p>	<p>Currently on a six-month Probation contract at 3Energy</p>	
Additional		
<p>Expressed displeasure having had to arrange the mandatory in-service training from his own capacity; however, is grateful to have been offered a contract in the wind industry.</p>		

Name	
Zuko Tshandu	
Qualification	
NDip: Engineering Studies	
In-Service Training	
Gouda	
Previous Occupation	
Aircraft Instrumentation Mechanic	
Course Reflections	Course Recommendation
Zuko said that as someone coming from the Airforce, he found it interesting for him to see that the practical work in the course was very similar to what he was doing at the Airforce. He loved having a group comprising of people from various discipline and skillsets, as it enabled to him to learn a lot from his peers. The course met his expectations in terms of content; however, did not meet them in terms of employment at the end of the in-service training. His general feeling was that he made a big mistake by trusting that the course would ultimately open doors of opportunity for him as he is now unemployed.	He would recommend the course to people however restricting it to recent High School Graduates as it would be less of a risk should the individual not be absorbed into full time employment upon completion of the in-service training. He did however feel that the skills learnt are transferable.
Suggestions for Improvement	Further Education/Training
The course is good, and is long enough in terms of the seven month; although, he would want to just lessen the entry requirements because he feels that as they are now the calibre of students would be coming from the working environment, and forsaking stable jobs.	Project management or health and safety courses
Next Steps	Permanent Contract
He does not have a plan and will be looking for job prospects.	Unemployed after in service training.
Additional	

Name		
Sifiso Nyalungu		
Qualification		
NDip: Mechanical		
In-Service Training		
Gibson Bay		
Previous Occupation		
Aircraft Mechanic		
Course Reflections	Course Recommendation	
<p>The in-service electrical components took getting used to, but found it manageable the more it was done. Overall the course was useful, he learned a lot and the content was good. Received 'good value' especially from electrical exposure. Gained a new skill set, which could be very useful.</p>	Yes.	
Suggestions for Improvement	Further Education/Training	
<p>SARETEC must listen to input from students who have experience in industry; they might have alternative solutions to solving problems. The content was good but how it is communicated is a problem.</p>	N/A	
Next Steps	Permanent Contract	
<p>He will stay in field for the foreseeable future; however, there might be external factors, such as family, that might change his career. Anticipates staying five years as WTST.</p>	Yes, Nordex. The students were notified in December.	
Additional		
<ul style="list-style-type: none"> • The students help each other during course • It will take about six months till he is comfortable with the turbines • Chances of employment after course is a concern, because I got an offer doesn't mean I am better than the others • "I needed the course" 		


Name	
Mvuso Nkonyeni	
Qualification	
N6: Mechanical	
In-Service Training	
Gibson Bay	
Previous Occupation	
Aircraft Mechanic	
Course Reflections	Course Recommendation
<p>He found power electronics was especially difficult. Overall received good value from the course, the most useful components being PLCs and LV (660V) modules. The electrical knowledge gained was great. Heard about course through friend (Jabavu) and then went online and found SARETEC. He used the skills learnt in SARETEC on the turbines, fault finding was easy because they trained us a lot on schematics etc. Pravesh (the guest lecturer) was a good addition. The theory was wine but the “practical components were too short. For in-service training, we arrived at the right time as we did a lot of maintenance. To the point that the wind farms “don’t call the contractors anymore to do maintenance” due to the students being capable and present.</p>	Yes.
Suggestions for Improvement	Further Education/Training
<p>The problem was that the lecturer couldn’t identify certain components on the wind turbine and there were only “1 or two guys that were working with turbines before”. SARETEC need to get people with on-site experience to take the practical’s. The lecturers know motors and generators, but when it comes to turbines, they don’t know.</p>	N/A
Next Steps	Permanent Contract
<p>His next step is lead technician, however, he still enjoying working as WTST, gaining experience in the industry. End goal is to become a commissioning technician. There is more of a career in WTST than at the Air Force.</p>	Yes, Nordex.
Additional	
<ul style="list-style-type: none"> • Found own accommodation in Bellville during the course, but had to sell his car to do the course • In the Air Force, he was restricted to Langebaan, and there was low chance of promotion. • Graduates can work in motor industry and Eskom due to mechanical and electrical exposure • OEMs “are not aware that there are people in SARETEC doing the course”, • Would be better to get companies to select students before the course and provide bursaries and then absorb them for in-service to prevent uncertainty around in-service training and selective bias from Nordex or whoever the first company to offer placements. 	


Name		
Yongama Nikelo		
Qualification		
NDip: Mechanical		
In-Service Training		
Gibson Bay		
Previous Occupation		
Submarine Technician		
Course Reflections	Course Recommendation	
<p>The in-service training wasn't difficult because of the course training. There were certain elements that were lacking, for example, "some turbine components weren't working so we couldn't touch them". The course content was good and he was happy to have done the course, "but some of the lecturers had no experience on the turbines", which is why he enjoyed guest lecture appearances. He valued electrical exposure and transferrable skills that were acquired. Found that the defence force experience helped greatly during this in-service training. Hence, two months is enough time for in-service training.</p>	Yes, "it's a good course".	
Suggestions for Improvement	Further Education/Training	
Would like more practical experience, that's the only problem.	Project management course.	
Next Steps	Permanent Contract	
Foresees five years as a WTST, like to be on more project planning and commissioning side in the future.	Yes, Nordex.	
Additional		
<ul style="list-style-type: none"> • There are more opportunities on the wind farms than in the navy as a submarine technician • Enjoys living closer to home in Eastern Cape on the wind farms • Comfortable to start working alone on turbines now, and feels that he knows certain things better than the lecturers. 		


Name	
Oliver Matemane	
Qualification	
NDip: Electrical	
In-Service Training	
Amakhala	
Previous Occupation	
Aircraft Electrician	
Course Reflections	Course Recommendation
<p>The course didn't completely meet expectations because he thought the course would be theoretical and then on-site for practical components followed by examinations and the trade test; whereas, in reality, the students were tested before the practical component. Being tested without in-service training doesn't mean you know the job and one is going to struggle. That said, he enjoyed exposure to skills usable in a lot of fields such as rigging, torqueing, distribution, bolting. The course "opens more opportunities for you and doesn't just restrict you to renewables and wind turbines". Disliked the length of the course, stating "it is too short". Five months of theory, for someone who has not worked as a tech is not enough. Used everything learnt in the course during in-service training. The "two-month internship is not enough... as the nature of this business is based on production". Students will only learn when there is a fault, but the wind farm is not going to stop turbines to teach students; therefore, only lucky if the farm is doing maintenance during internship. This is why they need to either lengthen internship or coordinate with wind farms to send students during maintenance period.</p>	<p>Yes, he would recommend it.</p>
Suggestions for Improvement	Further Education/Training
<p>There is too much info to do in five months; ideally a year course. Every week there are two modules, then the following week there is an exam and another module. The mechanical modules were manageable, though but there were not many mechanical modules.</p>	<p>Feels like expanding knowledge on mechanical engineering by studying more mechanical subjects. Additionally, wants to get GCC certificate, which he believes the wind industry will prepare him well for.</p>
Next Steps	Permanent Contract
<p>For now, working in Eastern Cape, but could be posted to any Nordex farm. Seeks to gain more knowledge and become comfortable as a WTST, believes two years is enough to do this. He is not limited to the wind industry and is open to other industries.</p>	<p>Yes, Nordex. The students knew by late December. Nordex made it clear that they only wanted five graduates when interviewing.</p>


Additional


- December was a tense period. We did everything together and worked as a unit, but some didn't get offered placement so getting an offer "was not something to celebrate as it destroyed the team". Other students were not encouraged to continue with the course after not being absorbed by Nordex, "People were uninspired"
- Concept of renewable/clean energy drew me to the course, how to tap into natural resources for electricity is very exciting
- He was bombarded with expectations of working in the industry, but found out that "it is not an easy job, takes your time and your strength... must endure extreme weathers...". This is a "very hard job".


Name	
Msimemelelo Ntshangase	
Qualification	
N4: Electrical	
In-Service Training	
Dorper Wind Farm	
Previous Occupation	
Maintenance Apprentice at Bokomo	
Course Reflections	Course Recommendation
<p>He loved everything about the course, and noted leaving his apprenticeship was the best thing he could have done for himself. Coming from an electrical background, he enjoyed being able to engage with mechanical and hydraulics learning material. He rated the lecturers a 7/10, appreciating their constant willingness to help. Coming into the course, Msimemelelo did not know anything about renewables nor dreamt about travelling out of South Africa - but having done the course he now knows more about the greater industry and sees the possibilities of one day working on wind farms overseas.</p>	<p>Msimemelelo has already referred four of his friends to the current call for applicants. He does not know whether they have made it into the course yet.</p>
Suggestions for Improvement	Further Education/Training
<p>Add PLC's to the course as that is the only area which is touched on the least on campus but used a lot on site during the in-service training.</p>	<p>He would like to pursue his National Diploma in Electrical Engineering.</p>
Next Steps	Permanent Contract
<p>For now, he is very happy where he is and feels that the skills learnt at SARETEC are definitely transferable into other industries, should he not get absorbed beyond the three months. He would, however, like to first try and build a career within the wind sector.</p>	<p>Nordex has provided them with a six-month contract but given no certainty yet regarding permanent employment - they have been encouraged to keep applying for jobs. Currently still earning R7000 per month.</p>
Additional	
<p>He has been approached by Gemsa regarding an offshore wind farm overseas - he had an interview and has not heard from them since he had the interview.</p>	


Name	
Vusumuzi Sibisi	
Qualification	
NDip: Electrical	
In-Service Training	
Kouga	
Previous Occupation	
Aircraft Electrician	
Course Reflections	Course Recommendation
Most valuable element is the workmanship and the team environment. The course met expectations and improved theoretical and practical abilities, as well as giving excellent exposure to the wind industry. Enjoyed the (external) practical expert in the course, but disliked the delays in the course and in-service training due to protests. SARETEC is not as good as some other colleges in the country but will improve with time.	Yes, especially friends and colleagues in aviation.
Suggestions for Improvement	Further Education/Training
Two-month internship is not enough, especially because industry generally requires one year experience to be employable.	Project management and OHS courses.
Next Steps	Permanent Contract
Applying for employment to further experience in the industry as a WTST. He has an ambitious future in the wind industry, and experience as a WTST will be a great stepping stone for four years; after which, he is then looking to go into a management role. Applied online to Nordex and Vestas for overseas roles.	No.
Additional	
<ul style="list-style-type: none"> • Referred to course through Jabavu from WTST 1 programme, and resigned from air force to attend. • WTST is a very physical job, one can't do it forever. 	


Name	
Lulamela Majiza	
Qualification	
National Diploma: Electrical Engineering	
In-Service Training	
Sere Wind Farm	
Previous Occupation	
South African Navy	
Course Reflections	Course Recommendation
Lulamela enjoyed the course and coming from an electrical background he found that the mechanical aspect of the course was very interesting- comparing the nacelle to the inside of a submarine where he gained exposure to electrical and mechanical understanding of its operations and therefore did not feel lost when. He thought that there was a great balance between the mechanical and electrical aspects.	Yes, he would recommend it, especially for someone seeking a change in their career. He is just a bit worried about what will happen post the course and the jobs do not seem guaranteed.
Suggestions for Improvement	Further Education/Training
He would suggest having a longer in-service training to gain more practical experience. Otherwise he is happy with everything.	Lulamela would like to pursue his B Tech Electrical Engineering.
Next Steps	Permanent Contract
Work towards being a Site Supervisor on a wind farm	Nothing has been said to them
Additional	Additional
All good, Favourite was Martial he taught them Power - He has a way of doing thing things and ensures that everything is understood e.g. In class when something does not make sense to. He did not mind making time for the students after class.	Since joining this course, he has started to think of prospects overseas - Previously never thought of even getting a passport. He does however want to first work in South Africa and therefore has high hope for the energy industry in SA.


Name	
Apelele Tyali	
Qualification	
National Diploma: Mechanical Engineering	
In-Service Training	
Hopefield	
Previous Occupation	
Engine room Attendant at South African Navy	
Course Reflections	Course Recommendation
They can't go up the turbine without the certificate. The course helped them a lot especially with manual handling, First Aid, firefighting, working at heights, after induction they were up the turbine on day 2. The overall exposure has been great. Coming from a mechanical background she enjoyed working with the students coming from an electric background and had no clue regarding mechanical drawings for example and the mechanical student could help here. The mix was around a 60:40 split between electrical and mechanical.	Yes, she has already recommended her friends.
Suggestions for Improvement	Further Education/Training
She would have wanted more time on hydraulics and PLC's.	Currently busy with her B Tech.
Next Steps	Permanent Contract
She has been applying to directly to other OEM's and has had no feedback.	Nothing has been spoken of yet.
Additional	
When she resigned from the Navy, she took the risk of leaving behind a salary of 14K month, and is now receiving a stipend of 2,5k with the worry of what happens upon completion of the course.	


Name	
Nontasa Gaga	
Qualification	
National Diploma: Mechanical Engineering	
In-Service Training	
Grassridge Wind Farm	
Previous Occupation	
Engineering Officer at the South African navy	
Course Reflections	Course Recommendation
Nontsasa loved the overall experience on the course, she reckons she has gained a variety of experiences beyond her trade of Mechanical Engineering - She mentioned that she struggled with the electrical side of thing, however felt like she had great support from the lectures.	She certainly would.
Suggestions for Improvement	Further Education/Training
She suggested that the theory aspect can be shortened. Often the duration of the training could have been completed in much shorter time. Also they need more external people addressing the students (with industry experience). This may also give enough time to do more in service training.	Advanced wind turbine service technician course
Next Steps	Permanent Contract
Become a wind turbine service technician.	Nothing has been said to her.
Additional	
Worked for 8 years after completing studies in 2006; has applied to Siemens, Vestas & Acciona.	


Name	
Siphosakhe Mazibu	
Qualification	
National Diploma: Mechanical Engineering	
In-Service Training	
Hopefield	
Previous Occupation	
Engine Room Attendant at the South African Navy	
Course Reflections	Course Recommendation
The SARETEC course was very good. It has helped him understand the renewable energy systems well and coming from a mechanical background, the electrical was the best part as well as the GWO certificates. The lecturers were good. They had 3 from outside, computer skills, Parvesh from Nordex was excellent and then someone from environmental studies at CPUT. The theory was excellent.	Judging from the experience he has gained he would recommend the course.
Suggestions for Improvement	Further Education/Training
The internship is too short, the students need to be exposed to more 'incidents' and with the given time they don't see enough faults and how to deal with them. One cannot tell when an incident will happen. It may be worth extending it. 6 months is too long, maybe 3 - 4 months	
Next Steps	Permanent Contract
Become a wind turbine service technician.	Nothing has been said to them.
Additional	
Resigned from the Navy for the course - he was earning a monthly salary of 18K - now getting a stipend of 2,5K - Sharing rental of accommodation with 3 other interns and using his own car to get to site.	


Name	
Relebohile Marumo	
Qualification	
National Diploma: Mechanical Engineering	
In-Service Training	
Amakhala Emoyeni Wind Farm	
Previous Occupation	
Technician at Adventure Power	
Course Reflections	Course Recommendation
<p>She found the course very interesting and coming from Adventure Power she had knowledge of Turbines however was keen to learn some more. She learnt a lot from her peers, and enjoyed the mixed class aspect of the class -The in-service electrical components took getting used to, but she found it manageable.</p>	<p>Yes she has already .</p>
Suggestions for Improvement	Other Training in SA
<p>More time allocated to the in-service training.</p>	<p>She would like to learn more about renewable energy in South Africa.</p>
Next Steps	Permanent Contract
<p>Become a wind turbine service technician.</p>	
Additional	


Name	
Usher Sonwabo Gqokoma	
Qualification	
National Certificate: Electrical Engineering	
In-Service Training	
Sere Wind Farm	
Previous Occupation	
Artisan at DCD Towers	
Course Reflections	Course Recommendation
Loved the course – only two weeks into his in-service training however he is enjoying it as being hands on is what he enjoys - Sere is currently undergoing in the yearly maintenance and is therefore keeping them busy. He loves how comfortable everyone has made him feel also having the patience of working with them as they learn. The lecturers were all good.	Yes, he would - he sees Renewable Energy as a new kid on the block and was excited to join DCD Towers not knowing that would soon be retrenched as the factory closed its doors.
Suggestions for Improvement	Further Education/Training
He would like to have more time to covering the PLC, only three days were spent on this area and if you don't have an Electrical background this is not enough..	None
Next Steps	Permanent Contract
Becoming a lead technician – growing within the industry.	Nothing has been discussed .
Additional	


Name	
Sabelo Mabandla	
Qualification	
National Diploma: Mechanical Engineering	
In-Service Training	
West Coast One	
Previous Occupation	
Aircraft Technician at the South African Airforce	
Course Reflections	Course Recommendation
Felt prepared for the in-service training but felt that the onsite time however is rather short- Gearboxes changes don't happen every day.	Yes, but he would be very clear about the risks before having someone quit their job.
Suggestions for Improvement	Further Education/Training
Shorten the duration of the training; need more external people addressing the students (with industry experience).	
Next Steps	Permanent Contract
Go back to school as there are no jobs.	
Additional	
Feels like there was a lack of Transparency in SARETEC, there isn't a lot of communication.	


Name	
Nokubonga Ximba	
Qualification	
National Diploma: Electrical Engineering	
In-Service Training	
Dassiesklip Wind Farm	
Previous Occupation	
Engine Room Attendant at the South African Navy	
Course Reflections	Course Recommendation
Nokubonga did not have major expectations however wanted to broaden skills and expand knowledge; enjoyed the introduction to the wind industry She enjoyed the exposure to mechanical side of things. Adding that she thinks over all "It is a good programme"	Yes
Suggestions for Improvement	Further Education/Training
Lengthening the internship is very important..	Advanced wind turbine service technician course.
Next Steps	Permanent Contract
Become a wind turbine service technician.	Nothing has been said to her.
Additional	

Name		
Sinesipho Pongoma		
Qualification		
National Diploma: Mechanical Engineering		
In-Service Training		
West Coast One		
Previous Occupation		
South African Navy as an Engine room attendant		
Course Reflections		Course Recommendation
Having a class that is really mixed was great (electrical and mechanical) She felt like they needed lecturers who would be more patient and taking the relevant time for the course. She felt wind farm ready and having the Nacelle at SARETEC was very useful.		Yes, most of her friends have applied for the next intake already.
Suggestions for Improvement		Further Education/Training
Adding more time to the internship, opportunity to gain more experience on site and the lecturers must be well versed about the subject they present and attend teaching courses if they have not.		Risk Management course or Project Management course.
Next Steps	Permanent Contract	
She has been applying for jobs - Not focusing on Renewables now because she is unsure of the direction of where the industry.	None.	
Additional		
Being a woman on the course is not that easy, she sometimes finds the tools heavy and sometimes felt bad when the guys ended up doing most of the hard work as it requires muscle. She has no regrets about doing the course as she has learnt a lot.		

Name		
Wynand De Kock		
Qualification		
National Diploma: Electrical Engineering		
In-Service Training		
Jefferey's Bay Wind Farm		
Previous Occupation		
Telkom- Technician		
Course Reflections	Course Recommendation	
<p>Apart from his Trade test- this is the best course he has done. He gained a lot of value to his personal growth and development – his knowledge and understanding of turbines has improved significantly. Having started out at Kouga Wind Farm, he moved to Metro Wind - Van Staden's wind farm (Sinovel Wind farm), that was great experience as they had major problems on 3 of turbines had the Rotor bearing on the generator packed up, we had to go and change them - that was great hands on experience Otherwise we would have had very little experience on the turbine- he was sent to Dassiesklip from time to time as well when needed.</p>	Yes	
Suggestions for Improvement	Further Education/Training	
<p>He was very impressed with the course, content, lecturers, everything, he just questions how it is that no one can't fail the course.</p>	Would like to complete his GCC.	
Next Steps	Permanent Contract	
<p>Would like to remain working within the wind industry, gain more technical exposure on site. Has concerns of the industry regarding the signing of PPA's.</p>	Nothing has been discussed.	
Additional		
<p>The position at seems to be more of a facility technician rather than service tech - the work sometimes is more administrative.</p>		

Name	
Motjatji Malatji	
Qualification	
National Diploma: Electrical Engineering	
In-Service Training	
Amakhala Emoyeni Wind Farm	
Previous Occupation	
South African Navy as an Electrician	
Course Reflections	Course Recommendation
<p>The course was valuable, and she gained a lot of skills; however, she would have liked more exposure to generators and fault finding. - She is currently doing her in- service training through 3 Energy and says she gets very limited exposure to the actual turbines as a technician. The course was structured in a way that kept everyone interested.</p>	<p>Yes Family, friends and colleagues.</p>
Suggestions for Improvement	Further Education/Training
<p>SARETEC should find sponsorship to assist with the stipend and possible accommodation.</p>	
Next Steps	Permanent Contract
Additional	

Name		
Elethu Mvunelo		
Qualification		
National Diploma: Electrical Engineering		
In-Service Training		
Jefferey's Bay Wind Farm		
Previous Occupation		
South African Navy		
Course Reflections	Course Recommendation	
The course was good just felt to short, coming from the electrical background she felt like she needed more time regarding the mechanical aspect but that they had good support from the lectures. She knew nothing about turbines prior to the course. Everything was good besides the limited duration.	She came to the course through a recommendation from friends in the Navy - She therefore applied directly.	
Suggestions for Improvement	Further Education/Training	
Not enough to understand everything about wind turbines, so a period of 1 year for the whole course would make a difference.	None.	
Next Steps	Permanent Contract	
This qualification will help her with jobs - seeking and not only on wind industries but everywhere engineering is concerned.	Nothing has been discussed yet.	
Additional		
3Energy provides a good balance between the admin office based work and work outside in the turbines. She has very good computer skills which then works in her favour as she spends a lot of her time with the Facilities manager.		

Name	
Sicelo Thamsanqa Gumede	
Qualification	
National Diploma: Electrical Engineering	
In-Service Training	
Sere Wind Farm	
Previous Occupation	
South African Navy	
Course Reflections	Course Recommendation
Course was great, started with the in-service training at the best time. Most of what was taught in class they are putting into practice onsite. The course has certainly delivered to expectation - He has enjoyed learning the mechanical sides of things adding to his electrical background.	
Suggestions for Improvement	Further Education/Training
Shorten the duration of the training; need more external people addressing the students (with industry experience); met expectations.	He would like to complete his B Tech.
Next Steps	Permanent Contract
Post Graduation he would like to be absorbed into the industry but remain in South Africa.	None.
Additional	
Worked for a long time after completing studies in 2006; has applied to Siemens, Vestas & Acciona.	

