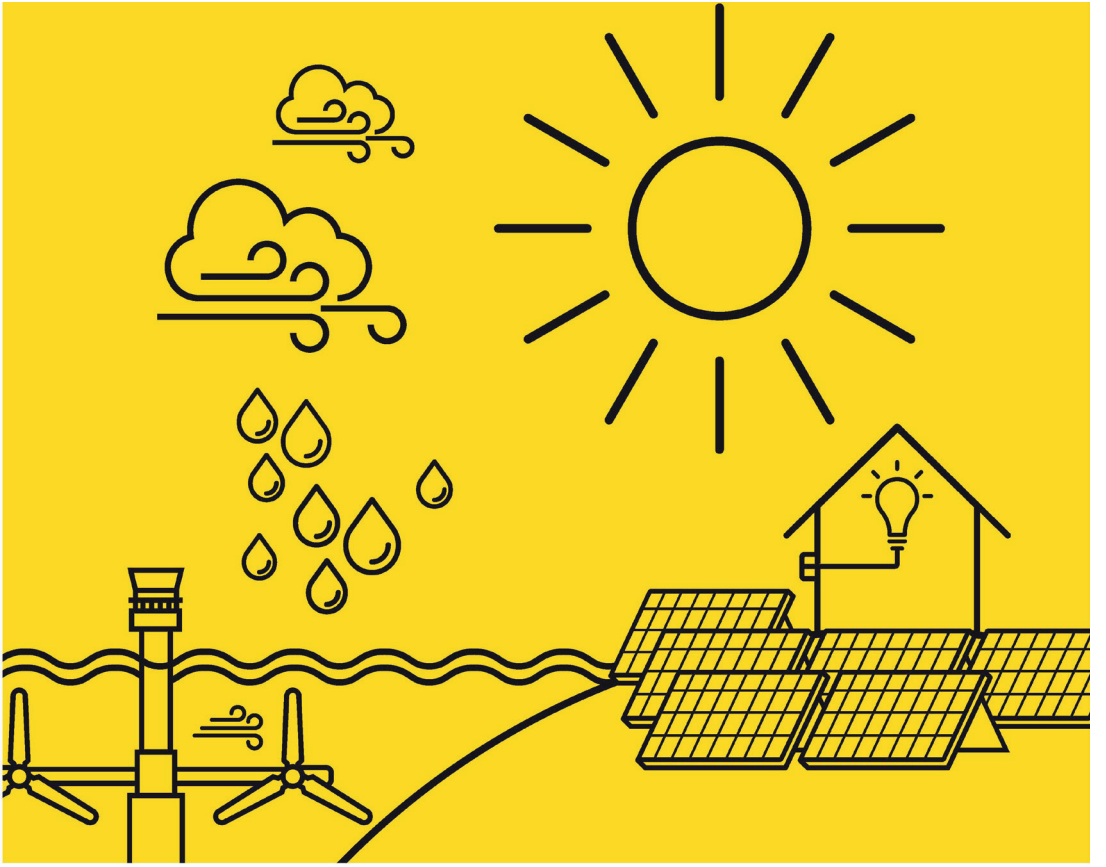
SAWEA
South African Wind Energy Association

WattsCURRENT

Amandla acocekileyo angomso



energyDRIVE

Clean energy for tomorrow

Scatec

EDF power solutions

Dorper Wind Farm

ENERTRAG

LEROLE POWER

LOERIESFONTEIN WIND FARM

Yintoni i

UKUSEBENZA KAKUHLE KWAMANDLA

Ngaphezulu kwe-90% yamandla esiwasebenzisayo avela kumafutha ezimbiwa, angavuselelekiyo kwaye abangela ungcoliseko. Enye yezona zixhobo zibalulekileyo esinazo kukusebenzisa amandla ngokufanelekileyo, okanye amandla ebeya kuchithwa ngenye indlela.

WONKE UMNTU UYAWAFUNA AMANDLA

Ezinye zeendlela esivelisa nesisebenzisa ngazo amandla zinokuba nefuthe elikhulu kakhulu kokusingqongileyo. Le ncwadi yemisebenzi yokwazisa ngokusetyenziswa kwamandla inika iingcebiso neendlela ezahlukeneyo zokwenza izigqibo ezikrelekrele malunga namandla, ukonga imali, nokunciphisa ifuthe esinalo kokusingqongileyo. Ngaphambi kokuba uqale, jonga imithombo yamandla ahlaziyekayo esetyenziswa kakhulu kwiphepha elingaphesheya.

Ubusazi?



Ubungakanani bamandla elanga afikelela eMhlabeni ngomzuzu omnye banele ukuhlangabezana neemfuno zamandla ehlabathi unyaka omnye.

AMANDLA AHLAZIYWAYO

Amandla ahlaziywayo awangcolisi okusingqongileyo kwaye anokuhlaziywa rhoqo. Nantsi eminye yemithombo emikhulu yamandla ahlaziywayo esetyenziswa namhlanje:



AMANDLA EMVELISO

Amandla elanga ngamandla elanga anokufunxwa, agcinwe, aze akhutshwe zizinto okanye aguqulwe abe ngumbane ngqo.



AMANDLA OMOYA

Amandla omoya asetyenziselwa ukujika iiblade eziqhagamshelwe kwi-turbine ukuvelisa umbane. Lo mthombo wamandla uya uthandwa ngakumbi kwiindawo ezikude nolwandle kunye nezo zikude nolwandle.



AMANDLA OKUGQIBELA EMHLABENI

Amandla obushushu behlabathi aveliswa embindini woMhlaba. Amandla obushushu behlabathi aphantsi angasetyenziselwa ukufudumeza okanye ukupholisa iindawo zangaphakathi. Izixhobo zobushushu behlabathi ezishushu kakhulu zingasetyenziselwa ukuvelisa umphunga nombane.



AMANDLA EBIOMASS

I-Biomass yiyo nayiphi na into ephilayo enokutshiswa okanye iguqulwe ibe yipetroli. Xa itshisiwe, amandla akwi-biomass akhutshwa njengobushushu kwaye angasetyenziswa njengomthombo wamandla.

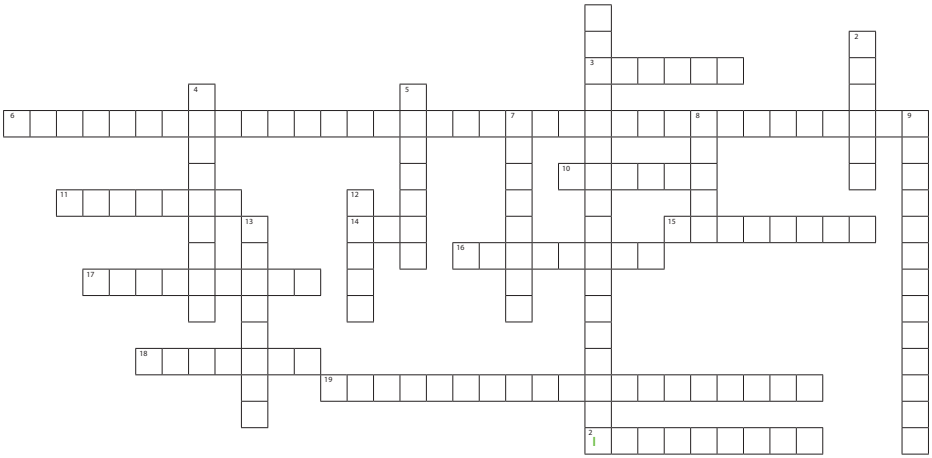


AMANDLA OKUQHUBA AMANZI

Amanzi ahambayo adala amandla anokubanjwa aze aguqulwe abe ngumbane. Oku kubizwa ngokuba ngamandla ombane okanye amandla ombane. Isikhululo samandla ombane sisebenzisa idama elisemlanjeni ukugcina amanzi kwindawo yokugcina amanzi.

Cinga ngaphandle kwebhokisi

Sebenzisa izikhokelo ezingezantsi ukugqibezela i-crossword.



NGOKUNQAMLEZA

1. Isixhobo sokugcina amandla
6. Ukuvelisa ungcoliseko oluncinci
7. Isibane esikhanyayo okanye ibhalbhu encinci
8. Amandla aveliswa bubushushu bangaphakathi boMhlaba
11. Izinto zendalo
12. Igama lamandla enziwe ngezinto ezicocekileyo nezihlaziyekayo
14. Iyakwazi ukusebenza kakuhle ngaphandle kokuchitha amandla
15. Ukuvelisa amandla
16. Umatshini wokudala amandla omoya
17. Iiyunithi eziliwaka zamandla ombane
19. Amandla aveliswa ngamanzi ahambayo

PHANTSI

1. Izinto eziphilayo ezifumaneka ngokuhlaziyeka
2. Amandla avela emanzini kwimo yomphunga
3. Iyunithi yamandla ombane
4. Nasiphi na isixhobo esinokutshiswa ukwenza amandla
5. Amandla e-electromagnetic adluliselwa eLangeni
6. Amandla ee-electron ezihambayo
7. Ukunikezelwa kwamandla
11. Ukuthintela inkunkuma okanye ukulahleka kwamandla
14. Umthombo wokukhanya owenzelwe ukukhanya ngqo kwindawo ethile yokusebenza; isabelo

Icocekile kwaye iluhlaza

Joyina uphando lwamandla avuselelekayo nasebenzayo! Fumana amagama angezantsi kuphando lwamagama.

G C I N A M A N D L A E L A N G A H P I
C T U U O V E L I S A S E Z U L U W R F
Z T M M E D R G B I C O C E K I L E T K
S A T B V C X I N G A H L A Z I Y W A W
I M H A I N Z U L U L W A Z I H L U R E
- A O N Y V B I W O B U P H U M A O T G
H N M E V W B I H I N K W E N K W E Z I
Y D B A A W V E I - H Y D R O G C I N A
D L O Y A W I - B I O M A S S F G K N Z
R A E C C A I N G X U B E V A N G E T P
O I - P H O T O V O L T A I C K X B W B
G S U K U L U N G I S E L E L A V M C T
E I U Z I N Z O W K O M H L A B A G G I
N M V U M O Y A W N G A P H A N T S I F
S O W I C E E S E B E N Z A Y O M N - O
U M K X C F K I - T U R B I N E E D W S
D E I - K I L O W A T T H L M M D C A I
C L U H L A Z A B H I A M A N D L A T L
P X P N G O K U K U K O E M K C E E T I
A M A F U T H A P Y U B U S H U S H U S

i-biomass (biomass)
CFL (CFL)
icocekile (clean)
Gcina (Conserve)
Esebenzayo ngokukuko (efficient)
Umbane(electricity)
amandla (energy)
Ifosili (fossil)
Amafutha (fuel)
Velisa (generate)
Ubushushu obuphuma ngaphantsi komhlaba (geothermal)
Luhlaza (green)
Ingxubevange (hybrid)
i-hydro (hydro)
i-hydrogen (hydrogen)
i-kilowatt (kilowatt)
i-photovoltaic (photovoltaic)
Amandla(power)
ingahlaziywa (renewable)
umthombo (resource)
Gcina (save)
Inzululwazi (science)
amandla elanga (solar)
inkwenkwezi (star)
Uzinzo (sustainable)
i-turbine (turbine)
i-watt (watt)
Ukulungiselela isimo sezulu(weatherize)
Umoya (wind)

Ubusazi?



Ukukhupha amandla kwi-biomass yindlela yakudala eqala xa abantu babetshisa iinkuni okokuqala ukuze banike ubushushu nokukhanya.

Yenza Izi balo

Ukuba yonke imizi yaseMelika ibinokutshintsha ibhalbhu enye yokukhanyisa ngebhalbhu yokonga amandla, besiya konga amandla aneleyo okukhanyisa amakhaya angaphezu kwezigidi ezi-3 ngonyaka. Faka amanani ukusuka ku-1 ukuya ku-9 kwisikwere ngasinye se-3 x 3, umqolo kunye nekholamu. Akukho kuphinda-phinda!

	7			4	2		5	
	4			8			7	
	9			5			6	
7					9			2
	5	6			4	3		9
		4			5			7
5			3				9	
3				6		8		
4			5					6

1 =

Ubusazi?

Amandla aphuma ngamanzi namhlanje abonelela malunga ne-20% yombane wehlabathi kwaye ngumthombo oyintloko wamandla kumazwe angaphezu kwama-30.

Ubusazi?

I-turbine enye yomoya inokuvelisa umbane owaneleyo ukunika amandla amakhaya angama-300.

Musa ukungabi nalwazi

Yaphula ikhowudi uze ufumane umyalezo!



A M A N D L A _ _ _ _





NDOQO



Ubusazi?

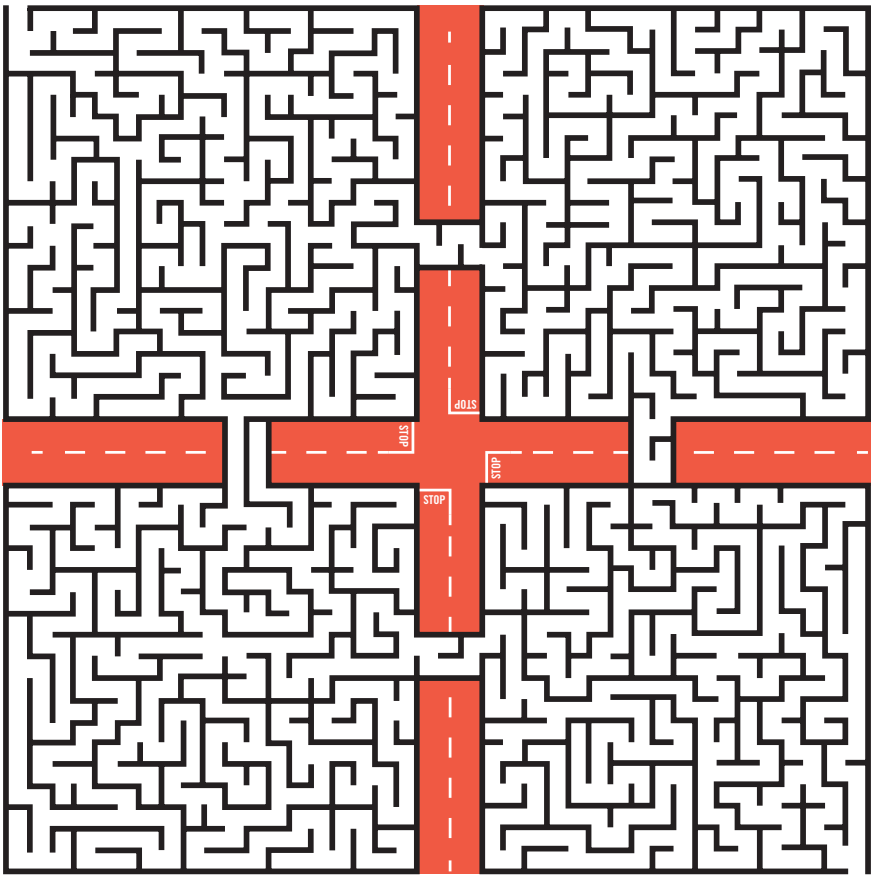


Izithuthi zasemoyeni kunye nezikhululo zasemoyeni ezifana ne-International Space Station (ISS) zihlala zisebenzisa iiphaneli zelanga ukuvelisa umbane.

Yiba yintshatsheli yamandla

Yonga amafutha ngokucwangcisa indlela yakho, udibanise uhambo kwaye wabelane ngokuhamba ngeenqwelo-mafutha.

QALA



GQIBA

Yenza unxibelelwano

Ukusebenza kakuhle = Ukonga! Qhagamshelanisa igama ngalinye nentsingiselo echanekileyo.

COCA	1	a	Lawula isetingi
LUHLAZA	2	b	Hlaziya usebenzise izixhobo ezonga amandla
UMTHOMBO	3	c	Ukuvelisa amandla
IXESHA LEMFUNO EPHANTSI	4	d	Okusempilweni, okonga amandla nokuzinzileyo
VELISA	5	e	faka i-insulation uze uthintele ukuvuza komoya
AMANYE AMAFUTHA	6	f	Ukwenza umsebenzi omninzi usebenzisa amandla amancinci
IZINTO EZIPHILAYO	7	g	Imithombo yamandla ahlaziyekayo
NGOKWANELE	8	h	Izinto eziphilayo ezisetyenziselwa ukuvelisa amandla
LUNGISA ISAKHIWO	9	i	Ibhalbhu esebenzisa amandla amaninzi
AMAFUTHA EZIMBIWA	10	j	Isithuthi esonga amandla, esinobuchwepheshe obuphambili.
I-INCANDESCENT	11	k	I-Hydrogen and Ethanol
PHUCULA IZIXHOBO	12	l	Isixhobo esivela kwindalo
ISITHUTHI ESIXUBILE	13	m	Iyunithi yomlinganiselo wombane
I-WATT	14	n	Amalahle, i-oyile negesi
LALA	15	o	Ixesha apho imfuno yamandla iphantsi

Ubusazi?



Amandla e-biomass okwangoku ahlangabezana malunga ne-10% yamandla abantu abawadingayo kwihlabathi liphela.

Ubusazi?



Iintaba-mlilo kunye nemithombo yamanzi ashushu yimizekelo yamandla obushushu behlabathi

Watt umahluko

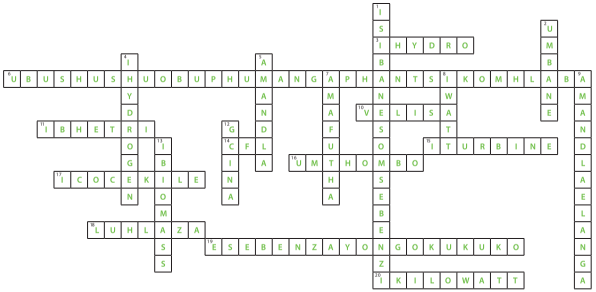
Bona umahluko! Jonga ukuba ungazifumana na zonke ezili-14.



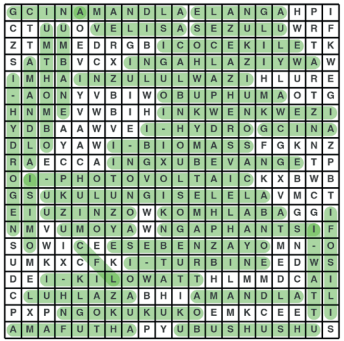


Izisombululo

Iphepha 4 | Cinga ngaphandle kwebhokisi



Iphepha 5 | Icocekile kwaye iluhlaza



Iphepha 6 | Yenza Izibalo

6	7	3		4	2	9	5	8
	4	5	9	8	6	2	7	3
8	9	2	7	5	3	4	6	
7	8		6	3	9	5	4	2
2	5	6	8	7	4	3		9
9	3	4	2		5	6	8	7
5	6	8	3	2		7	9	4
3		9	4	6	7	8	2	5
4	2	7	5	9	8		3	6

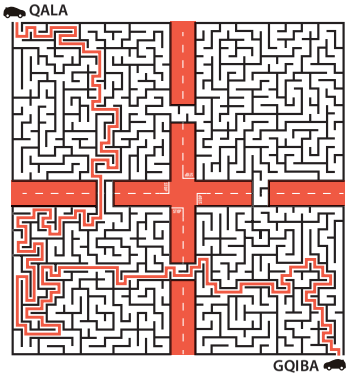
Iphepha 7 | Musa ukungabi nalwazi

I-ENERGYDRIVE. AMANDLA ACOCEKILEYO NGOMSO

Iphepha 9 | Yenza unxibelelwano

1 - g	6 - k	11 - i
2 - d	7 - h	12 - b
3 - l	8 - f	13 - j
4 - o	9 - e	14 - m
5 - c	10 - n	15 - a

Iphepha 8 | Yiba yintshatsheli yamandla



Iphepha 10 | Watt umahluko



Ukunika amandla ikamv

Amandla avuselelekayo anceda uMzantsi Afrika ukuvelisa umbane ococekileyo ngelixa edala imisebenzi, exhasa uluntu kwaye ekhusela okusingqongileyo. Njengoko uMzantsi Afrika ukhula, sidinga umbane ongakumbi. Umoya, ilanga kunye nokugcinwa kwebhetri kunceda ekuboneleleni ngamandla athembekileyo ngelixa kunciphisa ungcoliseko kwaye kwenza inkqubo yethu yamandla ibeluqilima.

UHAMBO LWAMANDLA AVUSELELWAYO



UPHANDO NOBUCHULE

Izazinzulu, abaphandi nabavelisi bezinto ezintsha baphuhlisa ubuchwepheshe obutsha obuphucula indlela amandla aveliswa ngayo, agcinwa ngayo nendlela asetyenziswa ngayo.



UCWANGCISO NOPHUHLISO

Phambi kokuba kwakhiwe iprojekthi, iingcali zenza izifundo, zifumane iimvume, zisebenzisane nabachaphazelekayo kwaye ziyile izisombululo.



ULWAKHIWO NEMISEBENZI YOKUQHUBA

Iinjineli, amagcisa, abaphathi beeprojekthi namaqela okwakha benza ukuba iiprojekthi zamandla ahlaziyekayo zibe yinyani baze baqinisekise ukuba ziyaqhubeka nokusebenza.



OKUSINGQONGILEYO NOZINZO

Iingcali zokusingqongileyo zinceda ukukhusela indalo, izilwanyana zasendle, imithombo yamanzi kunye nokwahluka kwezinto eziphilayo.



ULUNTU NEMPUMELELO YENTLALO

Abasebenzi bophuhliso loluntu basebenzisana noluntu lwasekuhlaleni ukuze bandise inzuzo yentlalo noqoqosho.



USHISHINO NEZEMALI

Amaqela ezemali, ezomthetho, ezokuthengwa kweempahla nezentengiso anceda ekuqinisekiseni ukuba iiprojekthi ziyaphumelela kwaye zizinzile.

a lomzantsi Afrika

Ubusazi?

UMzantsi Afrika unezinye zezona zixhobo zelanga zibalaseleyo emhlabeni.

Imithombo yomoya yeli lizwe iphakathi kwezona zibalaseleyo kwihlabathi liphela.

IiNkqubo zokuGcina aMandla eBhetri (BESS) zigcina umbane ukuze usetyenziswe kwanaxa ilanga lingakhanyi okanye umoya ungavuthuzi.

Amandla ahlaziyekayo anceda ekunciphiseni ukukhutshwa kwegesi ezibangela ubushushu.

Iigesi zegreenhouse zibamba ubushushu emoyeni, nto leyo ebangela utshintsho kwimozulu. Yonke iyunithi yombane eveliswa ngumoya okanye lilanga endaweni yamalahle inceda ekunciphiseni ukukhutshwa kwekhabhoni diokside (CO_2), iphucula umgangatho womoya kwaye ikhusela iplanethi yethu kwizizukulwana ezizayo.

INKCUKACHA EKHAWULEZAYO

Inkqubo yamandla avuselelekayo/ahlaziyekayo yaseMzantsi Afrika sele incede ekuthinteleni izigidi zeetoni zokukhutshwa kwe-CO_2 ngokutshintsha umbane obungaveliswa ngamafutha efosili.

Amandla ahlaziyekayo adala amathuba emisebenzi kwezobunjineli, kwezokwakha, kwezenzululwazi, kunxibelelwano, kwezemali, kuphuhliso loluntu nakwamanye amacandelo amaninzi.



PHONONONGA NGAKUMBI

GLOBAL WIND ATLAS

WIND ATLAS FOR SOUTH AFRICA

SAWEA RESOURCE CENTRE

Ingaba ungasebenza kwicandelo lamandla ahlaziyekayo?

Amandla avuselelekayo afuna abantu abaneetalente ezahlukeneyo haayi iinjineli kuphela. Nokuba uyonwabela ukusombulula iingxaki, ukunceda abantu, ukukhusela indalo, ukuyila imizobo okanye ukuphatha iiprojekthi, kunokubakho umsebenzi oza kuwenza.



NDIYAZITHANDA IZIBALO, ISAYENSI NETEKHNOLOJI

- Injineli yoMbane
- Injineli yekhemikhali
- Umhlaziyi wamandla
- Ingcali yeenkqubo zokugcina amandla ngebhetri
- Igcisa le-mechatronics



NDIYAKONWABELA UKWAKHA NOKULUNGISA IZINTO

- Ingcali yeTurbine yoMoya
- Ingcali yePV yelanga
- Ingcali yoMbane
- Millwright
- Umphathi Xa Kusakhiwa



NDIBAKHATHALELA ABANTU NONXIBELELWANO

- Igosa lonxibelelwano noluntu
- Ingcali yomsebenzi wentlalo-ntle
- Ingcali yophuhliso lwamashishini
- Umququzeleli wophuhliso lwentlalo noqoqosho
- Ingcali yothelelwano nabachaphazelekayo/ingcali yonxibelelwano lwabaxhamli



NDIYAYIKHATHALELA INDALO

- Isazinzulu sezendalo
- Ingcali yovavanyo lwefuthe kwindalo
- Ingcali yenzululwazi ngezinto eziphilayo nendalo yazo
- Ingcali yozinzo
- Ingcali yezinto eziphilayo ezahlukeneyo

NDIYALITHANDA ISHISHINI NOBUNKOKELI

- UMphathi WeeProjekthi
- Umhlalutyi Wezezimali
- Ingcali Yokuthengwa Kweempahla NeeNkonzo
- UMphathi Wezorhwebo
- Umhlalutyi Wotyalo-mali

NDIYAKONWABELA UKUBHALA, UYILO NOKUNXIBELELANA

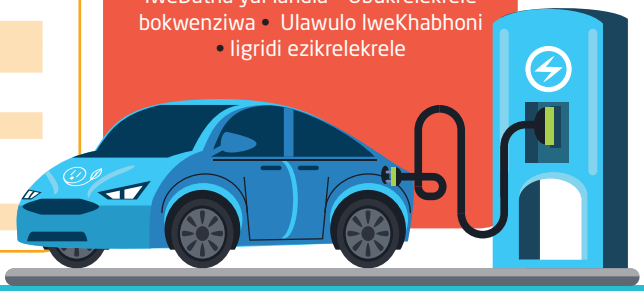
- Ingcali yoNxibelelwano
- Umququzeleli weMidiya yeNtlalo
- Umyili weMifanekiso
- Ingcali yoThengiso
- Ingcali yoBudlelwane boLuntu

NDINOMDLA KUMTHETHO, UMGAQO-NKQUBO NORHULUMENTE

- Umcebisi weMigaqo-nkqubo yaMandla
- Igqwetha lezeNdalo
- Ingcali yoLawulo
- Umhlalutyi weMigaqo-nkqubo yeMozulu
- Ingcali yeNgxelo ye-ESG

IMSEBENZI YEXESHA ELIZAYO

Ukugcinwa kweBhetri • I-Hydrogen eluhlaza • Izithuthi zoMbane • Imali yeMozulu • Uhlalutyo lweDatha yaMandla • Ubukrelekrele bokwenziwa • Ulawulo lweKhabhoni • Igridi ezikrelekrele



Indlela yakho enga kwicandelo lamandla

Akukho ndlela inye eya kumandla avuselelekayo. Nokuba ukhetha iyunivesithi, ikholeji yeTVET, uqeqesho lomsebenzi okanye uqeqesho lomsebenzi, yonke indlela inokukhokelela kumathuba emisebenzi anomdla.

KHETHA INDLELA YAKHO

SHIYA ISIKOLO

YEYUNIVESITHI

YESIDANGA

WOBUGCISA

IKHOLEJI YETVET

IDIPLOMA / URHWEBO

UQEQESHO LOMSEBENZI

INKQUBO YESIDANGA / UQEQESHO LOMSEBENZI

UMSEBENZI WAMANDLA AVUSELELEKAYOIZIFUNDO ONGAZIKHETHA

UQEQESHO LWE-TVET NOBUGCISA

- UBUNJINELI BOMBANE
- UKWAKHIWA KWEZISEKO ZOMBANE
- UQEQESHO LWEMILLWRIGHT
- I-MECHATRONICS
- UKUFAKELWA NOKUJIKISWA
- UKUFAKWA KWE-PV YELANGA
- UQEQESHO LWETEKHNOLOJI YETURBINE YOMOYA

IKAMVA LIYAKUDINGA

Icandelo lamandla avuselelekayo/ ahlaziyekayo lifuna abantu abatsha, abasombululi beengxaki, abanxibelelanisi, izazinzulu, iingcali, iintshatsheli zokusingqongileyo, abakhi boluntu kunye neenkokheli zexesha elizayo. Kukho indawo yetalente nganye kwikamva lamandla eMzantsi Afrika.

Ubusazi?

Abantu abaninzi abasebenza kumandla avuselelekayo/ ahlaziyekayo namhlanje bafunda izifundo ezifana nezoqoqosho, unxibelelwano, isayensi yokusingqongileyo, inzululwazi yezentlalo, ezezimali, umthetho kunye nomgaqo-nkqubo woluntu – Hayi ubunjineli kuphela.

IZIFUNDO ONGAZIKHETHA

UBUNJINELI
Ubunjineli boMbane
Ubunjineli booMatshini
Ubunjineli boLuntu
Ubunjineli beMechatronics

OKUSINGQONGILEYO NOZINZO
ISayensi yokusiNgqongileyo
IJografi
I-Ecology
Izifundo ngeMozulu
Uphuhliso oluZinzileyo

UMGAQO-NKQUBO NOPHUHLISO
UMgaqo-nkqubo woLuntu
Izifundo zoPhuhliso
Ulawulo loLuntu
Ubudlelwane baMazwe ngaMazwe

ISHISHINI NEZEMALI
EzoQoqosho
EzeMali
Ezobalo
Ulawulo Lwempahla
Ulawulo lweeProjekthi

ABANTU NOLUNTU
Uphuhliso loLuntu
ISosioloji
IiSayensi zeNtlalo
IPsychology

UNXIBELELWANO NAMAZIKO EENDABA
Unxibelelwano
Intengiso
Uyilo lweMizobo
Ubuntatheli
Ubudlelwane boLuntu

Imibutho ekufuneka

SAWEA
South African Wind Energy Association

Ilizwi leshishini lamandla omoya laseMzantsi Afrika kwaye lixhasa uphuhliso lwezakhono, ukukhula kweshishini kunye nokuvelisa izinto ezintsha. Isebenzisa iNkqubo yoQeqesho lweShishini loMoya (i-WIIP) ngokubambisana ne-EWSETA kubafundi abaphumeleleyo abafuna ukungena kweli candelo.

SAPVIA
South African Photovoltaic Industry Association

Imele ishishini laseMzantsi Afrika le-photovoltaic (i-PV) kwaye ixhasa uphuhliso lwezakhono, ukukhula kweshishini kunye nokuvelisa izinto ezintsha.

EW SETA
ENERGY AND WATER SECTOR EDUCATION AND TRAINING AUTHORITY

Ibonelela ngeebhasari, izifundo zokufunda, uqeqesho kunye namathuba oqeqesho kulo lonke icandelo lamandla.

sanedi
South African National Energy Development Institute

Ixhasa uphando lwamandla, ubugcisa kunye nophuhliso lwetekhnoloji.

CSIR
Touching lives through innovation

Enye yeziko eziphambili zophando lwesayensi kunye netekhnoloji eMzantsi Afrika.

SARETEC
SOUTH AFRICAN RENEWABLE ENERGY TECHNOLOGY CENTRE

Iziko loqeqesho lwamandla avuselelekayo olukhethekileyo eMzantsi Afrika lweengcali zomoya kunye nelanga.

ihlolwe

GreenCape

Ixhasa uphuhliso loqoqosho oluluhlaza, uphuhliso lwamashishini kunye neenkqubo zezakhono.

GBC SA
Green Building Council South Africa

Ikhuthaza izakhiwo ezizinzileyo kunye nezakhono eziluhlaza kulo lonke indawo eyakhiweyo.

em
energy mobility
education trust

Ixhasa imfundo kunye namanyathelo ophuhliso lwezakhono anxulumene necandelo lamandla.



Iiyunivesithi ezininzi zenza uphando malunga namandla ahlaziyekayo kunye nokuzinza kokusingqongileyo, kuquka iYunivesithi yaseStellenbosch, iYunivesithi yaseKapa, iYunivesithi yasePitoli, iYunivesithi yaseNorth-West, iYunivesithi yaseNelson Mandela kunye neYunivesithi yeTekhnoloji yaseThekwini.

PHONONONGA OKUNGAKUMBI

ULWAZI LWEWIIP

AMATHUBA EEWSETA

UQEQESHO LWESARETEC

SAPVIA

Kusekho ixesha lokufundisa abantwana bethu ukuba bathathe inyathelo lokukhusela umhlaba wabo.





I-EnergyDrive ngumboniso ophathwayo oziswa kuwe yiSitishi seTekhnoloji yaMandla kwiYunivesithi yeTekhnoloji yaseDurban. Eli phulo lijolise ekufundiseni nasekukhuthazeni uluntu lwasekuhlaleni malunga namathuba angenamkhawulo ombane ohlaziyekayo.

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INYUVESI YASETHEKWINI YEZOBUCHWEPHESHE

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SAWEA
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