

ISICWANGCISI SENKQUBO YEMFUNDO KUNYE NOKUQONDWA KOKUSINGQONGILEYO

UHLOBO LWENKQUBO (yenza isangqa/nqamleza): inkqubo yemfundo yoluntu/yabantu abadala – AMANDLA OMBANE

IINKCUKACHA

Igama lesikolo/igela				
Inani labafundi/abathathi nxaxheba abalindelekileyo		Inani ngqo labafundi/abathathi nxaxheba		Ubude/ixesha elithathwa yinkqubo lyure e-1
Indawo (irizevu/isiza)			Ibanga/igela lobudala	Abantu abadala/abantwana abafikisayo
Umhla wesihlo				
Ingaba le yinxalenye yesicwangciso sokusebenza?	EWE/HAYI		Ukuba nguhayi, xela ukuba kutheni ifuneka inkqubo	

ISIQULATHO

	Umxholo (isangqa/ukunqamleza)	Amandla ombane
Yazi	Izihloko ekuthethwa ngazo (umzkl. umjikelezo wamanzi/ukubaluleka kwamanzi)	Into ayiyo amandla ombane Kutheni kubalulekile ukulondoloza amandla ombane Indlela yokweza uhlobo lwamandla ombane
	Ukudibanisa ikharithulam (kwiinkqubo ezinxulumene nekharithulam kuphela) – qaphela umxholo/umgca/izihloko ukuba ngaba azidweliswanga kwizihloko ezingentla)	AKUNGENI
Ye	Ulwazi lwangaphambili luyafuneka (ukuba luyangena)	AKUNGENI
	Izakhono ekuqhelanise nazo (nqamleza/yenza isangqa)	Cacisa, Chonga, Xela, Hlalutya, Yithi thaca, Funda, Rekhoda, Nika ingxelo, Zibophelele, Khetha, Yenza isigqibo
Ixabis	Umyalezo ongundoqo (umzkl. kufuneka silondoloze amanzi)	Kufuneka siwalondoloze amandla ombane

ULUNGISELELO JIKELELE

	Umntu onoxanduva	Gqibile (phawula)	Isimo
Mema *			
Indawo			
Isithuthi			
Ukubhukisha kuqinisekisiwe			
Imvume ye-WCED *			
Izixhobo nekhamera yentetho eza kuthiwa thaca			

Okunye:

Isicwangciso sicelewe ngu: _____ (igama)

_____ (umhla)

Isicwangciso sivunywe ngu: _____ (igama)

_____ (umhla)

Uhlolo lomngcipheko lwenziwe, uqinisekiso noluhlu lokukhangela luthunyelwe.			
Ulungiselelo lokutya *			
Ukhuselo *			
Uhlahlo lwabiwo-mali neziko leendleko			

*Ukuba kuyangena

ISICWANGCISO SESIFUNDO

Ixesha	Indawo	Umsetyenzana nengcaciso	Imithombo yolwazi kunye nomntu onoxanduva lokuzisa/ukulungisa umthombo wolwazi	Abasebenzi abaququzelelayo (ukuba bangaphezulu kom-1, khombisa umququzeleli ophambili nomgcini xesha)
INTSHAYELELO NOMSETYENZANA WOKWAZISA ABANTU				
Imizuzu emi-5		<p>Umsetyenzana wokwazisa abantu – umsetyenzana webhotile ye-coke Ukucinga ngokuba kutheni sihlawulela into esiyisebenzisa kakubi.</p> <p>Cela wonke umntu ukuba eme ngaphandle ngesangqa. Bonisa wonke umntu ibhotile ye-coke emele amandla ombane (icoke ineswekile njl. njl.). Baxebele bonke ukuba bacinge ngokuba banebhotile ye-coke ezandleni zabo kwaye yibhotile ye-coke yokugqibela emhlabeni, umthombo wokutya/wamandla ombane wokugqibela. Bacele babhidele ibhotile ye-coke. Banokuyihlawulela malini? Wakube umntu ekuhlawulele i-coke, yivule uze uchithele phantsi konke okungaphakathi emgangathweni uze unike umntu lowo uyithengileyo ibhotile engenanto.</p> <p>Cacisa ukuba le yinto esiyenza yonke imihla – SIYAWAHLAWULELA AMANDLA OMBANE, KODWA ASIWASEBENZISI. Ngoba? Ungenza ke ingxoxo ngethile yemiba engezantsi. Nyanzelisa ukuba KONKE KUMALUNGA NOKHETHO; sikhetha ukuchitha okanye ukulondoloza.</p>	Ibhotile ye-coke (ingasetyenziswa iti endaweni ye-coke emva kokuyisebenzisa ka-1)	
UMZIMBA/IMISETYENZANA				
Imizuzu eli-10		<p>Intshayelelo kumandla ombane</p> <p>a) Luqale njani usuku lwakho?</p> <p>Bohlule ngokwamaqela. Kwiqela banokuxoxa ngento abayenzileyo ukusukela ekuvukeni kwabo kunye naxa kusetyenziswe amandla ombane/umbane. Banokukhankanya kananjalo izinto ezifana nale 'ndivule amehlo am' (oko kusebenzisa amandla ombane kananjalo). Imizekelo ethile:</p> <ul style="list-style-type: none"> • Layita. • Uye ekhitshini, walayita. • Layita isitovu ukupheka isidudu. • Ufudumeze ubisi kwimicrowave. • Wenze isonka esirhawuliweyo. 	<p>Ibhodi emhlophe</p> <p>Imakha yebhodi emhlophe</p> <p>Intetho ethiwa thaca ngamandla ombane</p>	

Imizuzu eli-15		<p>Sebenzisa inkqubo yamanqaku, xesha ngalinye umbane usetyenzisiwe kuze ke kongezwe inqaku. Khangela kwiqela ngalinye uze uxele ukuba liwusebenzisele ntoni umbane kunye nokuba lifumene amaqaku amangaphi.</p> <p>Xa onke amaqela eyinikile ngxelo, umququzeleli ukhangela iqela lonke elisebenzise umbane omninzi kusasa kuphela.</p> <p>b) Intetho ethiwa thaca ye-PowerPoint ngamandla ombane</p>		
Imizuzu engama-20	Qhuba uhlobo lwamandla ombane endlini okanye iindkelo zohlolo lwamandla ombane okanye ukukhutshwa kwekhabhoni	<p>Umzekelo onokusebenziseka wokuba kulula kanjani na ukwenza utrhintsho kubomi bethu bemihla ngemihla oluza kulondoloza amandla ombane – ubungqina bokuba singakwenza ngokwethu oko. Into enye ESINAKO ukuyenza.</p> <p>Xoxani ngeziphumo kwaye nibone ukuba ngamnye uwalondoloze njani amandla ombane/umbane.</p>	<p>Amaphetshana okuHlola aMandla oMbane (<i>iNcwadi yokuPhila</i> ngobuLumko – jonga ulwazi ngezantsi.</p> <p>Shicilelela umntu ngamnye ikopi ukuze bagcwalise iifomu.</p> <p>Umatshini wokubala okanye ababini</p>	
UKUHLANGANISA NOKUHLOLA				
Imizuzu eli-10	Ukuhlanganisa	<p>Into enye ESIZA kuyenza ukulondoloza amandla ombane</p> <p>Xoxani ngento enye eza kwenziwa ngumntu ngamnye ukuya phambi ukulondoloza amandla ombane. Umntu ngamnye makabhale phantsi isithembiso sakhe kwisiqwenga sephepha, eze ngaphambili, asifunde aze asincamathisele edongeni okanye kwiphedi enkulu.</p>	Sika iphepha, iibholpeni/iiKoki, ibhodi yephedi enkulu	

Ikhredithi nongqinisiso lwemithombo: ISixeko saseKapa

✓ **cause quality and sustainability problems** with the grid, as actual generation capacity and schedules are unknown to the City.

City Connect explains the PV registration process in detail and provides the necessary forms. Find the link under **"CONTACTS AND RESOURCES"**.

EXERCISE: DOING AN ENERGY AUDIT OF YOUR HOME

This exercise will help you understand exactly where you use electricity in your home, and where you can save.

STEP 1: COLLECT THE DATA

In column 1 of the table on the following page, list the appliances you have in your home.

In column 2, note the electricity power (W) of each appliance. Appliance power is usually measured in watts and written on the appliance itself. (Note, however, that this can indicate maximum power use, which could be higher than average power use.) The table 'Average electricity consumption of typical home appliances' on page 218 provides estimates for common appliances, which may be helpful.

If you have more than one of any appliance, such as lightbulbs, write down in column 3 how many of each appliance you have.

In column 4, record how long (for how many hours) each appliance is used per day. Consider differences in weekday and weekend use, as well as summer and winter use, and calculate an average.

Note that some appliances, such as fridges and hot-water cylinders, regulate themselves by constantly switching on and off. Consult the table on page 218 to estimate your consumption.

STEP 2: DO THE CALCULATIONS

To determine your daily electricity consumption, use this simple formula:

$$\frac{(\text{Watts} \times \text{hours used per day} \times \text{number})}{1\,000} = \text{daily consumption in kilowatts}$$

In essence, therefore, you are multiplying column 2 by column 3, and then by column 4 (if there is more than one item). This final figure is then divided by 1 000 to convert from watt-hours to kilowatt-hours, because 1 kilowatt (kW) = 1 000 watts (W). Fill in the total in column 6 to get an estimate of your daily use per item.

Add up your total kilowatt-hours for all appliances to calculate your total electricity consumption. To get your monthly consumption figure, multiply your total daily figure by 30,4 days.

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5	COLUMN 6
APPLIANCE DESCRIPTION	POWER USE PER UNIT (WATTS)	HOURS/DAY IN USE (HOURS)	NUMBER OF UNITS	AVERAGE NUMBER OF WH PER DAY (WATT X APPLIANCES HOURS/1 000)	AVERAGE KWH PER DAY
e.g. LED lamp	5 W	6 hours	7 lights	$5 \times 7 \times 6 = 210 \text{ Wh/day}$ divide by 1 000 to get kWh/day	0,21 kWh



AVERAGE ELECTRICITY CONSUMPTION OF TYPICAL HOME APPLIANCES

APPLIANCE DESCRIPTION	POWER USE (WATTS)	AVERAGE HRS/DAY IN USE	APPLIANCE DESCRIPTION	POWER USE (WATTS)	AVERAGE HRS/DAY IN USE
LIGHTING			REFRIGERATION		
LED downlight	5	5	Chest freezer	105	4
Halogen downlight	50	5	Fridge - with freezer	158	5
Incandescent bulb	60	5	Fridge - no freezer	250	5
Compact fluorescent light	18	5	HOME MAINTENANCE		
LED lamp	8	5	Dishwasher	2 500	0,9
LED security light	10	8	Vacuum cleaner	1 000	0,5
Halogen security light	150	8	LAUNDRY		
COOKING			Iron	980	0,4
Coffee machine	670	0,5	Steam iron	1 235	0,8
Electric stove	3 000	2	Washing machine	3 000	0,75 *
Frying pan	1 250	0,4	Tumble dryer	3 300	0,5 *
Kettle	1 900	0,3	* indicates per load		
Hotplate - large	2 400	0,3	OTHER		
Induction stove	2 000	0,3	Burglar alarm	10	24
Microwave oven	1 230	0,8	Cellphone charger	9	2
Toaster	1 010	0,3	CD player	9	0,4
Snackwich maker	1 200	0,3	Computer	134	1,5
Food processor	166	0,2	Cordless phone	2	15
GEYSER			Hair dryer	647	0,1
Electric geyser	2 600	4,4	Radio	12	3
Solar water heater, with electric backup	2 600	1,7	Pool pump - variable speed drive	200 to 1 200	winter 2 x 4 h
Heat pump	1 250	2,5			summer 2 x 6 h

STEP 3: IDENTIFY PRIORITY ACTION AREAS AND POTENTIAL FOR SAVINGS

Examine your results and identify which areas of the home use the most electricity. By doing this, you can take simple, effective cost-saving actions to reduce your electricity consumption. A simple way to check the accuracy of your audit is to compare it to your actual electricity units used. Remember, it might change depending on the season and number of people in your home. Yet it remains a good yardstick.

EXERCISE: DETERMINING THE COST OF ENERGY IN YOUR HOME

This exercise will look at the amount of money spent on energy, instead of total energy consumed. Understanding what uses most energy (and money) will help you identify where you can make savings.

STEP 1: COLLECT THE DATA

In column 1 of the table on the following page, list the fuels you use, such as electricity, paraffin, gas, batteries, wood or candles.

In column 2, note the different purposes for which you use each fuel, such as cooking, lighting, entertainment, heating, refrigeration or ironing. You could even include transport fuel and costs if you want to get the full picture.

In column 3, write down how much of each fuel you use in a week.

In column 4, write down the price of the fuel for each unit, such as a litre or kilogram of fuel.

STEP 2: DO THE CALCULATIONS

To determine the cost of each fuel per week, multiply the amount you use (column 3) by the cost per unit (column 4). Write down the result in column 5. If you wish to obtain a rough monthly figure, multiply this by 4,2.

FUEL DO YOU USE?	FUEL USED FOR?	FUEL DO YOU USE PER WEEK?	PRICE OF THE FUEL PER UNIT?	WEEK FOR FUEL?
ELECTRICITY				
PARAFFIN				
GAS				
BATTERIES				
WOOD				
TOTAL COST				

STEP 3: IDENTIFY PRIORITY ACTION AREAS AND POTENTIAL FOR SAVINGS

Think about where you spend the most money on energy every week and use the tips in this chapter to make better energy choices. Also look at "A safe home" on page 222 to see whether you can improve on energy safety in your home.

CALCULATING YOUR HOUSEHOLD'S CARBON EMISSIONS

Different fuels have different carbon dioxide (CO₂) emissions levels. Electricity in South Africa emits substantial amounts of CO₂, as it is derived from the burning of low-grade coal. For a quick estimate of your energy consumption and related carbon emissions, follow these steps:¹⁸

- ✓ **Step 1:** If you do not have a record of your electricity and fuel bills, fill in the amount of fuel you use each month in column 1.
- ✓ **Step 2:** Multiply this by the value provided in column 2. For example, for electricity, this is 0,995. This will give you the kilograms of CO₂ you emit per month. Write this in column 3.
- ✓ **Step 3:** For your annual CO₂ emissions, multiply column 3 by 12 months, and add for all fuels.
- ✓ **Step 4:** If you want to calculate this per tonne, you will need to divide it by 1 000, as 1 tonne = 1 000 kg.

COLUMN 1: FUEL USAGE PER MONTH	COLUMN 2: EMISSIONS FACTOR	COLUMN 3: CARBON EMISSIONS - KG CO ₂
Electricity: _____ kWh	x 0,995 kg CO ₂ per kWh	kg CO ₂ /month
LPG: _____ kg	x 1,622 kg CO ₂ per kg	kg CO ₂ /month
Paraffin: _____ litres	x 2,577 kg CO ₂ per litre	kg CO ₂ /month
Total household energy-related emissions per month		kg CO ₂ /month
Total household energy-related emissions per annum		kg CO ₂ /annum

Compare your household's carbon emissions with typical annual CO₂ emissions from Cape Town homes, excluding transport.

HOUSEHOLD TYPE	KG CO ₂ /MONTH
Average low-income non-electrified home in Cape Town	146
Average low-income electrified home in Cape Town	193
Average mid-income home in Cape Town	737