



# **ZIMBABWE ELECTRICITY TRANSMISSION & DISTRIBUTION COMPANY**

**A PRESENTATION TO THE AGENDA FOR FARMERS INDABA**

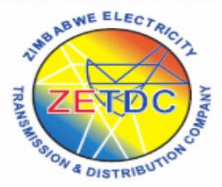
**ON**

**AGRICULTURE SECTOR POWER SUPPLY SUPPORT**

*Ensuring food security through energy efficiency*

**By R. T. Katsande    Commercial Director**

***18 August 2015***





# PRESENTATION OUTLINE

- ✓ 2015 Power Supply Outlook
- ✓ Operational Challenges
- ✓ Power Supply Security Measures
- ✓ Agriculture Sector Support
- ✓ Historical Wheat belts power demand
- ✓ Customer Base
- ✓ Agriculture contribution to power consumption
- ✓ Agricultural Sector Tariff Options
- ✓ Safety Issues
- ✓ Agricultural Debt & Recovery strategies



# POWER SUPPLY SITUATION

Source	Dependable Capacity (MW)	Current Av. Capacity (MW)	Remarks
<b>Kariba</b> 	750	696 ( <b>709</b> )	<ul style="list-style-type: none"> <li>❖ All units in Service</li> <li>❖ Reliable plant</li> </ul>
<b>Hwange</b> 	780	349 ( <b>610</b> )	<ul style="list-style-type: none"> <li>❖ Units 3,4,6 in service</li> <li>❖ G1 {Rotor issue}; G2 {Turbine vibrations}; G5 {ID fans &amp; Balancing}</li> </ul>
<b>Small Thermals</b>	150	72	<ul style="list-style-type: none"> <li>❖ Bulawayo - 20MW</li> <li>❖ Munyati - 22MW</li> <li>❖ Harare - 30MW</li> </ul>
<b>IPP &amp; Imports</b>		53	<ul style="list-style-type: none"> <li>❖ HBC - 50</li> <li>❖ Pungwe B - 1</li> <li>❖ Green Fuel - 2</li> </ul>
<b>Total</b>	<b>1680</b>	<b>1170</b>	



# POWER IMPORTS/EXPORTS

Supplier	Contractual Capacity (MW)	Actual Capacity	Remarks
<b>HCB (Mozambique)</b>	50 (firm)	50	❖ Upfront payment required
<b>Eskom (South Africa)</b>	400 (Non Firm)	0	❖ Emergency Source ❖ Capacity constraints in RSA ❖ High Cost
<b>SNEL (DRC)</b>	50 (Firm)	0	❖ Poor Reliability
<b>ZESCO (Zambia)</b>	150 (non-firm)	0	❖ Tariff issues pending
NAMPOWER (Namibia)	<b>-80</b>		
<b>Total</b>	<b>650</b>	<b>50</b>	

# SUPPLY - DEMAND BALANCE

IPPs		3	
<b>Sub Total</b>	<b>1680</b>	<b>1170</b>	
Imports MW			
HCB	50	50	Normal
ESKOM	0		
ZESCO	0		
SNEL	0		
<b>Sub Total</b>	<b>50</b>	<b>50</b>	
<b>TOTAL</b>	<b>1730</b>	<b>1429</b>	
<b>MAXIMUM DEMAND</b>	<b>1950</b>	<b>1600</b>	
Export to Nampower	-80		
<b>SURPLUS/SHORTFALL</b>	<b>-300</b>	<b>-171</b>	<b>Met through load shedding -</b>
			<b>Schedules advertised</b>



# OPERATIONAL CHALLENGES

1. Power shortage resulting in load shedding.
2. Old Infrastructure – resulting in increased faults
3. Theft & Vandalism of infrastructure.
4. Electrical accidents on farms.
5. Huge & mounting customer Debt (\$1016m. Agriculture Sector owe \$76.3m).

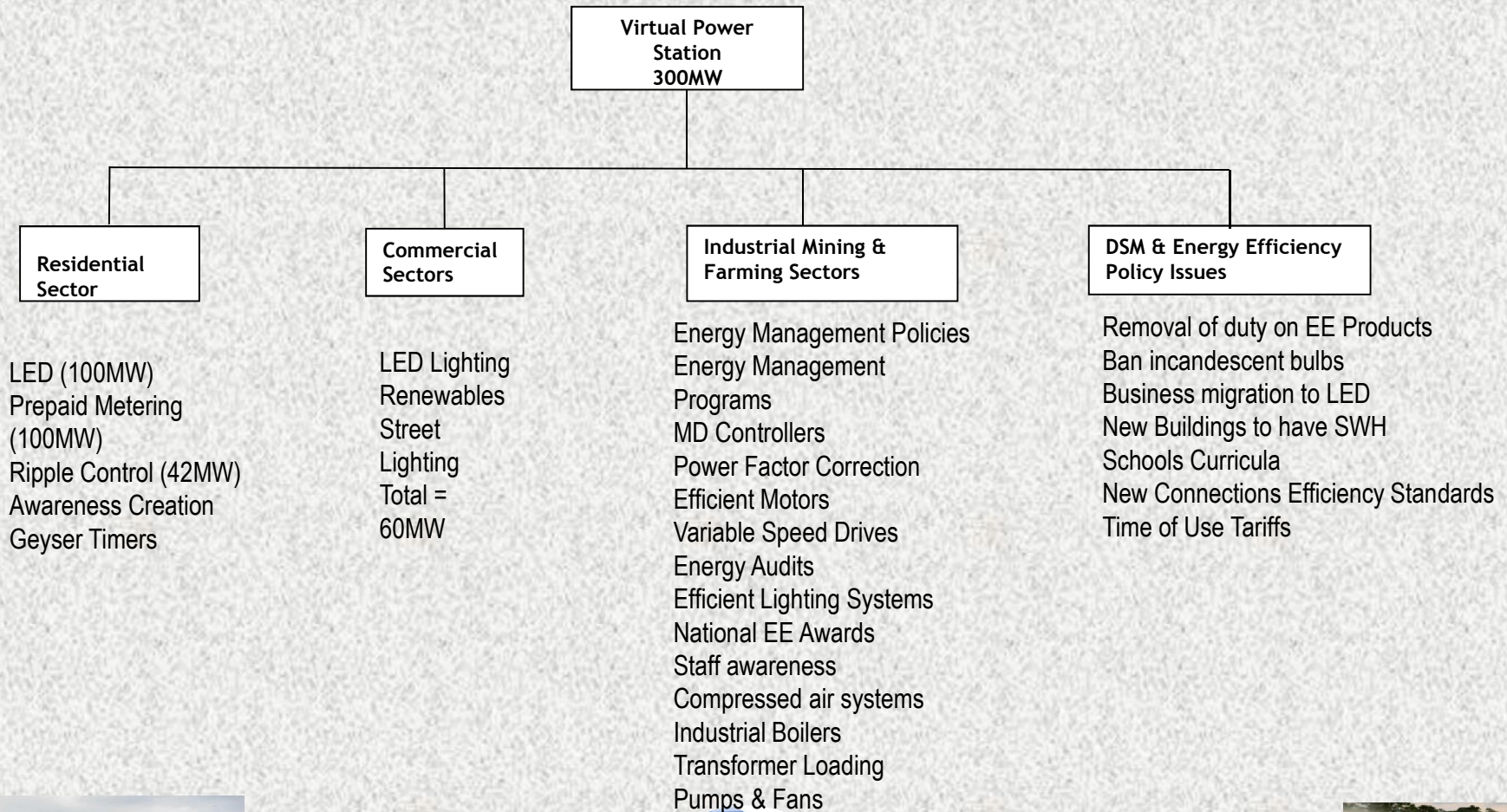


## MITIGATION MEASURES TO ADDRESS CHALLENGES

1. DSM Measures
2. Energy Saving Measures
  - a) Improve Power Factors.
  - b) Manage Maximum Demand.
  - c) Improve Load Factor.
3. Generation Projects- Hwange 7&8, Kariba 7&8 Expansion.
4. Anti-vandalism Awareness Campaigns.
5. Conducting Electrical Accident Safety Campaigns (*Schools, Farms, Residential Association*).
6. Prepayment Metering Programme.
7. Smart Metering Programme


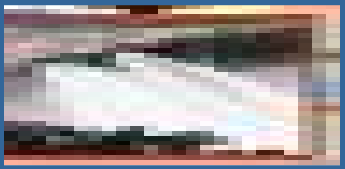


# Utility Driven DSM Initiatives





# PLANNED GENERATION PROJECTS

Project Description	Estimated Cost (USD million)	REMARKS
<b>Hwange 7 &amp; 8 2 x 300MW (600MW)</b> 	<b>600</b>	<ul style="list-style-type: none"> <li>❖ Awaiting financial closure</li> <li>❖ Pre-commencement work underway</li> </ul>
<b>Kariba South Ext 2 x 150 MW(300MW)</b> 	<b>300</b>	<ul style="list-style-type: none"> <li>❖ Project on schedule</li> <li>❖ Tunnel drilling to power houses underway</li> <li>❖ Unit7 commissioning 24/12/17</li> <li>❖ Unit8 commissioning 10/3/18</li> </ul>
<b>Gairezi</b>	<b>30</b>	<ul style="list-style-type: none"> <li>❖ Tender closed</li> <li>❖ 3.5 years completion</li> </ul>



# INDEPENDENT POWER PRODECERS (IPPs)

Supplier	Installed Capacity MW
Nyamingura	1.1
Pungwe A	2.75
Pungwe B	15
Duru	2.2
Green fuels	5
<b>Total</b>	<b>26.05</b>



## **AGRICULTURE SECTOR SUPPORT**

- ❖ In line with Zim-Asset goals of food security beneficiation and maximisation of export proceeds ZETDC supports the Agriculture Sector.
- ❖ Agriculture to set to contribute 18% of GDP in 2015
- ❖ Tobacco and Winter wheat power supply support schemes are in place.



# HISTORICAL WHEAT BELTS POWER DEMAND ESTIMATES

	District	Hectrage	MW
<b>Mash West Sub Total</b>	<b>Chegutu</b>	<b>3,387</b>	<b>6</b>
	<b>Hurungwe</b>	<b>1,429</b>	<b>5</b>
	<b>Makonde</b>	<b>7,876</b>	<b>10</b>
	<b>Zvimba</b>	<b>8,154</b>	<b>10</b>
		<b>20,846</b>	<b>35</b>
<b>Mash Central Sub Total</b>	<b>Bindura</b>	<b>6,731</b>	<b>19</b>
	<b>Mazoe</b>	<b>9,842</b>	<b>11</b>
	<b>Shamva</b>	<b>2,563</b>	<b>5</b>
	<b>Muzarabani</b>	<b>1,360</b>	<b>3</b>
	<b>Guruve</b>	<b>164</b>	<b>3</b>
	<b>20,660</b>	<b>41</b>	
<b>Mash East Sub Total</b>	<b>Goromonzi</b>	<b>3,614</b>	<b>23</b>
	<b>Marondera</b>	<b>2,015</b>	<b>10</b>
	<b>Murewa</b>	<b>1,570</b>	<b>5</b>
	<b>Seke</b>	<b>1,421</b>	<b>5</b>
	<b>Chikomba</b>	<b>737</b>	<b>3</b>
	<b>Mutoko</b>	<b>133</b>	<b>3</b>
	<b>Hwedza</b>	<b>1,112</b>	<b>5</b>
	<b>10,602</b>	<b>54</b>	



# HISTORICAL WHEAT BELTS POWER DEMAND ESTIMATES.....cont,

<b>Manicaland Sub Total</b>	<b>Chipinge</b>	<b>4,700</b>	<b>8</b>
	<b>Makoni</b>	<b>950</b>	<b>3</b>
	<b>Headlands</b>	<b>1,300</b>	<b>5</b>
	<b>Mutare</b>	<b>760</b>	<b>3</b>
	<b>Mutasa</b>	<b>1,000</b>	<b>5</b>
		<b>8,710</b>	<b>24</b>
<b>Masvingo</b>	<b>Eastern Lowveld</b>	<b>5,000</b>	<b>4</b>
<b>Midlands</b>	<b>Sherwood Block</b>	<b>1,000</b>	<b>5</b>
	<b>KweKwe East</b>	<b>2,000</b>	<b>3</b>
<b>TOTAL</b>		<b>67,818</b>	<b>162</b>



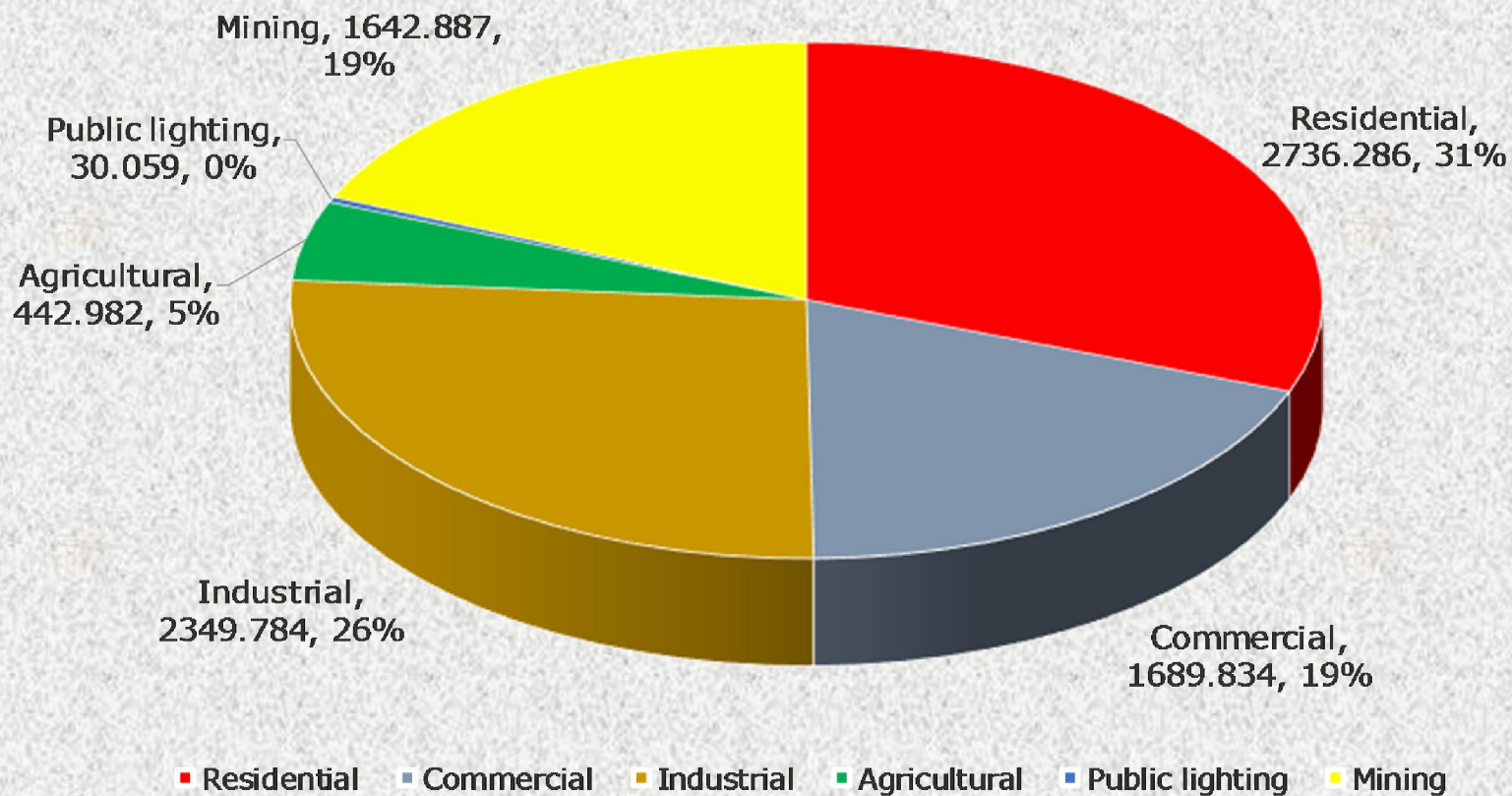
## CONTRIBUTION OF AGRICULTURAL CUSTOMERS

<b>Category</b>	<b>Pre-paid</b>	<b>Post-paid</b>	<b>Total</b>
Agriculture	2895	6314	9209
Domestic	519317	104574	623891
Commercial	31138	27324	58462
Mining	584	1697	2281
Industrial	82	295	377



# ELECTRICITY CONSUMPTION (CNT'D)

## Electricity Sales GWh (2015)





# ELECTRICITY CONSUMPTION (GWh)

**Table 4a**

Year	Residential	Commercial	Industrial	Agriculture	Public lighting	Mining	Total (National)	% Contribution of Agriculture
2009	2,609.3619	1,630.8746	1,403.8162	598.5170	22.3155	802.32260	7,067.2078	8%
2010	2,283.2046	1,499.2954	2,196.9256	464.1751	25.6579	914.50060	7,383.7591	6%
2011	2,634.6473	1,473.2525	2,156.1347	510.5543	57.9544	1,107.2570	7,939.8001	6%
2012	2,708.8963	1,586.3279	1,960.9015	499.2001	29.1337	1,106.6666	7,891.1261	6%
2013	2,878.1643	1,630.9739	3,289.0383	490.2817	48.4378	1,654.4875	8,288.4582	6%
2014	2,496.0000	1,643.2684	2,161.0000	467.8230	21.6154	1,464.0000	8,253.7068	6%
*2015	2,736.2860	1,689.8340	2,349.7840	442.9820	30.0590	1,642.8870	8,891.8320	5%

- Budget figures for the year





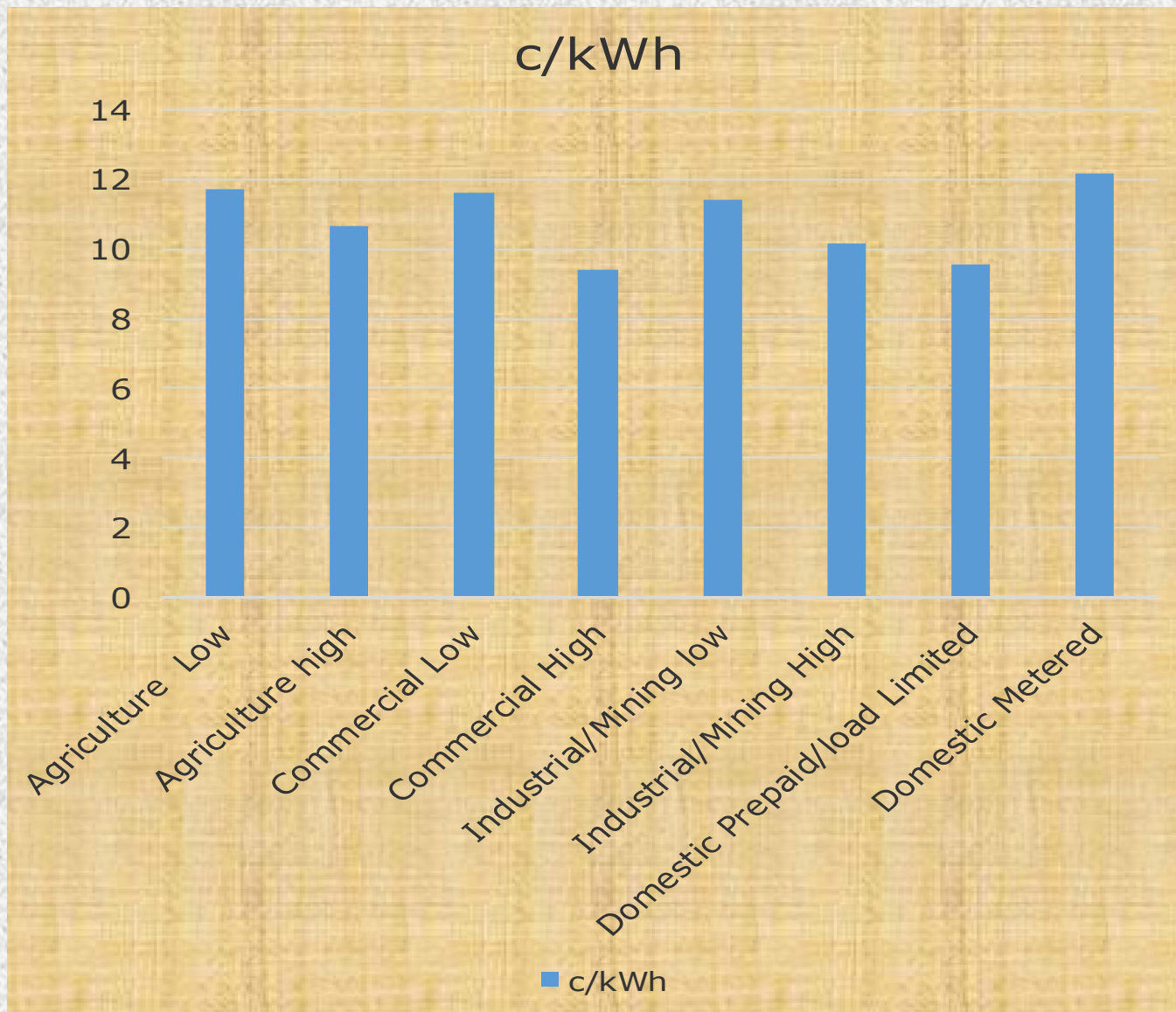
# TARIFFS: AGRICULTURAL CUSTOMERS

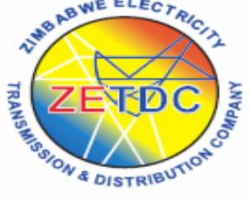
## Agricultural Customers

	<b>Low Voltage E5.1</b>	<b>11kV Supply E5.2.11</b>	<b>33kV Supply E5.2.33</b>
a) Fixed Monthly Charge	\$0.00	\$0.00	\$0.00
b) Monthly MD charge per unit of demand	\$0.00	\$5.54	\$4.07
c) An Interruptible demand charge	N/A	N/A	N/A
d) On-Peak Energy charge per kWh	\$0.12	\$0.13	\$0.13
e) Standard Energy charge per kWh	\$0.12	\$0.07	\$0.07
f) Off-Peak Energy charge per kWh	\$0.12	\$0.04	\$0.04



# ACTUAL PRICES (C/kWh)



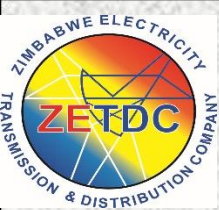


# AGRICULTURAL SECTOR TARIFF OPTIONS

## Time of Use Tariff

	<b>Low Voltage E5.1</b>	<b>11kV Supply E5.2.11</b>	<b>33kV Supply E5.2.33</b>
a) On-Peak Energy charge per kWh	\$0.12	\$0.13	\$0.13
b) Standard Energy charge per kWh	\$0.12	\$0.07	\$0.07
c) Off-Peak Energy charge per kWh	\$0.12	\$0.04	\$0.04

## SMART METERING



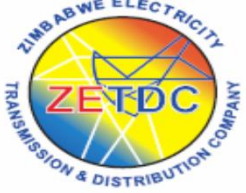
# STATISTICS OF FATAL ELECTRICAL ACCIDENTS INVOLVING PERSONS IN THE FARMING COMMUNITIES

Year	<b>Faults on ZETDC Networks</b> e.g. victims electrocuted when they walked onto fallen energised OHL conductors	<b>Illegal and Substandard Customer installations</b> e.g. victims electrocuted by illegal and substandard private LT lines	<b>Theft and Vandalism</b> e.g. victims electrocuted whilst attempting to steal copper or oil from PMT substations	<b>Tampering with Live ZETDC Equipment</b> e.g. victims electrocuted whilst trying to close open line links or replace blown HT fuses	<b>Unsafe Acts by the Victims</b> e.g. victims electrocuted when they raised irrigation aluminum pipes vertically under HV lines
<b>2012</b>	<b>11</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>5</b>
<b>2013</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>
<b>2014</b>	<b>6</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>2</b>
<b>Total</b>	<b>20</b>	<b>6</b>	<b>4</b>	<b>4</b>	<b>14</b>

## Unsafe & illegal connections, cause electrical accidents

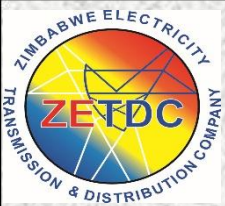


**Pictures showing dangerous connections at farms**

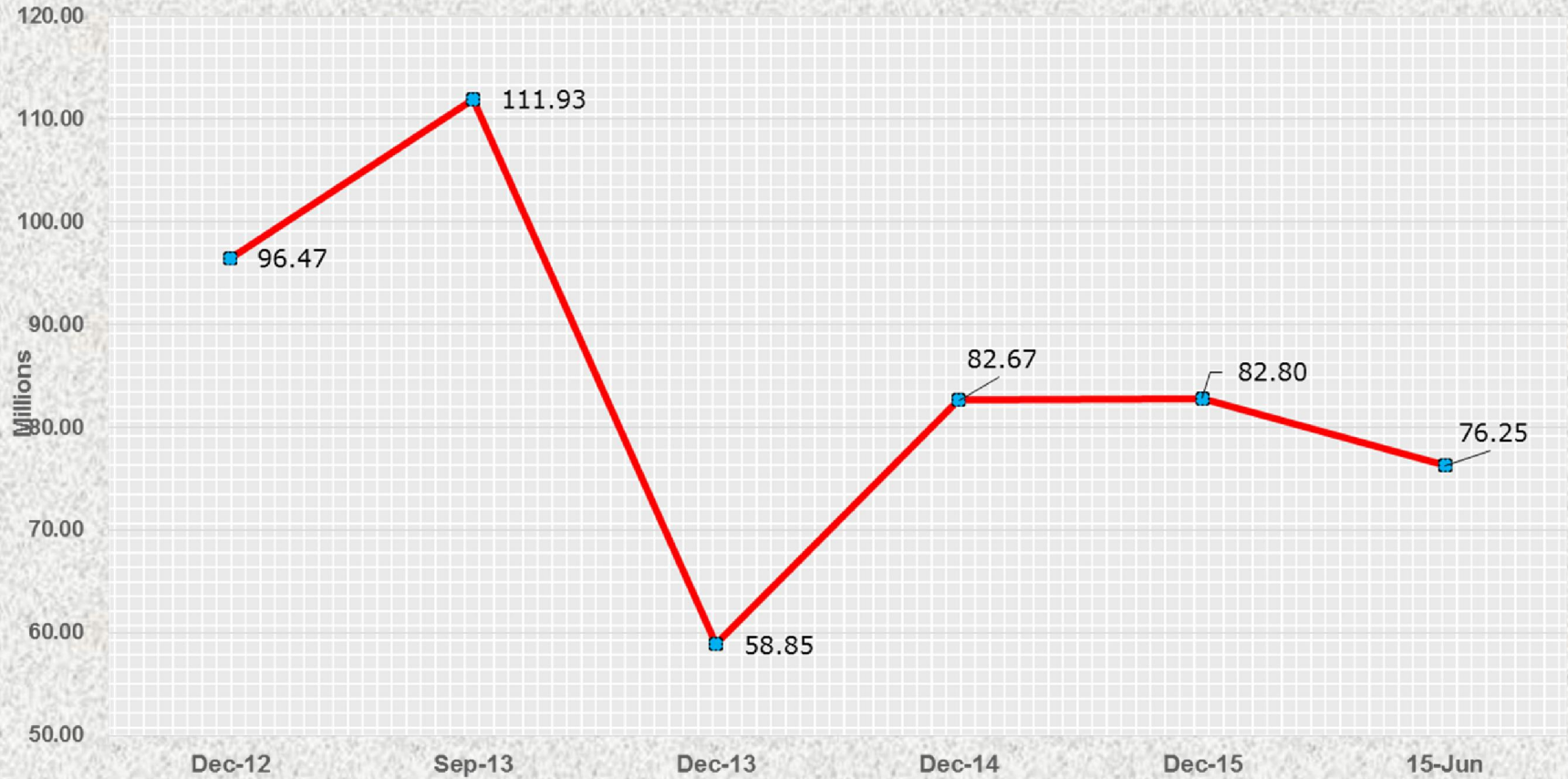


## **THEFT & VANDALISM OF INFRASTRUCTURE**

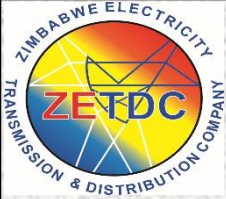
- A cause for concern as the trend is on the increase.
- Another major cause of unplanned power interruptions.
- Huge cost to replace and repair affected equipment (Approx. US\$51m).
- Customers go for days, weeks, months or years without electricity – customer inconvenience and negative public image for the utility.
- Appliance damage is a major source of conflict between Customer and Utility.
- The distribution network has been seriously vandalised. Over 1500 distribution transformers damaged. Over 5000km of conductor stolen.



# AGRICULTURAL DEBT TREND



The drop is due to debt relief write-off extended to agricultural customers

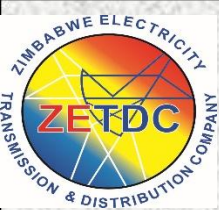


# AGRICULTURAL DEBT IMPACT

## Impact of Debt

- ❖ **Compromised Power Supply Security:** Failure to collect poses a risk to power security as key creditors are threatening to withdraw their services
- ❖ **Poor Credit Rating:** Difficult to attract financiers/investors to fund/invest in power sector assets in a market where service bills are not being paid
- ❖ **Impact on Operations:** Compromised power supply security and network maintenance cannot be sustained.
- ❖ **Failure to Meet Creditors' Obligations-** Most suppliers are demanding upfront payment for goods and services.

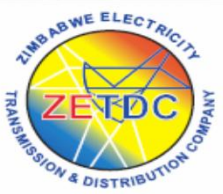




# AGRICULTURAL DEBT RECOVERY STRATEGIES

## Debt Recovery Strategies

- ❖ Engaging farmers to sign-up payments plans.
- ❖ Encouraging farmers whose produce are marketed on the structured markets to sign-up the stop order schemes
- ❖ Engaging farmers to accept installation of prepaid meters  
*(There has been resistance to prepaid meters on the farms.)*
- ❖ Smart metering



THANK YOU