



PROPOSED USE OF WELLHEAD ELECTRICAL POWER IN DRILLING GEOTHERMAL WELLS

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OUTLINE

- 1 Introduction**
- 2 Current Situation**
- 3 Proposed Solution**
- 4 Cost Benefit Analysis**
- 5 Conclusion**



INTRODUCTION

- The concept of wellhead generators;
 - ✓ Early generation of electricity.

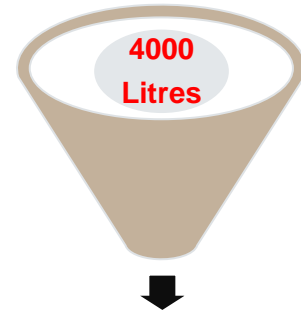
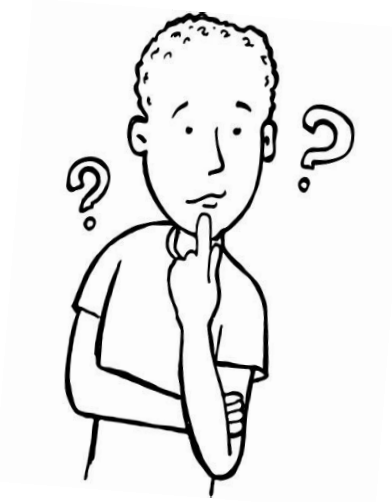
- Current installed capacity at Olkaria- **81.1Mwe**

- Installed capacity in Eburru;
 - ✓ Eburru **2.5 Mwe**

CURRENT SITUATION

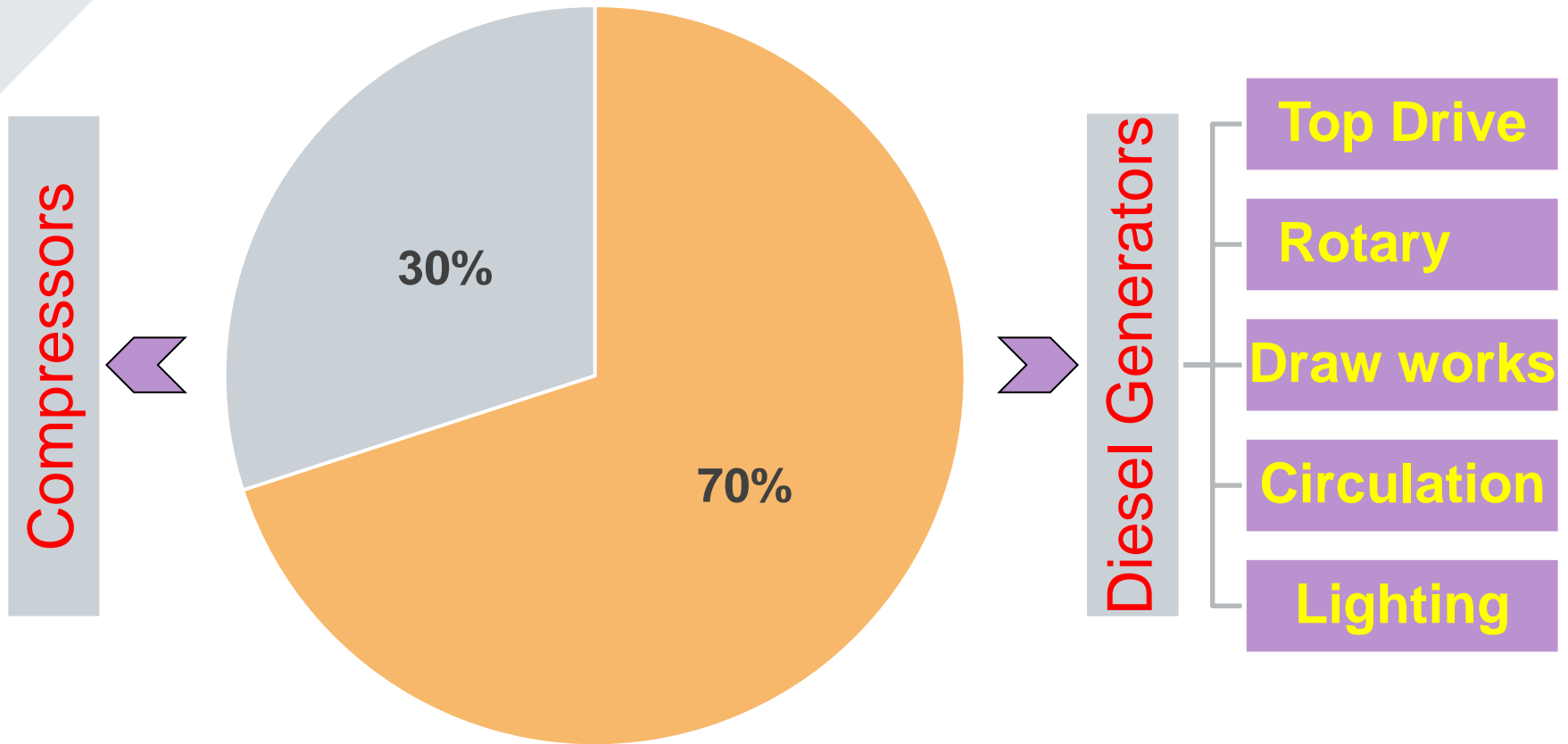
KenGen new rigs are electric and use **diesel fuel** as means of generating **electrical power** needed for the various systems.

Average fuel consumption



CURRENT SITUATION...cont'

Percentage diesel consumption by rig equipment



CURRENT SITUATION...cont'

Fuel consumed in drilling wells OW-11A and OW-724A

| | KGN-01 at well OW-11A | KGN-02 at well OW-724A |
|--|--------------------------|---------------------------|
| Total fuel consumed in 2 months duration, (ltr) | 323,000 | 237,000 |
| Fuel cost per litre, (USD) | 0.95 | 0.95 |
| Total fuel cost per well, (USD) | 306,850 | 225,150 |
| Total fuel cost per month, (USD) | 153,425 | 112,575 |
| | | |
| TOTAL (USD) | 266,000.00 | |

CURRENT SITUATION....cont'

- ❖ Average cost of diesel fuel consumed by the **two electric rigs** per year is therefore;

✓ **USD 2,660,000.00**

- ❖ **70%** of this cost can be saved by **using wellhead electrical power in drilling geothermal wells.**

SOLUTION



WHAT ?

- **Save 70%** of total cost of fuel consumed by rigs every year.....

HOW ?

- **Connect the rig to the nearest Wellhead generator.....**

SOLUTION...cont'

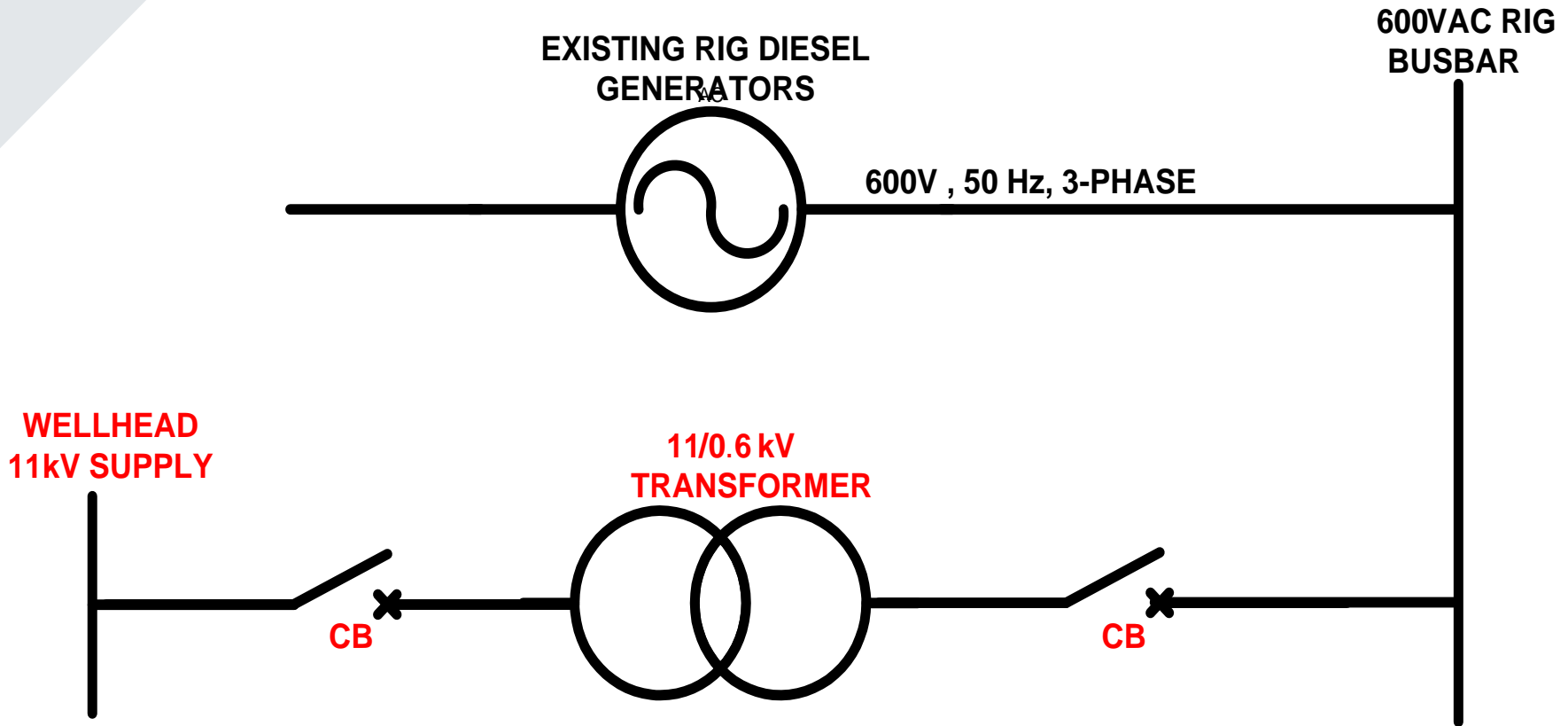


Fig. 1. Single Line Diagram for Wellhead to rig power connection.

CURRENT SITUATION....cont'



Fig. 2. Wellhead Plant OW-37 with rig KGN02 drilling on the same well pad.

COST BENEFIT

- ❖ By connecting rigs to a nearby wellhead generator,
 - Use of diesel generators will be substituted,
 - Savings of **70%** of total fuel cost,



Annual savings from the two rigs;

USD 1,862,000.00

COST BENEFIT....cont'

Cost of the Project (USD)

| | |
|-----------------------------|--------------|
| Connection | 540,000.00 |
| Loss of Generation per year | 1,159,299.36 |

❖ The annual savings of **USD 1,862,000.00**

➤ The Cost Benefit is **USD 702,700.00**



OVERALL BENEFITS

- ✓ Improved profits for the Company
- ✓ Reduced carbon emissions
- ✓ Reduced noise levels
- ✓ Reduced fuel spillages at rig sites
- ✓ Reduced risk of thefts of diesel fuel
- ✓ Reduced risk of fire hazards
- ✓ Carbon credits

CONCLUSION

- ❖ The savings from the fuel costs can be directed to other projects.
- ❖ KenGen will benefit from Carbon credits due to reduced emissions from generators.

RECOMENDATIONS

- ❖ Built a grid network of 33kV lines into Olkaria field for internal loads
- ❖ Extend the metering points of the existing KPLC 33kV network and tap power from it.



THANK YOU

