

Olkaria I reservoir performance during 27 years of production

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Introduction

- Olkaria lies within the East African Rift System
- It is a complex volcanic system among other systems dotting the Kenya Rift.
- Has been explored since the 50's and exploited since 1981.
- Current power generation from Olkaria is 130 MWe. Will increase to 166 MWe in December 2008 and expected to triple in the next few years.

Great Rift Valley and Kenyan Geothermal prospects KenGen Ethiopia EURASIAN PLATE KENYA L. Turkana Persian Nairobi 🖷 Gulf ARABIAN Tanzania PLATE ◀ 🗲 Barrier Nile AFRICA River Namarunu 2⁰N -AFRICAN Emuruangogolak PLATE Gulf of Aden 'Erta 'Ale (Nubian) Silali ATLANTIC Paka OCEAN Koros Baringo INDIAN PLATE Bogoria Kisumu 00 -Nyanza Rift Menengai Equator 🔥 Δ. Elmenteita **Oldoinyo Lengai** -Eburru AFRICAN L. Naivasha Naivasha PLATE Olkaria Longonot volcanic complex ictoria Margaret (Somalian) NAIROBI LEGEND Suswa Quaternary Volcanoes **EXPLANATION** 📢 L. Maga Lakes 2°S -Plate Shompole boundaries Faults Notre Geothermal Area / / East African 50 **Rift Zone** 0 km Ol'Doinyo Lengai TANŻANIA 36⁰E 38⁰E





Olkaria I – 45 MWe (Commissioned 1981)





Olkaria II – 70 MWe (Commisioned 2003)



Olkaria III – 13 MWe (Commissioned 2000)





Well OW-101: Hot water source for Oserian Green House project





Direct Use – Flower farming



Temperature distribution at 250 masl



Typical Olkaria I wells T & P profiles



Overall production history of Olkaria I









- 800



Olkaria I Wells



9902 000

9901 000

Pressure drawdown in Olkaria | KenGen

- Time constant
 = 2 yrs
- Recharge coefficient = 116 kg/MPa.s



Chemical changes due to production



 No major changes in fluid chemistry that is large enough to merit particular or unique interest has occurred.



Chemistry of well OW-18

- Cl increased over time due to boiling
- Increase in gases also due to boiling



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Conclusions

- Minimal change has occured in the last 27 years.
- Low pressure drawdown has been experienced and the chemistry is good.
- The field has possibly reached steady state conditions, under the current production rate.
- No cold incursion has been observed.
- This has been a good case of sustainable use of geothermal resource.



THANKS FOR YOUR ATTENTION

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Blowing Geothermal Well

