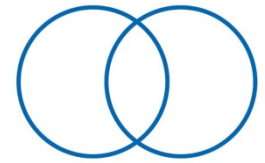


# Kayelekera Uranium Mine, Malawi

## Narrative Report

Rachel Etter-Phoya and Grain Malunga, October 2016

# OpenOil



## Context

Kayelekera uranium mine is the biggest mining project in Malawi's history and began production in 2009. In 2013, revenues from the mine contributed 2.6% to Gross Domestic Product.<sup>1</sup> The mine is operated by Paladin Africa Limited, a subsidiary of ASX- and TSX-listed Paladin Energy Limited. Paladin Energy acquired exploration rights in 1998 although initial exploration at this site commenced as early as 1982 by the Central Electricity Generating Board of Great Britain.<sup>2</sup> The Government of Malawi has a 15% free equity stake in Paladin Africa.

In 2014, production at Kayelekera was suspended as a result of the crash in uranium prices following the Fukushima nuclear accident and the mine is now under care and maintenance.<sup>3</sup> This price slump was coupled with high operating costs related to energy and staff costs. The mine had been operating using diesel generation and has so far been unable to connect to Malawi's national electricity grid. The key question our model aims to answer is what uranium price would be required to induce Paladin to restart production?

The Government, Paladin Africa and Paladin Energy Minerals Netherlands entered into a Mining Development Agreement in February 2007. This negotiation process and agreement has been accompanied by strong public outcry over concerns of lack of public consultation and transparency, and the perceived generous fiscal concessions for royalty rates and income tax. The Mining Development Agreement is now public.<sup>4</sup>

This economic model of project cash flows and the fiscal regime for Kayelekera Uranium Mine has been built on the Mining Development

### Executive Summary

- Kayelekera needs a breakeven price of \$58/lb to reopen (October 2016 uranium spot price is \$20-26/lb)
- Paladin Africa has lost \$387 million to date
- Government revenue is \$12 million to date
- Reduction of the general royalty rate for this project has cost \$15 million so far
- Further reducing the royalty would make only a marginal difference to the breakeven price for restarting production

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KEY FEATURES & ASSUMPTIONS	2
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<sup>1</sup> GDP contribution calculation: 2013 Paladin Energy reported revenues of \$145 million for Kayelekera Uranium Mine against World Bank reported GDP (\$5.519 billion) for Malawi.

<sup>2</sup> Paladin Resources, 1999, Annual Report 1999, page 13, url:

[http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/ar1999a.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/ar1999a.pdf)

<sup>3</sup> Paladin Energy, 7 February 2014, Announcement: Suspension of Production at Kayelekera Mine, Malawi, url:

<http://www.asx.com.au/asxpdf/20140207/pdf/42mlr46syb3741.pdf>

<sup>4</sup> Mining Development Agreement between the Government of the Republic of Malawi, Paladin (Africa) Limited and Paladin Energy Minerals NL on the Kayelekera Uranium Project, 22 February 2007, url:

<http://www.resourcecontracts.org/contract/ocds-591adf-MW2617313743RC/view#/pdf>

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Agreement and Paladin Energy's disclosures to the Australian and Canadian stock exchanges where they are listed.

### Key Features & Assumptions

Between 2010 and 2014, Kayelekera Uranium Mine produced 10.9 million pounds of uranium oxide. A conservative estimate of remaining proved and probable reserves suggests 11.4 million pounds of uranium oxide is available, assuming the reserve base is not extended.<sup>5</sup> The model also includes an alternative and higher forecast production profile, based on reserves plus measured and indicated resources. This is selectable from the dashboard. The plant has the capacity to produce 3.3 million pounds per year and peak production to date has been 2.96 million pounds in 2013.<sup>6</sup> We assume that production could be restarted at 2.30 million pounds per year, consistent with actual production in 2014.

Kayelekera Uranium oxide has been sold under term contracts at prices ranging from \$71 per pound (2010)<sup>7</sup> to \$35 per pound (2014).<sup>8</sup> These have been generally higher than the spot market prices. The price forecasts applied in the model are from NUEXCO (formerly Nuclear Exchange Corporation)<sup>9</sup> and the Energy Minerals Division of the American Association of Petroleum Geologists (AAPG),<sup>10</sup> and a forecast presented by Paladin Energy.<sup>11</sup> We assume that contract prices will be the same as our benchmark forecast in the future but this parameter can be changed in the model.

Paladin Energy has spent \$15 million on exploration to date which includes the initial acquisition of data from previous exploration.<sup>12</sup> A conservative assumption is made that exploration costs of \$5 million will only be incurred should the company decide to prove up measured and indicated resources to increase reserves and thereby extend the life of the

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<sup>5</sup> Paladin Energy, 2016, Annual Report 2016, page 14, url: [http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/160630-paladin-2016-annual-report.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/160630-paladin-2016-annual-report.pdf)

<sup>6</sup> Paladin Energy, 2014, Annual Report 2014, page 36, [http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/2014annualreportandfinancialstatements2.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/2014annualreportandfinancialstatements2.pdf)

<sup>7</sup> Price derived from total revenue divided by total sales volume as reported by Paladin Energy, 2010, Annual Report 2010, pages 34 and 122, [http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/2010ar.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/2010ar.pdf)

<sup>8</sup> Paladin Energy, 2014, Annual Report 2014, page 36, [http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/2014annualreportandfinancialstatements2.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/2014annualreportandfinancialstatements2.pdf)

<sup>9</sup> NUEXCO, 2015, Uranium, NUEXCO, Restricted Price, Nuexco exchange spot, US\$ per pound, url: [https://www.imf.org/external/np/res/commod/External\\_Data.xls](https://www.imf.org/external/np/res/commod/External_Data.xls)

<sup>10</sup> American Association of Petroleum Geologists (AAPG) Energy Minerals Division (EMD) Uranium (Nuclear Minerals and REE), 2016, Committee Annual Report 2016, page 17, url: American Association of Petroleum Geologists (AAPG) Energy Minerals Division (EMD) Uranium (Nuclear Minerals and REE) Committee Annual Report, url: <http://www.aapg.org/Portals/0/docs/emd/reports/annual-meeting/2016-06-18/2016-06-18-EMD-AnnualMeeting-Committee-Uranium.pdf>

<sup>11</sup> Paladin Energy, 2016, Paladin Annual Results Presentation 2016, page 16, url: [http://www.paladinenergy.com.au/sites/default/files/presentation\\_file/16.08.24-pdn-annual-results-presentation-final.pdf](http://www.paladinenergy.com.au/sites/default/files/presentation_file/16.08.24-pdn-annual-results-presentation-final.pdf)

<sup>12</sup> Paladin Energy Annual Reports 2005-2015, url: <http://www.paladinenergy.com.au/financial-reports> (see model source list for page numbers)

# Kayelekera Uranium Mine, Malawi

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mine; this is assumed to be carried out three year after restart (under the alternative forecast production profile).

The initial development costs to establish the mine were \$215 million,<sup>13</sup> lower than the projected outlay of \$254 million indicated in the company's Technical Report 2009.<sup>14</sup> An assumed further \$195 million was expended on development capital, including a sulphuric acid plant for processing, in 2011 and 2012. The forecast for average annual sustaining capital costs is assumed to be 2.8% of development costs, determined by calculating the relationship between sustaining and development costs as projected in the initial Technical Report.<sup>15</sup>

Operating costs are reported by Paladin and \$39.3 per pound is used as the forecast, which is an average of the most recent years of production (2013 and 2014). Any management fees are assumed to be included in reported operating costs but potentially would have been subject to a withholding obligation that may have generated some revenue for government.<sup>16</sup> Payments towards corporate social responsibility are also assumed to be included in operating costs. Transportation costs - for trucking the uranium from the mine to the Walvis Bay port in Namibia - are an additional \$2.68 per pound (average 2012-2014), assumed to remain constant in real terms in the future.

In 2016, care and maintenance costs were reduced to a minimum \$10.1 million<sup>17</sup> from \$13.4 million in 2015<sup>18</sup> and are assumed to remain constant in real terms for the care and maintenance period. The restart cost is assumed to be \$50 million in the absence of a restart feasibility study. The fiscal regime for Kayelekera Uranium Mine is outlined in Attachment B of the Mining Development Agreement.<sup>19</sup> The differences between the negotiated fiscal regime terms applied in the model and the terms which

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<sup>13</sup> Paladin Energy, 2009, Annual Report 2009, page 10, url:

[http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/casdeliversept242009.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/casdeliversept242009.pdf)

<sup>14</sup> Paladin Energy, 2009, Kayelekera, Malawi Resource and Reserve Estimation Technical Report, page 117, url:

<http://www.sedar.com/GetFile.do?lang=EN&docClass=24&issuerNo=00022090&issuerType=03&projectNo=01363579&docId=2337473>

<sup>15</sup> Ibid.

<sup>16</sup> It is possible that interest costs have been similarly included in operating costs. Our analysis aims to evaluate the project before financing.

<sup>17</sup> Paladin Energy, 2016, Annual Report 2016, page 125, url:

[http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/160630-paladin-2016-annual-report.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/160630-paladin-2016-annual-report.pdf)

<sup>18</sup> Paladin Energy, 2015, Annual Report 2015, page 129, url:

[http://www.paladinenergy.com.au/sites/default/files/financial\\_report\\_file/15.08.27paladinenergy2015annualreport.pdf](http://www.paladinenergy.com.au/sites/default/files/financial_report_file/15.08.27paladinenergy2015annualreport.pdf)

<sup>19</sup> Mining Development Agreement between the Government of the Republic of Malawi, Paladin (Africa) Limited and Paladin Energy Minerals NL on the Kayelekera Uranium Project, 22 February 2007, pages 78-79, url: <http://www.resourcecontracts.org/contract/ocds-591adf-MW2617313743RC/view#/pdf>

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	Mining Development Agreement 2007	Mines and Minerals Act 1981/Taxation Act	Taxation (Amendment) Act 2016
<b>Royalty</b>	1.5% (years 1-3) and 3% thereafter	5%	5%
<b>Corporate income tax</b>	27.5% income tax	30%	30%
<b>Depreciation</b>	Immediate write-off of capital investment	5 years	-
<b>Resource rent tax (RRT)</b>	Not payable for mine life	10% on profits after tax if rate of return exceeds 20% per year	Minimum of 15% RRT, $\frac{40.5-t}{100-t} \times 100$ 't' = company income tax rate
<b>Stability</b>	10 years	undefined	10 years

Figure 1. Table of comparison for legislated and negotiated fiscal terms in the model

exist in Malawi's general legislation are outlined in the following table. Most significant for the model is the reduction in royalties from 5% to 1.5% for the first three years and then 3% thereafter.

In exchange for the reduction in corporate income tax and the exemption from resource rent tax, the government received 15% equity in Paladin Africa. For ten years, the company is allowed to import duty-free.

## Findings

Kayelekera needs the current price of uranium to more than double to be able to reopen the mine profitably. The uranium spot price for October 2016 is \$20-26 per pound while the model shows a breakeven price<sup>20</sup> of \$58 per pound. When Kayelekera opened in 2009, the average uranium spot price for the three preceding years was \$70 per pound.<sup>21</sup>

Paladin Africa has lost \$387 million to date because of the uranium price slump and the high operating costs related to electricity access. At present, operating costs are \$13-19 per lb more than the average global spot price for October. Project financing (including intercompany loans and debt-to-equity ratio) has not been considered in this model. As the project is unlikely to be in an income-tax paying position anyway, use of project financing would be unlikely to affect materially overall profitability of the mine.

<sup>20</sup> To achieve a Net Present Value of zero with a 7% nominal discount rate. The user can change this assumption in the dashboard and recalculate the required breakeven for a different discount rate, or different cost assumptions.

<sup>21</sup> NUEXCO, 2015, Uranium, NUEXCO, Restricted Price, Nuexco exchange spot, US\$ per pound, url: [https://www.imf.org/external/np/res/commod/External\\_Data.xls](https://www.imf.org/external/np/res/commod/External_Data.xls)

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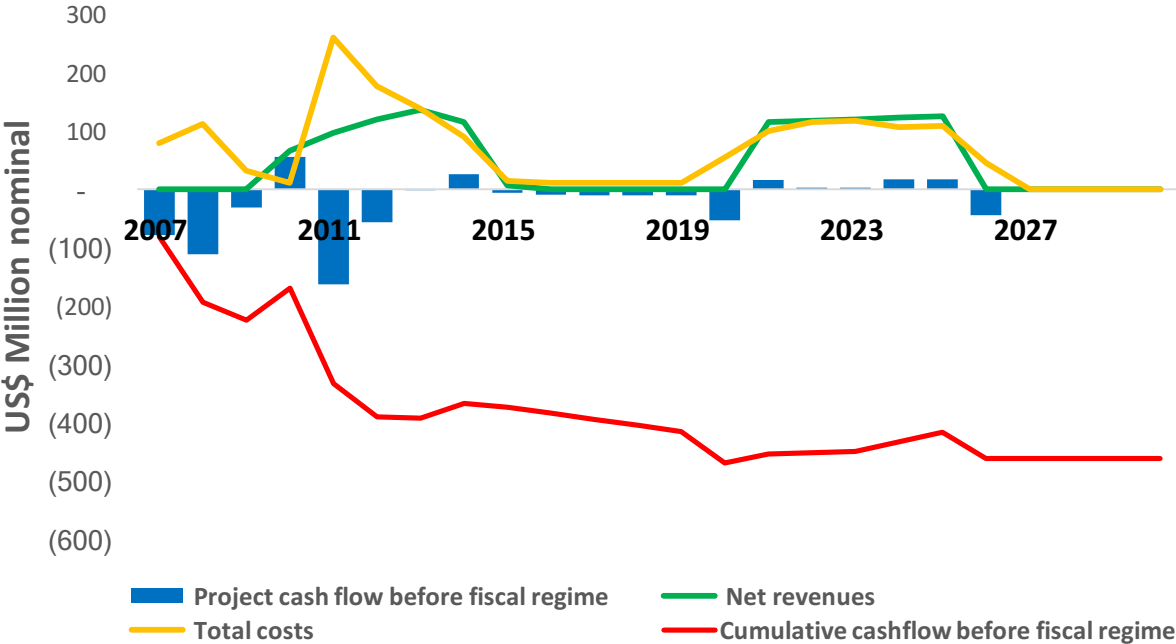


Figure 2. Project Cashflows for Kayelekera Uranium Mine

The model suggests that Government should have received \$12 million from royalty payments only. There has been no government revenue from income tax and dividends because of incurred losses. Reduction of the general royalty rate for this project has cost government \$15 million so far. The model shows that even if 5% royalty (as legislated) were to be applied going forward instead of the agreed 3%, it would only increase the breakeven price by \$1 per pound, to \$59 per pound. This reveals that keeping the royalty rate at 3% will have little bearing on the company’s decision to reopen the mining project, and that the price, and reducing operating costs, are more important for the project’s future.

### Information Gap Analysis

There are several gaps in information that, if filled, would improve the economic model:

- Publication of the restart feasibility study now underway.
- Sustaining capital has been assumed given that Paladin Energy does not report this expenditure on a project-by-project basis
- Uranium spot price forecasts beyond 2022 are not publicly available. Malawi should obtain a long-term uranium market outlook.

# Kayelekera Uranium Mine, Malawi

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- There is limited information on interest payments, management fees and other payments that may have been subject to a withholding obligation. Government should disclose past actual revenues from the project to calibrate the model against.

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