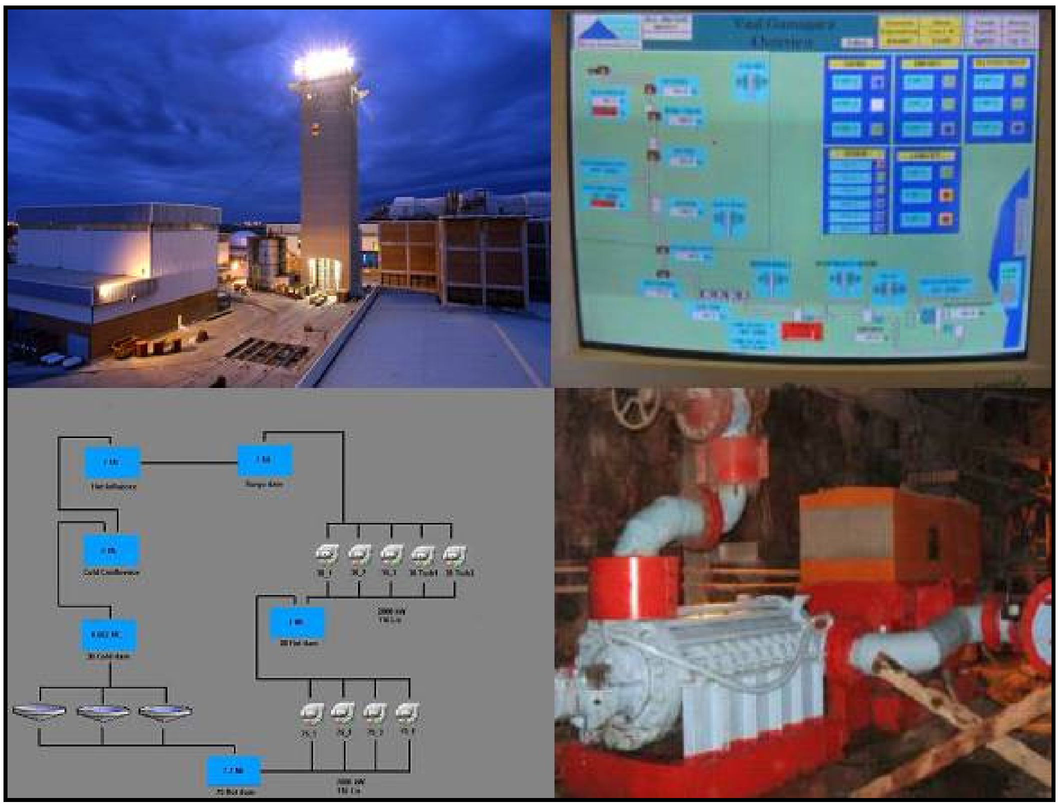
5 Identification and development of a project activity



Chapter 5 takes an-indepth look at the clear water pumping system of a gold mine and identifies an energy-efficiency project activity. The project activity is then used to develop a DSM proposal and a PDD using the codes of best practices as reviewed in Chapter 3.

5.1 Introduction

The aim of Chapter 5 is to identify an energy-efficiency project activity that could be exploited and developed as either a DSM or CDM project. A retrospective approach is followed in which the developer first establishes a project that realises energy efficiency savings with a high level of confidence. Only then are the various funding opportunities investigated to save time and money.

To establish the viability of an energy-efficiency project activity through reduced electricity consumption, a few criteria must be met.

- The service on demand must be identified. This service could be clear water pumping, compressed air, ventilation air, etc;
- The duty demand cycle must be reduced. This is only possible if the service is not utilised 100% of the time; and
- A manual process can be automated to improve system savings and reliability.

An intelligent control system (REMS-CARBON) and supporting system (OSIMS) can balance supply and demand more accurately and maintain sustainability in support of the project activity.

5.2 Energy efficiency through water supply optimisation

Mines make use of water for cooling, production and cleaning purposes. Large volumes of water delivered into the mine must be pumped out again. This comes at a great cost to the mine, because it is an electricity intensive process. Pamodzi Gold's General Manager in the East Rand, Graham Chamberlain, estimates that 22% of the direct cost results from the pumping of water [1].

Mines have complex underground water supply systems and lack of measurement instrumentation, hardware, control systems and control philosophies result in uncertain demand. Generally more water is then supplied than demanded, to prevent possible production constraints. This means that an unnecessary amount of water is cooled in the fridge plant and that more water needs to be pumped back to the surface causing higher electricity consumption.

The theoretical power required to pump water to the surface is calculated as follows:

$$Power = \rho.Q.g.H \qquad [2]$$

Where:
ρ = the density of the fluid in kg/m^3;
Q = the flow in m^3/s;
g = gravitational constant; and
H = height to which the water is pumped.

From this formula it can be seen that, for a given height a reduction in the amount of water pumped will result in a reduction in power.

The installation of underground water flow monitoring equipment together with flow control valves will make it possible to monitor, optimise and automatically control the water supply. This will decrease pumping time, resulting in decreased electricity usage and an energy efficiency component compliable to DSM energy efficiency and CDM funding opportunities.

5.3 Water usage at Kopanang gold mine

5.3.1 The project activity

The clear water pumping system at AngloGold Ashanti's Kopanang gold mine has been identified as an industrial site with possible energy-efficiency potential. The water usage for Kopanang has been obtained for the period from July 2006 to January 2007 and analysed. All data were considered, except holidays and days when there was no demand for water, with the latter usually due to maintenance.

During the blasting time, which is normally between 14:00 and 20:00, no miners and operators are allowed underground according to the law. This also implies that there will be no demand for water during this period. By strategically placing valves on the production levels where water is required, it was possible to isolate the demand-side for water as seen in Figure 60.

With the installation of REMS-CARBON the valves can be automatically controlled. During blasting the valves are closed for approximately 6 hours per day, which results in zero flow between 14:00 and 20:00 as seen in Figure 61. Note that even though the surface valves are completely closed at 14:00 there will still be flow into the dams until the pipe columns are completely drained. During the operating hours clear water will only be supplied to active mining levels.

Figure 60: Control valve unit with bypass

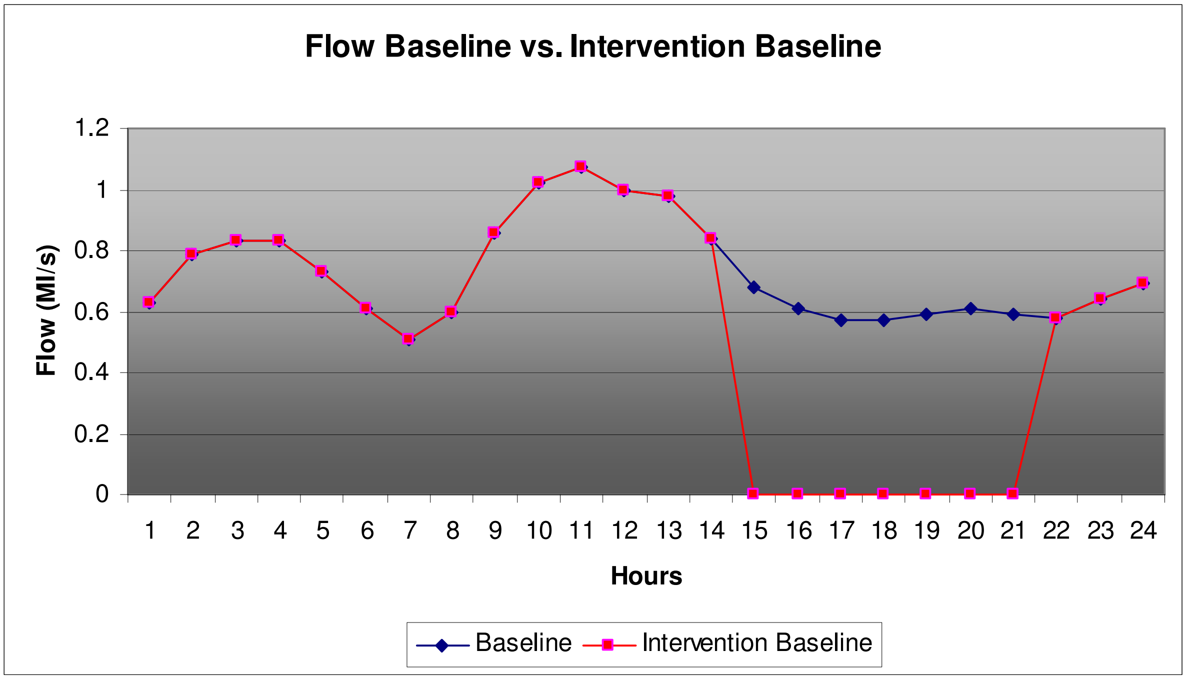


Figure 61: Water baseline vs. optimised water baseline

5.3.2 Water and energy efficiency savings

To determine the monthly savings, the monthly flow data was evaluated and compared to the historic flow baseline. By comparing the optimised flow data to the water flow baseline, a percentage water saving was obtained. The amount of energy saving as a direct result of less water being pumped out of the system, will only be available the following day. Water in the columns, haulages and dams acts as a buffer between the reduced flow of water and the energy savings from pumping. This energy reduction is divided by 24h to give a MW saving.

The daily water flow was reduced from 17.43 Ml/day to 13.89Ml/day, resulting in a 20.28% saving in water usage per day. This means that the mine will be capable of reducing the daily energy consumption, with regard to the pumps, with approximately 26.25 MW hours. By dividing this value by 24h, the power demand will be reduced by 1.09 MW per day. Figure 62 shows the possible reduction in energy consumption.

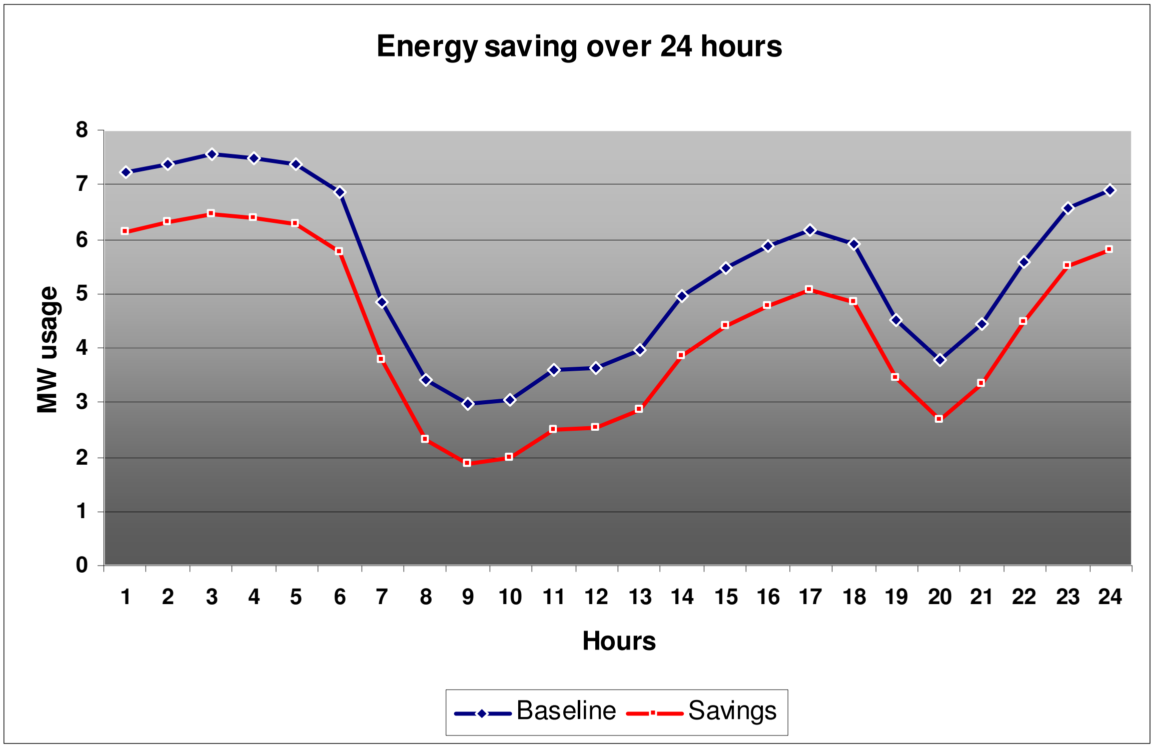


Figure 62: Energy-efficiency baseline vs. business as usual

In terms of monetary savings, the average annual electricity cost saving is R1,079,593 for this project activity. This saving is calculated using Eskom real-time pricing structure, MegaFlex. Eskom draft applicaton for electricity price increase for 2008/9 suggests that the electricity tariff may increase by 53% before 2008 and another 43% in 2009 [3]. However, NERSA only granted Eskom 27,5% tariff increase for the 2008/9 financial period [4]. The above increases in electricity cost will make energy-efficiency projects more viable and in line with companies' minimum IRR project policies.

5.3.3 Infrastructure costs

All the infrastructure necessary to realise the above water and energy saving has already been installed on a DSM load-shift project by HVAC International. This type of infrastructure is not always present on South African deep mines and will have to be acquired for the purpose of a DSM or CDM project.

Typical infrastructure requirements for these type of projects include:

Kopanang Water Handling Project			Requirements			
Item	**Description**	**Unit**	**Qty**	**Rate**	**Amount**	**Total**
1	**COMMUNICATION**					**R 202,145**
1.1	**Fibre optic cable**					
1.1.1	12 Fibre (S)SM, 12 Element TB(PA), PA/PE ARAMID, LSZH,					
1.1.2	CST/LSZH, SWA, LSZH MINE SHAFT CABLE - DF03597	meter	**1500**	R 100	**R 150,000**	
1.2	Profibus cable					
1.2.1	Profibus DP SWA OS LSZH	meter	**1500**	R 34	**R 51,375**	
1.2.2	Splicing	each	**7**	R 110	**R 770**	
2	**PUMP INSTRUMENTATION**					
						R 676,917
2.1	**SURFACE PLC**	**each**	**1**		**R 676,917**	
2.1.1	SIEMENS DN400 MAGFLOW C/W TRANSMITTER	each	**9**	R 71,413	R 642,717	
2.1.2	Commissioning of Flowmeters (Excluding modification on pipes)	each	**9**	R 3,800	R 34,200	
						R 1,122,400
2.2	**LEVEL 89, 94, 99, 104 & 109 PUMP PLC**	**each**	**20**		**R 56,120**	
2.2.1	SIEMENS Z-SERIES 0-1 BAR ½" FIXED RANGE PRESSURE TX	each	**1**	R 6,997	R 6,997	
2.2.2	SIEMENS DN40 MAGFLOW C/W TRANSMITTER	each	**1**	R 27,811	R 27,811	
2.2.3	Metrix Loop powered Vibration Tansmitter c/w elbow Range 20mm/s velocity	each	**2**	R 7,993	R 15,986	
2.2.4	Siemens SIMEAS P50 Power Meter with Profibus DP	each	**1**	R 4,752	R 4,752	
2.2.5	SIMATIC DP,BUS CONNECTOR FOR PROFIBUS UP TO 12 MBIT/S90 DEGREE ANGLE OUTGOING CABLE,(WX H X D): 16 X 72,7 X 34 MMIPCD TECHOLOGY FAST CONNECT, P/n:6ES79720BA500XA0	each	**1**	R 574	R 574	
3	**CONTROL VALVES**					**R 857,498**
3.1	Hyrdo control valve with manual bypass valve and piping	each	**9**	R 95,278	R 857,498	
4	**CABLES**					**R 212,620**
3.1.1	1mm² Single Pair SWA OS LSZH	meter	**1000**	R 29	R 28,950	
3.1.2	1mm² Single Triad SWA OS LSZH	meter	**1000**	R 30	R 29,870	
3.1.3	1mm² Two Pair SWA OS/IS LSZH	meter	**500**	R 41	R 20,500	
3.2.1	2.5mm² 4 CORE SWA OS LSZH	meter	**1000**	R 45	R 45,300	
3.3.1	Hot Dipped Cable Racking 200mm	meter	**200**	R 440	R 88,000	
5	**INSTALLATION AND WIRING**					**R 82,368**
5.1	Technician	hr	**136**	R 270	R 36,720	
5.2	Boilermaker	hr	**36**	R 180	R 6,480	
5.3	Engineering Helpers (Six)	hr	**136**	R 288	R 39,168	
6	**Commissioning**					**R 4,200**
6.1	Software Engineer	hr	**12**	R 350	R 4,200	
7	**SOFTWARE**					**R 42,000**
7.1	**PLC SOFTWARE DEVELOPMENT**	hr	**60**	R 350	R 21,000	
7.2	**SCADA SOFTWARE DEVELOPMENT**	hr	**60**	R 350	R 21,000	
					TOTAL	**R 3,200,148**

Table 9: Kopanang infrastructure cost

The total cost of the installed infrastructure is R3,200,148 at present market costs.

5.3.4 DSM at Kopanang

HVAC International has been operating a DSM load-shift project at Kopanang mine since August 2003. A load-shift project as described in section 1.5.3 is energy neutral and not acceptable under the CDM. Real-time electricity pricing does however make load-shifting more operationally cost effective due to cheaper off-peak rates.

This energy-efficiency project activity will be additional to the existing load-shift project. The performance of each project will be independent from the other. This can be explained by analysing the electricity baseline profiles before and after energy-efficiency intervention as shown in Figure 63. The energy-efficiency value remains constant over a 24 hour period, as illustrated by constant spacing between the DSM load-shifting line and the DSM EE line in Figure 63.

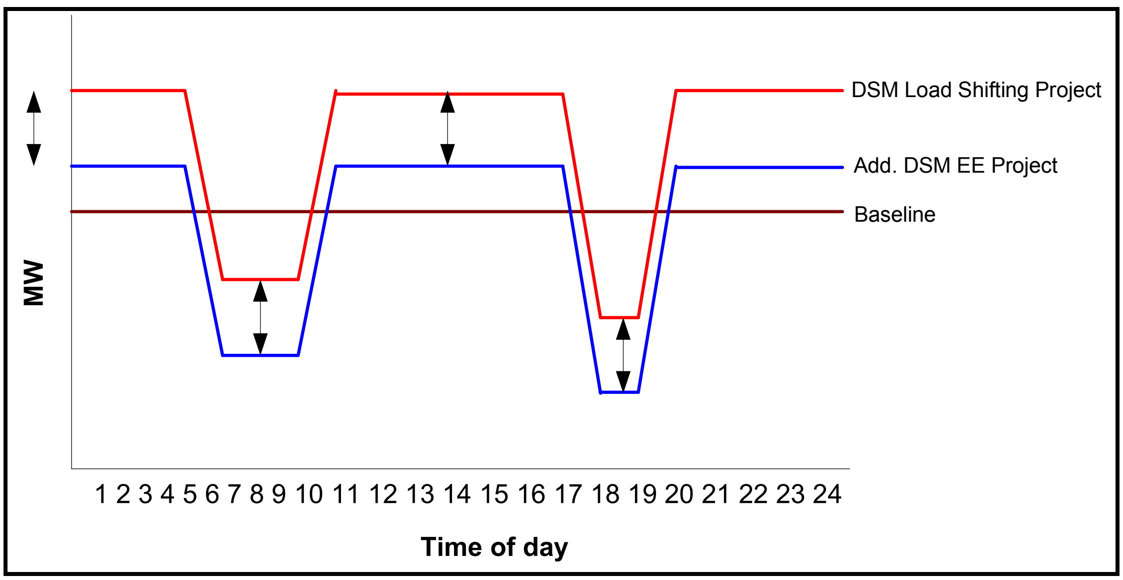


Figure 63: DSM EE additional to DSM LS

During February 2008 REMS and OSIMS shifted 4.45 MW out of the evening peak times on the Kopanang pumping system. The evening peak load reduction is 1.45 MW more than the target impact of 3.00 MW, as shown in Figure 64

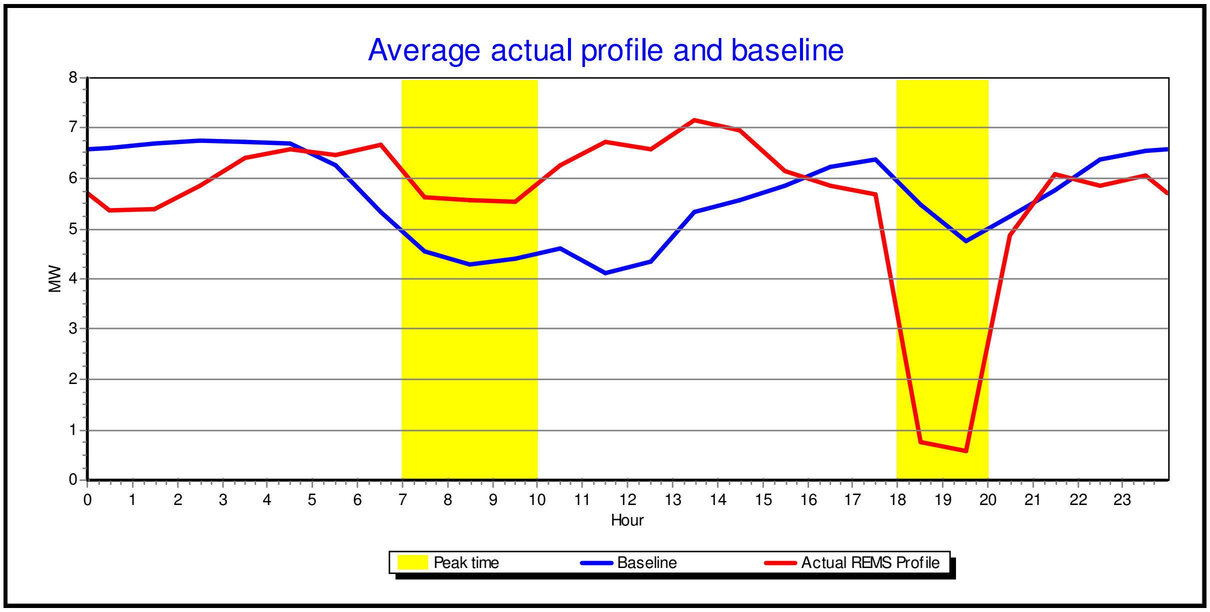


Figure 64: Load-shifting at Kopanang gold mine

The performance assessment value is the performance measured by the independent M&V team and is normally the maximum performance of the system. The ESCo will be penalized for under-performance against the contractual value which the ESCo has stipulated in the DSM agreement. HVAC International has chosen to design a safety margin into the system and make the contractual value 3MW, as shown in Figure 65.

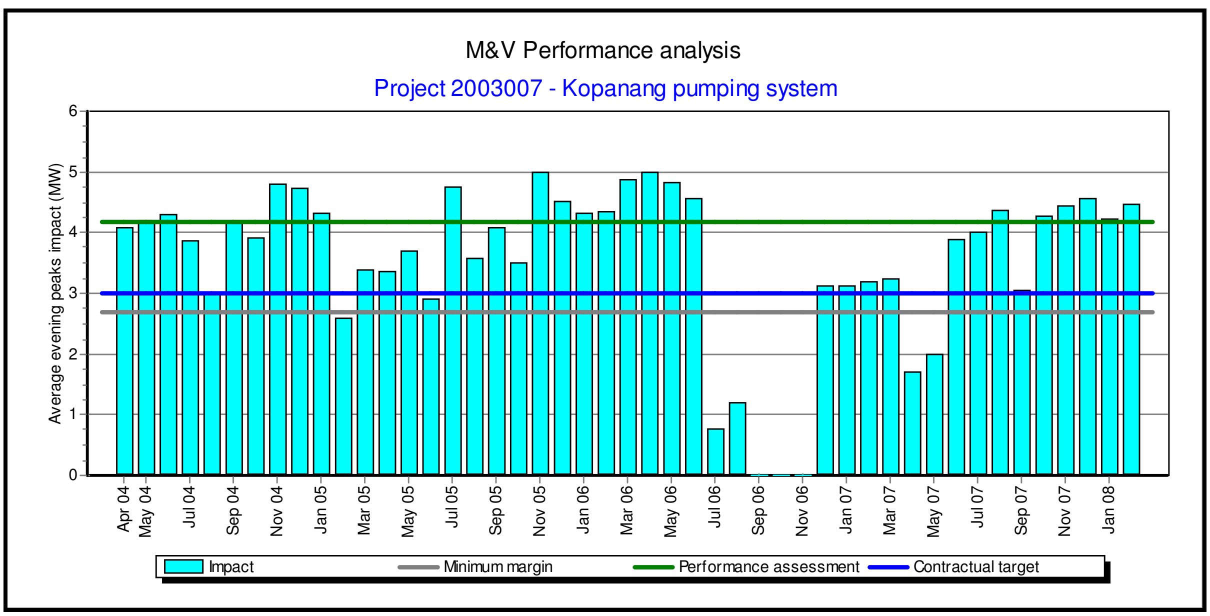


Figure 65: Historic performance analysis for Kopanang

For the months of June, July, September and November there is almost no DSM performance, as seen in Figure 65. This was due to pump maintenance and the cleaning of the dams and is considered condonable. The cumulative performance is shown in Figure 66.

The minimum margin is the 10% under-performance allowance free of penalties for Kopanang. Should the under-performance continue for more than 3 months, Eskom will penalise the mine if negligence can be proved from the mine's side. The impact of the penalties is discussed under the DSM risk assessment in Chapter 6.

The next section will analyse the past performance of the DSM load-shift project. The purpose of this section is to show the high level of confidence encompassed in the existing REMS platform. This will reassure mine management that REMS-CARBON, as an extension of REMS, will be reliable, sustainable and commensurate with the mine safety practices.

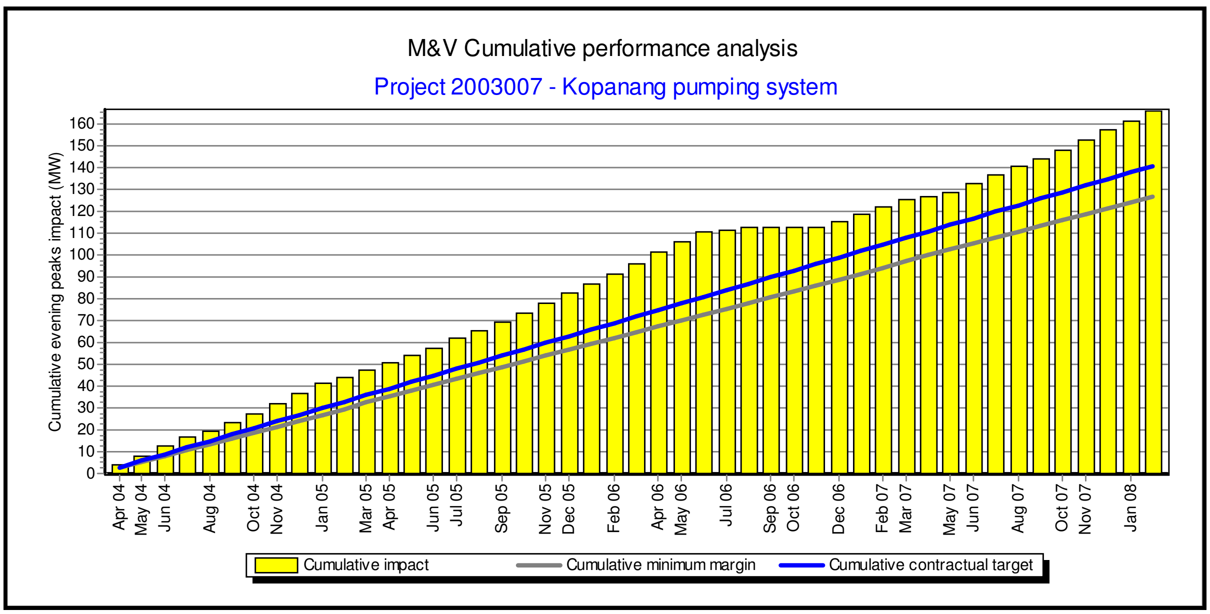


Figure 66: Historic cumulative performance analysis for Kopanang

The under-performance of the 4 months (June, July, September and November) can also be seen in the historic cumulative performance data in Figure 65, as a flat section. Nevertheless, the overall level of confidence is very high, making this a low risk environment for energy efficiency project development. All the above figures are outputs of OSIMS and generated automatically.

5.4 DSM energy-efficiency proposal

5.4.1 Non-disclosure of project costs

The cost to implement either a DSM or CDM project to a level where the project activity realizes energy savings is exactly the same. This excludes all forms of registration costs, for example the CIBD registration costs, in terms of DSM and the PDD and CER registration costs at the CDM Executive Board, in terms of CDM. From a comparison perspective there is no need to disclose the project costs.

Eskom's funding threshold is not public knowledge and is estimated at R3 million per MW power reduction. The question remains as to whether CDM can match or improve on this R/MW value. In certain cases where an energy-efficiency project is too expensive to be submitted as a DSM project, carbon credits could be used as an additional means of funding. This cross functional funding will be explored in later Chapters.

In summary, a project activity consists of the following costs:

- REMS-CARBON capital and labour costs;
- OSIMS capital and labour costs;
- Automation infrastructure (PLCs, SCADA, control valves, flow meters); and
- Travel and subsistence.

A full DSM proposal has been developed and submitted to Eskom DSM for approval, but only the work plans are briefly disclosed. The cost of individual work plan activities is privileged information and is not disclosed in this document.

5.4.2 REMS-CARBON work plan

The REMS-CARBON work plan as summarized in Table 10, gives the steps for which an ESCo would typically invoice Eskom. The sum of the REMS-CARBON and OSIMS development costs, together with the automation infrastructure, divided by the energy-efficiency saving in MW/hrs yields the total cost benefit to Eskom. This cost benefit will always be less than the capital expenditure Eskom will have to undergo for every additional MW generation capacity.

WORKPLAN SUMMARY: REMS-CARBON		
No.	**Steps**	**Cost [R]**
1	**MARKET DSM AND OBTAIN LETTER OF INTENT** *HVAC performs preliminary work to identify and verify DSM projects. First a client has to be identified, and a letter of intent have to be obtained. This is required before any on site work at the client's facility can commence.*	-
2	**PERFORM PRELIMINARY TEST AND EXPERIMENTS** *HVAC always verifies experimentally that the proposed project will work. This entails the co-operation of mine personnel, together with after hour and/or weekend work from HVAC personnel. This ensures that test will have no impact on the operation of the mine, and guarantees no risk to Eskom and the client.*	-
3	**COMPLETE HARDWARE DESIGN OF NEW SYSTEM** *When the experimentation has been completed and acceptable results have been obtained, the project is taken to the next step. Hardware required for the new automated pumping system must be designed in acceptance with mine personnel.*	-
4	**COMPLETE COSTING AND TENDER PROCESS FOR PROPOSAL** *In most cases, there is a requirement for infrastructure on the mine to enable automatic control. Together with the mine, a tender process must be entered into in order to obtain the best and most cost effective solution based on the detail specifications from step 3.*	-
5	**COMPLETE PROPOSAL AND NEGOTIATE CONTRACTS** *A lot of contact is required between the Esco and Eskom, and between the Esco and the client. This ensures that everybody knows what the situation is with the project and to ensure speedy resolution of outstanding issues.*	-
6	**COMPLETE COSTING AND TENDER PROCESS FOR CONTRACTS** *The placing of contracts from Eskom-DSM usually takes too long to allow the Esco to re-use the tenders or quotations received when writing the proposal. Before the project can start, new tenders must be obtained. Only then can contracts be placed on sub-contractors.*	-
7	**COLLECT DATA FOR DETAILED SIMULATIONS** *We have preliminary information on the following: how the system works, where DSM potentials exists, how much DSM potential exists, and how new control can be implemented. This information must now be checked, updated, and verified to ensure production safety when applying DSM on the mine.*	-
8	**MATHEMATICAL MODELS** *Mathematical models for each component at the mine will be investigated and configured. These models will be used in our proprietary integrated simulation model to simulate the mine. (Partially sponsored by TEMMI)*	-
9	**INTEGRATE MATHEMATICAL MODELS AND SIMULATION** *Integrate the models obtained in step 8 with the new interface, adapt existing and develop new components needed for this simulation. Preliminary research has been done, but needs to be checked and updated with this specific DSM project in mind. This ensures the confidence of the client that is needed to allow us to do DSM on the mine.*	-
10	**VERIFY INTEGRATED SIMULATION MODEL** *The simulation model obtained in step 9 must be verified to ensure that accurate results of the mine are generated. Preliminary research information can now be extended to detailed verification to demonstrate the process to the client.*	-
11	**OPTIMISE** *An integrated simulation model will be optimised to find the lowest operating electricity cost. To ensure safety of production the experience gained in the preliminary research will be extended to the satisfaction of the client. We must prove that the optimised schedules will not affect safety and production.*	-
12	**INVESTIGATE SCADA SYSTEM** *REMS-CARBON must communicate with the client's SCADA system. The sustainability of this DSM action is dependant on perfect integration of REMS-CARBON and the SCADA. The current SCADA system (if present) on the mine will be investigated to determine whether it complies with the required standards of REMS-CARBON.*	-
13	**DEVELOP INTERFACE BETWEEN SCADA AND REMS-CARBON** *Interfaces need to be developed to facilitate communication between REMS-CARBON and SCADA. To ensure sustainability we ensure that all interfaces are generic. This is an important programming task.*	-
14	**CONFIGURE REMS-CARBON** *The completed REMS-CARBON model must be configured to integrate with the current processes of the mine. We can not change current operational procedures. In this step this issue will be addressed by modifications to the existing REMS-CARBON to adapt to the strategies used on the mine.*	-
15	**DEVELOP REMS-CARBON SUPPORT SYSTEM** *This support system will assist in the gathering, storing, analysing, and distribution of important system data. This support system will be implemented at the remote site where REMS-CARBON is situated. This ensures sustainability of the DSM actions.*	-
16	**IMPLEMENT REMS-CARBON** *Finally REMS-CARBON will be implemented to do automatic energy management on the mine.*	-
17	**TRAIN PLANT PERSONNEL** *Staff using the system is trained to operate the REMS-CARBON technology. The support staff would also be trained to be adequate in their tasks.*	-

Table 10: REMS-CARBON work plan

5.4.3 OSIMS work plan

OSIMS ensures the sustainability of the project activity and is implemented according to the steps shown in Table 11. The sustainability criteria are very important and give an ESCo leverage for negotiating the best possible CER price in the ERPA in the case of a bilateral agreement.

WORKPLAN SUMMARY: OSIMS		
No.	Steps	Cost (R)
1	**COLLECT DATA** *Collect data from the mine. Information that the mine needs to log should first be discovered. The possible data to be collected need to be rated. The rating would tell which paper-based log-sheets should be turned into computer log-sheets*	-
2	**ENABLE PROTOCOL** *The protocol must be enabled through mine buy–in to get the system up and running.*	-
3	**DEVELOP OSIMS SPECIFICATIONS** *After the data is collected and the OSIMS protocol is enabled we can develop the specification OSIMS must comply to. Data logger interface and functionality specifications should be determined. The interface with peripheral systems is also determined. The specifications must be verified with the mine before any configuration starts.*	-
4	**CONFIGURE OSIMS SOFTWARE SYSTEMS** *OSIMS software can now be configured according to the specifications for the specific mine. The interface systems must also be configured where needed (e.g. reporting and foreign system interfacing).*	-
5	**INTEGRATE SET-UP HARDWARE AND SOFTWARE** *OSIMS hardware needs to be integrated with OSIMS software. The specific software configured in step 5 needs to be integrated with the hardware.*	-
6	**VERIFY THE SOFTWARE WITH ACQUIRED HARDWARE** *The integration process between the data logger hardware and OSIMS software must be verified in this step. Any problems with this matter must be sorted out at this stage. Tests needs to be done on the pumping system to ensure that the final implementation process runs smoothly.*	-
7	**IMPLEMENTATION OF OSIMS ON THE MINE** *Now OSIMS is ready to be installed on the mine. The OSIMS hardware and software will be installed at the mine.*	-
8	**TRAIN PLANT PERSONNEL** *Staff using the system is trained to operate OSIMS technology. The support staff would also be trained to be adequate in their tasks.*	-
	TOTAL COST OF PROJECT STAFF (OSIMS) [in RANDS]	**-**

Table 11: OSIMS work plan

The DSM proposal development process is very familiar to ESCos and in particular to HVAC International with 4 years of Eskom DSM proposal development experience. Due to this fact a complete DSM proposal will not be developed as part of this study. A complete PDD is however developed to fill the knowledge gap that exists within the CDM proposal protocols and procedures existing in the CDM approach.

5.5 CDM Project Design Document

5.4.1 General PDD information

The PDD is the equivalent of the Eskom DSM proposal and needs to be approved by the CDM Executive Board before the project activity can commence with the purpose of generating CERs. A complete PDD has been developed and can be seen in Appendix B.

The CDM-SSC-PDD presents information on the essential technical and organizational aspects of the proposed small-scale (SSC) project activity. It is a key input to the validation, registration, and verification of the small-scale project activity as required under the Kyoto Protocol. The relevant simplified modalities and procedures are detailed in Annex II to decision 4/CMP.1 [5].

"The scope and detail of the description in the PDD, should allow interested parties to reproduce the rationale of the project. Project participants shall therefore, in accordance with paragraph 45 (b) of CDM M&P, describe the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality in a transparent and conservative manner" [6].

5.4.2 Classification of a Small-scale PDD

The energy-efficient project activity at Kopanang mine as described earlier in this section, results in a 1.09MW power saving. The annual saving is:

1.09(MW) x 24 (hours/day) x 365 (days/year) = **9548.4MWh/year**

This project activity classifies as a Small-scale Project Activity (CDM-SSC-PDD) according to the following UNFCCC criteria:

Type (ii) project activities: energy-efficiency improvement project activities which reduce energy consumption, on the supply and/or demand-side, by up to the equivalent of 15 gigawatt hours per year (decision 17/CP.7, paragraph 6 (c) (ii)).

The CDM EB further agreed on the following clarifications and definition of “energy efficiency improvement project activities”:

- Energy efficiency is the improvement in the service provided per unit power, that is, project activities which increase unit output of traction, work, electricity, heat, light (or fuel) per MW input are energy-efficiency project activities; and
- Energy consumption is the consumption reduced and measured in watt-hours with reference to an approved baseline. Lower consumption as a result of lower activity, shall not be taken into consideration.

Demand-side, as well as supply side, projects shall be taken into consideration, provided that a project activity results in a maximum reduction of 15 GWh per annum. as illustrated by Figure 67:

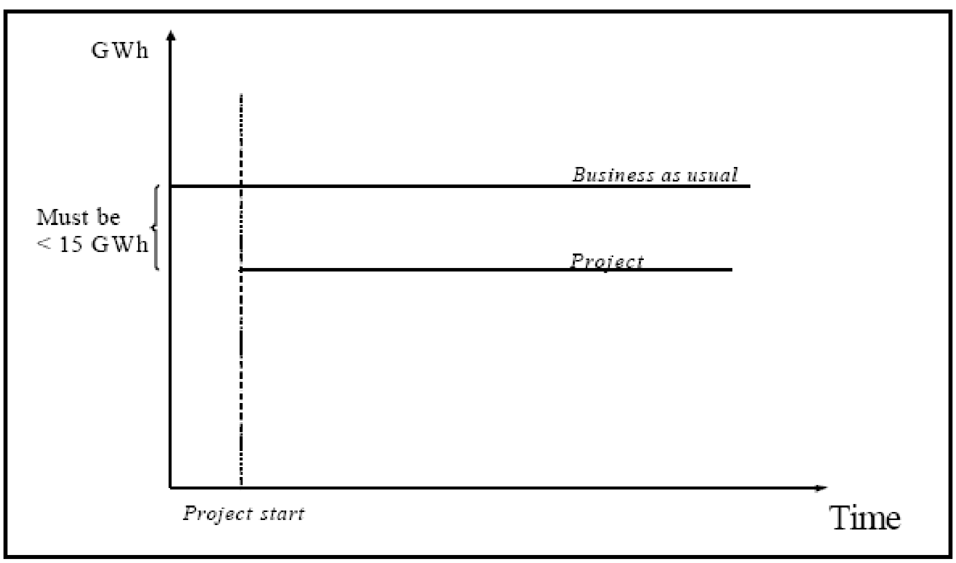


Figure 67: Definition of energy efficiency

Lower consumption of electricity due to lower production will thus be excluded from CDM.

The CDM EB agreed that, if the maximum reference value of a small-scale CDM project activity is exceeded on an annual average basis during any verified period, CERs should be issued only up to the maximum value.

Project participants shall select a crediting period for a proposed small-scale CDM project activity from one of the following alternatives:

- A maximum of 7 years which may be renewed at most twice, provided that, for each renewal, a designated operational entity determines and informs the Executive Board that the original project baseline is still valid, or has been updated taking account of new data where applicable; or

- A maximum of 10 years with no option of renewal.

The following indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories are listed by the Executive Board and can be seen in Table 12:

Project types*	Project categories
Type (i): Renewable energy projects	A. Electricity generation by the user/household
	B. Mechanical energy for the user/enterprise
	C. Thermal energy for the user
	D. Electricity generation for a system
Type (ii): Energy efficiency improvement projects	E. Supply-side energy efficiency improvements – transmission and distribution activities
	F. Supply-side energy efficiency improvements – generation
	G. Demand-side energy efficiency programmes for specific technologies
	H. Energy efficiency and fuel switching measures for industrial facilities
	I. Energy efficiency and fuel switching measures for buildings
Type (iii): Other project activities	J. Agriculture
	K. Switching fossil fuels
	L. Emission reductions in the transport sector
	M. Methane recovery
Types (i)–(iii)	N. Other small-scale project**

Table 12: Categories of CDM-SSC project activities [5]

Any energy-efficiency project activity with more than a 1.7MW power saving will result in immediate large-scale project activity according to the CDM EB with associated registration, validation and verification cost increases.

5.4.3 The influence of PCP on CDM additionality

Ekom's Power Conservation Programme (PCP) is targeting South Africa's top 300 energy-intensive businesses to mandatorily reduce their demand by 10% (3,000MW) over the next 4 years starting 2009. Those exceeding their allocations by between 1% and 2.5% will be charged R2,80/kWh for the additional consumption on top of the industry tariff of 25c/kWh. This figure is derived from the running costs of diesel-fuelled open-cycle gas turbines (OCGTs) [7].

Any consumption beyond the "control band", but less than 10% above the agreed allocation level, will be charged at a so-called "disincentive tariff" of R4,80/kWh - the full operating and capital cost of running the OCGTs. Finally, there is a so-called "punitive band" for those consumers exceeding their agreed allocations by more than 110%, with a tariff of R9/kWh that could be levied. In addition, there is a proposal for additional penalties for repeat offenders, with an ultimate tariff of up to R18/kWh.

The proposed project activity in this study yields a 1.09MW power saving at Kopanang. If these projects falls within the "control band" of mandatory reduction, the preventative penalty cost saving will be far greater than the incentives for selling CERs as shown in Table 13.

Project activity saving (MW)	Penalty control band	Penalty (R/kWh)	Project penalty
1.09	1% - 2,5%	R2.80	R 26,735,520
1.09	2.5% - 10%	R4.80	R 45,832,320
1.09	> 10%	R9.00	R 85,935,600
1.09	Repeated offenders	R18.00	R 171,871,200

Table 13: Eskom's Power Conservation Programme penalty control bands

With the PCP as national policy in place, it appears to make CDM projects non-additional because industry role players will surely implement energy-efficiency interventions to avoid the PCP penalties. Luckily the CDM EB makes provision for such changes in national and sectorial policies.

In EB 22 Annex 3, the Board differentiates between two types of national and/or sectoral policies that need to be taken into account when establishing the baseline scenario (paragraph 6). The second type is relevant to the PCP since it concerns energy efficiency:

Paragraph 6 (b): "*National and/or sectoral policies or regulations that give comparative advantages to less emissions-intensive technologies over more emissions-intensive technologies (e.g. public subsidies to promote the diffusion of renewable energy or to finance energy efficiency programs). These policies are E- type policies that decrease GHG emissions" [8].*

The Board then goes on to state that policies applicable under paragraph 6 (b) need not be taken into account when establishing the baseline scenario if they have been implemented since the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001).

The PCP is still in development, but will, more than likely, be legislated before project implementation. However, this is after 11 November 2001 and, as such, the PCP need not be taken into account when establishing the baseline scenario for the Kopanang mine.

5.6 Conclusion

By integrating REMS-CARBON and OSIMS with the necessary hardware infrastructure, it is possible to reduce the amount of clear water that reticulates into Kopanang's pumping system. Balancing the supply of water with the demand, reduces the runtime of the pumps. The energy-efficiency saving realised is 1.09MW resulting in 9548MWh per annum, equivalent to 11,458 CERs per annum.

This project activity is less that 15 gigawatt savings per annum and classifies as a Small-scale CDM project under the rules of the CDM Executive Board. A Type (ii) small-scale project design document, (CDM-SSC-PDD), is developed for demand-side energy efficiency programmes using the new proposed methodology and best practices.

Eskom is in the process of introducing the PCP in 2009 to mandatorily reduces the baselines of the high-energy consumers. This is as a result of the unsuccessful attempt through DSM and DMP to voluntarily reduce the industry consumption with 3000MW. According to the CDM EB, the CDM project will still be additional in South Africa and should not be seen as a national / sectorial barrier. Additional CDM income could greatly soften the effects of PCP.

With all the attributes and procedures of developing a DSM or CDM project defined, it is now necessary to analyse the risk of each attribute. Chapter 6 will quantify and analyse the risk of each, which will then be used for decision analysis.

5.7 References

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