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Bridging the Gap Between Project Planning and Execution— A Case of Menengai Geothermal Prospect of Geothermal Development Company in Kenya

Jane Mwangi and Diana Langat

Geothermal Association of Kenya (GAK)
jmwangi@gdc.coke and dlangat@gdc.co.ke

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ABSTRACT

Realization of the envisaged results greatly depends on how well the execution of the strategy is undertaken. While planning remains an important aspect in achieving the set objectives, Performance Management is central in the execution of the strategy. The 20-80 principle may be applied whereby 20% of core activities in an organization that provide 80% results require clear planning and monitoring. Definition of every activity, assigning the required resources and responsibility, setting specific timelines, tracking of performance and reporting at every stage of a project are all essential in project execution. Kenya has a geothermal potential of over 10000 MWe along its rift system and Geothermal Development Company (GDC) was formed to fast track its development. The strategy for GDC is to boost electricity production to meet the increasing demand from the current 1,350 MWe to 15,000 MWe by 2030. In this regard, GDC will provide reliable, sustainable, cost effective, affordable and clean supply of energy. Critical to the company is the delivery time of its geothermal steam projects for power generation that is highly essential to the realization of the Country's "Vision 2030". GDC has to develop 10,000 MWe of electricity by 2030. GDC has identified Performance Management as being critical to achieving its mandate. In GDC Performance management entails planning, implementation, monitoring, reporting and progress review of all projects to be implemented by all departments to enable the company achieve its corporate objectives.

1.0. Introduction

The establishment of the Geothermal Development Company (GDC) as a 100 % state owned corporation in 2008 was a response by the government towards the country's growing demand for electricity and an initiative to ensure adequate energy capacity for Kenyan citizens.

GDC is a special purpose vehicle established under the Energy Act to accelerate geothermal development through exploration, appraisal production drilling, steam field development and management. The country of Kenya's geothermal energy resources are estimated at about 10,000 MWe along the Kenya Rift system.

2.0. Objectives

1) To identify the importance of project planning and execution in achieving corporate objectives.
2) Assess the role of the balanced scorecard as a tool to guide project planning and monitor execution.
3) Identify key factors for successful project execution.

3.0. Identification and Planning of Geothermal Projects

Geothermal projects' identification criteria are based on their projected contribution towards the company's speedy geothermal resource development in the areas with high resource potential. The focus is on;

1) The high potential of geothermal energy in a particular region.
2) Quality of the projects in terms of electricity production capacity.
3) The total number of MW of generation capacity available from those projects.
4) Other benefits to the nearby communities including hot water heating, greenhouse projects and other related businesses.

3.1. Successful Project Planning

Successful Project planning entails:

a) Determining the project goal by the sponsor based on the corporate strategy.

b) Identification and engagement of stakeholders, who are directly or indirectly impacted by the project and communicate the project goal and expected benefits to the community.

c) Determining the project scope.

d) Preparing a project schedule for every task and determine resources required. Identifying project teams determine the project deliverables, outlining timelines and assign responsibilities.

e) Establishing project costs and identifying potential financiers.

3.2 . The Geothermal Development Company Projects

The Geothermal Development Company projects are outlined in the company's Ten (10) Year Business plan, the strategic plan and the Performance contract 2010/2011 as follows;

1) Undertake detailed surface exploration in Barrier, Silali, Paka and Baringo geothermal prospects along the Kenya Rift system, Mwana Nyamala and Homa Hills in the coast and western regions respectively.

2) Drilling of Geothermal wells in Olkaria and Menengai prospects.

3) Developing access roads within the prospects.

4) Installation of the water supply system with a capacity of 20 million litres at Menengai geothermal prospect.

5) Acquisition of drilling rigs with requisite materials, tools and equipment.

This paper will however focus on the on-going project implementation of phase 1 of Menengai geothermal power project for due to;

a) Detailed level of surface exploration

b) Infrastructural development

c) It is one of the largest prospects with an estimated 800MWe of steam.

d) Accelerated development will attract private partnership for development of power plants.

4.0. Project Timelines and Schedule

Project timelines and the schedule for Menengai geothermal project are as shown in Tables 1 and 2 and are summarized below;

a) Funding program

b) Project site preparation

c) Feasibility Studies

d) Project procurement plan

e) Production drilling

Table 1. Menengai Geothermal Project Phase I Timelines.

ID	WBS	Task Name	Duration	Start	Finish	Predecess
1	1	MENENGAI PHASE I PROJECT	2900 d	Jul 25 '08	Jul 3 '16	
2	1.1	FUNDING PROGRAM	2071 d	May 1 '09	Jan 1 '15	
106	1.2	PROJECT SITE PREPARATION	708 d	May 1 '09	Apr 9 '11	
143	1.3	PROJECT PROCUREMENT PLAN	1401 d	Jul 25 '08	May 26 '12	
333	1.4	EXPLORATION PROGRAM	277 d	Jan 15 '11	Oct 19 '11	
387	1.5	APPRAISAL PROGRAM	499 d	Dec 25 '10	May 7 '12	
457	1.6	FEASIBILITY STUDY	397 d	Jan 15 '11	Feb 16 '12	
509	1.7	TECHNICAL REVIEW MEETING	24 d	Dec 18 '11	Jan 11 '12	
512	1.8	PRODUCTION DRILLING	2474 d	Nov 18 '08	Aug 28 '15	
1885	1.9	POWER GENERATION	1648 d	Nov 5 '10	May 11 '15	
1904	1.10	ENVIRONMENTAL MANAGEMENT PR	1956 d	Jan 1 '10	May 11 '15	
1906	1.11	MANAGEMENT SUPPORT SYSTEMS	2432 d	Nov 5 '09	Jul 3 '16	

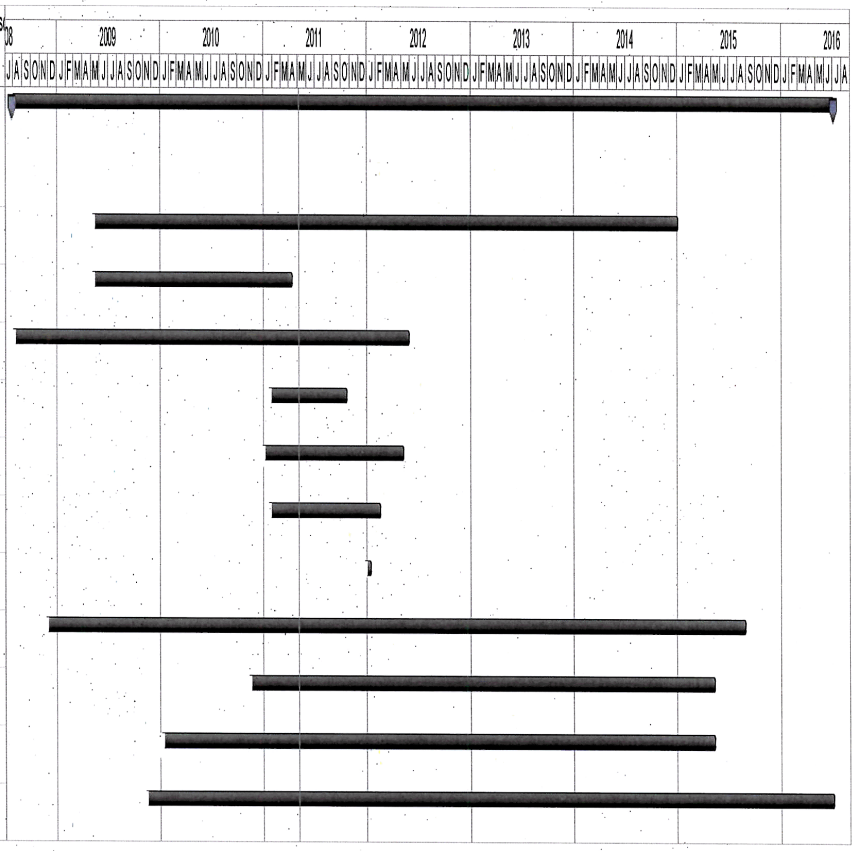
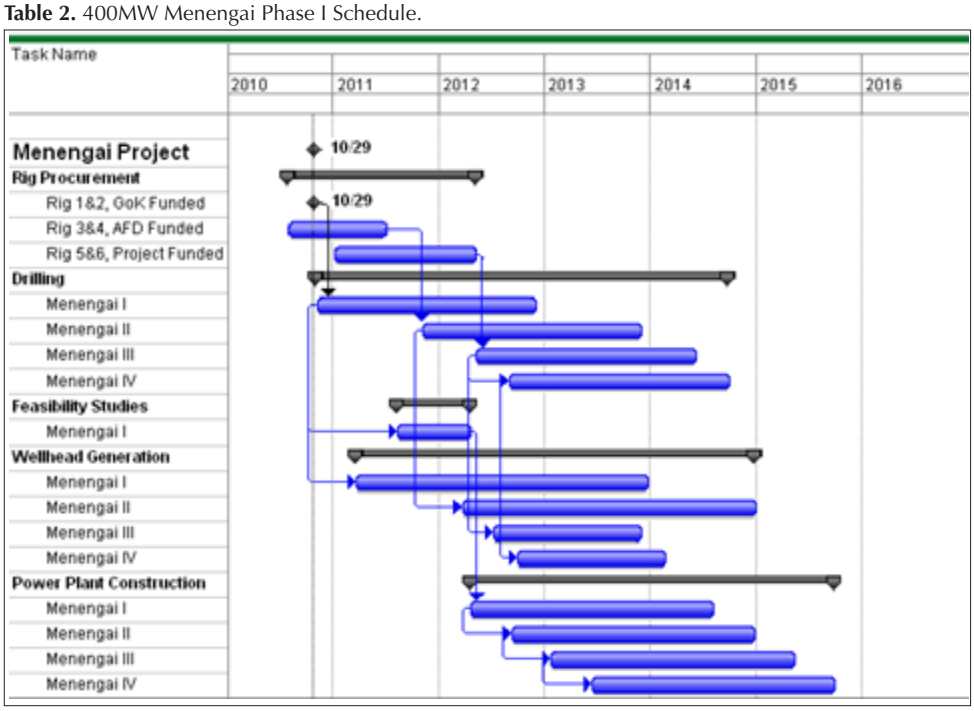


Table 2. 400MW Menengai Phase I Schedule.



f) Power plant generation

g) Environment management plan

h) Management support systems

4.1. Project Execution

This is the actual project undertaking and putting the project plan into action. Activities undertaken during this phase include;

a) Coordinating and directing project resources to meet the objectives of the project plan by managing each activity.

b) Keeping track of the project plan with careful monitoring and control processes to ensure that the final deliverables meet the set criteria.

c) Holding regular meetings with the project teams to review and document project progress.

d) Communicating the project progress to the project sponsor and other stakeholder

e) Progress tracking and preparing regular project status reports and updating management.

5.0. Menengai Geothermal Project Status

The current status of the project is as follows;

a) Funding Program

- A total of MUSD 291 has been raised from the government and development partners for drilling of wells and purchase of equipment, materials and accessories.

b) Project site preparation

- Access roads to the well pads and lying of the water pipeline were completed.
- The building of the water supply system involved procurement and installation of Victaulic pipes and storage tanks.
- Water connection from the storage tanks to the well pads was done.
- The water system was commissioned in January 2011.

c) Feasibility Studies

- A grant agreement was signed with USTDA in August 2010. The contract has been awarded and contract negotiations were completed in May 2011.Expression of interest for consultancy services to undertake the feasibility studies was advertisement in the local dailies on 08/06/2011.

d) Project procurement plan

- The plan was prepared for rig acquisition, drilling equipment, materials and accessories.

e) Well siting reports were compiled and surface exploration studies were completed.

f) Production drilling

- Mandate for development of all geothermal resources in Kenya were issued to Geothermal Development Company by the Minister of Energy on 01/02/2010.
- Two (2) drilling rigs together with materials and accessories were procured through government funding and delivered to Menengai on 18/10/2010.
- Rigging up started on 24/11 2010 and completed in January 2011.
- Commissioning of the two Rigs was done and spudding started on 12/02/2011 and 28/02/2011 for MW-01 and MW-02 respectively.
- By 30/04/2011 MW-01 was successfully completed at the depth of 2206m and estimated steam produced was 10MWe.
- The approval for the completed well was given by top management and discharged on 13/05/2011. The well has successfully been capped and Rig move complete.
- Drilling of MW-02 is on-going and current depth by 13/06/2011 was 2605m.

(g) Power plant generation

- Procurement process for the development of 400MW power plants in Menengai commenced in November 2010 and the Evaluation report is completed awaiting approval.

(h) Environment management plan for the project is in place.

(i) Management support systems

- Drilling staff were recruited in May 2010 and underwent one month training before the rigs arrived. GDC engineers and foreign experts are managing the drilling rigs and the drilling process.
- Continuous training of staff on Rig operation, safety and cost saving measures.

6.0. Next Steps

The next steps of the project include:

a) Rig one move and rigging up in MW-03-Well spud.

b) Complete drilling of MW-02.

c) Preparation of access roads to the new drill sites and lying down of the pipeline are in progress.

d) Follow up on the timelines of the for the feasibility studies which will give way for concessioning the blocks to interested developers for power plant construction through competitive bidding.

e) Procure additional Rigs to fast track drilling within the prospect.

f) Finalize the procurement process for development of the 400 MW power plants.

7.0. Conclusion

Key factors for successful project execution include;

a) Proper identification of projects that will contribute to the achievement of the company's top goals.

- Active sponsorship and support by top management ensure that viable projects are identified; resources allocated and are a priority for the organisation.

b) Identify key activities that have to be done during the project execution and assign team members to accomplish the tasks.

- Realistic project plans project plans for all projects must be prepared in consultation with all stakeholders and realistic project timelines set within the available resources.

c) Developing an effective tool that communicates the project goals to the project teams.

- The use of the balanced score card helps to reconcile personal and organisational goals, assign tasks and responsibilities to individual team members, make them accountable and promotes reporting on the project progress.
- This initiative makes everyone in the team to know and commit to a few "80/20"activities of the project that will have the most impact and then use the set lead measures to track those activities. The Balanced score card with the four perspectives is illustrated in Figure 2.

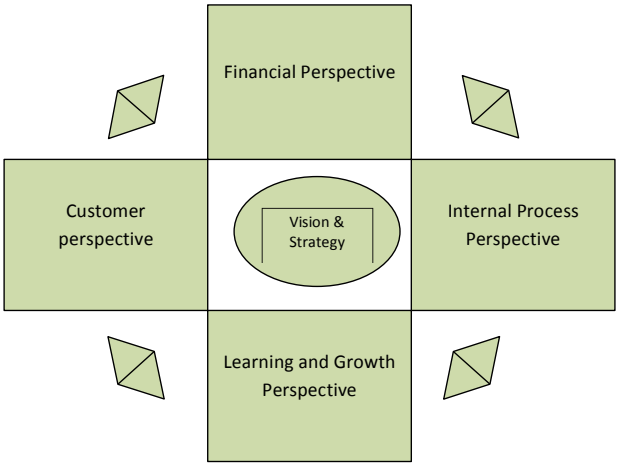


Figure 1. Balanced Scorecard (BSC).

d) Competent project personnel

- It is critical to recruit project staff with expertise in the relevant fields in order to realize the expected results.

e) Sufficient resources and funding

- Funding for the project must be determined at the project planning stage to ensure adequate resources are allocated and project execution is on schedule.

f) Proactive Risk Management

- An effective Risk management policy helps to identify potential risks during project execution and put in place mitigation measures.

g) Vigilant Tracking

- Continuous communication to ensure that necessary resources are available to do the work and know what needs to be completed.
- Regular meetings between project managers and project teams put everyone on check and promote accountability.
- Maintain project documentation at every project stage and give regular reports on project progress.
- Project manager keeps the project stakeholders informed of the progress by providing project status reports.

- Regular monitoring of the project by management ensure timely execution.

8.0. Proof of Successful Project Execution

What is the proof of successful project execution or measurement of success?

1. Project deliverables is the final product of the project for instance drilled wells within the project period.
2. Project acceptance by the sponsor and other stakeholders who contributed to the project development.
3. Final status meeting between the sponsor, the project manager and project team members to confirm project completion as per the set specifications and guidelines.
4. Gain acceptance signature from the project sponsor.

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