



PERFORMANCE AUDIT

OF

THE GEOTHERMAL ENERGY DEVELOPMENT PROJECT:

GOVERNANCE AND PROJECT MANAGEMENT

2012 - 2018



Office of the Auditor General
Brades
Montserrat

September 2019

**THE GEOTHERMAL ENERGY
DEVELOPMENT PROJECT:
GOVERNANCE AND PROJECT
MANAGEMENT**

This is a Report of a Performance Audit conducted by the Office of the Auditor General pursuant to Section 103 of the Montserrat Constitution Order 2010.

Marsha V. E. Meade
Auditor-General (Ag)
Office of the Auditor General
September 13, 2019

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ABBREVIATIONS

CARICOM	Caribbean Community
CAROSAI	Caribbean Organisation of Supreme Audit Institutions
DFID	Department for International Development, U.K. Government
DITES	Department of Information Technology & E-Government Services
EEP	Empowering Excellence Programme
EME	Early Market Engagement
EMP	Environmental Management Plan
EU	Energy Unit
E.U.	European Union
GDP	Gross Domestic Product
GU	Geothermal Unit
GIS	Geographical Information System
GOM	Government of Montserrat
GPSC	Geothermal Project Steering Committee
ICT	Information and Communication Technologies
IRD	Inland Revenue Department
INTOSAI	International Organisation of Supreme Audit Institutions
ISSAI	International Standards for Supreme Audit Institutions
MCC	Montserrat Chamber of Commerce
MCRS	Montserrat Customs & Revenue Department
MCWEL	Ministry of Communications, Works, Energy & Labour
MOFEM	Ministry of Finance & Economic Management
MOH	Ministry of Health & Social Services
MPS	Montserrat Public Service
MUL	Montserrat Utilities Limited
OAG	Office of the Auditor General
ODG	Office of the Deputy Governor
ODPP	Office of the Director of Public Prosecution
OECS	Organisation of Eastern Caribbean States
OOP	Office of the Premier
PS	Permanent Secretary
SDP	Sustainable Development Plan
TC	Technical Co-operation
TOR	Terms of Reference

PREAMBLE

Vision Statement

The Office of the Auditor General plays a crucial role in ensuring that public monies are spent wisely. Our vision is therefore “to be a proactive Supreme Audit Institution that helps the nation to make good use of its resources”.

Mission Statement

The OAG is the national authority on public sector auditing issues and is focused on assessing performance and promoting accountability, transparency and improved stewardship in managing public resources by conducting independent and objective reviews of the accounts and operations of central government and statutory agencies; providing advice; and submitting timely Reports to Accounting Officers and the Legislative Assembly.

The Goal

Our goal is “to promote staff development, enhance productivity, and maintain a high standard of auditing and accounting in the public sector, thereby contributing to the general efficiency and effectiveness of public finance management”.

AUDITOR GENERAL'S OVERVIEW

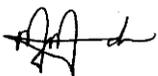
Renewable energy is a vital part of the Government of Montserrat's Energy Policy 2016 to 2030, as well as contributing in a major way to the achievement of the Sustainable Development Plan 2008 to 2020. Both solar energy and geothermal energy are being developed as parts of this strategy. To date, three geothermal wells have been dug and two have been tested, successfully proving the adequacy of the geothermal resources to provide more than 100% of the current on island needs for electricity.

Overall, there is a satisfactory framework of oversight and accountability, but the functioning of committees or stakeholders has some weaknesses, and the project's implementation has shown several inefficiencies and delays. Given DFID's decision to take over from MCWEL in having direct oversight of geothermal well MON #3, the project has lagged significantly in recent years with little progress since year 2016, by when the original plan was (1) that the project would have been completed and (2) that the power station would have been installed and operating.

Since 2012, the budget has more than doubled from the initial GBP 8.5 million to GBP 18 million (roughly EC\$60 million). The testing of the 3rd well was expected to be completed by early 2019 and to achieve a functioning power station within 2 to 3 years thereafter but this projected timeline is behind schedule. We also found that DFID's negotiations with the contractor had lagged for over 2 years and their continuous personnel absences or changes affected the efficiency and effectiveness of project management. Additionally, recruitments for key positions were too slow and these also impacted the project.

Subsequent to our review, (1) the drilling contractor has removed their equipment and left the island and (2) the OAG was finally presented with the Memorandum of Understanding between Government of Montserrat and the Department for International Development for this project. Other findings and recommendations are included in the report that we feel would benefit the Government and the citizens of Montserrat once they are actioned.

I wish to thank the staff of the Ministry of Communications, Works, Energy & Labour and all other persons who provided information, clarifications or extended any courtesy to my staff during this assignment.



Marsha V.E. Meade
Auditor-General (Ag)
Office of the Auditor General
Brades, September 13, 2019

EXECUTIVE SUMMARY

1. The Geothermal Energy Development Project began in the year 2012 with projected completion of a power station by the year 2016 and is fully funded by the UK Government's Department for International Development (DFID). In partnership with the DFID, under the GOM's direct oversight, through MCWEL, the first two geothermal wells (MON #1 and MON #2) were successful and were completed within their budgeted time and below budgeted cost. Since then, following the DFID's intervention and direct oversight of procurement during MON #3, there have been extensive delays in the negotiating of the terms of the extended contract with the drilling contractor, Icelandic Drilling Company.

2. Under the DFID's hands-on approach to oversight from MON #3 onward, delays and inefficiencies in other aspects of project management have incurred additional costs such as the need to clean the long idle third geothermal well (MON #3), which still needs both short-term and long-term testing. Hence, the current tentative projection is that the power station will be completed by December 2021, approximately 5 years later than the original estimate. Meanwhile, the total cumulative cost since the year 2012 is approximately GBP 18 million (well over EC\$60 million). Beyond MON #3, it is proposed [1] that the DFID's funding will cease, and [2] that the GOM will work with private sector partners to fund and to complete the final stage of the project: the harnessing of the now proven geothermal resources and the completion and operation of the power station.

Main Findings

3. **Good governance overall.** An important finding of our research is that there is an adequate framework for oversight of the Geothermal Project. The Steering Committee (GPSC), for instance, has 14 members, representing diverse stakeholders: e.g., MCWEL, PWD, MOFEM, DFID, MVO, and the Department of Environment. However, we have identified some areas to be improved within various bodies/committees: e.g., quality of records, attendance and participation.

4. **Since DFID's intervention/direct oversight, the project has stalled since MON #3.** Under the MCWEL's direct oversight, MON #1 and MON #2 were completed within budgeted time and cost. Throughout the project, the DFID had general oversight. However, from year 2015 onward, the DFID intervened with a hands-on approach and took over the direct oversight of the procurement for the project for MON #3. This well was dug, but was not promptly cleaned or tested. Since it has been idle for over 3 years, this will incur extra costs for the re-drilling and the cleaning of MON #3 to resume the project.

5. **DFID's negotiations with the contractor have lagged over 2 years.** These negotiations for the extension of the drilling contract have been in progress since the year 2016. Up to the time of this report, we had received no evidence of a new contract. On the contrary,

during early 2019, the contractor has subsequently removed its assets from Montserrat. Hence, the re-drilling and the testing of MON #3 remain pending, and the future of the entire project continues to be left in doubt.

6. Recruitments/Appointments are too slow. Over the past several years, these processes have been repeatedly delayed, inefficient, and ineffective. For example, despite giving adequate notice, the Project Manager and the GOM's Strategic Environmental Specialist left without suitable replacements. As another example, even though the Committee is expected to meet weekly, the vacancy of Deputy Chairman for the GPSC was officially unfilled for months.

7. DFID's personnel absences/changes affect project management. Given the DFID's decision to take over from the MCWEL in having direct oversight of this project after MON #2, the efficiency and effectiveness of project management and governance have suffered from (1) the recurring unavailability of the DFID's personnel on the island (e.g., for meetings of the GPSC and other on-island functions), (2) changes of the DFID's assigned personnel, and (3) vacancies in these positions. Attempting to manage major projects remotely/overseas is not appropriate in these circumstances.

Key Recommendations

8. Urgent need to improve contract management. The experience of the past three years revealed an urgent need for the DFID and other stakeholders to revisit their approach (1) to negotiations with contractors, and (2) to ongoing relationship management. The completion of MON #3 requires the soonest agreement with the drilling contractor. Several key persons left the project/island without clear succession plans or timely and suitable replacements.

9. Need for more flexible budgeting. This is especially important with long-term projects. Over time, projected costs tend to rise and new costs and issues emerge, making original estimates of limited relevance. Risks and contingencies need better planning. In the past several years, an overly rigid approach to budgeting and to negotiations with contractors has caused long delays in projects. Overall effectiveness, relevance, and value for money are more important than simply getting the lowest price or input cost on contracts or on items to be procured.

10. Review and assess committees and their members. In view of the extent both (1) of absenteeism (not being present when scheduled/required) and (2) of presenteeism (dutifully attending, but not functioning or significantly contributing) documented in meeting notes, key stakeholders, including the Permanent Secretary of MCWEL, the Financial Secretary, MOFEM, and the Cabinet, must exercise diligent oversight of all public committees and bodies. This includes objective ways (e.g., attendance rates; participation rates; outputs; outcomes) to assess both the committees and their individual members and any sub-committees.

11. Improve recruitment, retention, & succession planning. Within 1 to 2 months, the MCWEL and the GPSC must liaise with the HRMU to place urgent focus on improving workforce planning, recruitment, and succession-planning [1] to improve the efficiency and the effectiveness of the project management ecosystem, [2] to improve retention of talent, while minimising the costs and risks of staff-turnover, and [3] by extension, to achieve much improved people management across the MCWEL, including (a) compensation, (b) morale, (c) team building, (d) internal and external communication, (e) recognition and rewards, and (f) performance related incentives. Key roles deserve to be filled promptly and to have the relevant capacity and funding.

Audit Conclusion

12. With 100% reliance on imported fossil fuels and diesel generators to produce electricity, Montserrat has experienced many interruptions of power since October, 2016. This approach also creates very high (and rising) per-kilowatt prices for GOM, for businesses, and for households. Hence, the Geothermal Energy Development Project is extremely important as a long-term investment in achieving the Montserrat Energy Policy 2016 to 2030. Through solar power and geothermal energy, this policy seeks to achieve 100% renewable energy and sustainable national electricity-independence by year 2020. While the solar project is making progress, the geothermal project is years behind schedule, and will very likely not be finished by the target of year 2020.

13. In its early years, under the MCWEL's direct oversight, this project produced two successful geothermal wells (MON #1 and MON #2) within budgeted time and cost. In year 2015, the DFID, which had had general oversight of the project from its inception, intervened, taking a hands-on approach to all matters of procurement, and effectively took over from the MCWEL the direct oversight of the project for MON #3 onward. Since then, the project has had major overruns, both in time and in cost, to complete and to test well MON #3. With three viable wells, there would be two wells for production and one well for reinjection and/or additional production to ensure 100% of Montserrat's electricity needs.

14. The revised schedule for this project tentatively projected economic viability and power distribution by December, 2021. These outcomes are necessary to propel private sector led growth of the four central economic pillars in line with the national vision in the Sustainable Development Plan. However, the DFID's negotiations with the drilling contractor have been pending since year 2016, leaving the remainder of the geothermal project increasingly in doubt.

CHAPTER 1: INTRODUCTION

Background

1. This performance audit focused on (1) the internal organisation, governance, and processes of the Geothermal Unit and related stakeholders, (2) the GOM's policy framework for major public capital projects, and (3) the supporting stakeholders (e.g., the MCWEL, the PWD, MUL, and the DFID). These interconnected dimensions have implications (a) for project-related governance, (b) for departmental effectiveness and efficiency, and (c) for the quality of project outcomes and post implementation services to the public. In turn, the quality and the timely completion of public projects particularly (and, more generally, the activities of the GOM and throughout the MPS) affect the entire economy and society of Montserrat. This is amplified since the central GOM and the wider public sector still constitute over 50% of GDP and roughly 65% of full-time employment in the national economy, and they have numerous multiplier effects.

Objectives of the Audit

2. The audit sought to examine the level of governance of large capital projects and the quality of project management in the public sector of Montserrat. Consideration was given to (a) the quality of internal records and reporting, (b) management of human and other resources, (c) issues, limitations, and challenges and their causes, and (d) their impact on the organisational efficiency and effectiveness of the project management ecosystem (e.g., the PWD, the GU, the EU, and the GPSC) for stakeholders. Finally, the study aimed to identify, to measure, and to assess the channels of communication with other agencies and stakeholders. In particular, we sought to identify the major challenges and deficiencies facing the relevant Departments and their ecosystem, and, hence, opportunities and recommendations for improving the outcomes for all stakeholders.

Scope of Performance Audit

3. The scope of this performance audit was an investigatory pilot project to examine the status and the past 6 years' trends within public projects and, especially, within the Geothermal Project. We included several GOM departments, the DFID, and private sector contractors in our review in order to assess the 360-degree perspective of stakeholders regarding their mandate, structure, efficiency, quality of outputs, communication, quality of service, and overall performance. Financial and other data analyses focused on the current year and the prior 6 years (i.e., years 2012 to 2018).

Scale of Performance Audit

4. The scale of this performance audit included agencies and Departments within the GOM that interact in any way with or through the PWD in relation to the public works system in Montserrat, with an emphasis on the Geothermal Project.

What We Excluded from this Audit

5. We excluded geothermal related and capital project data preceding those of the year 2012, except for background knowledge and local context. We excluded comparative compensation analyses and other cross country reviews. We also largely excluded regional and international data-sets, except for background information, thus emphasising Montserrat specific current and very recent historical data sets. Future performance audits and GOM's own strategic plans will need to address these areas in order (i) to reach optimal human resources management (including effective recruitment, competitive compensation, and long-term retention of talent), including major areas such as geothermal energy management, environmental safety, and sustainable development, (ii) to embed a culture of effective financial management and public accountability, and (iii) to exceed comparative Caribbean standards and global best practices, as Montserrat competes with other countries for talent, for funding, and for investments.

Why We Performed This Audit

6. **Economic Role of Government.** In Montserrat, the public sector is much larger as a percentage of the workforce and as a percentage of Gross Domestic Product (GDP) than it is the case in most other countries in Caribbean and Latin America. Hence, Government of Montserrat's (GOM) policies and programmes, public sector spending, and public services play pivotal roles in either catalysing economic development or impeding national progress (National Tourism Policy, 2016, p. 22). Public utilities and energy affect both public and private sectors.

7. **Quality of Public Services.** Since most of the island's employment is within the public sector, any deficiencies in public servants' attendance and performance have ramifications for the entire country, including the sustained development of businesses and job creation in the private sector. During the past 24 months, the public sector, as well as the rest of the society and the economy, has suffered, for example, (a) some interruptions of ferry service, (b) recurrent outages of power supply and internet services, and (c) related significant losses of productivity in its internal operations, including early closure of offices in several instances. All citizens and residents interact with the public service directly and indirectly, and they depend on the efficient, reliable, and effective provision of electricity, among many other public services.

8. **Effective Private Sector Development.** Investors depend on having certainty about the quality of regulations, utilities, and infrastructure in the country. Businesses and households alike expect [a] low cost essential services and [b] availability of energy on demand. The orderly development both of the society and of the economy requires an efficient and effective

distribution of energy and power in line with international standards. Major projects and investments all depend on electricity both during their construction/implementation and during post-completion deployment and usage. Furthermore, increasing reliance on ICT requires an infrastructure that works “24/7” every day of the year, and systems that achieve as near as possible to 100% up-time.

How We Performed This Audit

9. Interviews. Initially, we engaged in interviews with senior public sector officials across various GOM Ministries, MPS Departments, and external agencies that interact with the geothermal project. With the guidance provided by these meetings, we proceeded to devise questionnaires and data gathering techniques suitable for the purpose of assessing (i) the governance of public works projects, (ii) the efficiency and the effectiveness of data gathering, reporting, human resources, and interdepartmental communication and co-operation related to public projects, and (iii) the trends, outcomes, and costs of project management in public works, with an emphasis on the geothermal project in each case.

10. Reviews of relevant law, regulations and literature. Before and during our fieldwork, we researched GOM laws and regulations in order to establish the legislative framework for our performance audit. The programme of research then encompassed the scholarly literature on such relevant subjects as (a) governance, (b) human resources management, (c) public sector efficiency and effectiveness, (d) project management, (e) renewable energy and public utilities, and (f) performance benchmarks and standards of service. These sources supplemented our reviews of various internal and external documents related to the GOM’s policies, structures, and operations affecting the issues of major public projects and delivery of electricity from renewable sources of energy.

11. Internal & External Evidence. Various information requests were made during May, 2018, to August, 2018. Emphasis was placed on factors affecting the Geothermal Project’s governance, project management, efficiency, and performance. In particular, we sought to know (a) whether the staff was adequately trained, equipped, and managed during the past few years, (b) issues affecting the project’s progress and outputs, (c) the quality of communication and co-operation among the stakeholders, and (d) recommendations/opportunities for improvements.

12. Standards used. This audit was conducted according to standards promulgated by the International Organisation of Supreme Audit Institutions (INTOSAI) for performance audits. Those standards require that we plan and perform our audit in order to obtain sufficient and reliable evidence to reach a reasonable conclusion about the performance of the geothermal project with regard to [a] its governance and [b] its management during the period under review. The international standards used to perform this audit engagement and to assess the findings of this audit include ISSAI 1, ISSAI 100, ISSAI 3000, and ISSAI 3100.

CHAPTER 2: GOVERNANCE

Overview

13. The Geothermal Energy Development Project began in the year 2012 with projected completion of a power station by the year 2016. It is fully funded by the UK Government's Department for International Development (DFID). Initially, the DFID provided the funding and the GOM was directly responsible for the project management. Under the GOM's oversight, through the MCWEL and the PWD, (a) the first two geothermal wells (MON #1 and MON #2) were drilled and tested successfully and (b) they were completed within their budgeted time and cost. Since then, primary oversight for the project management shifted from the GOM to the DFID. During that period, there have been extensive delays (now over 3 years) in the DFID's negotiating of the terms of the extended contract with the drilling contractor, Icelandic Drilling Company.

14. Under the DFID's direct oversight, repeated delays and inefficiencies in other aspects of project-management have incurred additional costs such as the need to clean and to re-drill the long-idle third geothermal well (MON #3), which still needs both short-term testing and long-term testing. Hence, the current tentative projection is that the power-station will be completed by December, 2021, approximately 5 years later than the original estimate. Meanwhile, the total cumulative cost since the year 2012 has more than doubled from the initial budget of GBP 8.5 million to the current budget of approximately GBP 18 million (or more than EC\$60 million). Beyond MON #3, it is proposed [1] that the DFID's funding will cease, and [2] that the GOM will work with private sector partners to fund and to complete the final stage of the project: the harnessing of the now proven geothermal resources and the completion and operation of the power station.

Findings of the Audit

15. Geothermal Unit long delayed; then, under-performing. In the first 3 years (2012 to 2014) of the project, the GU did not materialise in its full intended form and functionality. Hence, the PWD in the MCWEL continued to manage the contract and to sign variations of the contract directly rather than through the GU under the MOFEM [DFID Annual Review, January, 2014, p. 4]. This same finding was reported in the next Annual Review, indicating that this continued into years 4 and 5 (2015 and 2016), notwithstanding the renaming of the GU to the Energy Unit (EU), which has a broader mandate for developing and managing all forms of energy [DFID Annual Review, October, 2015, p. 2].

16. New contract with the drilling contractor delayed the past 3 years.

[a] Despite successful tendering and contracting for the first 2 phases (from planning to completion and testing of MON #1 and MON #2), the DFID has not resolved the contractual arrangements for MON #3 with the drilling contractor since December, 2016.

[b] The existing contract with the drilling contractor expired on June 30th, 2017. The DFID took direct responsibility for the new negotiations with this contractor for the drilling of MON #3. The DFID asserted that it took this hands-on approach to procurement since its internal audits revealed weaknesses in the GOM's process of procurement. However, whilst there are overall opportunities to improve the GOM's processes, the evidence that we gathered within this project does not support this specific assertion, nor did the DFID respond to our requests, dating from May, 2018, for a copy of this alleged internal auditors' report. Furthermore, it was not in line with best practice for the funding agency to be also the contracting authority for the same project.

17. GOM's Infrastructure Review Board is functioning. As it does with all other DFID-funded and E.U.-funded projects in Montserrat, the Infrastructure Review Board (which resides under the MOFEM) provides high level oversight over the Geothermal Project [DFID's Addendum to Business Case, Geothermal Project, 2014, p. 5, 6].

18. GOM's Geothermal Project's Steering Committee (GPSC) is functioning. The GPSC continues to provide a forum for the engagement of multiple stakeholders, including e.g.:

[a] The DFID is represented in the Committee by (i) the Infrastructure Advisor, (ii) the Deputy Programme Manager, & (iii) a Procurement Officer, supported by the project manager;

[b] The MVO's scientific team is represented by the Director;

[c] A representative from the Department of Environment [DFID's Addendum to Business-Case, 2014, paragraph 24, p. 6];

[d] The Project Aid Officer represents the MOFEM;

[e] The Director of the PWD, MCWEL;

[f] Civil Engineers from the MCWEL;

[g] MUL is represented by its Managing Director and its Specialist Projects Officer.

In all, 14 persons are officially listed as members of the GPSC. Evidence from its meeting-notes indicates that the GPSC met as often as weekly, but there have been many gaps in the expected meeting-schedule over the past few years (e.g., during August 1st, 2017, to September 30th, 2018).

19. The GPSC had a high rate of absenteeism. Evidence from the GPSC's meeting-notes indicates that several appointed committee members were frequently absent from the GPSC's scheduled meetings. Overall, the GPSC's reported absence rates were consistently in the range of 40% to 50% over the past 24 months. There was very little evidence of effective use of deputies or alternate members to cover periods of absence of substantive committee members.

20. Several members of the GPSC made little or no contribution. Evidence from the GPSC's meeting notes indicates that several of its fourteen (14) appointed members rarely or never asked or said anything in the meetings that they attended. The combination of (1) the high absence rates of several members and (2) the low participation rates of some other members effectively highlighted that only a small core of the members (i) regularly attended, (ii) adequately prepared for, and (iii) effectively participated in the GPSC's meetings. We found no evidence that the committee assessed itself or any of its members.

21. MOFEM's Procurement Unit & GOM's Public Procurement Board are functioning. Public works exceeding E.C.\$100,000 are subject to public tenders and are evaluated by a team appointed by the Public Procurement Board. This includes relevant expertise from the DFID, from the GOM, and from the MOFEM, supported by external technical advisors [DFID's Addendum to Business Case, Geothermal Project, 2014, paragraph 25(II), p. 6]. All public tenders/procurements are also subject to review by the MOFEM's Procurement Unit, which provides (a) independent oversight for procurement and (b) advisory services to the Procurement Board.

22. The GPSC: Slow appointment process. For example, the vacancy of the post of the Deputy Chairperson (whom the DFID was responsible to appoint) was noted in several meetings, spanning months. The meeting pertaining to the filling of the position of deputy chairman finally occurred on the 19th of December, 2017. Generally, we found that the GPSC's decision-making was very slow.

23. The GPSC: Terms of Reference long delayed/unfinished. After the process of drafting them was pending a long while, a meeting on the 19th of December, 2017, updated the TOR for the GPSC, but that document was still not finalised for several months. Only after their completion could the GPSC review the TOR before sending them to the Cabinet for approval.

Three months later, another meeting was held at the MCWEL to discuss the TOR; the changes arising from that meeting would finalise the TOR, which would then be circulated to the Committee. This was another example of very slow decision-making within the GPSC.

Outcomes: [a] **May 1st, 2018: Item 8.2:** The GPSC discussed the updated TOR, which identified the GPSC's Deputy Chairperson but did not specify its Chairperson. The agreed amendment was that the holder of the post of Director of PWD will be the ex-officio chairperson.

[b] **Uncertainty:** Since its TOR concluded at the end of the drilling and testing phase, the query arose as to whether the GPSC would come to an end after completion of MON #3, or whether, by default, it would continue into subsequent phases of the Geothermal Project. Subsequent to our fieldwork, the MCWEL confirmed that the current framework would remain in place, unless it were replaced by the Cabinet of the GOM.

24. Tendering Process: Lack of interest from drilling contractors. Despite the GOM's directly approaching fourteen (14) internationally recognised drilling contractors, and meanwhile advertising the project publicly, only one firm responded to the initial tender for the drilling of the wells (MON #1 & #2) [DFID Annual Review, January, 2014, p. 5].

25. Tendering Process: Land purchases are often long delayed. Significant project-delays related to legal and procedural matters arising from the need to purchase parts of privately owned lands needed for the well-sites and for related infrastructure [DFID Annual Review, October, 2015, p. 1]. These issues will likely affect the remaining phases of the project and, particularly, the much bigger surface-work that will be needed (i) for the generation of power, (ii) for the transmission of power, and (iii) for the distribution of electricity from the three (3) geothermal wells. In the MCWEL's view, the DFID's hands-on approach in the latter stage of this project added considerably to the time taken [a] to arrive at approved budgets for acquisitions, [b] to negotiate acquisitions of land, and [c] to complete the acquisitions.

26. Tendering Process: Supply of valves for the holding tanks delayed. Only two tenders were submitted for the supply of these valves. One quotation was very expensive whilst the other was reasonable and within the MCWEL's budget. However, the problem arose that there were no suitable valves on the island [G.P.S.C.'s meeting notes: December 12th, 2017: Item 3.2]. Therefore, after the contract was awarded, the main challenge was how to get the valves from Antigua to Montserrat.

Recommendations

27. Clarify and confirm the GSPC's Terms of Reference. It is urgent and overdue for the MCWEL and the Cabinet to review, to update, and to conclude both (a) the current TOR and (b) the prospective TOR for the GSPC (for MON #3 onward). Annual reviews of boards/committees and their TOR should become a standard practice across the GOM.

28. Expedite appointments/replacements. It is urgent and overdue for the MCWEL, the MOFEM, the Cabinet, and other stakeholders to review and to enhance the process for the appointment of persons to serve in bodies such as (1) the GSPC, (2) the Procurement Board, (3) the Public Tenders Board, and (4) the Infrastructure Review Board. There must be a transparent process and merit based criteria both for appointments and for any subsequent replacements of committee members. In the event of (a) the death, (b) the illness, (c) the prolonged absence, (d) the resignation, and/or (e) the under-performance of any committee members, suitably experienced, knowledgeable, and competent replacements must be appointed in a timely manner to optimise the performance of committees in the public interest.

29. Review and assess committees and their members. In view of the extent both (1) of absenteeism (not being present when scheduled/required) and (2) of presenteeism (dutifully attending, but not functioning or significantly contributing) documented in meeting notes, we recommend that key stakeholders, including the Permanent Secretary of MCWEL, the Financial Secretary, MOFEM, and the Cabinet, must exercise diligent oversight of all public committees and bodies under their respective portfolios. This includes objective ways (e.g., attendance rates; participation rates; outputs; outcomes) to assess both the committees and their individual members and any sub-committees. This also requires a framework, perhaps compatible with the Empowering Excellence Programme and with the HRMU's Performance & Development Assessment and Review parameters and templates, to establish (a) the breadth, (b) the depth, and (c) the frequency of reviews (e.g., condensed reviews quarterly and detailed assessments not less than annually). Generally, members need feedback on their roles and contributions.

30. Improve induction and orientation of committees and their new members. In view of the deficiencies noted within individual attendance and participation, we recommend that key stakeholders, including the Permanent Secretary of MCWEL, the Financial Secretary, MOFEM, and the Cabinet must establish a suitable framework [a] for the effective orientation of every new committee/board and [b] for the effective induction of every new member appointed to any public-sector committee/board. Generally, each member needs [1] support in personal development, [2] accountability for performance, and [3] clarity of roles and expectations.

31. Accreditation and development of Committees/Boards. Develop long-term competencies of members: e.g., through the Eastern Caribbean Securities Exchange's (ECSE) Accredited Directors programme, which targets the training and accreditation of persons before and during their service in committees and boards throughout the OECS.

CHAPTER 3: DATA & COMMUNICATION

Overview

32. This section of the performance review examined the Geothermal Energy Development Project and related departments to assess (a) the extent of their use of electronic tools and channels for information and communication, (b) their data-security and the handling of information assets, (c) their effectiveness in engaging stakeholders throughout projects, and (d) the quality of records and communication within and between committees and stakeholders.

Findings of the Audit

33. No comprehensive Electronic Information System. Despite the large volume of files, contracts, and documents, project management stakeholders, including the MCWEL, the GPSC, the GU, the EU, and the PWD, have no comprehensive databases or integrated digital document management. Persons and units often operate separately, without enough communication, and information is sometimes lost, slow to be found, and/or not readily shared. Essentially, too many processes remain in manual mode with costly and excessive use [a] of stationery, [b] of paper/forms, [c] of printing, and [d] of physical transportation/delivery. Many items are now electronic but are not centralised by project and/or shared or accessible by all participants or stakeholders. These findings entail several negative implications: e.g.,

- (a) High and increasing carbon emissions and impact on the environment,
- (b) Excessive energy-use and related operating costs,
- (c) Employees' ailments (e.g., accumulating dust and declining indoor air-quality),
- (d) The increasing storage space required, and the lack of insurance for assets,
- (e) Fire hazards, and
- (f) Security risks.

34. Rising risks and costs of information assets. In their current forms, the huge accumulated volume of files, of paper documents, and of unprocessed/under-processed data and reports is time consuming to handle. Some of the costs and risks pertain to these factors:

- (a) Physical storage is costly and retrieval of files is tedious;
- (b) Research and analysis are inefficient;
- (c) Policy formulation and decision making are too slow;
- (d) Over time, documents can easily be misplaced, damaged or lost (especially when moving from place to place between departments and officials);
- (e) Generally, much effort goes into preparing forms, files, records, and reports, but very little effective or strategic use is being made of many of these documents.
- (f) These risks are heightened when key participants leave their roles and/or leave the island altogether: e.g. #1, the Project Manager that resigned and left Montserrat in year 2017; e.g. #2, the Environmental Specialist that left without replacement in year 2018.

35. Internal Communication: Errors, omissions & inconsistencies. Numerous times in the various reports and minutes, we noted errors, omissions, faulty sentences, and internal inconsistencies in statements of facts and figures. The number and the types of errors, taken together, as well as their persistence over time, undermine the integrity, the reliability, and the usefulness of records and, hence, governance itself. Over time, a number of challenges arise: e.g., [a] current members of committees/departments (especially those who were absent from a particular meeting), as well as other users of internal records, would be unsure of what was actually discussed, decided, or done; [b] new members of staff/committees would be unsure of accuracy, completeness, and the intended meaning of records; [c] external users (e.g., internal auditors; external auditors) would be left in doubt.

36. Reporting: Timeliness and quality need improvement. Timeliness, quality, and reliability are matters of great concern. In many cases, the number and types of errors and omissions that we found indicate that Heads of Department and Chairpersons of Committee have been signing reports, but without checking that each report is complete and accurate. Furthermore, too often, acronyms were used without explanation/definition. Several times, Departments/Committees submitted revised data/reports showing significant changes and corrections from the originals.

37. Internal reviews/controls are inadequate. In too many cases, the GPSC's meeting notes indicated that there were no comments, questions, discussion, or corrections of the notes, or their approval, from the preceding meeting(s). A cursory reading of the meeting notes showed obvious errors, omissions, and/or internal inconsistencies. In turn, this means that timely decisions are not made and/or that inaccurate or misleading reports could easily undermine the quality of some of the decisions that are made at all levels: e.g., employees, Departments, Ministries, the HRMU, and the Cabinet.

38. External Communication: Poor public relations, interested third parties. The records of the GPSC indicated that members representing the DFID were extremely reluctant to provide additional information to interested third parties or to respond to their direct queries. Furthermore, very little information has been released to the general public. The Early Market Engagement was the only piece of information released to the general public as the Minister made a statement on the radio. However, a further constraint expressed was that the Minister would not make a statement without the necessary information from the DFID. Evidently, these internal attitudes and perceptions severely limited the quality, the content, and the frequency of the public relations of the project stakeholders almost to nil.

39. External Communication: Early market engagement (EME). On November 17th, 2017, the GOM launched another instance of EME.

40. External Communication: Advertising & early market engagement. Very little action has followed in terms of EME since the original initiative several years ago. Since November 2017, an advertisement was on the My Tenders website, inviting interested persons to share their information. However, only one company showed interest and came to the island as of December 31st, 2017. In the past year, since November 2017, reports indicated that only one other interested firm has visited the island. [MNI Alive news article, 2018, January 23.] Meanwhile, information is available from the formal market engagement in January 2015: e.g., the DFID's procurement teams have a list of participants in fields of work relevant to the Geothermal Project, including people that attended the first time. Previously, questions were put out to the market to see what the market would suggest as solutions.

41. External Communication: Public announcements. The GPSC observed that, for a long time, information has not been shared with the general public, and that public feedback and inquiries have been few to none. However, no clear channels for public input are clearly (and regularly) advertised or widely known; therefore, it is unsurprising that the public appears to be silent about the geothermal project. Committee members representing the MCWEL stated that

the relevant Minister did not have any official information from the DFID and, hence, would not make an official statement. The proposed official information would include statements about [1] the change of the contract for drilling MON #3, [2] why it has been delayed, and [3] the process that is about to occur: directional drilling. Without receiving the information from the DFID, Committee-members representing MCWEL did not think that it was wise to make a statement.

42. Very limited public education and interaction. News reports indicate that only one public information forum was convened in the past several years: a town hall meeting to discuss the Environmental Impact Assessment report in year 2015. [Discover Montserrat, 2015, November 9.]

43. Website: out of date; inadequate information. The GPSC repeatedly acknowledged that the website needs updating and that the committee should provide MCWEL with pertinent information to be uploaded. However, there is no evidence that this has happened. [G.P.S.C.'s Meeting Notes: December 5th, 2017: Item 5.1] Likewise, for the years 2012 to 2017, very few documents pertaining to progress of the Geothermal Project appeared on DFID's project-tracking website: [1] zero in year 2013; [2] zero in year 2014; [3] 2 in year 2015; [4] 0 in year 2016; and [5] 2 in year 2017. Only after this audit began in May 2018, did a set of documents appear on the website (5 items dated June, 2018). [<https://devtracker.dfid.gov.uk/projects/GB-1-202824/documents>]

44. Early Market Engagement: long gaps; little follow-up. Committee members representing MCWEL reported that there was limited information to report back to the GPSC as it pertained to the EME; the current plan was to gather as much information as possible from interested parties, after which an informed decision could be made. However, this followed the trend of the previous several months: meeting notes continually reflected no action on either developing or executing the communication strategy for the Geothermal Project.

45. Gaps between external views/news versus insiders' views/facts. For instance, the GPSC referred to an article by Think Geo Energy that announced that drilling would begin in a few weeks at MON #3 [Think Geo Energy, 2018, January 25]. However, the committee had not been informed of such plans and raised this as a concern in a meeting. It also demonstrated, once again, that there were gaps in communication between stakeholders since [a] the GPSC was not informed or included, but [b] representatives of DFID gave assurances about the imminent start of drilling, and [c] the Minister with responsibility for MCWEL was included in the site tours with an interested firm, and was also prominently featured in the relevant news articles [MNI Alive news-article, 2018, January 23]. Besides the obvious disconnections and lapses in communication

between stakeholder groups, the gap between (i) the optimism of the reported news and (ii) the facts of repeated delays and the actual lack of progress on the ground is clear as, nearly a year later, the DFID's negotiations with the drilling contractor for the new contract for work at MON #3 are still pending, inconclusive, and unconfirmed.

46. Early Market Engagement: outcomes and uncertainties.

During the most recent EME (November, 2017), there were seven (7) expressions of interest. Some issues arising for the GPSC in the process included the following:

[1] After the procurement team and others prepare it, will the EME-report be sent to the GPSC?

[2] Will the GPSC be able to give advice before the report will be published?

[3] Who would be the beneficiary of the report?

[4] To whom would it be submitted for further actions?

The MCWEL's representatives informed the GPSC that those are questions that they would direct to the responsible Minister.

47. Early Market Engagement: delays in analysis and reporting.

[a] Six months later, there was still no update or final report. The GPSC was attempting to understand how the EME impacts the overall development of the current phase of the Geothermal Project. It requested an update on the plan of action for the EME.

[b] The DFID's position is that it has around £18 million invested in the project, and sees it as an important element for the sustainability of Montserrat. Hence, the DFID is very keen to ensure the utilization of the geothermal potential (even though it will not be funding the final phase post-MON #3).

[c] One of the EME's participants was interested in entering into an agreement with the GOM based on the data available for the existing wells (MON #1 and MON #2).

[d] Most of the EME's participants were asking about the output from MON #3, primarily to see how best to configure the well and to establish if there would be any interference.

[e] It would be beneficial to have data from MON #3 available but there are good enough data (from MON #1 and from MON #2) on which the private sector participants have based their proposals.

[f] The ideal configuration would be two (2) production wells and one (1) re-injection well, but, if MON #3 fails, the configuration would be one production well and one re-injection well. [G.P.S.C.'s Meeting Notes: May 8th, 2018: Item 8.3]

48. File management and storage. In its new headquarters, the MCWEL has fireproof and waterproof safes/cabinets for important documents. However, many other physical documents have limited security/storage. There is a fire alarm system in the main building but no water sprinkler system. There are security guards at the Ministry's headquarters, but there is no comprehensive electronic security system or monitoring system for each of the Ministry's various buildings and premises. Intensive use and retention of paper and physical documents creates a number of costs and risks: e.g.,

- (1) Fire hazards,
- (2) Health risks,
- (3) Risks of unauthorised access,
- (4) Risks of misappropriation and/or theft,
- (5) Progressive deterioration/damage of documents,
- (6) Rising cost of physical storage,
- (7) Ever increasing requirements of physical storage space, and
- (8) Loss of originals and/or the sole available copy/copies.

Recommendations

49. Install up-to-date security systems for files/staff/premises. Security must be given urgent attention. Stakeholders' life, health, and safety require smoke detectors, fire alarms, emergency procedures, constant electronic security, and 24 hour per day monitoring of work premises. In turn, it is imperative to provide fireproof and waterproof storage for more files, for important software, for electronic systems, and for equipment. Backup power sources and remote electronic data storage (e.g., cloud-computing) are essential (a) to the maintenance of security systems and (b) to provide robust resilience both (1) against natural disasters (e.g., business continuity and systems restoration) and (2) in robust and durable data security in the event of any (i) physical burglaries, (ii) thefts, (iii) fires, (iv) flooding/leaks, or (v) other damage to physical and digital information assets. Cloud computing, software as a service, and infrastructure as a service options also offer major new opportunities (a) for very low costs, (b) for security of

information assets, (c) for central storage of files, and (d) for controlled sharing of documents in real time across all stakeholders for each project or for any other area of common interest within or between departments and other stakeholders.

50. Internal Communication: Recommended improvements within the Steering Committee.

(1) Implement a risk management approach that will: (a) identify the main project relevant risks, (b) select a leader/team for action on managing each risk/risk cluster, and (c) specify how each risk will be mitigated/insured/prevented.

(2) At each meeting, review and correct the minutes of the previous meeting; condense the minutes to key items (i.e., actions and decisions) and add a page with the highlighted key risks of the project.

(3) Review the reporting format for the Committee and ensure clear linkages between meeting notes, the risk register, and the project plan.

(4) In each meeting, present and discuss a clear statement of the project's expenses for the most recent period.

(5) In each set of meeting notes, summarise the cumulative spending versus the budget: from the project's inception to the most recent reporting date.

51. Improve interdepartmental flows of information. The Minister and the GPSC would benefit from having at least quarterly or semi-annual meetings. The link between the Committee and the Minister can be made more effective by presenting the key information to the Minister in a brief PowerPoint every fortnight or every month. In turn, each stakeholder's representative in the GPSC could share regular Committee approved summaries with his/her department or agency.

52. Improve the quality of reports. Review and harmonise the format and the content of all reports within the MCWEL, the PWD, the GU, and the EU, and across all the related departments, contractors, and partners, and across the project management ecosystem. Some can be discontinued; others need to be upgraded; in some cases, new types of report are required to measure and to monitor performance and progress. Innovations and best practices in high performing departments can be shared with all other departments through regular quarterly

meetings and e-newsletters. In all cases, electronic information and communication-channels ought to be the default choices.

53. Document inputs and learning. Initiate a register of lessons learned and document the inputs and observations from each stage of each project/phase: e.g.,

[a] What stakeholders learnt from the first commercial enterprise that came to the island regarding the project;

[b] The questions that parties posed; and

[c] The kinds of information that they were seeking.

This will allow for a more elaborate and tailored package of information to be provided next time.

54. Strategically host relevant conferences and events. Proactively, the GOM, MCWEL, OOP, and MUL could collaborate in hosting such fora, as well as encouraging international organisations to host their project related and energy-related events in Montserrat. This would greatly reduce the cost to Montserrat, while providing much more effective networking, including **(1)** island tours, **(2)** meetings between overseas individuals/firms and their local counterparts, and **(3)** on-site visits for prospective partners, suppliers, and investors, to prepare for the final phase of the project, which requires private sector funding to replace DFID's funding.

55. Improve record keeping and file management.

(a) Internal: Within the MCWEL, the PWD, the GU, and the EU, and across all the related departments, contractors, and partners, urgent attention needs to be given [1] to standardisation of file naming, file saving, record management, and [2] to the primary use of the GOM H-drive rather than personal C-drives.

(b) External: For external stakeholders in projects, ensure either appropriate access to a shared partition of the DITES' intranet or to other file sharing technologies such as Drop Box or Google Chrome's OneDrive. This will facilitate central document management and real time access for all approved participants.

(c) General: Clerical and administrative staffers require regular scheduled coaching and training to make sure that they are utilising the full range of functionalities within the standard suite of software available to them, so as to produce complete, accurate, and timely records and reports to support effective decision making.

CHAPTER 4: MANAGEMENT OF HUMAN RESOURCES

Findings of the Audit

56. HR Issues: Limited local geothermal development skills developed: All international experts were used during the exploration period of year 2012 to year 2014; hence, there was limited development of local capabilities in the exploration and sourcing of geothermal energy [DFID Annual Review, January, 2014, p. 5]. This was contrary to the original plan to involve some local persons alongside the foreign experts to build long-term local capacity. Subsequent to our fieldwork, the MCWEL advised that some local persons did benefit from working alongside the expatriate experts.

57. HR Issues: Limited local geothermal management skills developed. The daily monitoring and management of geothermal reservoirs is an important skill set that needs to be developed in Monserrat in order to manage the geothermal energy facility effectively for the long term during the production stage [DFID Annual Review, January, 2014, p. 6]. DFID's original business-case had planned to build local capacity over the life of the project. However, all of the required geothermal advisors and experts have had to be recruited internationally for the past seven (7) years. Furthermore, the EME initiatives to date all point to the expected required use of international firms beyond MON #3. Subsequent to our fieldwork, the MCWEL advised that some local persons did benefit from working alongside the expatriate experts, and at least one person has pursued education in this area.

58. HR Issues: Little to no continuity for some key skills/posts: For example, within the GPSC, a key function of the Strategic Environmental Specialist (hired by and representing the Ministry of Agriculture) was to develop and to monitor the Environmental Management Plan (EMP) for the Geothermal Project. However, it is not good practice for this officer to develop and still monitor the EMP. The specialist contract ended late May 2018, with the GPSC reporting that there was no suitable alternative in place to implement and monitor the EMP.

59. Inadequate monitoring and review mechanisms. This study revealed the absence [1] of comprehensive and adequate records of incoming and outgoing comments, complaints, and queries, and [2] appropriate documented evidence of any actively implemented systems for identifying, for recording, for monitoring, and/or effectively utilising many aspects of employee data, client satisfaction, and external communication. Many external queries, comments, feedback, compliments, and complaints (e.g., from end users, from customers, from the public, from suppliers, and from contractors), as well as those arising internally from employees, arrive

via the telephone, the radio, the social media, and during interpersonal conversations, but they are not recorded or formally logged. Generally, the MCWEL and the PWD do not make or keep adequate records of these types of communication. Therefore, comprehensive reviews, analyses, and statistics are either unavailable or impossible to perform.

60. Recruitment: Issues arising (MON #3 under DFID's oversight).

[a] For the post of Project Manager/Coordinator, the TOR were finalised and sent to the HRMU for advertisement. However, these TOR were not shared with the GPSC as it was said to be an internal effort on the part of the MCWEL.

[b] Meanwhile, the TOR (i) for the post of Geothermal Coordinator and (ii) for the post of Director of Energy, were both submitted to the DFID for review. Communication indicated that the GPSC was uncertain as to whether there would be local hiring in TC posts and the fact that the TOR for both positions were sent to the DFID indicated that they would probably be treated as Technical Co-operation (TC) posts. However, the DFID's representative advised the GPSC that the post of Director of Energy should not be a TC post but further investigation is needed.

Recommendations

61. Reduce or eliminate all forms of garbage or pollution. Given the nature of their work and diverse indoor and outdoor work environments, the DFID, the MCWEL, and related departments in project management must [1] regularly review and [2] continually improve their guidelines and practices in order [a] to minimise the creation of waste, of garbage, and of pollution, and [b] to minimise the use of hazardous/toxic materials and products and their impacts (including human health and environmental harm): e.g., at the geothermal well sites. These responsibilities extend to any contractors or subcontractors used by the DFID or the GOM.

62. Improve oversight of health & safety on all project sites. MCWEL can liaise with the HRMU, together with the MOH's Environmental Health Department and the MCWEL's Labour Department, to get adequate training and support to all departments and stakeholders to coordinate policies and programmes (a) to identify, (b) to measure, and (c) to reduce/eliminate pollutants of all kinds, including those that affect food, water, air, clothing, machines, equipment, public service areas, and other interfaces with the workforce and with the public. The persistent high levels of paper use, of printing, of physical delivery, travel and transportation contribute to pollution and health risks for all stakeholders. The importance of these issues is very well captured in the recent warnings from the U.K. Chief Medical Officer (Annual Report, 2017, p. 11). Wherever contractors or subcontractors are used, the DFID and the MCWEL must make provision

for adequate supervision of project site activities and the health and safety of all project related workers.

63. Monitoring and review mechanisms. Given the absence [1] of comprehensive and adequate records of incoming and outgoing comments, complaints, and queries, and [2] appropriate documented evidence of any actively implemented systems for identifying, for recording, for monitoring, and/or effectively utilising many aspects of employee data, client satisfaction, and external communication, it is essential that the Heads of Departments work closely with the HRMU, where appropriate, and with the DITES, wherever necessary, to establish electronic systems and standard templates for weekly and monthly reporting of faults, of complaints, and of feedback from employees as well as clients and other stakeholders. This would contribute to GOM's mandate of open and accountable governance.

64. Responsiveness and prompt communication. The MCWEL and related departments should continue to ensure that all officers [a] monitor email inboxes and other channels of communication daily and [b] consistently respond within high standards of service, which must become written policies and be reviewed and assessed annually. In line with best practices, make all reasonable efforts to highlight exceptional items promptly for the soonest redress of (i) any grievances with employees, clients, or suppliers, (ii) process related or documentary deficiencies, and (iii) service quality issues. Data analysis can then ensue to show categories, trends, actions, costs, benefits, and progress in various employee satisfaction, service delivery, and client relationship issues within each year and between years.

CHAPTER 5: PROJECT MANAGEMENT

Overview

65. This section of the performance review examined aspects of the management of the Geothermal Energy Development Project. Under the MCWEL's effective oversight, the first two phases, MON #1 and MON #2, proceeded within their budgeted time and cost. Indeed, there were some cost savings, which were then carried forward to the next phase, MON #3. After MON #2, the DFID took direct oversight of the project and many delays have arisen. Accordingly, most of the following findings and recommendations relate to the period of the past 4 years that the project has been under the direct oversight of the DFID.

Findings of the Audit

66. **MON #3 has been repeatedly long delayed.** The drilling of MON #1 and MON #2 proceeded largely according to the budget. However, other aspects of the project lagged for long periods at a time e.g., little happened with the project between the Annual Review dated January, 2014, and the next Annual Review dated October, 2015. [Source: DFID Annual Review, October, 2015, p. 1.] The project stalled again from 2016 onward. As of December, 2018, MON #3 continues to be idle and its prospects remain uncertain.

67. **MON #3's delays caused much higher well cleaning costs.** The original plan was to clean the well with acid and pressurised water, and that was to be undertaken shortly after the drilling. However, this did not occur, and thus the bentonite has had time to bake and to harden in the well, thus making the successful cleaning of the fissures and the pore spaces much less likely. [G.P.S.C.'s meeting-notes, October 3, 2017: Item 3.1] These meeting notes also stated that the delay for MON #3 was already 9 months and threatened the scheduled completion date of December, 2018. [Item. 3.2]

68. **Oversight changed from MCWEL to DFID.** The drilling of MON #1 and MON #2 was under the supervision of the MCWEL on behalf of the GOM. In October, 2014, after stating that it had found deficiencies in GOM's project management capacity and capabilities, the DFID decided to intervene and to assume direct management of the project for MON #3 onward. Nevertheless, under DFID's supervision, major project implementation delays occurred during the ensuing year to the extent that the project effectively stalled. [Source: DFID Annual Review, October, 2015, p. 1]

69. Absences or changes of DFID's personnel. Given DFID's decision to replace MCWEL in having direct oversight of this project, both the evidence that we gathered and the other stakeholders' views indicated that the efficiency and the effectiveness of project management and governance have suffered to some extent from (1) the recurring unavailability of the DFID's personnel on the island (e.g., for some meetings of the GPSC and other on-island functions), (2) changes of the DFID's assigned personnel, and (3) vacancies in these positions. Attempting to manage projects remotely/overseas is not appropriate in these circumstances. Our own experiences in conducting this audit supported these observations by stakeholders, as all of our interviews and communication with the DFID's representatives were via telecommunications.

70. Ultimate completion date delayed by 5 years. The project's completion-date was originally March, 2016, including the commissioning of power-factory. However, under DFID's oversight, as of progress-reports for year 2017, the revised projection was for completion in the year 2021.

71. Hiring of Project Manager delayed by years. Under DFID's oversight, the project-manager's hiring date was originally expected to be by July, 2016, to manage phase 3 (MON #3) and phase 4 (including the commissioning of the geothermal power factory). [Source: DFID's Addendum to Business Case, 2014, paragraph 25(VI), p. 7.] However, the Project Manager had announced to GOM his resignation. Also noted was the imminent departure from Montserrat of the DFID's Resident Representative of the past 3 years.

72. Funding: not available from CARICOM. The MCWEL sought progress with regard to possible support from the CARICOM Energy Desk for the project and subsequent report indicated that the CARICOM Secretariat has no funds or manpower to provide support for this project.

73. Feasibility Study: Still to be determined and costed. Since MON #3, the cost of the feasibility study needs to be determined, after which the funding will need to be arranged. The GPSC noted that estimated costs were provided and suggestions were received as to how to approach the different activities of the study. The feasibility study is vital for determining the next steps forward and possible funding may be secured by DFID to enable completion of the exploratory phase of the project. We found no evidence (a) that the contract for study has been awarded or (b) that the study was completed.

74. Contractor's lapses in security of premises. The Environmental Specialist reported that, during the site visit on October 3, 2017, for the first time in the past 10 months, the project site was unmanned and unsecured.

75. Well Cleaning: Delayed; extra costs incurred. The original plan was that the geothermal well (MON #3) would be cleaned with acid and pressurised water shortly after it was drilled. Because this did not occur, the bentonite hardened in the well, thus making the successful cleaning of the fissures and pores less likely.

76. Water Tanks or Mud Holding Tanks. Several issues arose pertaining to the cleaning of the tanks:

- (a) **Delays:** e.g., [1] in getting responses from the contractor; [2] in the contractor's scheduling of the cleaning;
- (b) **Separation of duties:** The MCWEL provided the equipment, but the contractor supervised the actual cleaning to ensure that it was conducted in an environmentally friendly manner.
- (c) **Lack of personnel/capacity:** The MCWEL did not have the manpower to supervise the works.
- (d) **Contractual issues:** The supervision of cleaning the tanks was not a part of the contract, but the contractor agreed to supervise it.
- (e) **Funding shortfalls:** Although there was funding for the cleaning of the tanks, there was no budget for a supervisor.
- (f) **Recruitment:** The MCWEL could go to the market to find an appropriate person for the job. However, previously, when the MCWEL advertised the vacancy, there was a lack of interest.
- (g) **Uncertainty:** With a lack of definite arrangements for the tank-cleaning and supervision, the GPSC considered some options: (1) the selection of an individual who had expressed interest; (2) the hiring of a supervisor via the MCWEL's staff, or (3) the paying of the Specialist Project Officer from MUL to supervise the works.
- (h) In our exit meeting of February 6th, 2019, MCWEL's representatives advised that another recurring issue was the DFID's unwillingness to pay GOM employees (a) overtime allowances for such extra responsibilities and (b) Hazard Allowances for working in the Exclusion Zone.

77. MON #3 & beyond: the DFID's restricted role. From the DFID's perspective, after (a) the well will be drilled, (b) the geothermal resource will be tested, and (c) the yield and potential will be known, DFID's involvement in the Geothermal Project will end. It will then be for the GOM and the private sector to develop the geothermal resources. The DFID's representatives wanted to ensure that everyone had a clear understanding of the DFID's involvement in the project; after the completion of the exploratory phase of drilling, it will be the responsibility of the GOM to look beyond the DFID to the private sector and to international financial institutions for

expertise and funding to exploit these resources. There was a 14 month window to investigate these options, before the exploratory phase was slated to end i.e. December 2018.

78. Dredging at Plymouth has been long delayed. The GPSC discussed the plan to dredge the Plymouth jetty (for the movement of incoming and outgoing project-related equipment). It agreed to have a survey of the jetty done in December, 2017, to determine the volume of material to be removed (if any). This would then have to go through a competitive procurement-process. Any dredging would need to be scheduled in line with the demobilisation dates. DFID's representatives requested confirmation from the contractor of the likely dimensions of the vessel.

79. Contractor's lapses: Interruptions of Power & Fuel. The generator had no fuel for four (4) days and there was an issue with the refuelling. However, the arrangement of refuelling was established by the contractor, and not an issue caused by anyone else.

80. Contract management: Prolonged delays in negotiating the second contract for the drilling. The DFID's representatives met with the contractor and reported that the proposed cost of the project from the contractor is currently at the top of the DFID's budgeted range. This meant that, if the quoted cost were accepted, all the money allocated to the project, including that allotted for the long-term testing, would be exhausted. It was, therefore, still an unacceptably high proposed cost and needed to be reduced by £300,000 to £400,000 in order for the project to proceed. The GPSC discussed the possibility of engaging a different drilling company and of terminating the negotiations with the current drilling contractor. The DFID's representative responded that it cost about £1,000,000 to get the drilling rig onto the island; the PWD's representative added that it would cost even more to mobilize. The problem for DFID is in reaching agreement about the new contract, but, if no agreement can be reached, then it will be the end of the project.

81. Protective sheds for the geothermal wells: Repairs delayed for months. The repairs to the protective sheds at MON #1 & MON #2 were not done for at least three (3) months, as a budget had not yet been identified. The PWD was responsible for the developing of the estimates.

82. Contractor's lapses: Rusting of Drilling Equipment. The Environmental Specialist circulated a site report, which made notes of several observations. One concern was the condition of some of the drilling contractor's equipment, which exhibited a high level of rusting. Two of the firm's employees were scheduled to be on the island from the 24th to the 30th January 2018, and would be expected to inspect and to maintain their equipment. They were informed

that they need to contact the MVO's Director and the Environmental Specialist for an on-island induction.

83. Environmental Management Plan. The Environmental Specialist completed the Environmental Management Plan and circulated it for comments from the GPSC. The MCWEL's representative requested that the deadline for comments be extended a few more days, to allow him the time to communicate his comments on the EMP, and this was agreed. However, several months later, the EMP was still waiting to be approved and signed by DFID.

84. Testing of the Geothermal Wells (especially MON #3): Issues for the short-term tests & long-term tests. The MCWEL's representative advised the GPSC that the short and long term testing still needed to be conducted after the drilling would be completed, but before the end of December, 2018. The DFID's representative stated that the scale and scope of the testing would need to be determined, but the DFID had had some discussions with the Minister, MCWEL, on how detailed the testing would need to be: e.g., [1] Would the first two wells need to be retested? [2] Would they simply use the initial testing information? [3] Which type of testing is required for MON 3, given that the stakeholders already know that there is private sector interest in the Geothermal Project?

85. Gaps in monitoring and record keeping. From the evidence that we found, there is no comprehensive system that is documented for checking, for monitoring, or for reviewing critical metrics such as (a) service quality, (b) employee satisfaction and achievements, (c) client satisfaction, (d) fault calls, and (e) disruptions to service/utility delivery. Matters are usually handled (e.g., by telephone or in person) whenever they arise, but without adequate records in most cases. Hence, in many instances, valuable organisational history, service related data, and useful statistics are unavailable and/or they are available, but are not being used. Happy employees create positive service-outcomes and satisfied public-service customers, which, in turn, reinforce employees' sense of satisfaction, purpose, and meaningful contribution to national development.

Analysis of the Findings

86. Poor or under-use of electronic systems. MCWEL and its Departments, as well as many of the project related contractors/suppliers/businesses in Montserrat, have limited and inadequate internal administrative systems. In many client facing functions, there is little or no use of electronic channels e.g., they have no websites and or online channels. The widespread availability of e-commerce websites, online accounts, and online banking would enable real-time confirmation and viewing of transactions by employees as well as all end-users, customers, project

contractors, other suppliers, or stakeholders interacting with service providers in any capacity. These are important steps towards achieving the GOM's ICT Strategy and the Montserrat SDP, which also includes ICT as one of the four targeted economic pillars.

87. Underdevelopment of human resources. In this study, most of the persons surveyed reported lack of trained staff and/or infrequent opportunities for training on Montserrat. Over the past 20 years, more than 50% of the population, including many persons who had valuable knowledge, experience and skills within the public service, left the island permanently. Attracting and retaining suitable candidates has been challenging for filling many vacancies, some of which have persisted for months or years. Key examples of this are the chronic shortages of (1) Environmental Specialists, (2) Energy Specialists, and (3) certified Project Managers, including recent vacancies that persisted for up to one to two (2) years.

Recommendations

88. Review recruitment, compensation & retention of talent. To provide high standards of service, the MCWEL must continue to liaise with the HRMU and with the DFID to address the identified HR issues. For instance, hiring must be done more expeditiously and effectively to eliminate the protracted internal and interdepartmental delays (e.g., between the HRMU, the MCWEL, the PWD, the EU, the GU, & the DFID) that cause qualified candidates to be lost through slow recruitment processes and/or not retained for the long term.

89. Upskill and hire proactively. The MCWEL must continue to liaise with the HRMU and with the DFID to plan for the internal long-term staffing needs as well as shorter-term project related staffing issues. It is needful (a) to increase the numbers of public works and project related officers in Montserrat, and (b) to hire/develop the new skill-sets required for the 21st-century context. In the short term, the most effective approach is to hire those with the necessary expertise, qualifications, and experience for the emerging areas (e.g., solar energy, electric vehicles, and geothermal energy) and the development of those already within the MPS and the project management ecosystem.

CHAPTER 6: MANAGEMENT RESPONSE

SECTION 1: DFID's Comments

DFID (OTD)'s overall assessment

DFID believes that this report includes factual inaccuracies, is not a fair representation of events, and does not reflect the views and perspectives of all stakeholders.

The project was challenging, but ultimately the exploratory drilling phase has concluded with the confirmation of a Geothermal resource. DFID grant funding was required as GoM was not able to attract the necessary private sector funding to confirm the existence of a resource.

The drilling of MON1 and MON2 showed positive results. The problems experienced on MON3 have been frustrating to all parties, however GoM colleagues have been provided with extensive analysis and remedial information to resolve the MON 3 issues.

DFID remains committed to supporting GoM as it continues its engagement with potential private sector partners in relation to the surface developments. Provision has been built into the new CIPREG programme for any further technical expertise GoM require.

DFID (OTD)'s specific comments on findings and comments:

Under DFID's oversight, the project has stalled since MON3

Technical challenges were faced in relation to the drilling of the 3rd well. However, the suggestion throughout the report from [Page x, para 4] that DFID only had direct oversight for the MON3 drilling is erroneous. OTD has had management and programme oversight for the full duration of the project.

The only management change during the project's lifetime was that procurement of the 3rd well was led by DFID.

DFID's personnel absences/changes affect project management

Natural turnover in DFID staffing was managed to avoid gaps in the Senior Responsible Owner, Lead Adviser and Programme Management roles. The statement that "such technical issues were entirely expectable" is erroneous as is the statement that GoM advice was ignored in the budgeting for the MON3 drilling programme. DFID team both

on island and in the UK liaised closely with GoM colleagues both on island and through the project steering committee as demonstrated by the steering committee minutes.

DFID's engagement going forward; reference to DFID not engaging with third parties and a need for an update on MON3 for private sector engagement

DFID remains committed to supporting GoM as it continues its engagement with potential private sector parties in relation to the surface developments and technical expertise has been programmed.

DFID (OTD) Observations on Key Recommendations

Urgent need to improve contract management [page xi, para 8]

DFID continues to support GoM in reforms to its corporate systems including its procurement, audit and programme management functions. Funding is also provided for key TC posts in these areas. The new CIPREG programme will see close engagement between DFID and the recently appointed GoM Programme Management Officer.

Need for more flexible budgeting [page xi, para 9]

DFID and GoM continue to cooperate closely to ensure effective and efficient budgeting of future capital projects, ensuring value for money and strengthened risk management. Improvements in Public Financial Management is a key aim of the recently approved Governance Reform and Institutional Development Programme.

Review and assess committees and their members [page xi, para 10]

DFID recognises the value of close engagement with GoM counterparts through project committees or boards. In addition, the meetings are scheduled well in advance with a clear agenda and programme.

Improve recruitment, retention & succession planning [xi, para 11]

DFID accords due importance to succession planning and ensuring business continuity through critical staffing deployments. In addition, it continues to support GoM fill key critical staffing gaps and develop its in-house capacity both in the short as well as longer term. Effective succession planning is crucial to these efforts. GoM are also working on the recommendations of the Technical Cooperation staffing review to ensure GoM receives the maximum benefit from the technical corporation assistance it receives.

SECTION 2: MCWEL's Management Response

General Comments

1. No reference is made in this report to the Memorandum of Understanding (MOU) between GOM and DFID for the geothermal project. This is one of the most important documents which had set the parameters and guided the project and provides insight for the unfolding and development of the geothermal project.
2. A number of references are being made to external factors which are not directly related to the geothermal project. For example, items 86-87 of the original report.
3. It is important that the report highlight and conclude that the practice of the funding agent acting as the contracting authority is not good governance and standard project management practice.
4. There was gross cost underestimation on DFID's part as to the full scope of the project. This led to scope creep, cost and time overrun coupled with failure to deliver a successful Well.
5. There were omissions from the drilling supplier's tender document developed by DFID -;(maintenance of the water holding tank, safe disposal of garbage etc.) which created gaps.
6. Planned contingencies were removed from MCWL's budget estimates, for site preparation works, which is unlike standard project management practice.
7. During implementation of MCWL's site preparation aspects which aligns with the MOU, DFID's Infrastructure Adviser stopped the works for in excess of three weeks citing the need to gain an understanding of the implementation cost.
8. Although the MOU carried a budget for the works, DFID continuously interrupted the progress of works to gather understanding of project activities. This entailed redeveloping quantities and generating revised estimates; these were frequently questioned and went through a stage of processing for approval before the works can continue at the MON-03 site.
9. During the site preparation works, new processes were introduced which led to increased stress, delays and frustration on the HR assets.
10. The audit looked at the geothermal project's ecosystem but little information was reflected from project players such as the drilling contractors and sub-contractors who were involved in the project.

Main Findings

6. Recruitments/Appointments are too slow.

The Project Manager left when the project had already come to a halt, awaiting DFID's actions. DFID as the contract administrator was unsure of the direction of the project and so there was no urgency to recruit another Project Manager. In addition, MCWL agreed with central GoM and DFID after the departure of the Project Manager, that it would be more prudent not to employ another Project Manager for Geothermal but to have the duties under that post subsumed under the Director of Energy post. This was done.

The Environmental Specialist was working in the Department of Environment and represented that department at the GPSC level. This individual was also new to the science of geothermal exploration like most of the steering committee members. DOE would have had to indicate another suitable replacement.

The Deputy Chairman for the GPSC was a DFID representative so filling this post was a matter for DFID.

Key Recommendations

8. Urgent need to improve contract management.

We agree with the recommendation that there is an urgent need to improve contract management. This role should stay within GoM/MCWEL and not with DFID. Going forward it is uncertain whether DFID or GoM will deal with contract management. Agreement with the Drilling contractor was with DFID. It is expected that project management for this project going forward would be done by the Director of Energy who is being currently recruited by GoM. He/she would have the responsibility for Energy in general and not just geothermal operations. This was recommended by the former Energy Committee.

Regarding succession for the Geothermal Manager, while that person worked in that role, MCWL engineers would have understudied him. As explained in #5 above, there was no need to replace the Geothermal Manager.

Regarding succession for the DoE representative, the representative who departed did not possess any special skills in the area of geothermal but rather in EIAs, so there was no need for any succession from her. Before she represented DoE, the role within the GPSC was carried by the Director of Environment and the Environment Technician.

9. Need for more flexible budgeting.

MCWL agree with this finding and has suggested this but without uptake. This should be clearly highlighted to DFID in the provision of flexible budgets covering risks, inflation and contingencies.

10. Review and assess committees and their members.

(1) Absenteeism

The overall attendance at meetings reflected that the bulk of the absences were from the DFID representatives which the Permanent Secretary of MCWEL have no control over.

There was always a representative at these meetings from MCWL. In fact, MCWL presented 2 Civil Engineers and 2 Directors (PWD Director and MCWL Strategic Director).

Participation rates dropped when the drilling operation started at the MON-03 site. At such stage, the Drilling Supplier, Site Supervisor, (all DFID contracts), along with the Geothermal Project Manager led the charge. There were times when DFID would have had meetings with the Drilling Supplier without involving the Steering Committee. Further, DFID's Site Supervisor was never involved in these meetings although GoM/MCWL would have involved its Site Supervisor at both the Steering Committee and Infrastructure Board Meetings for MON-01 and MON-02.

The level of absenteeism became noticeable when drilling activity ceased at MON-03 drill site. This was around the period when DFID and IDC embarked on the long period of negotiating new terms and conditions for a revised contract which did not materialize. This point on absenteeism is the case for MON-03 drilling only. MON-01 and MON-02 were different.

(2) Presenteeism (dutifully attending, but not functioning or significantly contributing)

The point about participation rates, outputs and outcomes cannot be measured unless there are contractual deliverables, and with the committee made up of diverse skill sets this can only be applied to their areas of expertise. This emphasizes the need for this Audit to reflect the content of Committee Members' TOR coupled with the content of the MOU which are both specific and time bound.

Also, in retrospect, perhaps the meetings were too frequent (weekly), and persons would not have been able to attend each time given other priorities, leave, sickness, travel etc. With that level of frequency, meeting times were not always amenable.

11. Improve recruitment, retention, & succession planning.

The post of Director of Energy is being advertised with salary commensurate with qualifications and experience which means that compensation is not a deterrent. Filling of this role is fully dependent on market response. Staff of MUL and MCWL would also have understudied the previous Project Manager. As an added effort to ensure local skills are available in the geothermal and energy fields, the aspect of training and development is now included in the ToRs for contractors being recruited.

CHAPTER 2: GOVERNANCE

Findings of the Audit

15. Geothermal Unit long delayed; then, under-performing.

It is stated within the (DFID Annual Review, Jan, 2014 p.1 that; *"DFID has agreed to fund the recruitment of an on island project manager who will be embedded within the Ministry of Communications, Works & Labour (MCWL)"*). Hence, MCWL under its duly authorized Accounting Officer for this project was identified to lead and implement the project which included managing and signing variations through MoF.

The Geothermal Unit was envisaged to provide geothermal and project management expertise for day to day activities and assist with building local capacity. The genesis of

geothermal, going back to 2006 and earlier, begun with MCWL. In accordance with the Laws of Montserrat, the Ministry is the technical arm of Government.

19. The GPSC has a high rate of absenteeism.

See 9(1) above

20. Several members of the GPSC make little or no contribution.

See 9(1) above

22. The GPSC: Slow appointment process.

The Deputy Chairman for the GPSC was a DFID representative so filling this post was a matter for DFID.

23. The GPSC: Terms of Reference long delayed/unfinished.

There was considerable back and forth corresponding with DFID on a revised ToRs due to changes which were necessary within the project governance which took time.

25. Tendering Process: Land purchases are often long delayed.

If the technicians were allowed to go through with their work without DFID's interference, the negotiations would have gone through successfully within the allotted time and approved budget. Their involvement created complications in the land acquisition process for MON-03. DFID felt they needed to be involved in the land negotiation process which then led to the outcome of over time and cost for acquiring the land.

Recommendations

27. Clarify and confirm the GSPC's Terms of Reference.

The last GSPC which was approved by Cabinet will always be in place until Cabinet approves a new GSPC. The membership comprises of posts and not individuals so there is always coverage in anyone's absence.

28. Expedite appointments/replacements.

There is no urgency or alarm concerning appointments/replacements for the GSPC. The last GSPC which was approved by Cabinet will always be in place until Cabinet approves a new GSPC. The membership comprises of posts and not individuals so there is always coverage in anyone's absence. It is expected that DOE will provide new representatives as necessary.

29. Review and assess committees and their members.

(1) Absenteeism

See 9(1) above.

Also, the Permanent Secretary of MCWEL will be guided by MOFEM and Cabinet regarding any added oversight of public committees.

30. Improve induction and orientation of committees and their new members.

Members of the GPSC are already adequately induction and orientated which was not the cause of any deficiencies with individual attendance and participation.

DATA & COMMUNICATION

Findings of the Audit

33. No comprehensive Electronic Information System.

It has been noted that in the quest to implement Electronic Information Systems, both Internal and External auditors have expressed their requirement to have certain manual files available to facilitate their ease of access. We also recognize that their abilities are sometimes limited in being able to access electronic files completely. Also, until there is a proper dependable seamless electronic system in place, there is need to have a secondary paper storage (back-up) of digital information in the event that the system crashes or is compromised. Paper copies of documents are also kept as evidence in the event of claims against the Ministry or wider GoM. The GoM central agency responsible for government data would need to provide clear directions on changes for data storage. MCWL is open to any change which would create the efficiencies mentioned.

34. Rising risks and costs of information assets.

See 33 above

36. Reporting: Timeliness and quality need improvement.

This was the case where the Project Manager pushed through reports without the knowledge of the Head of Department. It should also be expected that if technical persons hired at the rate in excess of \$400,000 per year, who are responsible for writing reports, they should be expected to write flawless reports not requiring Heads of Department and Chairpersons of Committees to check them.

37. Internal reviews/controls are inadequate.

The Chairman, Director PWD at that period of time, was responsible for the accuracy of the meeting Minutes with input from the members.

45. Gaps between external views/news versus insiders' views/facts.

Items #38-45 above. It is agreed that Communication concerning geothermal require improvement. This is a certain symptom of the change in governance since the changed oversight of MON-3 by DFID and prior to that the shared fragmented responsibility for the project. Any communication to the general public and stakeholder would require clear understanding and arrangements between the parties and the statement in #41 above explains it well; 'the relevant Minister did not have any official information from the DFID and, hence, would not make an official statement. Without receiving the information from the DFID, Committee-members representing MCWEL did not think that it was wise to make a statement.'

46. Early Market Engagement: outcomes and uncertainties.

The EME survey was not included in the MOU between DFID and GOM. However, MCWEL, led by the Minister, took the initiative to test the private sector's appetite for geothermal development going forward. Further, the EME was not within the GPSC's TOR.

47. Early Market Engagement: delays in analysis and reporting.

See 46 above

Recommendations

49. Install up-to-date security for files/staff/premises.

The costs and risks associated with the retention of paper and physical documents is noted and agreed. However, the following considerations are also to be noted;

- i. MCWL has continued to keep paper files as both Internal and External auditors have expressed difficulty in accessing electronic documents for their audits and even when electronic files are made available to auditors, we recognize that their abilities are sometimes limited in being able to access files completely.
- ii. Paper copies of documents are also kept as evidence in the event of claims against GoM or the Ministry.
- iii. Until there is a proper dependable seamless electronic system in place, there is need to have a secondary paper storage (back-up) of digital information in the event that the system crashes or is compromised.
- iv. The GoM central agency responsible for government data would need to provide clear directions on changes for data storage.
- v. Matters pertaining to remote electronic data storage (e.g., cloud-computing) are for GOM DITES to address.

50. Internal Communication: Recommended improvements within the Steering Committee.

Item (1) is a Project Manager's lead responsibility: identify risks, qualify and quantify; monitor and manage risks. The steering committee's role is to provide guidance and information necessary to aid the Project Manager in risk identification.

Item (4). This was the responsibility of the contract administrator DFID, particularly in the management model applied for MON-03. Again, the committee's TOR would have laid out the responsibility of each member.

Item (5). This activity was already captured on a monthly basis and presented within the monthly and quarterly reports to MOFEM. This could have also been shared by the Project Manager.

51. Improve interdepartmental flows of information.

Information was sufficiently communicated across departments through GPSC representatives reporting back to their Heads. Also, GPSC representatives shared

information within their Ministries. The Minister had access to monthly and quarterly reports.

52. Improve the quality of reports.

It is unclear what precisely is suggested here and to what end.

53. Document inputs and learning.

This is a very good recommendation. However, the applied management model applied by DFID was fragmented which made it difficult to gather and collate this knowledge base platform.

55. Improve record keeping and file management.

The GoM central agency responsible for government data would need to provide clear directions on changes for data storage. HRMU would need to provide such training resources and/or provide full time trained staff for these projects.

MANAGEMENT OF HUMAN RESOURCES

Findings of the Audit

58. HR Issues: No continuity for some key skills/posts:

It is not protocol for the same person to develop and monitor an EMP. One of the key deliverables of the ESIA consultant captured the formation of the EMP. It is the drilling contractor's responsibility to implement the EMP through the contractor administrator (DFID) with the representative from DOE monitoring such implementation. Further, it is incorrect to state that there was no suitable individual from DOE to monitor the implementation of the EMP since before the recruitment of the said representative, these functions were being carried by others in the DOE. Therefore, the EMP draft and subsequent monitoring could have been done by the DoE. No request was made to do such. Such an activity was not dependent on the Strategic Environmental Specialist.

59. Inadequate monitoring and review mechanisms.

Resources for a full time Secretary with the required skills will be required for these projects if these are the expectations.

60. Recruitment: Issues arising (MON #3 under DFID's oversight).

The Steering Committee's TOR addresses the scope and extent of geothermal project which did not include handling with the TOR for the Project Manager nor the recruitment of personnel for the project. These matters are dealt with by MRMU.

Recommendations

61. Reduce/eliminate all forms of garbage/pollution.

This matter was the contractor's total responsibility. DFID as the contract administrator would have made provision in the bill of quantities for the contractor to manage the site.

In fact, the contractor became the responsible agent for the site for the drilling operation upon GOM handing the site over to DFID & the drilling supplier.

62. Improve oversight of health & safety on all project sites.

Supervision of project site activities should be defined in the contract document and carried out by the contract administrator (DFID). MCWEL supervised and ensured that its staff under the 'site preparation stage' complied with health and safety measures. Hence, health and safety protocols were in place to include orientation for contractors. The suggestion of collaboration on a wider and more general basis is a direct responsibility and has to be initiated by other agencies/ministries. MCWL will always support through its Labour Department for training in these areas and has been doing so consistently.

63. Monitoring and review mechanisms.

The GoM central agency responsible for government data DITES would need to provide clear guidance and assistance on the systems referred to. MCWL is willing to work with HRMU to ensure that such training is provided. Resources for a full time Secretary with the required skills will be required for these projects if these are the expectations.

PROJECT MANAGEMENT

69. Absences/changes of DFID's personnel.

The project suffered as well due to DFID persons assigned to the project did not have the relevant skills to manage such a project.

73. Feasibility Study: Still to be determined and costed.

This feasibility study will determine a suitable configuration amongst the wells: MON-01, MON-02 and inclusion of MON-03's potential. It will also recommend a suitable surface plant based on the existing geothermal resource and provide various economic options model. No funding has yet been received from DFID to conduct this study.

74. Contractor's lapses in security of premises.

This observation refers to the MON-3 site. Security of the site was the responsibility of the drilling contractor IDC contracted under DFID.

76. Water Tanks or Mud Holding Tanks.

The cleaning and supervision of the water tanks/mud holding tanks was not a MCWEL responsibility. It was never included in the MOU between GOM & DFID. At the post contract closure between DFID and the drilling supplier, DFID became aware that this was an oversight on their part. DFID approached MCWEL for assistance in this regard.

77. MON #3 & beyond: the DFID's restricted role.

The 14 months window to investigate the options resulted due to the long delay and unfinished MON-3 and is not linked to exploring private sector financing options.

There was no defined objective from the onset for GoM to seek funding from the private sector. This was not GoM's decision, but rather DFID's response to GOM concerning the future of geothermal development.

Exploring private sector funding could not have happened without the completion of the feasibility study. (see#81 above) The feasibility study is an essential deliverable to provide guidance on suitable private sector models to finance the surface plant.

81. Protective sheds for the geothermal wells: Repairs delayed for months.

The identification of a budget was the issue and not the development of estimates. MUL was eventually requested by DFID to do this.

83. Environmental Management Plan.

MCWEL's representative provided the comments.

85. Gaps in monitoring and record keeping.

There was monitoring and record keeping at the drill site. The Geothermal Project Manager would have been involved in this process alongside DFID in monitoring and logging of drilling information at the site. The Works Programme would have shown achievement of various milestones. The HR elements can be developed with the necessary staff available.

Analysis of the Findings

86. Poor/under-use of electronic systems.

GoM would need to provide additional resources for this to unfold. See response also in 55, 59 & 63.

87. Underdevelopment of human resources.

Projects are defined within timeframe/s and skill sets are recruited on a 'needs basis'. There was no chronic shortage of "Environmental Specialists, energy specialists and projects managers" in the case of the geothermal project. These skill sets were recruited accordingly. For example, there was a consultant who undertook the ESIA for the geothermal project for MON-01, MON-02 and MON-03. The Project Manager came on board but then resigned. The project never required an energy specialist.

88. Review recruitment, compensation & retention of talent.

In the case of this project, the skills required for example, Geothermal Project Manager, was acquired. Any delays which were experience are outside the control of GoM since applications could only be processed if and when persons apply. Retention of the specific skill was based on the project's timeframe. Compensation for the skill set was very adequate and quadrupled the average GoM senior officers' pay. The Project Manager resigned for personal reasons. The Environmental Specialist was recruited through Department of Environment purely for other DOE's functions and happened to represent DOE at the GPSC. Retention of such individual would have been is a function of

DOE/HRMU not this project under MCWL. Overall, projects are time bound and therefore projects' skill sets can only be retained against a defined budget.

89. Upskill and hire proactively.

While upskilling is a pertinent recommendation, hiring proactively can only be done in accordance with approved budgets.

CONCLUSION

(a) Under-use of electronic data & reporting.

GoM would need to provide additional resources for this to unfold. See response also in 56, 61 & 65.

(b) Urgent need to improve contract management.

See 7 above

(c) Need for more flexible budgeting.

See 8 above

(d) Health & safety practices are inadequate.

The geothermal project was adequately reinforced with good health & safety measures and practices. For example, MVO provided induction sessions for all individuals who would have worked at MON-01, O2 and O3. MCWL also provided exit routes with reflective signage for safe exit from the geothermal sites in case of a volcanic eruption. Health and safety protocols were in place to include orientation for contractors. Under MCWEL contract administration site preparation works, there were line items that reflected insurance coverage of contractor's employees coupled with health and safety practices. The Labour Department conducts regular health and safety sessions with businesses on Montserrat, to include MCWL. Supervision of project site activities should be defined in the contract document and carried out by the contract administrator (DFID).

(e) Long term planning.

It is incorrect to state that no local capacity has been built. Local capacity was created under the drilling of MON-01 and MON-02. PWD staff was involved from the initial stage of siting the locations to specifically creating the drill platforms and mud chipping tanks.

Further, an engineer was trained to collect data for the short and long term testing of the wells using sophisticated geothermal testing device. Knowledge was also transferred to PWD staff on the procedure to stimulate and shut off MON-01 and MON-2. Additionally two PWD staff received technical training, funded through the United Nation University, firstly on Sustainability and Environmental Management of Geothermal Resource Utilization on the Role of Geothermal in Combating Climate Change and secondly on Feasibility Studies for Geothermal Projects.

Ironically, the local persons had skills they were able to share with DFID. An important element for the project had to do with the preparation of the tender dossier to procure the

drilling supplier. It was thought that lessons learnt from MON-01 and MON-02 would provide a good foundation to create a better tender dossier for the successful delivery of MON-03. MCWL and other GPSC members expressed this sentiment to DFID but were never given an opportunity to add value to the tender dossier. DFID exclusively undertook preparation of the tender document.

CHAPTER 7: OVERALL CONCLUSION

(a) Under-use of electronic data & reporting. A modern project management system requires (1) electronic transcripts of all meetings, (2) scanning of documents, and (3) electronic communication, data, transmission, and storage.

(b) Urgent need to improve contract management. The experience of the past three years revealed an urgent need to revisit the approach (1) to negotiations with contractors, and (2) to ongoing relationship management. Several key persons left the project/island without clear succession plans or timely and suitable replacements.

(c) Need for more flexible budgeting. This is especially important with long-term projects. Over time, projected costs tend to rise and new costs and issues emerge, making original estimates of limited relevance. Risks and contingencies need better planning. In the past several years, an overly rigid approach to budgeting and to negotiations with contractors has caused long delays in projects. Overall effectiveness, relevance, and value for money are more important than simply getting the lowest price or input-cost on contracts or on items to be procured.

(d) Health & safety practices are inadequate. Policies and emergency plans must be reviewed regularly, communicated to all stakeholders, and rehearsed at least annually. To minimise injuries, absence days and healthcare costs, Departments must focus on employee education, on prevention of illness, and on providing a safe environment on all project sites.

(e) Long term planning. The GU and EU have been under-staffed since their inception. To be effective, the staff's capacity and skills require significant upgrades to keep abreast both in traditional areas and in emerging topics. Strategic HR management is needed across all related Ministries/Departments. Contrary to DFID's original plan, limited local capacity has been built for developing and/or managing geothermal resources on the island.

(f) Inadequate infrastructure. The MCWEL needs more storage capacity and modern security systems for files, for other assets and for personnel. Departments have, for far too long, reported various unsatisfactory conditions. Repairs and maintenance are frequently delayed.

(g) Renewable energy. Renewable energies are cheaper and readily available to replace old paradigms and imported fossil fuels, along with their risks and costs to the environment, to human health, to the economy, to energy security, to the cost of living, and to the cost of doing business. Green business is vital for the growth of Montserrat's economy generally. In particular, the achievement of the Montserrat Energy Plan requires a transformation of existing modes of power, of transportation, and of business practices to switch to 100% renewable energy by the year 2020 (i.e., within the next 2 years).

APPENDIX 1: OFFICE OF THE AUDITOR GENERAL

Functions

By force of *The Montserrat Constitution Order 2010*, the O.A.G. is established and upheld in its independence and in its functions within the public sector of Montserrat. The relevant section states as follows below:

“Functions of Auditor General

103.—(1) The Auditor General shall audit and report on the public accounts of Montserrat and of all public offices, including the courts, the central and local government administrations, universities and higher education institutions, and any public corporations or other bodies or organisations established by an Act of the Legislature, and may conduct financial and value for money audits in respect of any project involving public funds.

(2) The Auditor General shall submit to the Legislative Assembly annually a report of the accounts audited by him or her under subsection (1) for the immediately preceding financial year.

(3) For the purposes of subsection (1) the Auditor General and any person authorised by him or her shall have a right of access at all reasonable times to all such documents as appear to him or her to be necessary for the purposes of the audit, and shall be entitled to require from any person holding or accountable for any such documents such information and explanation as he or she thinks necessary for those purposes.

(4) In the exercise of his or her functions, the Auditor General shall not be subject to the direction or control of any other person or authority.”

The independence of both (a) the functioning of the Auditor-General and (b) the budgetary allocations from the Government’s national Consolidated Fund to finance the Office of the Auditor General are clearly stated and emphatically declared as follows below:

“National Audit Office

104.—(1) The Legislature shall by law make provision for the establishment of an independent National Audit Office headed by the Auditor General.

(2) The budget for the National Audit Office shall be charged on and paid out of the Consolidated Fund, and must at all times be adequate to enable the full performance of the functions conferred on the Auditor-General by this Constitution or any other law.

(3) The accounts of the National Audit Office shall be audited and reported on by an auditor appointed by the Legislative Assembly.”

In line with international standards for public-sector auditors and global best practices for Supreme Audit Authorities, the O.A.G. of Montserrat espouses the following values and priorities:

Our Values

Respect. We seek to build productive professional associations and cordial personal working relationships with colleagues internally as well as with other public servants externally.

Honesty. We tell the truth even when it is unpleasant or embarrassing. Accurate self-assessment is vital for every person and for every unit of Government to acknowledge its strengths and its weaknesses, and to begin to address performance-gaps and shortfalls from relevant policies, from applicable standards, and from currently binding laws and regulations.

Transparency. Our work is in the service of the Government and the people of Montserrat. Therefore, all of our final reports on engagements undertaken are made available to all stakeholders, to the public and to any other interested parties via publication on our website.

Confidentiality. In the course of our duties, we protect the identity of all persons who reveal secret information or private details. Our reports disclose general conclusions and focus on practicable solutions rather than highlighting any person or department directly.

Accountability. By definition, the work of the O.A.G. is to hold accountable all public-sector Ministries, Departments, agencies, public-private partnerships, and State-owned enterprises. In turn, we are accountable (a) to colleagues through quality-control procedures and through peer-review, (b) to local, regional and multinational professional accounting and auditing bodies, and (c) to global standards-setting bodies. Finally, the O.A.G. itself is subject to annual audits by an independent external audit-firm of the highest repute.

Objectivity. Auditors must remain impartial, devoid of partisan bias, without membership of political parties, and otherwise focused on the truth and the facts, rather than personal opinions, emotions, or self-interest. All of our analyses, conclusions and recommendations are based on facts and verifiable and auditable evidence, supported by retained audit-papers and work-in-progress files throughout each and every audit-engagement. Information is gathered solely for the purposes of the official audit and never to be used for personal advantage of either the auditors themselves or of any other person, party, entity, or enterprise.

Independence. Vitally important to the respectability of the O.A.G. is the independence of the Auditor-General and of his/her staff both in appearance and in fact, both in public discourse and in social intercourse. Auditors must avoid any potentially compromising personal relationships or business activities with any public-sector auditee. Where he/she has (i) any material private indirect interest and/or (ii) any direct financial or other interest in an auditee and/or (iii) in or with any of its employees, suppliers, investors, creditors, or other related parties, an auditor must either refrain from any part of an audit of such entity and/or disclose the nature and the extent of such actually or potentially compromising interest whatsoever it be.

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APPENDIX 3: TERMINOLOGY

Efficiency. Efficiency is measured as the ratio of inputs per given or desired unit of output. The performance-goal is to minimise inputs and/or input-costs per unit of output.

Productivity. Productivity is measured as the ratio of actual units of output per given unit of each input. The performance-goal is to maximise output per unit of each input.

Effectiveness. Effectiveness is measured as the ratio of actual units/costs of all outputs to the desired units/costs of output. The performance-goal is to minimise gaps between desired output(s) and actual output(s), subject to the desired quality of that output.

Value for money. This is the *desired surplus and/or value of benefits* derived from actual output(s), deliverable(s), or outcome(s). It is measured as the consumer's utility or economic surplus: i. e., (1) the actual (and/or user-perceived) value of all benefits of each unit of output, minus (2) the actual costs per unit of each input required to produce and to enjoy the benefits of that unit of output. The performance-goal is to maximise the total value of incremental benefits (minus marginal costs) derived from all units of output (e. g., public services or public goods), subject to the desired quality of that output, and to any applicable standards, regulations, contractual obligations, client-service objectives, or legal requirements.

Performance. This concept defines observable behaviours in respect of a specified function or activity. In practical terms, performance is measured as the comparison of *ex post* actual outcomes with *a priori* desired or pre-agreed outcomes. This lends itself very well to objective definition, measurement, monitoring, reporting, feedback, and recommendations for improvement, wherever gaps are identified between (a) desired behaviours and outcomes and (b) actual behaviours and outcomes. Learning, for instance, is measured by improved behaviours.

Performance audits. Performance audits are objective, external, and independent reviews of activities, processes, organisations, financial statements, and/or other objects of interest, having explicit regard to such parameters as (i) applicable laws, (ii) external regulations, (iii) internal policies, (iv) internal rules, (v) international treaties, (vi) bilateral or multilateral agreements, (vii) industrial benchmarks, (viii) contracts, (ix) codes of conduct, (xi) ethics, (xii) morals, and/or (xiii) professional standards. Performance-audits go well beyond (1) *financial audits* and (2) *internal audits*, for instance, to examine the actual, observable, and measurable behaviours, outputs, efficiency, effectiveness, and value for money of an entity, a programme, an agency, a statutory corporation, or an entire public sector, as the case might be. In this regard, performance auditing is inherently more far-reaching, more strategic, and more consultative than other types of audit. When it is well executed by the auditor(s), and when, thereafter, its findings are wisely attended and its recommendations expeditiously implemented, a performance audit in the public sector has the potential to offer the greatest value for money to the Government and, ultimately, to the people of Montserrat. In short, it pays for itself many times over.

APPENDIX 4: AUDIT FIELDWORK

Questionnaire for Interviewees

Senior Interviewees & Correspondents

- (1) Permanent Secretary, Ministry of Communications, Works, Energy, & Labour
- (2) Resident Representative, Montserrat, DFID
- (3) Deputy Programme Manager, DFID
- (4) Civil Engineer, Public Works Department, MCWEL
- (5) Chairman, Geothermal Project's Steering Committee
- (6) Director, Public Works Department, MCWEL