INDEPENDENT EVALUATION DIVISION
OFFICE OF EVALUATION AND INTERNAL OVERSIGHT

Independent Terminal Evaluation

SOUTH AFRICA

Climate Change, Clean Energy and Urban Water in Africa. Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot initiative in South Africa

UNIDO Project ID: 140341

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Distr. GENERAL

ODG/EIO/IED/19/R.6

October 2019

Original: English

This evaluation was managed
by the responsible
UNIDO Project Manager with
quality assurance by the
Independent Evaluation Division

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Acknowledgements

The evaluation team would like to thank all the individuals and institutions that volunteered their time to be interviewed for this evaluation. Their perspectives and inputs were essential for the assessment, and it would simply not have been possible to undertake this evaluation without their contribution.

Particular thanks are extended to Nicole Algio, Nokwazi Moyo and Robert Novak, all of whom – along with providing deep insights into the project – supported the broader data provision process and managed the logistics of the evaluation visit within South Africa. Thanks also to Adot Killmeyer-Oleche of UNIDO's Independent Evaluation Division for her support and guidance throughout the process.

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Abbreviations and acronyms

Abbreviation	Meaning
ADA	Austrian Development Agency
AFD	Agence Française de Développement
AfDB	African Development Bank
DEA	Department of Environmental Affairs
DOE	Department of Energy
DWS	Department of Water and Sanitation
EEDSM	Energy Efficiency and Demand-side Management Programme
EIB	European Investment Bank
EU	European Union
GCF	Green Climate Fund
GHG	Green House Gas
M&E	Monitoring and Evaluation
NCPC	National Cleaner Production Centre
PMU	Project Management Unit
PSC	Project Steering Committee
RBM	Results Based Management
REEEP	Renewable Energy and Energy Efficiency Partnership
SADC	South African Development Community
SAGEN	South African-German Energy Programme
SALGA	South African Local Government Association
SANEDI	South African National Energy Development Institute
TE	Terminal Evaluation
TOC	Theory of Change
TOR	Terms of Reference
UNIDO	United Nations Industrial Development Organization

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change due directly or indirectly to an intervention.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Lessons learned	Generalizations based on evaluation experiences that abstract from the specific circumstances to broader situations.
Logframe (logical framework approach)	Management tool used to facilitate the planning, implementation and evaluation of an intervention. It involves identifying strategic elements (activities, outputs, outcome, impact) and their causal relationships, indicators, and assumptions that may affect success or failure. Based on RBM (results-based management) principles.
Outcome	The likely or achieved (short-term and/or medium-term) effects of an intervention's outputs.
Outputs	The products, capital goods and services which result from an intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Relevance	The extent to which the objectives of an intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	The specific individuals or organizations for whose benefit an intervention is undertaken.

Executive summary

The *Climate Change, Clean Energy and Urban Water in Africa, Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot Initiative in South Africa* (hereafter "the pilot") aimed to improve energy efficiency within municipal waterworks by identifying and demonstrating technical solutions for reducing costs and greenhouse gas emissions in existing South African facilities, and by identifying and demonstrating options for financing those solutions. The project worked towards these aims through a series of activities including demonstration projects in two municipalities, capacity development for municipalities, knowledge exchange and networking events, and development of policy recommendations and knowledge products to capture the pilot's learning. The work was funded by the European Union (EU) and implemented by the United Nations Industrial Development Organization (UNIDO) in partnership with the Renewable Energy and Energy Efficiency Partnership (REEEP).

This independent terminal evaluation assessed the entire intervention from the design consultation process in early 2015, through to May 2019, just in advance of the scheduled closure in July 2019. The pilot's overall performance was reviewed against the standard evaluation criteria of relevance, efficiency, effectiveness, progress to impact and sustainability. A combination of evaluation tools were applied, with the most important being interviews and documentation review. In addition to assessing overall results, the evaluation also aimed to identify recommendations to inform and strengthen UNIDO's future interventions.

The evaluation found that pilot was a highly relevant intervention that addressed clear priorities within South Africa, and was especially timely given that its implementation overlapped with some high-profile energy and water crises within the country. It was particularly effective at demonstrating the technical and institutional feasibility of deploying energy efficiency within municipal waterworks, and at delivering capacity development for the pilot's core stakeholders.

Perhaps of most value though was the learning generated through the work, which identified the core challenges faced by municipalities when it comes to securing support and finance for energy efficient waterworks infrastructure. Much of this learning was not necessarily exclusive to waterworks, rather it mirrored and validated experience already built within different contexts. However, the pilot's validation of the existing evidence base was still worthwhile, and this learning was well-captured through a series of knowledge products. These products – and the broader experience developed through the pilot – have clear potential to inform and positively influence future interventions within the South African waterworks sector. However, there's a risk that the limited outreach undertaken to date could result in a correspondingly limited uptake of that learning. This in turn could reduce the potential influence of the pilot's work, within South Africa and beyond.

The pilot was less effective at identifying new investment channels and financial models for municipal waterworks but, again, valuable learning was generated through this activity. However, the pilot failed to achieve its originally anticipated outreach beyond South Africa, and the pilot's monitoring and evaluation was undermined by an over-reliance on a poorly articulated logframe that failed to measure the pilot's outcomes and influence.

While the pilot did generate valuable learning, there were a series of significant missteps during implementation. National ownership of the pilot's conceptualisation and design could have been stronger and – most seriously – the initial delivery model and governance arrangements were inappropriate for a UN-led intervention. The pilot's steering committee should never have been chaired by REEEP, and UNIDO's role as Implementing Agency should have been less ambiguous than it was. Unfortunately, these early difficulties have – to a considerable extent – tainted many stakeholders' perception of the pilot, and have somewhat undermined the pilot's substance: an inordinate amount of time and energy was spent resolving these internal issues, rather than on building ownership of the actual work.

Notwithstanding those difficulties, there are opportunities to build on the pilot's achievements. Based on detailed feedback from pilot stakeholders and the evaluation's findings, the following recommendations are made in order of priority.

Develop a clearer knowledge management strategy

1. The likeliest contribution to longer-term impacts will probably arise from the knowledge generated during the pilot, but work is still required to ensure that this knowledge is taken up by audiences within South Africa and beyond.

Embed any successor intervention within broader local and national efforts on energy efficiency and municipality capacity development

2. The highly targeted focus on waterworks was appropriate for a short *pilot* initiative, but waterworks facilities shouldn't be considered in isolation from a municipality's *other* functions and capital assets, rather municipalities and investors (including donors) need to look at how energy efficiency can be incentivised, managed and financed *across* a municipality's operations. Any successor intervention is aligned with municipalities' broader energy efficiency efforts and objectives. Any successor initiative should also be fully aligned with broader government and donor efforts on both energy efficiency *and* municipality capacity development.

Undertake long-term monitoring of capacity development work

3. There was an immediate positive reaction to the pilot's capacity development work, but no mechanisms are in place to monitor the long-term effects and outcomes of pilot-facilitated training.

Ensure UNIDO apply appropriate project development and delivery models

4. Frustratingly, many of the pilot's governance and management difficulties could have been avoided had UNIDO's standard approaches and delivery models been applied from the outset.

1. Introduction

1.0.1 This report documents the terminal evaluation of the *Climate Change, Clean Energy and Urban Water in Africa, Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot Initiative in South Africa* (hereafter "the pilot"). The report commences with an overview of the pilot, followed by a description of the evaluation's methodology. Findings are then presented in detail against the five key evaluation questions and criteria. Building on these findings, the project's performance is assessed against UNIDO's evaluation rating scales, conclusions are presented, and recommendations are provided for UNIDO and other project stakeholders.

2. Overview of the Pilot

2.1 Summary

2.1.1 Across Sub-Saharan Africa, governments and local municipalities are facing an increasingly complex set of challenges when it comes to the management of water and sanitation infrastructure. Most commonly, the primary challenges include increased energy costs (often coupled with insufficient energy supply), water scarcity, ageing infrastructure, limited options for securing capital investment, and increasing pressure to reduce Greenhouse Gas (GHG) emissions. The region's rapid urbanisation exacerbates the situation: as cities grow, a corresponding increase in the capacity of water and sanitation infrastructure is required, which in turn can result in increased energy demand, higher costs (both for energy and for infrastructure maintenance or replacement) and growth in GHG emissions.

2.1.2 Implemented by the United Nations Industrial Development Organization (UNIDO) in partnership with the Renewable Energy and Energy Efficiency Partnership (REEEP), the Urban Water pilot aimed to improve energy efficiency within municipal waterworks by identifying and demonstrating technical solutions for reducing costs and GHG emissions in existing South African facilities, and – crucially – by identifying and demonstrating options for financing those technical solutions. While the pilot's most immediate focus was on demonstrating solutions for deployment and upscaling in South Africa, it was also conceived as a first step towards identifying options for infrastructure and financing solutions that could be applied beyond the immediate context and across Sub-Saharan Africa. The project worked towards these longer-term goals through implementation of four components:

- Implementation of **demonstration projects** in selected municipalities, testing various **technical and financing options within different contexts**
- **Capacity development** to support **sustainability of the demonstration projects**, but also to **build broader awareness** of technical and financing options, and to **strengthen the associated skill base** across South Africa
- **Generate, document and communicate project learning**, including development of **policy recommendations** and other **knowledge products**
- Project **monitoring and evaluation**

2.1.3 Following preliminary consultation workshops in early 2015, the main project was initiated in February 2016. It was originally expected to conclude by January 2019 but received a no-cost extension and is due to close in July 2019. The project's budget was

€1.61m, comprised of a €1.55m grant from the European Commission (EC) and €60,000 of co-financing from UNIDO.

2.2 Main outputs and activities

2.2.1 Figure 1 summarises the main activities delivered through the four outputs:

Inception report developed and technical feasibility and commercial viability of clean energy in waterworks demonstrated	• Selection of municipalities for demonstration projects • Development of baseline energy assessments, technical assistance plans, and scoping of potential technologies for pilot municipalities • Facilitation of procurement processes and installation of selected technologies / infrastructure • Facilitation of financing / resourcing for selected technologies
Public and private partnership established for scaling-up demonstrated waterworks technology solutions	• Targeted capacity development for selected municipalities, aimed at operational staff and decision-makers • Energy efficiency sensitisation and capacity development for broader audiences (i.e. beyond pilot municipalities)
Lessons learnt and policy recommendations on waterworks technologies identified, showcased and disseminated, replication of projects promoted	• Roundtable events to exchange knowledge, build awareness and create linkages across (and within) public and private sector organisations • Development of knowledge products to share project learning, including a Policy Brief (for government-level decisionmakers) and step-by-step Best Practice Guide (for municipalities) • Development of replication strategy
Monitoring and evaluation	• Development of detailed theory of change for project • Ongoing monitoring • Annual progress reporting

Figure 1: Main pilot activities, by output

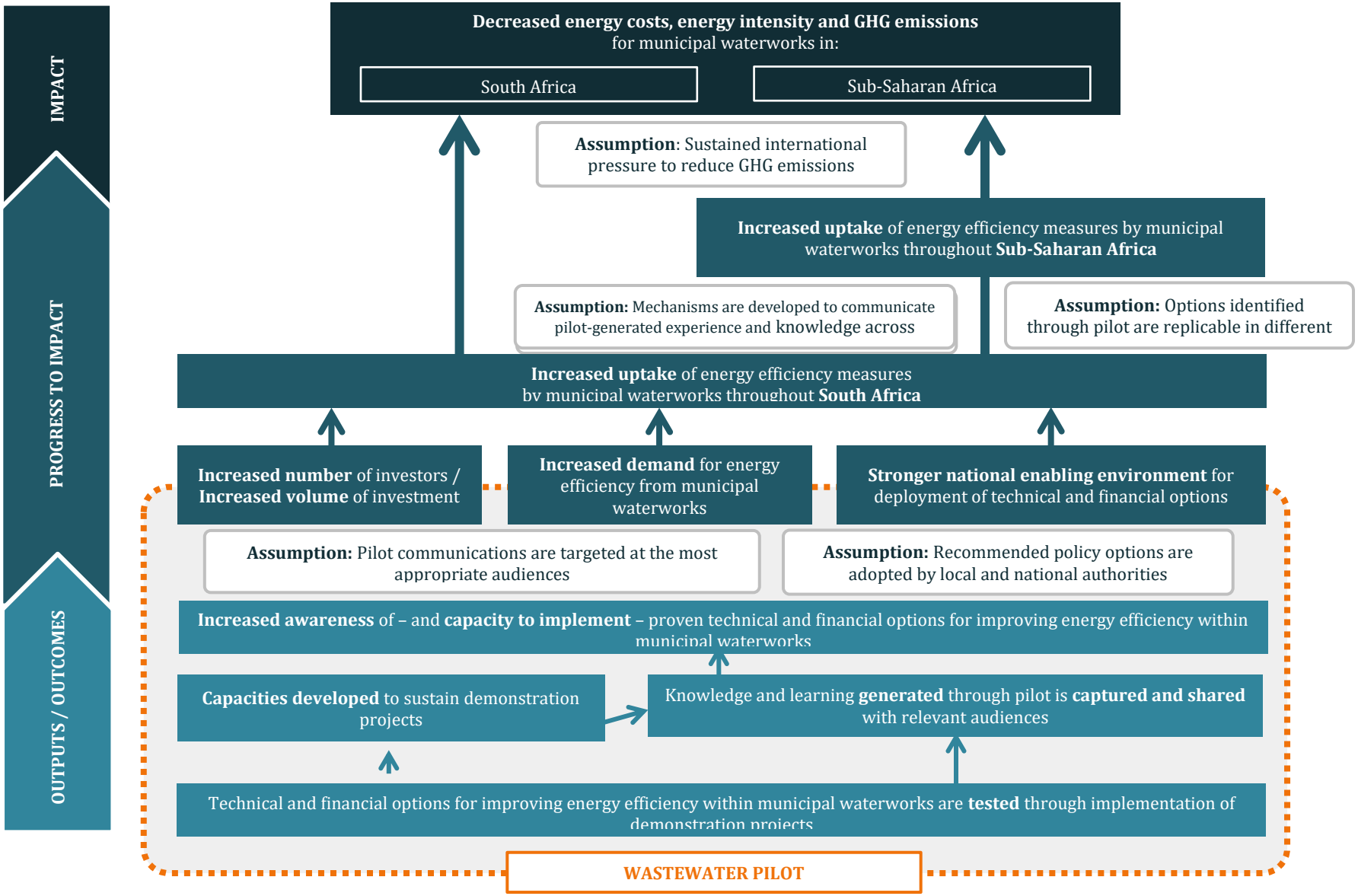
2.3 Pilot theory of change

2.3.1 Theories of change (TOCs) are a common management tool expressing the basic rationale behind an intervention. They describe the results an intervention aims to achieve, the longer term impacts it aims to contribute to, how the intervention works towards those results, and the main assumptions behind the intervention's approach. In turn, TOCs also support the identification of key elements that should – in due course – be evaluated. As such, TOCs are frequently used as the starting point for developing evaluation approaches, and for identifying evaluation questions.

2.3.2 A highly detailed, activity-focused TOC was developed for the pilot during its inception phase. For the purposes of this evaluation, the initial TOC was simplified and refocused away

from activities and more towards the longer-term impact pathways and results that the pilot aimed to contribute to. In turn, this helped the evaluation to better identify potential next steps and recommendations for sustaining and upscaling results delivered by the pilot.

Figure 2: Pilot Theory of Change



3. Evaluation methodology

3.1 Evaluation purpose, objectives, scope and audience

3.1.1 The overarching purpose of the evaluation was **to help UNIDO improve performance and results of future programmes and projects**. To achieve this – and as is standard for many evaluations – the evaluation had an **accountability** objective (identifying results) and a **learning** objective (improving actions).

3.1.2 The pilot had a logframe that established the expected outcomes and outputs, and indicators that were used to track progress against those results. This terminal evaluation aimed to assess progress towards those expected results and – where available – identify any unanticipated results.

Evaluation Objective 1 (accountability / results):
Assess the pilot performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact.

3.1.3 While understanding progress towards results was essential for accountability purposes, the assessment of progress was then used as a foundation for **learning** what had worked well (and why) and what hadn't worked so well (and why). To address this objective the evaluation assessed the broader pilot strategy and processes, exploring elements such as planning and coordination. This assessment then helped the evaluation to develop an understanding of the pilot's overall performance.

Evaluation Objective 2 (learning / improvement):
Develop a series of findings, lessons and recommendations for enhancing the design of new, and implementation of ongoing, projects by UNIDO.

3.1.4 The evaluation **scope** covered the entire intervention and all its activities, from the pilot's design, through its inception in 2015, to its final stages of implementation in May 2019.

3.1.5 The primary target **audiences** for the evaluation are:

- **UNIDO management**, particularly those with direct responsibility for the design and implementation of the pilot, for management of the UNIDO South Africa country programme and regional hub, and for UNIDO teams involved in the design and delivery of other related interventions;
- **REEEP**, as the pilot's executing agency and the organisation leading the day-to-day, on the ground delivery of project activities;
- The **European Union**, particularly those teams and individuals managing the EU's portfolio of work in South Africa;
- The pilot's **national partners and beneficiaries**, including the two pilot municipalities (!Kheis and Nelson Mandela Bay), the Department of Environmental Affairs (DEA)[1], the

[1] Changed to the Department of Environment, Forestry and Fisheries in May 2019

Department of Energy (DOE)[2], the Department of Water and Sanitation (DWS)[3], the South African Local Government Association (SALGA), the National Cleaner Production Centre (NCPC) and the South African National Energy Development Institute (SANEDI).

3.2 Evaluation framework

3.2.1 The evaluation purpose and objectives, the theory of change, and UNIDO's evaluative requirements (as established within their evaluation policy and manual) all provided the basis for the **evaluation framework**, which in turn underpinned and guided the whole approach. The framework was structured against the standard **OECD-DAC criteria** agreed for the evaluation (**relevance**, **efficiency**, **effectiveness**, **sustainability**). In line with UNIDO policy and acknowledging the early nature of the pilot's potential contributions to long-term impact, the OECD-DAC 'impact' criterion was simplified to instead measure '**progress to impact**'.

3.2.2 The framework identified **key evaluation questions**, supported by guiding **sub-questions**. The full framework is presented in annex 1, but figure 3 presents the five key evaluation questions:

1. **Relevance:** How relevant was the pilot to the needs and priorities of South Africa and the participating institutions?
2. **Efficiency:** How efficient was pilot delivery?
3. **Effectiveness:** Did the pilot achieve its planned outputs and outcomes?
4. **Progress to Impact:** How likely is it that the pilot's outputs and outcomes will contribute to long-term impacts?
5. **Sustainability:** To what extent are the pilot's outputs and outcomes likely to be sustained in the long term?

Figure 3: Key evaluation questions

3.3 Tools

3.3.1 To address the criteria and questions, the evaluation drew on a series of tools to gather and analyse qualitative and quantitative information:

- **Interviews:** 30 individuals participated in interviews, primarily conducted face-to-face during meetings in South Africa and Vienna, with some additional discussions held via Skype.
- **Desk review:** A comprehensive literature review analysed documentation such as pilot-produced material (including technical assistance plans, knowledge products, progress reports, web material, management meeting minutes and financial data), and relevant external documentation (e.g. related national policies, evaluations/reviews of other related interventions).
- **Logframe assessment:** The pilot's logframe was a central tool for day-to-day monitoring and was integral to the pilot's progress reports. The evaluation independently reviewed

[2] Changed to the Department of Mineral Resources and Energy in May 2019
[3] Changed to the Department of Human Settlements, Water and Sanitation in May 2019

progress against logframe indicators, providing an assessment of the extent to which the pilot achieved its originally envisaged results.

- **UNIDO ratings:** All UNIDO evaluations are required to rate a series of evaluation and project criteria against a six-point Likert scale, ranging from 'highly unsatisfactory' to 'highly satisfactory'[4]. The pilot's ratings are presented in section 5.3 of this report.

3.4 Key informants

3.4.1 The following groups were the main pilot stakeholders, and consequently were the main interviewee groups during the evaluation:

- **UNIDO:** South Africa and HQ-based personnel that oversaw the pilot's design, development and day-to-day management;
- **REEEP:** South Africa and Vienna-based personnel responsible for pilot development and on-the-ground delivery;
- **Municipalities:** Representatives from the two pilot municipalities, !Kheis and Nelson Mandela Bay;
- **Government of South Africa:** Primarily the Department of Environmental Affairs (DEA) and Department of Energy (DOE);
- **Other participating and beneficiary institutions:** Including public and private sector institutions that supported delivery of pilot activities, most notably Pegasys Institute and the National Cleaner Production Centre (NCPC), and participants in the pilot's roundtable events;
- **Donors:** The EU as the core donor, but also other donors and initiatives with an interest in municipality-level energy efficiency.

3.5 Analysis and reporting

3.5.1 Data analysis and the development of emerging findings were undertaken collectively by the evaluation team. As far as possible, emerging findings were derived through triangulation of data from multiple sources and tools, helping to ensure the robustness and internal validity of the assessment. Emerging findings were discussed and validated with pilot stakeholders through debriefings in Pretoria and Vienna.

3.5.2 Report preparation (including development of UNIDO ratings) was also undertaken collectively, but with the initial report drafting led by the evaluation team leader. The draft report was submitted to UNIDO's Independent Evaluation Division, who circulated to key stakeholders and managed the commenting process. The evaluation team then considered stakeholder comments, adjusting the draft report where appropriate, then submitted a final version to the UNIDO Independent Evaluation Division. The Independent Evaluation Division quality assured the final report and solicited UNIDO's management response for inclusion in the final product.

3.6 Evaluation team

3.6.1 The evaluation team comprised one independent international team leader and one independent national evaluation expert, both contracted by UNIDO for this specific

[4] See page 24, UNIDO Evaluation Manual, 2018.

evaluation. The team received logistical and interview scheduling support from the UNIDO office in Pretoria and the REEEP office in Johannesburg.

3.7 Challenges and limitations

3.7.1 The evaluation team collected and analysed quantitative and qualitative data. As with many evaluations, a considerable amount of this (particularly qualitative data) was based on individual perceptions and opinions. To mitigate any subjective bias, findings were – as far as possible – triangulated across sources, and across tools. Where potentially important findings were identified but it was not possible to triangulate (e.g. data/finding provided by a single source) this is explicitly noted within the evaluation report.

3.7.2 As noted within the above theory of change, the pilot represented only an early step towards economic and environmental impacts for South Africa. The UNIDO evaluation criterion of '**progress to** impact' is helpful here, as it recognises the long timescales to impact that are often inherent to UNIDO investments such as this pilot. In line with this approach – and instead of attempting to identify discrete impacts – the evaluation assessed the extent to which the pilot laid the **foundations for impact**.

4. Findings

4.1 Relevance

EVALUATION QUESTION 1:
How relevant was the pilot to the needs and priorities of South Africa and the participating institutions?

SUMMARY OF FINDINGS
The evaluation found that the pilot was highly relevant to South Africa's needs and priorities, to UNIDO's mandate, and to the work of REEEP. The pilot's focus on energy and water was particularly timely, given that the work's implementation overlapped with some high-profile energy and water crises within South Africa. Despite this clear strategic relevance, national and local government ownership of the work was relatively weak.

Highly relevant to the needs and priorities of South Africa

4.1.1 Evaluation interviewees unanimously identified the pilot as being a highly relevant, timely intervention that clearly addressed national needs and priorities. The high-level theme of efficient energy and water management was unquestionably relevant, but interviewees also felt that the pilot's *specific* focus – improving energy efficiency within municipality-level wastewater facilities – was a relatively underserved area that certainly warranted focused attention. Efforts to improve energy efficiency in South Africa had previously tended to focus on industry, buildings and lighting: but despite facing the same problems of inefficient, ageing infrastructure, only limited work had been undertaken on energy efficiency within the wastewater sector.

Highly relevant to mandate and work of UNIDO and REEEP

4.1.2 The evaluation also found that the pilot was well-aligned to the mandates and competencies of UNIDO and REEEP. Much of UNIDO's recent work in South Africa has been focused on improving energy efficiency, most notably through the Industrial Energy Efficiency Improvement Project. UNIDO also have a long track record of work with the pilot's key national partners, particularly the Department of Environmental Affairs (DEA) and the Department of Energy (DOE). More broadly, UNIDO have an extensive global portfolio of work and technical experience around energy efficiency, water management and climate-resilient industrial development. For REEEP, the pilot represented a clear fit with the organisation's mission of building market readiness (and identifying financing options) for clean energy and energy efficient technologies.

National ownership of pilot design process could have been stronger

4.1.3 When assessing relevance, the evaluation also considered the extent of national ownership of the pilot, both during the early conceptualisation of the work and during actual implementation. Firstly, the concept and initial development of the pilot design was undertaken 'externally' by REEEP and the EU, with no involvement of UNIDO or – more importantly – the South African government. Even for relatively small pilots, such top-down approaches are not generally viewed as good practice for development assistance and go against key international agreements such as the Paris Declaration.

4.1.4 UNIDO were only approached to be a pilot partner when it became clear that the EU would be unable to finance REEEP directly (due to REEEP's legal status) and that an implementing agency was required to take accountability for EU funding. UNIDO's involvement therefore became a necessity for getting the pilot off the ground, but the evaluation also found that UNIDO's engagement strengthened the nascent pilot's approach to national ownership. Once UNIDO were on board, engagement with the South African authorities improved and a formal pre-proposal consultation process was eventually undertaken. Government stakeholders interviewed during the evaluation confirmed that this consultation process helped to build a degree of national ownership and went some way to redressing the top-down approach.

Ownership also undermined through inappropriate governance arrangements

4.1.5 A common tool for building national ownership *during* implementation of UNIDO-led interventions (and indeed many development interventions) are Project Steering Committees (PSCs). PSCs are typically tasked to provide strategic guidance and oversight of donor-financed work, helping to ensure that interventions *continue* to be aligned with national needs and priorities. Committees are ordinarily formed of national stakeholders from – amongst others – government, public and private sector organisations that have an interest in the intervention's focus area. Aside from providing oversight and ownership, PSCs are for many interventions a central mechanism to ensure longer-term sustainability.

4.1.6 Evaluation interviewees were highly supportive of the approach to overseeing the pilot via a PSC and were complimentary of the Committee's membership, with the most important government departments being involved. Several interviewees felt that the early PSCs were particularly valuable for ensuring that the pilot was well-aligned to municipality priorities and processes. However, there was some concern around the relatively limited engagement of the South African Local Government Association (SALGA): although SALGA was a PSC member, some interviewees questioned whether the SALGA representative (an international seconder of a European donor institution, rather than a permanent national staff member) was sufficiently senior. SALGA's engagement was seen as particularly critical given not just their *general* work with municipalities, but also their *specific* work on driving energy efficiency and clean energy within municipalities.

4.1.7 Despite the clear support for the approach of using a PSC, the evaluation found that national ownership was greatly undermined during pilot implementation when REEEP took on the role of the PSC Chair. This was highly irregular for a UNIDO intervention: PSCs for UNIDO projects should be led by a national stakeholder, with that lead almost always being the project's main government partner. Aside from undermining national ownership, if the PSC is chaired by the implementing or executing agency, this is also poor governance: PSCs are analogous to the Board of a private company, and it is simply not good governance to have the 'Chief Executive' (in this instance REEEP) also serving as the Chair of the 'Board' (the PSC).

4.1.8 Although all evaluation interviewees now recognise that this was a serious misstep, it took some time for REEEP to appreciate *why* their chairing of the PSC was inappropriate. This can partly be attributed to REEEP's relative inexperience in delivering work in partnership with UN agencies and national governments (this was REEEP's first project with UNIDO) and – more practically – their understandable desire to expedite the work of the pilot. At the same time, it is not clear why UNIDO did not *insist* on appropriate chairing of the PSC from the

outset, given their institutional responsibilities and accountabilities as the pilot's implementing agency.

4.1.9 The PSC chairing was eventually resolved, with national ownership of the pilot strengthened accordingly, and a far stronger governance model in place should any follow-up initiatives be developed. However, the episode created considerable tensions across the PSC and amongst the delivery partners, and – for some evaluation interviewees – was damaging to the credibility not just of REEEP, but also UNIDO.

4.2 Efficiency

EVALUATION QUESTION 2:
How efficient was pilot delivery?

SUMMARY OF FINDINGS

The evaluation found that the pilot was generally well managed, but that the operating model was atypical for UNIDO projects, which in turn led to some inefficiencies and weaknesses with project coordination and communications. The evaluation also found that the pilot was time efficient, with the exception of a lengthy process to procure equipment for !Kheis municipality.

Multi-layered operating model led to some inefficiencies

4.2.1 General day-to-day management of the pilot was found to be efficient and effective, with many evaluation interviews singling out the technical inputs and capacity development work as being especially valuable and well-managed.

4.2.2 However, concerns were frequently expressed around the pilot's multi-layered operating model, and – particularly during the pilot's initial implementation – there was a degree of confusion as to UNIDO's role with the work. As above, the conceptualisation of the pilot was driven by REEEP and the EU, with UNIDO only becoming involved at a comparatively late stage in the design process. This relative 'marginalisation' of UNIDO was carried through to the pilot's operating model, where UNIDO was ostensibly the Implementing Agency and REEEP the Executing Agency. In practice though, REEEP's role was far more akin to that of Implementing Agency, as they took on the role of issuing subcontracts to the pilot's core service providers, including Pegasys Institute and the National Cleaner Production Centre (NCPC).

4.2.3 For many stakeholders, the arrangement raised concerns around cost efficiency: to paraphrase one interviewee, "*there was a proliferation of middle-men*". While it is probable that *transaction* costs were higher, the evaluation did not identify evidence that the arrangement actually resulted in increased *financial* costs for the pilot: it is likely that – had UNIDO taken on the 'standard' Implementing Agency role of subcontracting – the same amount of subcontracts would still have been necessary, albeit directly managed by UNIDO rather than by REEEP.

4.2.4 However, the evaluation did find that the operating model – and especially the multiple layers of reporting lines – reduced the efficiency of coordination and communication between delivery partners, particularly during the pilot's initial stages. With REEEP serving as the de facto Implementing Agency, UNIDO did not have substantive involvement in the subcontracting process and did not have a direct line of communication with the pilot's eventual service providers. There was a perception amongst some evaluation interviewees that UNIDO were not substantively involved in the pilot's early delivery, and that REEEP were forging ahead without the kind of oversight that would be expected of a UN-led intervention. While this did not necessarily reduce the effectiveness of the pilot (and REEEP's desire to be nimble is completely understandable), the approach further compromised UNIDO's role and responsibility as the pilot's *actual* Implementing Agency.

4.2.5 A further consequence of the pilot's operating model was that REEEP (rather than UNIDO) would take the lead in reporting pilot progress to the PSC. Again, this was highly atypical for a UNIDO-led project, and – in combination with the inappropriate chairing of the PSC – raised significant concerns amongst UNIDO's key, long-standing partners within South Africa's government. For both the Department of Environmental Affairs and the Department of Energy, this non-standard reporting approach was unnecessarily confusing, reduced national ownership of the project, and – as above – ultimately had a negative effect on UNIDO and REEEP's credibility.

Lack of integration with UNIDO Regional Hub resulted in missed opportunities

4.2.6 The pilot was managed on a day-to-day basis from REEEP's premises in the South African National Energy Development Institute (SANEDI) offices. The physical separation of the pilot's operations from UNIDO's South Africa office was not necessarily problematic in itself, but for some evaluation interviewees it further underlined the comparative independence of the pilot from UNIDO. More consequentially, it meant that there was only limited interaction between the pilot team and UNIDO's other South Africa-based project teams, including the *regional* work managed from UNIDO's South Africa office. Most seriously, the pilot team would often not attend UNIDO's regular national and regional coordination meetings, which are typically used to identify linkages across UNIDO's portfolio, and to identify opportunities for extending the reach and potential of UNIDO's interventions. This lack of integration with UNIDO's corporate processes resulted in clear, missed opportunities to extend the reach and awareness of the pilot, not just within the country, but also across the Southern Africa Development Community (SADC) region.

Generally time-efficient, although procurement processes introduced delays

4.2.7 The pilot was generally time-efficient, benefiting from a focused workplan that was closely adhered to. A notable exception to the pilot's time-efficient delivery – and the primary reason for the six-month no-cost extension – was the lengthy process to procure equipment for !Kheis municipality. While UNIDO-led interventions ordinarily apply UNIDO's own procurement processes to secure equipment, !Kheis's equipment was procured using a national institution, namely SANEDI. In principle this was an appropriate, logical decision, particularly given that the pilot aimed to build *national* capacity for implementing energy efficient technologies. However, this was the first time SANEDI had undertaken this kind of contracting roles and the process turned out to be inordinately lengthy, with a number of procedural errors and shortcomings compounding the delays. At the same time, the experience meant that a considerable amount of learning was gathered around national and institutional barriers and solutions for procurement. Using UNIDO processes may have

resulted in more time-efficient delivery, but it would also have bypassed one of the most complex parts of the pilot's work and would have resulted in the pilot missing out on some valuable learning.

4.3 Effectiveness

EVALUATION QUESTION 3:
Did the pilot achieve its planned outputs and outcomes?

SUMMARY OF FINDINGS

The evaluation found that the pilot was most effective at demonstrating the technical and institutional feasibility of deploying energy efficiency within municipal waterworks, and at delivering capacity development for the pilot's core stakeholders. Valuable learning also was generated through the pilot's various activities, although this learning was not necessarily exclusive to waterworks, rather it mirrored and validated experience already built within different contexts. The pilot's learning has been well-captured within a series of knowledge products, although work is still required to ensure that these products and the pilot's learning are taken up by key audiences within South Africa. The pilot was less effective at identifying new investment channels and financial models for municipal waterworks but, again, valuable learning was generated through this activity. However, the pilot failed to achieve its originally anticipated outreach beyond South Africa, and the pilot's monitoring and evaluation was undermined by an over-reliance on a poorly articulated logframe that failed to measure the pilot's outcomes and influence.

4.3.1 To assess effectiveness, the evaluation considered each of the four pilot outputs. The following section presents findings against each output in turn.

OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
Technical feasibility and commercial viability of clean energy in waterworks demonstrated	**Public and Private Partnership** established for scaling-up of demonstrated solutions	**Lessons learnt** and **policy recommendations** identified, showcased and disseminated	**Monitoring and evaluation**

Technical and institutional feasibility of deploying energy efficiency measures within waterworks demonstrated

4.3.2 One of the pilot's core activities was to demonstrate how clean energy and energy efficient technologies could be deployed within municipal waterworks. This was to be achieved by working with selected municipalities to undertake baseline energy audits, develop technical assistance plans, identify technological solutions, and support the procurement, installation and operation of selected technologies. Following a PSC-mediated assessment process, three municipalities were selected to undertake demonstration projects,

although only two of these municipalities were eventually able to participate. Of the two participating municipalities, Nelson Mandela Bay Metropolitan Municipality opted to install an energy monitoring and management system at their large-scale urban waterworks, while !Kheis Local Municipality chose to replace some existing infrastructure with a series of energy-efficient pumps, also supported by monitoring equipment.

!Kheis (project financed)	• 10 x pump sets • 15 x energy meters • 1 x desktop PC including energy management display
Nelson Mandela Bay (self-financed)	• 12 x energy meters • 1 x energy management software subscription • 2 x laptops • 2 x 3G modems

Figure 4: Equipment and software installed within pilot sites

4.3.3 Evaluation interviewees were unanimous in the view that this activity had certainly demonstrated the technical feasibility of deploying energy efficient solutions in waterworks and – of course – this capital investment was a prerequisite for the rest of the project. However, interviewees felt that the *main* contribution of this workstream was the demonstration of *institutional* feasibility, and the identification of concrete processes through which municipalities could assess, identify, deploy and manage such technologies within their waterworks.

4.3.4 Critical also was the learning generated through this workstream, particularly around the main challenges faced by municipalities. Several evaluation interviewees indicated that the pilot had helped to bring two specific preconditions to the fore: (i) the necessity of senior, top management support within municipalities for energy efficiency efforts, and (ii) the need to build awareness of energy efficiency and strengthen related capacities across the whole of a waterworks' staff base.

4.3.5 The experience within the two demonstration municipalities was instructive here. Both municipalities indicated that senior-level support was vital for their participation in the pilot and, more fundamentally, enabled the significant investment of municipality time and human resources required to deliver the work. Staff capacity was also identified as being critical within both municipalities, albeit based on quite different experiences. Nelson Mandela Bay's comparatively large staff base benefited from the pilot's sensitisation efforts, most notably the provision of training around broad energy efficiency principles. This helped to build – across the whole waterworks staff base – awareness of and support for the demonstration project and for longer-term energy efficiency efforts. Capacity was an equally important factor for !Kheis, but that municipality faced quite different challenges: while Nelson Mandela Bay had a full-time team of staff dedicated to waterworks management, Kheis's facilities were highly dependent on one individual. Here, the pilot's experience suggested that time-limited, targeted, and relatively intensive support may be a *necessity* for getting energy efficiency technologies adopted within lower resourced municipalities. Many evaluation interviewees – including personnel from municipalities – felt that a central lesson from all this experience was that the development and maintenance of capacity within municipalities was of *equal* importance to the actual provision of infrastructure.

Finance-focused work didn't deliver anticipated solutions, but generated important learning

4.3.6 In addition to demonstrating technical and institutional feasibility, the pilot also sought to identify options for financing the deployment of technologies within municipal waterworks, including the exploration of partnerships with private investors. This was to be achieved through a combination of research, market analyses, supporting development of financial proposals, and networking / direct facilitation of linkages between municipalities and investors. While the demonstration municipalities would be used as a trial for specific investment approaches, the pilot aimed to develop financing models that could be broadly applied across other South African municipalities.

4.3.7 Through progress reports and during this evaluation, UNIDO and REEEP have openly acknowledged that the pilot did not achieve its ambitions with this component. While *potential* funding channels were identified, no waterworks-specific financing approaches were developed, no partnerships with private investors were established, and no new investments were secured through the pilot. Instead of new forms of investment, the equipment procured for !Kheis was purchased using the pilot's resources, and Nelson Mandela Bay used their own municipality resources to purchase their energy management system (as discussed below, Nelson Mandela Bay's decision to self-finance their equipment should be considered a highly positive result for the pilot, but it did reduce the opportunity for testing novel financing approaches).

4.3.8 Even though the pilot did not identify new investment models for energy efficiency in municipal waterworks, the evaluation found that the pilot's 'negative' experience generated valuable learning. Through discussions with municipalities, government and investors – and through the pilot's *own* efforts to develop funding solutions – the pilot was able to identify common challenges faced by municipalities when trying to secure infrastructure investment.

4.3.9 One of the primary barriers for smaller municipalities such as !Kheis has been the comparatively low value of their resource needs. The volume of required finance isn't sufficiently high to attract private sector investors, with the 'rule of thumb' cited as being private investors are not generally interested until at least ZAR100m (c €6m) is required. This investment barrier is not specific to waterworks, rather municipalities face the same obstacle regardless of the type of infrastructure they are seeking to develop. However, waterworks have been doubly disadvantaged as the key national energy efficiency grant mechanisms available to municipalities have not been targeted at water facilities. In particular, the DOE-managed Energy Efficiency and Demand-side Management (EEDSM) programme has to date focused almost exclusively on supporting measures for municipality buildings and public lighting. Indeed, the pilot intensively supported !Kheis's efforts to secure EEDSM funding for their equipment, but the application was unsuccessful.

4.3.10 As with the pilot's learning around technical and institutional feasibility, municipality *capacity* (technical, human, financial) was also identified as a critical factor in securing finance for waterworks improvements. Pursuing investment is an intensive process that requires not just considerable person-hours, but also expertise that is not part of the 'usual' skill set of – for example – a waterworks facility manager. Beyond waterworks, *municipalities* need to have robust systems, processes and capacities in place before private (and even public) investors can be sufficiently confident that their investment will be well managed.

Many evaluation interviewees identified this municipality-level capacity gap as being a persistent area of concern for investors in South Africa. More positively, the Nelson Mandela Bay example demonstrates that the case *can* be made for larger, better-resourced municipalities to self-finance infrastructure improvements from their own resources.

4.3.11 Several evaluation interviewees noted that, while valuable, all this learning identified issues that were not exclusive to waterworks, rather they were common investment barriers faced by municipalities *regardless* of the form of technology or infrastructure improvements being sought. The pilot therefore helped to build the evidence base around municipality-level investment challenges, validating learning and experience developed in different contexts.

Delivering in a third municipality would have been beneficial

4.3.12 The pilot originally aimed to deliver demonstration projects within three municipalities and indeed three municipalities were selected to participate. However, the third municipality withdrew from the pilot before substantive work had commenced. At that point, the PSC decided to limit demonstration projects to two municipalities, with the overriding concern being the constrained amount of time remaining and the likelihood that selecting a replacement third municipality would necessitate extension of the pilot's timeframe. In lieu of delivering a third demonstration project, resources were reallocated to extend the pilot's capacity development activities to a broader set of municipalities (discussed in more detail below).

4.3.13 However, a majority of evaluation interviewees felt that the decision to only deliver two demonstration projects undermined the relevance and depth of learning generated through the pilot, and that any time extension would have been a price worth paying for the broader insights that a third municipality would have afforded. Most significantly, several interviewees noted that the contexts provided by !Kheis and Nelson Mandela Bay were outliers when compared with other South African municipalities. !Kheis is predominantly rural with one of the lowest population densities in the country, whereas Nelson Mandela Bay is at the other end of the spectrum, containing one of the South Africa's largest cities. The majority of municipalities lie in between these two contexts and – consequently – are likely to face different challenges.

OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
Technical feasibility and commercial viability of clean energy in waterworks demonstrated	**Public and Private Partnership** established for scaling-up of demonstrated solutions	**Lessons learnt** and **policy recommendations** identified, showcased and disseminated	**Monitoring and evaluation**

Capacity development activity was highly regarded

4.3.14 The pilot's second output focused on delivery of capacity development for municipalities. Tailored support was provided for the two demonstration municipalities

including, for example, technical guidance during procurement processes, post-installation operation and maintenance training on the specific systems and equipment secured through the pilot, and workshops delivered for each waterworks' broader staff base on energy efficiency principles. These latter, general workshops on energy efficiency principles were also delivered for nine additional municipalities, following the pilot's decision to not proceed with a third demonstration municipality.

4.3.15 All capacity development work – the general workshops, the technology-specific training, and the tailored support for demonstration municipalities – was highly regarded by the participating institutions and individuals. Within Nelson Mandela Bay the general workshops in particular were identified as having placed energy efficiency on the agenda within the waterworks facility, helping to build support across the staff base for the facility's long-term drive towards improved energy efficiency. The intensive support provided to !Kheis and Nelson Mandela Bay during their procurement processes was also highly appreciated. Crucially, this support was conducted in a participative manner so that municipality personnel were able to develop a firm understanding of the many technical considerations and decisions required during the development of tender documents.

4.3.16 Linking back to the pilot's learning around the need for senior management support for energy efficiency efforts, a related observation was made by some evaluation interviewees regarding capacity development. Interviewed training *providers* and training *recipients* both indicated the importance of involving senior management (or at least the line managers of trainees) during workshops. This helped to ensure that trainees were – in the long-term – given sufficient opportunity and support within the workplace to apply skills obtained through training, and contributed to building greater institutional (rather than just individual) capacity.

Capacity workstream also benefited training service provider

4.3.17 Although a potentially unintended result of the pilot, the capacity development workstream has benefited the core training service provider, namely the National Cleaner Production Centre (NCPC). Prior to the pilot, NCPC had mostly focused on delivering capacity support to South Africa's industrial sector. By focusing on municipalities, the pilot essentially introduced NCPC to a new sector and audience for their training services. NCPC intend to continue and build their portfolio of support for municipalities, which should benefit both NCPC and South African municipalities in the long run.

Long-term monitoring of capacity outcomes is not well developed

4.3.18 Notwithstanding the immediate, positive reaction to the pilot's capacity development work, mechanisms are not in place to monitor the long-term effects and outcomes of pilot-facilitated training. Typically, the success (or otherwise) of training needs to be measured through post-delivery monitoring, whereby participants are approached well after workshop delivery (ordinarily 6-12 months) in order to ascertain the extent to which skills developed through training are (or are not) being applied. NCPC regularly carry out such monitoring, although it is ordinarily undertaken at the request of the client (in this instance, the municipalities and/or the pilot itself). While post-workshop monitoring has been discussed between NCPC and the pilot team, a clear plan has not yet been formalised or delivered[5].

[5] Following completion of the evaluation, two post-implementation workshops were conducted at both sites in June and July 2019, with part of these workshops focused on discussing and assessing the long-term impact of training.

OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
Technical feasibility and commercial viability of clean energy in waterworks demonstrated	**Public and Private Partnership** established for scaling-up of demonstrated solutions	**Lessons learnt** and **policy recommendations** identified, showcased and disseminated	**Monitoring and evaluation**

Roundtable events helped to build awareness and networks

4.3.19 Two workstreams were delivered through the third pilot output. Firstly, a series of 'roundtable' events were organised whereby diverse stakeholders (national government, local government, NGOs, academia, private sector) were brought together for day-long workshops on specific themes such as financing municipality waterworks, and developing energy efficient infrastructure for municipalities. Secondly, a series of knowledge products were developed to capture pilot learning, with the most substantive being a Policy Brief targeted at decisionmakers within the South African government and a step-by-step Best Practice Guide for municipalities.

4.3.20 Roundtable participants routinely commended the events, welcoming in particular the opportunity to engage with institutions and individuals that they would not normally interact with: private sector companies appreciated the chance to talk with public sector stakeholders (and vice versa), national government representatives appreciated the chance to talk with municipality / local government representatives (and vice versa). Moreover, the engagement was substantive, helping to build participants' technical knowledge, supporting the creation of new relationships and bringing to the fore previously underappreciated challenges. For example – and to paraphrase one national government stakeholder – the roundtable events "*were an eye-opener for us, helping us to better understand the barriers faced by municipalities*". Intra-municipality linkages were also created: during one roundtable event the Nelson Mandela Bay waterworks representative met, *for the first time*, their equivalent staff member within Nelson Mandela Bay municipality's Electricity Division. While this was a valuable outcome supported by the pilot, it also served to highlight the challenges facing municipalities when it comes to building a coherent, multi-sectoral approach to energy efficiency.

Good quality knowledge products generated, but outreach has been limited

4.3.21 Along with all the other experiences gained through the pilot, the roundtables directly informed the development of the pilot's two core knowledge products: the Policy Brief and the Best Practice Guide. Evaluation interviewees that were familiar with these products were generally complimentary about their content, their accurate distillation of the pilot's learning, and their relatively concise format. At the same time, some interviewees felt that the material could have benefited from more practically focused outputs, potentially providing (e.g.) templates for municipality strategic and implementation plans, annotated contract templates, and real-world examples of financing agreements, governance structures and so on.

4.3.22 However, it was not clear that – at the time of the evaluation – the target audiences were sufficiently aware of these core knowledge products. The pilot team *had* disseminated material via email and through the PSC, but a notable number of evaluation interviewees

(some *core* pilot stakeholders) were unfamiliar with the final, published products. Even if the products had been circulated, the limited awareness amongst stakeholders demonstrates that further efforts and additional communication channels are needed to ensure that the pilot's learning attains sufficient exposure and that core stakeholders 'internalise' the pilot's learning.

4.3.23 The longer-term strategy for post-pilot ownership and dissemination of these knowledge products was also unclear. While the South African Local Government Association (SALGA) had been identified by the pilot as a critical partner for disseminating pilot learning, no formal agreement had been established to – for example – ensure that SALGA use its existing structure to maximise awareness amongst municipalities of the pilot's outputs.

No substantive knowledge dissemination beyond South Africa

4.3.24 The original pilot design envisaged considerable knowledge sharing beyond South Africa's borders, particularly across the SADC region. The pilot was conceived as a starting point for further work and investment in South African waterworks facilities, but also as a foundation upon which *other* countries could build. In practice though, the pilot's work was conducted exclusively within South Africa, with no formal activities delivered outside the country. Moreover, pilot knowledge products were explicitly focused on the South African context, with no attempt to generalise the pilot's learning for a broader international or even regional audience. Aside from the exclusively domestic-focused knowledge products, the pilot's relationship with UNIDO's Regional Hub was also weak, and – as noted above – there were clear missed opportunities to raise awareness and create linkages using UNIDO's existing structures.

OUTPUT 1	OUTPUT 2	OUTPUT 3	OUTPUT 4
Technical feasibility and commercial viability of clean energy in waterworks demonstrated	**Public and Private Partnership** established for scaling-up of demonstrated solutions	**Lessons learnt** and **policy recommendations** identified, showcased and disseminated	**Monitoring and evaluation**

Monitoring systems placed too much emphasis on activities and outputs, at the expense of meaningful measurement of pilot outcomes

4.3.25 Pilot progress was predominantly monitored and reported on against the pilot's logframe, which described the four outputs and their constituent activities. However, this logframe was poorly articulated with considerable crossover between some outputs and – of greater concern – insufficient description of the pilot's intended *outcomes*: the *qualitative changes* that it aimed to deliver and influence. REEEP proposed revisions to the logframe so as to improve clarity of outputs and – more fundamentally – to build-in at least some focus on outcomes rather than just outputs. However, the proposed amendments were never adopted, potentially due to a misplaced position within UNIDO that logframes should not evolve once initially approved. During the pilot's inception a highly detailed theory of change was also developed, which provided a far clearer overview of the pilot's logic and – crucially

– the qualitative outcomes (as opposed to just activities and outputs) that the work aimed to deliver. However, this theory of change was never subsequently applied during pilot measurement or progress reporting, with the monitoring effort instead being wholly guided by the logframe. Taking its cue from the logframe, the pilot's routine monitoring therefore focused exclusively on activities and outputs, with no substantive work undertaken to measure the work's qualitative influence. The consequence of this approach is best exemplified by the above-noted lack of post-training monitoring with workshop participants: in the absence of such outcome-level monitoring there is now a lack of evidence around the extent to which pilot-facilitated training has *actually* delivered benefits for participants.

4.3.26 Other monitoring tools proposed within the original project document were only partially realised, or not delivered at all. A stakeholder analysis and outcome map was developed during the pilot's inception phase, but – as with the theory of change – was not subsequently applied. The project document also indicated that the *Most Significant Change* technique would be used to measure outcomes, but this work was never undertaken. These oversights are unfortunate, as both (or even *either*) of these tools would have addressed the monitoring gaps that arose due to the over-reliance on the logframe for progress reporting.

Aside from formal reporting channels, communication of progress was weak

4.3.27 A number of evaluation interviewees expressed concern that, in comparison to other UNIDO interventions, there was limited communication of progress to core stakeholders throughout the course of the pilot. Certainly, all of the obligatory reporting requirements were adhered to, including routine progress updates to the PSC. However, some stakeholders felt that this was insufficient and that ongoing updates (even if informal) would have been beneficial, rather than relying on rigid, periodic reporting. The perception that there was weak communication of progress may also have been a consequence of the relative physical separation of the REEEP office from core stakeholders: ordinarily, UNIDO-led interventions are either based in the UNIDO premises, or within the offices of one of the core national counterparts (which in this instance would have most logically been the DEA, DOE or DWS).

4.4 Sustainability and Progress to Impact

Sustainability and *Progress to Impact* are two separate evaluation criteria linked to two separate questions, but during the evaluation it became clear that there was considerable overlap between the related findings. Consequently, both criteria are addressed together within the following section.

EVALUATION QUESTION 4:
How likely is it that the pilot's outputs and outcomes will contribute to long-term impacts?

EVALUATION QUESTION 5:
To what extent are the pilot's outputs and outcomes likely to be sustained in the long term?

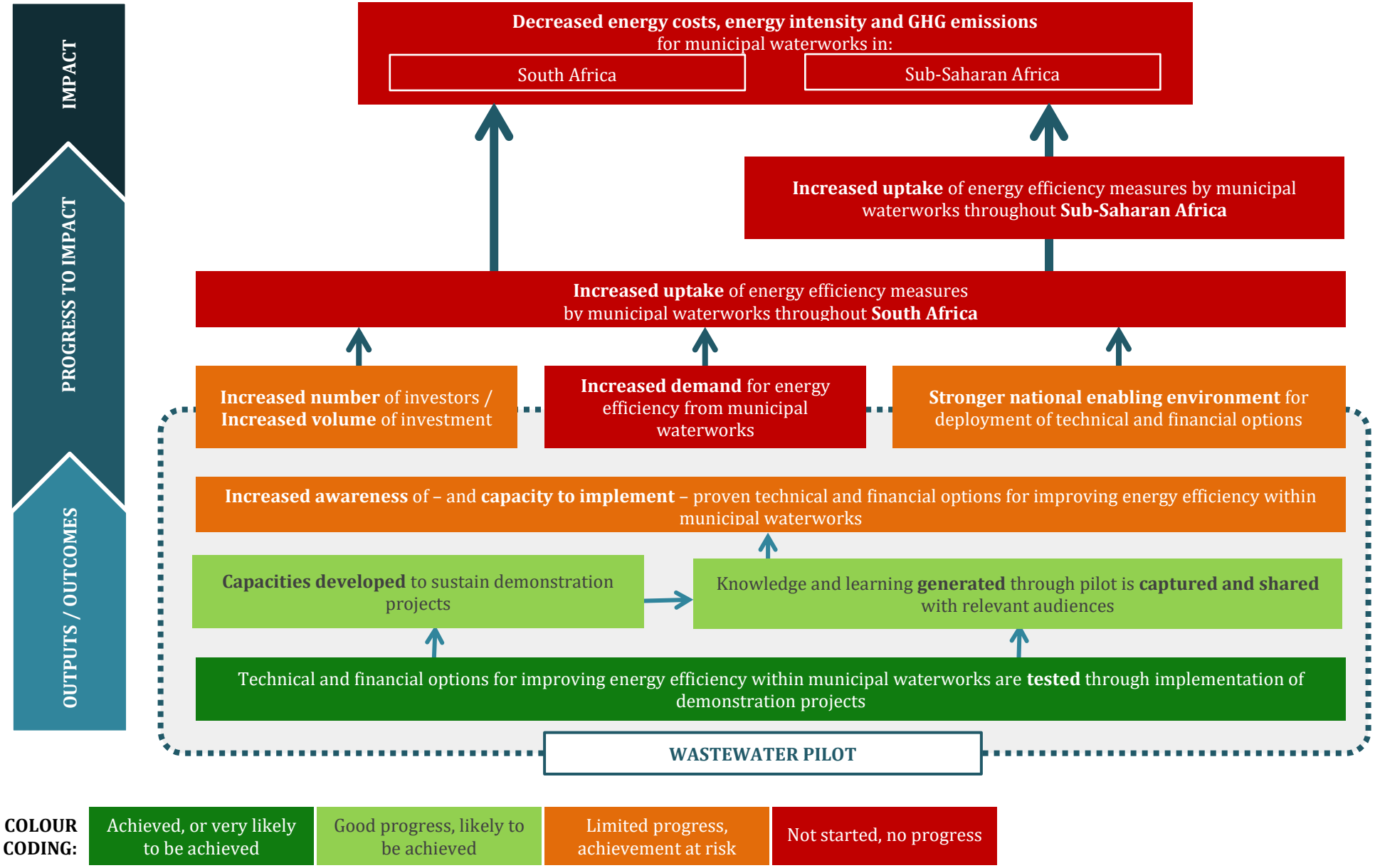
SUMMARY OF FINDINGS

The evaluation found that the pilot's main potential contributions to longer-term impact derive from the awareness, knowledge and learning generated through the work. Lessons developed around the challenges faced by municipalities could be particularly valuable for future interventions in the waterworks sector. However, there's a risk that the limited outreach undertaken could result in a correspondingly limited uptake of that learning. This in turn could reduce the potential influence of the pilot's work, within South Africa and beyond.

4.4.1 The pilot aimed to contribute to longer-term impacts (social, economic and environmental changes) by identifying solutions and approaches for improving energy efficiency across local authority-managed waterworks facilities that could, in turn, be upscaled within South Africa and beyond. These broader improvements would eventually deliver impact, through decreased energy costs, decreased energy intensity, and decreased greenhouse gas emissions.

4.4.2 The theory of change (page 3, above) summarised this long-term rationale. It is instructive to apply the evaluation's findings to the theory of change and – in turn – to identify where the pilot has most clearly contributed to long-term changes, but also where most attention will be required in the future. The following diagram provides summary assessments of progress towards each of the theory of change's elements. The presence of several elements that are assessed as 'red' (not started / no progress) should not necessarily be interpreted as a shortcoming of the pilot. Rather, the theory of change describes the *long-term* pathway to impact. Given that the pilot represented an early step in that process, it is expected that *many* elements will have not yet been delivered or even initiated. However, the remainder of this section considers which theory of change elements could be most influential on the long-term sustainability of the pilot's achievements.

Figure 5: Assessment of progress against theory of change



Likeliest contribution to impact should come from pilot-generated learning

4.4.3 The evaluation found that the likeliest contribution to longer-term impacts will probably arise from the learning and knowledge generated during the pilot. This is in line with the core purpose of many pilot initiatives: to test new ideas, identify what does and does not work, then to ensure that this knowledge informs and influences the design and approach of future interventions.

4.4.4 There is evidence that the ideas tested through the pilot have had at least some influence on work within South Africa. Most immediately, Nelson Mandela Bay Metropolitan Municipality appear to be committed to an energy efficiency agenda within their waterworks facilities. Long-term plans are being developed to roll-out energy management systems across all of the municipality's waterworks, and there is clear support for the agenda from senior management. The level of commitment is in part demonstrated through the municipality's self-financing of the equipment required for participation in the pilot: the pilot *could* have provided seed funding for this equipment, but the municipality instead elected to invest their own resources in the effort.

4.4.5 Similarly, !Kheis municipality's participation appears to have influenced a similar level of commitment to the delivery of energy efficient waterworks infrastructure in the long-term. However, the local authority faces sustainability challenges that are quite distinct from Nelson Mandela Bay. While the pilot's work in both Nelson Mandela Bay and !Kheis was largely driven by individual 'champions' in each municipality (and these champions *continue* to be intimately involved in ongoing energy efficiency work), the sustainability of efforts in !Kheis is far more precarious. Whereas Nelson Mandela Bay's waterworks facility is supported by a full-time team of staff (all of whom participated in the pilot's sensitisation workshops), !Kheis's facilities are essentially managed by a sole individual: if that individual moves on, there's a risk that the current focus on energy efficiency will also be lost.

4.4.6 More broadly, the pilot has had a degree of influence on key national government departments. The DEA noted that they have seen benefits from the work and that they would support a follow-on initiative. The DOE were similarly supportive, also indicating that the pilot's work helped to inform the development of a new waterworks-focused funding stream within the DOE-managed EEDSM grant mechanism. This represents a clear improvement in the resourcing environment for municipality waterworks and will go some way to addressing the problems that the pilot originally set out to address. Separately, the South African-German Energy Programme (SAGEN) indicated that the pilot also influenced their work to an extent, validating some of their concerns about working with municipalities, but also helping to shape SAGEN's approach to working with municipalities on energy efficiency and clean energy.

4.4.7 But as above, the most important learning generated through the pilot was not necessarily specific to *waterworks* facilities. Instead, the pilot's lessons served to validate learning generated within other contexts, and further strengthened the existing evidence base around the challenges faced by municipalities seeking to secure infrastructure investments. These core lessons are well reflected within the pilot's own *Policy Brief*, which emphasises the need for intra-municipality coordination and 'nexus thinking' when it comes to securing investment for energy efficient infrastructure. Waterworks facilities shouldn't be considered in isolation from a municipality's *other* capital assets, rather municipalities – and

investors – need to look at how improvements in energy efficiency can be managed and financed *across* a municipality's operations.

4.4.8 While the pilot's learning represents a *potential* contribution to longer-term impacts, this potential can only be achieved if the right institutions and audiences are aware of the knowledge and lessons generated. The sustainability of the pilot's contributions therefore rests – to a large extent – on the development and delivery of a robust knowledge management and dissemination strategy. As above though, it is not clear that sufficient measures are in place to ensure appropriate ownership and dissemination of the pilot's knowledge products.

Continuing evolution of NCPC provides a good example of UNIDO's contributions to longer-term outcomes

4.4.9 Often, impact and qualitative outcomes can only be identified and appreciated over a long time horizon, frequently well beyond the implementation period of a 3, 4 or even 5-year donor-funded project. With that in mind – and although not directly related to the pilot's anticipated results – it is important to acknowledge UNIDO's long-run, continuing contribution to the development of the NCPC in South Africa. UNIDO were instrumental in the NCPC's creation in 2002, when the Centre was established as part of UNIDO and UN Environment's National Cleaner Production Centres programme. The NCPC's growth since 2002 has been well-supported by UNIDO, perhaps most notably through the Industrial Energy Efficiency Improvement Project, which supported NCPC's development and delivery of an extensive portfolio of energy-focused workshops targeted at industrial clients across South Africa. Through this waterworks pilot – and as noted above – NCPC were able to extend their offering to a new audience and potential client base, namely South African municipalities. NCPC have become an important service provider within South Africa that now look well-placed to support the development of municipality capacity, a key gap identified through this pilot. UNIDO's long-term 'investment' in NCPC continues to pay dividends for both NCPC *and* UNIDO itself.

5. UNIDO Project Evaluation Ratings

5.0.1 In addition to the main assessment against the evaluation criteria (relevance, efficiency, effectiveness, progress to impact, sustainability), evaluations of UNIDO-supported work routinely assess specific aspects of an intervention's delivery. The following section summarises (and restates, where appropriate) the evaluation's findings on **performance of partners**, and on **factors facilitating or limiting the achievement of results**, particularly with regards to M&E and results-based management. The section concludes with a table (standard to all UNIDO evaluations) that summarises performance ratings for each component of the pilot's design, delivery and management.

5.1 Performance of partners

UNIDO and REEEP

5.1.1 To reiterate some of the evaluation's main findings, the initial delivery model and early partnership between UNIDO and REEEP went against UNIDO's standard approaches. Although UNIDO were on paper the Implementing Agency and REEEP were the Executing Agency, REEEP were in reality serving as the Implementing Agency, issuing subcontracts to service providers and driving project strategy and direction. This atypical approach did not go unnoticed, particularly amongst those national counterparts that had a long track record of working with UNIDO. Concerns were raised amongst many partners as to the role of UNIDO, with the situation exacerbated by the inappropriate chairing of the PSC by REEEP. Despite these missteps, the roles and responsibilities were clarified and an appropriate governance model was eventually implemented. However, the management and coordination had an enduring negative effect on some key stakeholders' perception of the pilot.

National Counterparts

5.1.2 A significant number of national counterparts were involved in the PSC, with many showing considerable interest in and support for the pilot, with their enthusiasm in part demonstrated by their firm desire to resolve the pilot's governance difficulties. The two demonstration municipalities were regularly commended by evaluation interviewees for their professionalism and willingness to both participate in, and feed into the pilot's work. And the pilot's service providers – particularly Pegasys Institute and the NCPC – were frequently singled out by evaluation interviewees as having delivered valuable, high quality technical inputs to the pilot.

Donor

5.1.3 The EU fulfilled its core obligations, but it was notable that *several* evaluation interviewees expressed frustration at the EU's emphasis on the pilot's hardware / infrastructure component. While the capital investment was a prerequisite for the project and its results, many interviewees felt that the EU had little interest in – or appreciation for – the less tangible (but just as important) work of the pilot, such as capacity development, relationship building, and lesson learning.

5.2 Factors facilitating or limiting the achievement of results

5.2.1 Paragraphs 4.3.25-26 provide the main analysis of the pilot's performance with regards to monitoring, evaluation and results-based management. In summary, pilot monitoring and reporting was based almost exclusively on the original logframe, which was heavily focused on activities and outputs. The logframe's lack of emphasis on outcomes – and the pilot's failure to implement originally anticipated monitoring tools such as *Most Significant Change* – meant that substantive outcome monitoring did not take place. Consequently, monitoring procedures could not support 'true' results-based management.

5.3 Gender mainstreaming

5.3.1 Both UNIDO and REEEP openly acknowledged that there were no systematic efforts to address gender within the pilot. This was a conscious decision by the pilot team, as gender was not viewed as relevant to the pilot's focus on identifying financing solutions for waterworks infrastructure. While a strong case can be made that gender did indeed have limited relevance within this intervention, the absence of *any* gender-focused activity went against the original project document. Within that document, repeated references were made to the need for gender mainstreaming, including the delivery a gender analysis as part of the project inception. This work was not undertaken.

5.3.2 Notwithstanding the clear, acknowledged lack of a systematic approach to gender, participation across pilot activities was gender-balanced including – most crucially – at decision-making levels.

5.4 Performance ratings table

5.4.1 Evaluations of UNIDO-supported work routinely provide performance ratings for each component of an intervention's design, delivery and management. Performance is assessed against UNIDO's six-point rating scale, which ranges from 'highly unsatisfactory' (score 1) to 'highly satisfactory' (score 6).

5.4.2 Based on the foregoing findings and analysis, the following presents ratings and summary assessments for each of the UNIDO performance components.

	Project element	Summary assessment	Rating
A	**PROGRESS TO IMPACT (OVERALL)**	Assessing progress to impact is somewhat premature for a pilot, but learning generated through the work has the potential to be influential on future interventions.	Satisfactory (5)
B	**PROJECT DESIGN (OVERALL)**		Moderately satisfactory (4)
1	Overall design	The project design was robust, although governance considerations should have been better developed.	Satisfactory (5)
2	Logframe	The logframe was poorly articulated and failed to incorporate longer-term qualitative outcomes. A good opportunity to revise the logframe was not taken up.	Unsatisfactory (2)
C	**PROJECT PERFORMANCE (OVERALL)**		Moderately satisfactory (4)
1	Relevance	Highly relevant to South Africa's needs and priorities, although national ownership could have been stronger.	Satisfactory (5)
2	Effectiveness	Most work was delivered effectively, although there were only limited achievements for the finance and knowledge work. The M&E output was not effective.	Moderately satisfactory (4)
3	Efficiency	Project efficiency was undermined by multi-layered delivery model and initial governance difficulties.	Moderately unsatisfactory (3)
4	Sustainability of benefits	Learning gained through the pilot has the best potential for influencing future impacts, but the required knowledge dissemination strategy is under-developed.	Moderately satisfactory (4)
D	**CROSS-CUTTING PERFORMANCE (OVERALL)**		Unsatisfactory (2)
1	Gender mainstreaming	Even though gender was unlikely to have a substantive influence on project design and delivery, the planned gender analysis was never undertaken.	Unsatisfactory (2)

Project element		Summary assessment	Rating
2	M&E	Progress monitoring against the agreed logframe was undertaken rigorously. However, this limited monitoring to outputs and activities; the anticipated outcome monitoring tools were never applied.	Moderately unsatisfactory (3)
3	Results-based management	Given the logframe's lack of qualitative outcomes and the broader lack of outcome monitoring, 'true' RBM was not feasible.	Unsatisfactory (2)
E	**PARTNER PERFORMANCE (OVERALL)**		Moderately satisfactory (4)
1	UNIDO and REEEP	Initial performance was weak, with governance problems significantly undermining efficiency and partner relationships. However, improvements were eventually made, with communication and coordination strengthened accordingly.	Moderately satisfactory (4)
2	National Counterparts	National counterparts involved in the PSC made substantive contributions to the pilot, as did the demonstration municipalities. The pilot's SA-based service providers were also regularly commended.	Satisfactory (5)
3	Donor	Although the EU fulfilled its obligations, there was some frustration at their emphasis on the pilot's hardware-focused activities, and apparent lack of interest in the 'softer' components such as capacity development, relationship building, and lesson learning.	Moderately satisfactory (4)
F	**OVERALL ASSESSMENT**		Moderately satisfactory (4)

6. Conclusions and recommendations

6.0.1 The pilot was a highly relevant, timely intervention that addressed clear priorities within South Africa. It was particularly effective at demonstrating the technical and institutional feasibility of deploying energy efficiency within municipal waterworks, and at delivering capacity development for the pilot's core stakeholders. Perhaps of most value though was the learning generated through the work, which identified the core challenges faced by municipalities when it comes to securing support and finance for energy efficient waterworks infrastructure. Much of this learning was not necessarily exclusive to waterworks, rather it mirrored and validated experience already built within different contexts. However, the pilot's validation of the existing evidence base was still worthwhile, and this learning has been well-captured through a series of knowledge products. These products – and the broader experience developed through the pilot – have clear potential to inform and positively influence future interventions within the South African waterworks sector.

6.0.2 However, there were a series of significant missteps during implementation. National ownership of the pilot's conceptualisation and design could have been stronger and – most seriously – the initial delivery model and governance arrangements were inappropriate for a UN-led intervention. The pilot's steering committee should never have been chaired by REEEP, and UNIDO's role as Implementing Agency should have been less ambiguous than it was. Unfortunately, these difficulties have – to a considerable extent – tainted many stakeholders' perception of the pilot, and have somewhat undermined the pilot's substance: an inordinate amount of time and energy was spent resolving these internal management issues, rather than on building ownership of the actual work.

6.0.3 Notwithstanding those difficulties, there are opportunities to build on the pilot's achievements. Based on detailed feedback from pilot stakeholders and the evaluation's findings, the following recommendations are made in order of priority.

Develop a clearer knowledge management strategy

6.0.4 The likeliest contribution to longer-term impacts will probably arise from the learning and knowledge generated during the pilot. While the existing knowledge products are good quality, work is still required to ensure that these products and the pilot's learning are taken up by key audiences within South Africa and beyond.

Recommendation 1

UNIDO and REEEP should develop a long-term knowledge management strategy that includes, at the very least:

- Development of a more practically-orientated product, targeted at municipalities and including – for example – templates for municipality strategic and implementation plans, annotated contract templates, real-world examples of financing agreements;
- Assessment of potential for developing a knowledge product of interest and relevance to a non-South African (regional, international) audience;
- Stakeholder analysis to identify who should receive what products within South Africa, and potentially in the broader SADC region;

- Development of a formal agreement with an appropriate institution (e.g. SALGA) to ensure that ownership of the pilot's knowledge products are better embedded within South Africa and/or that existing structures are used to maximise awareness amongst municipalities of the pilot's outputs.

Embed any successor intervention within broader local and national efforts on energy efficiency and municipality capacity development

6.0.5 Some of the most important learning generated through the pilot was not necessarily specific to *waterworks* facilities, highlighting instead the challenges faced by municipalities seeking to secure *any* kind of infrastructure investment. The pilot's own *Policy Brief* emphasises the need for intra-municipality coordination and 'nexus thinking' when it comes to securing investment for energy efficient infrastructure. Waterworks facilities shouldn't be considered in isolation from a municipality's *other* functions and capital assets, rather municipalities and investors (including donors) need to look at how improvements in energy efficiency can be incentivised, managed and financed *across* a municipality's operations. While the highly targeted focus on waterworks was appropriate for a short *pilot* initiative, any successor intervention should look well beyond waterworks, ensuring that any proposed work is aligned with municipalities' broader energy efficiency efforts and objectives. Any successor initiative should also be fully aligned with broader government and donor efforts on both energy efficiency *and* municipality capacity development.

Recommendation 2

UNIDO and/or REEEP should ensure that any follow-on project is well-integrated with the main policies and programmes being delivered in South Africa on both energy efficiency and municipality capacity development.

Undertake long-term monitoring of capacity development work

6.0.6 Notwithstanding the immediate, positive reaction to the pilot's capacity development work, mechanisms are not in place to monitor the long-term effects and outcomes of pilot-facilitated training. In the absence of such outcome-level monitoring there is now a lack of evidence around the extent to which pilot-facilitated training has actually delivered benefits for participants.

Recommendation 3

UNIDO, REEEP and NCPC should undertake some form of post-workshop monitoring with all training participants supported through the pilot, with a view to identifying long-term capacity outcomes delivered by pilot-facilitated training.

Ensure UNIDO apply appropriate project development and delivery models

6.0.7 The management and governance missteps were damaging to UNIDO and REEEP's credibility, and had an enduring negative effect on some stakeholders' perception of the pilot, to the point that the substance of the work was somewhat undermined. Frustratingly, these difficulties could have been avoided had UNIDO's standard approaches and delivery models been applied.

Recommendation 4

During intervention design and delivery, UNIDO should ensure that:

- National counterparts are fully involved in project conceptualisation and design;
- Roles and responsibilities of delivery partners (Implementing Agencies, Executing Agencies) are fully articulated and applied;
- The principle of national ownership is fully reflected within an intervention's governance arrangements;
- All interventions are fully integrated within UNIDO's national and regional coordination processes.

Annex 1: Evaluation Framework

The evaluation purpose and objectives, theory of change, and UNIDO's evaluative requirements all provided the basis for the **evaluation framework**, which in turn underpinned and guided the whole approach. The framework is structured against the standard **OECD-DAC criteria** agreed for the evaluation (**relevance**, **efficiency**, **effectiveness**, **sustainability**). In line with UNIDO policy and acknowledging the early, foundational nature of the pilot's potential contributions to long-term impact, the OECD-DAC 'impact' criterion was simplified to instead measure '**progress to impact**'.

The framework identified **key evaluation questions**, supported by guiding **sub-questions**. The framework was also informed by a set of indicative questions presented within the evaluation TOR: all those indicative questions were incorporated accordingly.

Key evaluation questions	Guiding sub-questions
RELEVANCE	
1. How relevant was the pilot to the needs and priorities of South Africa and the participating institutions?	**1.1** To what extent was the pilot relevant to South Africa's national priorities and strategies?
	1.2 To what extent was the pilot's work relevant to broader priorities and strategies across Sub-Saharan Africa?
	1.3 To what extent was the pilot relevant to UNIDO's mandate?
EFFICIENCY	
2. How efficient was pilot delivery?	**2.1** Was the pilot plan clear, appropriate and realistic?
	2.2 How efficient and effective were the pilot's management arrangements? Were roles, responsibilities and accountabilities sufficiently clear?
	2.3 How effective were the pilot's monitoring processes?
	2.4 How cost- and time-efficient was the pilot?
EFFECTIVENESS	
3. Did the pilot achieve its planned outputs and outcomes?	**3.1** How effective was the pilot's approach to testing technical and financial options for energy efficiency within municipal waterworks?
	3.2 To what extent did the pilot identify technical and financial options that are replicable across different contexts and countries?
	3.3 To what extent was capacity and awareness developed through the pilot, both within the demonstration facilities, and across the broader South African sector?

Key evaluation questions	Guiding sub-questions
	3.4 How effective was the pilot at generating and sharing knowledge and learning, of both national and regional relevance?
PROGRESS TO IMPACT	
4. How likely is it that the pilot's outputs and outcomes will contribute to long-term impacts?	**4.1** To what extent has the pilot generated demand for improved energy efficiency within institutions that oversee and/or operate municipal waterworks?
	4.2 To what extent have guidance and lessons generated through the project been adopted by other municipalities and / or the national government?
	4.3 To what extent has the pilot attracted donors and investors towards the municipal waterworks sector?
	4.4 To what extent has the project delivered emissions reductions?
	4.5 Did the pilot contribute to any unintended impacts, positive or negative?
SUSTAINABILITY	
5. To what extent are the pilot's outputs and outcomes likely to be sustained in the long term?	**5.1** What are the key factors that will affect (negatively or positively) the sustainability and uptake of the pilot's results, both nationally and regionally?
	5.2 How (if at all) could UNIDO and REEEP potentially provide further support to the deployment of clean energy technology for urban water infrastructure nationally, and regionally?
	5.3 How were gender dimensions incorporated within the pilot design and delivery?

Annex 2: Interview participants

UNIDO Barisani, Anais El Mekwad, Khaled Emtairah, Tareq Moyo, Nokwazi Mhlanga, Alois Novak, Robert
REEEP Algio, Nicole Duggan, Thomas Hiller, Martin Zahner, Andreas
Pegasys Institute Vermeulen, Abri
NCPC van der Merwe, Wynand
Kheis Local Municipality Dolopi, Desmond
Nelson Mandela Bay Metropolitan Municipality Govinder, Trishal Mahote, Lunga
European Union / Commission Afonso Gallegos, Lidia Kaspar, Martin
Department of Energy Modise, Mokgadi
Department of Environmental Affairs Ngoma, Anam Richards, Leanne
Water Research Commission Pillay, Sudhir
National Business Initiative McNamara, Alex
Gesellschaft für Internationale Zusammenarbeit (GIZ) Balmer, Marlett
USAID South Africa Low Emissions Development Program Ndolvu, Melusile
Green Building Design Group Didiza, Songo
GreenCape Kruger, Raldo Mulcahy, Mike Pengelly, Clare Scrimgeour, Ian
Sustainable Energy Africa Euston-Brown, Megan

Annex 3: Documents reviewed

Climate Change, Clean Energy, and Urban Water in Africa, Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot Initiative in South Africa, UNIDO Prodoc, (2015), UNIDO

Energy Efficiency and Demand-Side Management Programme, Website, [Accessed 5 June 2019]

How to include energy efficiency and renewable energy in existing infrastructure grants: information guide for municipalities, (2017), SALGA

[Pilot] 1st Progress Report, (2017), UNIDO

[Pilot] 2nd Progress Report, (2018), UNIDO

[Pilot] Best Practice Guide, (2018), UNIDO / REEEP

[Pilot] Best Practice Guide: Pocket Version, (2019), UNIDO / REEEP

[Pilot] Capacity Building Plans, (2017), REEEP

[Pilot] Inception Report, (2017), REEEP

[Pilot] Policy Brief, (2018), UNIDO / REEEP

[Pilot] Technical Assistance Plan: !Kheis Local Municipality, (2017), Pegasys Institute / REEEP

[Pilot] Technical Assistance Plan: Nelson Mandela Bay Metro, (2017), Pegasys Institute / REEEP

[Pilot] Theory of Change and Outcome Mapping Plan, (2017), REEEP

[Pilot] Workshop proceedings report 3 March 2015, DEA / UNIDO / REEEP

[Pilot] Year 2 – Progress Report (February – July 2018), (2018), REEEP

Replication Strategy for [Pilot] Output 1: Key insights from review of pre-work reports pertaining to replication strategy, (2018), GreenCape

Replication Strategy for [Pilot] Output 2: Criteria for Prioritisation and Categorisation of Municipalities in South Africa, (2019), GreenCape

Replication Strategy for [Pilot] Output 3: Key actors, institutions, and initiatives required for the replication strategy and proposed governance structure, (2019), GreenCape

SA Water Works: Stock-taking Report, (2017), Pegasys Institute / REEEP

Terms of Reference: Independent terminal evaluation of [Pilot], (2018), UNIDO

UNIDO Director General's Bulletin: Evaluation Policy, DGB/2018/08, (2018), UNIDO

UNIDO Independent Evaluation Division Evaluation Manual, (2018), UNIDO

Annex 4: Terms of Reference

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

DRAFT

Terms of Reference

Independent terminal evaluation

Climate Change, Clean Energy and Urban Water in Africa
Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot Initiative in South Africa

UNIDO Project No.: 140341

OCTOBER 2018

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I. Project background and overview

1. Project factsheet

Project title	Climate change, Clean Energy and Urban Water in Africa - Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot Initiative in South Africa
UNIDO ID	140341
Region	Southern Africa
Country	South Africa
Planned implementation start date	October 2015
Planned implementation end date	October 2018
Actual implementation start date	1st February 2016
Actual implementation end date	31st January 2019
Implementing agency	United Nations Industrial Development Organization (UNIDO)
Government coordinating agency	Department of Environmental Affairs (DEA), Department of Energy (DOE), South Africa National Energy Development Institute (SANEDI), South African Local Government Association (SALGA)
Executing partner	Renewable Energy and Energy Efficiency Partnership (REEEP)
Donor(s):	European Commission, UNIDO
UNIDO input (€)	€ 60,000
Co-financing at CEO Endorsement, as applicable (€)	€ 161,402
Total project cost (€) excluding support costs and PPG	€ 1,610,000

(Source: Project document)[6]

2. Project context

The project "Climate Change, Clean Energy and Urban Water in Africa; Promoting market-based deployment of clean energy technology solutions in municipal waterworks: Pilot initiative in South Africa" is financed by the European Union and implemented by UNIDO.

[6] Project information data throughout these TOR are to be verified during the inception phase.

The proposed project includes:

- Implementation of demonstration projects in three selected municipalities in which pumping and water treatment systems will be optimized from the perspective of energy efficiency (e.g. implementation of EMS) and renewable energy systems will be installed to replace fossil-fuel electricity production;
- Tailored capacity building for both market players and enablers;
- Monitoring and evaluation and practice-based policy research to compile lessons learned and present practical solutions for clean energy deployment in waterworks and the concrete finance and business models behind them;
- Promotion of replication and scale up in South Africa and the SADC region.

The project aims at applying a market-based approach to demonstrate the cost effectiveness of GHG emission reductions and the cost-recovery potential of investments into energy savings and renewable energy technology.

Based on UNIDO`s extensive experience in the implementation of energy projects in South Africa, the project is expected to contribute to the creation of additional jobs for women and men in South Africa and the improvement of technical skills, and thus income growth and improved living standards. The widespread adoption of renewable energy and energy efficiency technologies, services and systems in both existing and new municipal waterworks in developing countries will also have social and environmental benefits at the local and global levels, as there is high potential for energy saving in the sector. With power generation still predominantly based on fossil fuels, energy efficiency and renewable energy in municipal waterworks will result in significant GHG emissions reduction.

South Africa was identified as the target country for this pilot project based on the following factors:

- **Strong need for energy efficiency:** Water and wastewater infrastructure accounts for around 35% of the total energy consumed by South African municipal administrations. This infrastructure is often identified as high priority for investment by municipalities wanting to reduce energy consumption costs.
- **Strong need for water efficiency:** South Africa is a water-scarce country, and water demand exceeds supply on national level.
- **High potential for GHG mitigation:** 90% of electricity in South Africa is generated by coal fired power stations. Carbon intensity of electricity generation is around 0.94t CO2e/MWh.
- **Strong role of South Africa in the international climate negotiations:** South Africa has been playing a prominent role in international climate change negotiations. The country`s position and potentially influential role is highly regarded and South Africa has, at times, operated as a diplomatic interface between developed and developing countries. In this sense South Africa can play a key role in promoting this pilot project initiative in Sub-Saharan Africa.
- **Large gaps for waterworks at municipal level remain unaddressed**, e.g.**:** South Africa has poor and ageing infrastructure; the level of non-revenue water stands at 35% (but national goal is to curb water losses by 50%). Over 55% of the treatment plants do not fulfill effluent standards; there are inadequate budgets for infrastructure, operation and maintenance. There is huge capacity deficit at municipal level (e.g. for energy assessments, development of energy management plans,

tendering processes for private sector services, implementation and monitoring of energy management plans).

- **High chances to establish viable demonstration projects that have high potential for replication and scale-up across the SADC region:** South Africa has a conducive policy environment (GHG reduction commitments, access to water and water quality policies, promotion of energy efficiency and renewable energy). Municipalities are at the forefront of the leading charge to address climate change. The private sector market is relatively mature and could be the driver for replication in other municipalities and the region.

The overall objective of the project is to catalyze market-based approaches to reduce GHG emissions in municipal waterworks in developing countries and emerging economies of Sub-Saharan Africa. More specially, the project seeks to create model pathways of market-based approaches for cost effective deployment of clean energy technologies (renewable energy and energy efficient) in municipal waterworks in Sub-Saharan Africa. This project was initially piloted in South Africa. It is envisaged to create a solid basis for replication and scaling up of the initiative not only in the country, but also in the SADC region throughout Sub-Saharan Africa.

Project implementation started in February 2016 and the initial project end date is planned in January 2019. The actual implementation end date will be requested to be extended to the end of February 2019.

The project document foresees regular monitoring and a Terminal Evaluation (TE).

3. Project objective

The key objective of the proposed project is increased energy use efficiency and renewable energy production in municipal waterworks in three selected municipalities in South Africa (small and medium cities with about 100,000 inhabitants).

The following **project components** have been developed, in addition to project management, to achieve the project objectives:

Project Component 1: Inception report developed and technical feasibility and commercial viability of clean energy in waterworks demonstrated.

Project will start with the development of Inception report that will describe the clean energy technology solutions, capacity needs assessment, municipalities selected, work plan and other key elements of the project implementation in consultation with all the relevant stakeholders. Once Inception report is finalized, project will proceed with the execution of activities focusing on cost effective clean energy measures for water and wastewater services in three pilot municipalities of South Africa.

Activity 1.1. Select demonstration projects and develop the visibility and communication strategy.

Activity 1.2. Collect targeted data, conduct stakeholder analyses and consultations, develop detailed project inception report.

Activity 1.3. Coordinate and support selected municipalities in energy management, planning, and implement cost effective clean energy measures for water and wastewater services

Project Component 2: Public and private sector partnership established for scaling-up of demonstrated waterworks technology solutions.

To ensure sustainability of the interventions beyond the life of the project, the project will create a critical mass of capacity for market enablers and market players. On one hand, the project will provide targeted training to municipalities on how to identify, develop, implement and manage clean energy investments in their waterworks. On the other hand training modules (based on experiences from ongoing UNIDO projects in South Africa) will be developed for potential service providers including financial service providers, technical experts and technology suppliers. During the project, the private sector trainees will participate in the demonstration projects to ensure applicability of capacity building and hands on practical experience. These capacities, seen together will ensure that municipalities who are interested to replicate the demonstration projects have capacities to develop and manage the projects and that they will have a supportive market environment with skilled service providers.

Activity 2.1 Develop capacity building plan and contract capacity building partners (where appropriate)

Activity 2.2 Conduct and monitor capacity building activities, linking public and private sectors.

Project Component 3: Lessons learned and policy recommendations on waterworks technologies identified, showcased and disseminated, replication of projects promoted.

A critical review into clean energy potentials of municipal waterworks in South Africa will complement the practical, hands-on implementation of demonstration projects, presenting practical solutions on efficiency gains in waterworks and the concrete finance and business models behind them. This review will be complemented by targeted research aiming at practice based policy and market insights and recommendations for replication in South Africa and the South African Region.

As an international climate initiative, the proposed project has the potential to increase the ambition levels of a large group of countries as it exploits achievable emission reduction options at a very low or even negative cost level. Based on the compiled lessons learned and results of targeted research, an outreach and communication campaign (with specific focus on the Southern African Region) will increase the visibility of business opportunities related to energy efficiency in the water supply and wastewater treatment sectors.

Active involvement of public or bilateral climate finance institutions is important to positively influence local innovation, technology development and provision of capital for replication and scaling-up of demonstration projects. Seminars and workshops will be organized to promote involvement of public or bilateral climate finance institutions such as e.g. the African Development Bank (AfDB), the European Investment Bank (EIB),

Development Bank of Austria, the World Bank, the Green Climate Fund (GCF), the Industrial Development Cooperation (IDB), the Development Bank of Southern Africa (DBS), KfW Development Bank, Agence Française de Développement (AFD), Austrian Development Agency (ADA).

Activity 3.1 Document data on lessons learned, outcomes and impacts of demonstration projects

Activity 3.2 Design and conduct targeted policy and market research and policy discussion forums and document data

Activity 3.3 Tailor publications (handbook, study, policy recommendations) for selected market and policy audiences

Activity 3.4 Organize, conduct and document peer to peer learning events between the demonstration projects and selected "satellite municipalities" in South Africa and develop recommendations for replication.

Activity 3.5 Communicate lessons learned, outcomes, and recommendations to targeted audiences in South Africa, the SADC region, and at international (e.g. UNFCCC) level

Project Component 4: Monitoring and evaluation performed.

Activity 4.1 Develop tailored monitoring and evaluation (M&E) framework and agree with project stakeholders on M&E procedures

Activity 4.2 Perform regular reporting and end of project terminal evaluation.

The following are, in brief, some of the expected results of the project/program:

- **Building Capacity:** The project provides training to municipal technical managers to help them identify, procure, finance, install and operate fit-for-purpose clean energy interventions in municipal water infrastructure.
- **Connecting Stakeholders:** The project creates opportunities for representatives of municipalities, the private sector, financiers and government to meet and discuss challenges and opportunities, improve mutual understanding and remove barriers for future cooperation.
- **Laying Foundations:** The project assists municipalities in carrying out energy audits and other baseline studies, so that technical interventions can be identified and selected based on reliable data, and any energy and cost savings proven.
- **Untangling Procurement Processes:** The project helps municipal technical managers identify and navigate the procurement pathways that must be followed to upgrade their water and wastewater infrastructure, and facilitates a dialogue with private sector stakeholders to enable them to respond effectively to municipal tenders.

4. Project implementation arrangements

The project was funded by the EC (DG Climate Action) and implemented under indirect management by UNIDO in close collaboration with REEEP.

The project will link into relevant ongoing UNIDO and REEEP initiatives in South Africa and the region. A detailed work plan for the project was developed by UNIDO and REEEP during the first 6 months of the project.

Project Steering Committee (PSC)

The success of this project hinges on proper coordination of the interventions under this project with other ongoing activities at the national level. Accordingly, a Project Steering Committee was established to provide strategic guidance to the project and ensure coordination of the project with other initiatives as well as provide cohesive leadership to the project. The PSC consisted of female and male high-level representatives from the Department of Environmental Affairs (DEA), Department of Energy (DOE), South Africa National Energy Development Institute (SANEDI), South African Local Government Association (SALGA), DCoG, UNIDO, EC Delegation and REEEP. According to the Project Document the PSC should be chaired by the DEA. Nevertheless, for the first PSC's REEEP (1-3) respectively and SANEDI (4), took over this function. The secretariat of the project has been provided by UNIDO. The purpose of the PSC is to provide strategic guidance of the project while minimising overlap with other development projects, and to maximize the input and participation of project counterparts, as well as coordinating these inputs. The PSC also reviews and approves or rejects amendments to the project based on the approved project document in accordance with UNIDO and EC procedures, and meets on a six-month basis, but can also be organized on an ad hoc basis as required.

Project Management Unit (PMU)

The Project Management Unit was established during the first 6 months of the project implementation with consideration of gender perspective.

5. Budget information

Table 1. Financing plan summary

Description	**Project Preparation** (€)	**Project** (€)	**Total** (€)
Financing (European Commission)		1,448,598	1,448,598
Co-Financing (UNIDO)		60,000	60,000
Remuneration (7% of the EC contribution)		101,402	101,402
Total (€)		**1,610,000**	**1,610,000**

Source: Project document

Table 2. Financing plan summary – project component breakdown

Project outcomes	Donor(s)(€)	Co-financing (€)	Total (€)
1. Component 1	804,650		**804,650**
2. Component 2	77,820		**77,820**
3. Component 3	505,698		**505,698**
4. Component 4	120,430		**120,430**
Remuneration (7% of the EC contribution)		101,402	**101,402**
Total (€)	**1,508,598**	**101,402**	**1,610,000**

Source: Project document

Table 3. Co-financing source breakdown

Name of co-financier (source)	Classification	Type (cash and/or in-kind)	Total (in €)
UNIDO	Implementing Agency	Cash	60,000
	Remuneration (7% of the EC contribution)		101,402
Total Co-financing (€)			**161,402**

Source: Project document

Table 4. UNIDO budget execution[7] (Grant No.: 2000003317)

Items of Expenditure	2016 (€)	2017 (€)	2018 (€)	Total Exp. (€)
Contractual Services (€)	279,398.5	623,909.93	388,666.55	**1,291,974.98**
Equipment (€)	-	-	-	**-**
International Meetings (€)	-	-	-	**-**
Local travel (€)	-	-	6,270	**6,270**
Natl. Consult./Staff (€)	-	-	-	**-**
Intl. Consult./Staff (€)	-	-	-	**-**
Other Direct Costs (€)	-	-	1,059	**1,059**
Premises (€)	-	-	-	**-**
Staff and Intern (€)	-	5,736.80	59,643.20	**65,380**
Staff Travel (€)	-	-	12,707	**12,707**
Train/Fellowship/Study (€)	-	-	-	**-**
Grand Total (€)	**279,398.5**	**629,646.73**	**468,345.75**	**1,377,390.98**

Source: UNIDO. ERP database as of [23/10/2018]

II. Scope and purpose of the evaluation

[7] Disbursement: Expenditure, incl. commitment

The purpose of the evaluation is to independently assess the project to help UNIDO improve performance and results of ongoing and future programmes and projects. The terminal evaluation (TE) will cover the whole duration of the project from its starting date in to the estimated completion date in

The evaluation has two specific objectives:

(i) Assess the project performance in terms of relevance, effectiveness, efficiency, sustainability and progress to impact; and
(ii) Develop a series of findings, lessons and recommendations for enhancing the design of new and implementation of ongoing projects by UNIDO.

III. Evaluation approach and methodology

The TE will be conducted in accordance with the UNIDO Evaluation Policy[8] and the UNIDO Guidelines for the Technical Cooperation Project and Project Cycle[9]. UNEG Norms and Standards for evaluation shall also be observed.

The evaluation will be carried out as an independent in-depth evaluation using a participatory approach whereby all key parties associated with the project will be informed and consulted throughout the evaluation. The evaluation team leader will liaise with the UNIDO Independent Evaluation Division (ODG/EIO/IED) on the conduct of the evaluation and methodological issues.

The evaluation will use a theory of change approach and mixed methods to collect data and information from a range of sources and informants. It will pay attention to triangulating the data and information collected before forming its assessment. This is essential to ensure an evidence-based and credible evaluation, with robust analytical underpinning.

The theory of change will identify causal and transformational pathways from the project outputs to outcomes and longer-term impacts, and drivers as well as barriers to achieve them. The learning from this analysis will be useful to feed into the design of the future projects so that the management team can effectively manage them based on results.

1. Data collection methods

Following are the main instruments for data collection:

(a) **Desk and literature review** of documents related to the project, including but not limited to:
- The original project document, monitoring reports (such as progress and financial reports, mid-term review report, output reports, back-to-office mission report(s), end-of-contract report(s) and relevant correspondence.
- Notes from the meetings of committees involved in the project.

(b) **Stakeholder consultations** will be conducted through structured and semi-structured interviews and focus group discussion. Key stakeholders to be interviewed include:
- UNIDO Management and staff involved in the project; and
- Representatives of donors, counterparts and stakeholders.

[8] UNIDO. (2015). Director General's Bulletin: Evaluation Policy (UNIDO/DGB/(M).98/Rev.1)

[9] UNIDO. (2006). Director-General's Administrative Instruction No. 17/Rev.1: Guidelines for the Technical Cooperation Programme and Project Cycle (DGAI.17/Rev.1, 24 August 2006)

(c) **Field visit** to project sites in the People's Republic of China.

2. Evaluation key questions and criteria

The key evaluation questions are the following:

(b) What are the key drivers and barriers to achieve the long-term objectives? To what extent has the project helped put in place the conditions likely to address the drivers, overcome barriers and contribute to the long-term objectives?

(c) How well has the project performed? Has the project done the right things? Has the project done things right, with good value for money?

(d) What have been the project's key results (outputs, outcome and impact)? To what extent have the expected results been achieved or are likely to be achieved? To what extent the achieved results will sustain after the completion of the project?

(e) Did the project succeed in reducing GHG emissions in municipal networks in South Africa?

(f) Did the project succeed in creating model pathways of market-based approaches for cost effective deployment of clean energy technologies, services and systems in municipal networks in South Africa?

(g) What lessons can be drawn from the successful and unsuccessful practices in designing, implementing and managing the project?

The evaluation will assess the likelihood of sustainability of the project results after the project completion. The assessment will identify key risks (e.g. in terms of financial, socio-political, institutional and environmental risks) and explain how these risks may affect the continuation of results after the project ends. Table 1 below provides the key evaluation criteria to be assessed by the evaluation. The details questions to assess each evaluation criterion are in annex 2.

Table 1. Project evaluation criteria

#	Evaluation criteria	Mandatory rating
A	**Impact**	**Yes**
B	**Project design**	**Yes**
1	• Overall design	Yes
2	• Logframe	Yes
C	**Project performance**	**Yes**
1	• Relevance	Yes
2	• Effectiveness	Yes
3	• Efficiency	Yes
4	• Sustainability of benefits	Yes
D	**Cross-cutting performance criteria**	
1	• Gender mainstreaming	Yes
2	• M&E: ✓ M&E design ✓ M&E implementation	Yes
3	• Results-based Management (RBM)	Yes

#	Evaluation criteria	Mandatory rating
E	**Performance of partners**	
1	• UNIDO	Yes
2	• National counterparts	Yes
3	• Donor	Yes
F	**Overall assessment**	Yes

Performance of partners

The assessment of performance of partners will ***include*** the quality of implementation and execution of the GEF Agencies and project executing entities (EAs) in discharging their expected roles and responsibilities. The assessment will take into account the following:

- Quality of Implementation, e.g. the extent to which the agency delivered effectively, with focus on elements that were controllable from the given GEF Agency's perspective and how well risks were identified and managed.
- Quality of Execution, e.g. the appropriate use of funds, procurement and contracting of goods and services.

3. Rating system

In line with the practice adopted by many development agencies, the UNIDO Independent Evaluation Division uses a six-point rating system, where 6 is the highest score (highly satisfactory) and 1 is the lowest (highly unsatisfactory).

Table 2. Project rating criteria

Score		Definition	Category
6	Highly satisfactory	Level of achievement clearly exceeds expectations and there is no shortcoming.	SATISFACTORY
5	Satisfactory	Level of achievement meets expectations (indicatively, over 80-95 per cent) and there is no or minor shortcoming.	
4	Moderately satisfactory	Level of achievement more or less meets expectations (indicatively, 60 to 80 per cent) and there are some shortcomings.	
3	Moderately unsatisfactory	Level of achievement is somewhat lower than expected (indicatively, less than 60 per cent) and there are significant shortcomings.	UNSATISFACTORY
2	Unsatisfactory	Level of achievement is substantially lower than expected and there are major shortcomings.	
1	Highly unsatisfactory	Level of achievement is negligible and there are severe shortcomings.	

IV. Evaluation process

The evaluation will be conducted from April to June 2018. The evaluation will be implemented in five phases which are not strictly sequential, but in many cases iterative, conducted in parallel and partly overlapping:

- ✓ Inception phase: The evaluation team will prepare the inception report providing details on the methodology for the evaluation and include an evaluation matrix with specific issues for the evaluation; the specific site visits will be determined during the inception phase, taking into consideration the findings and recommendations of the mid-term review.
- ✓ Desk review and data analysis;
- ✓ Interviews, survey and literature review;
- ✓ Country visits;
- ✓ Data analysis and report writing.

V. Time schedule and deliverables

The evaluation is scheduled to take place from February to May 2019.

The evaluation field mission is tentatively planned for March/April 2019.

At the end of the field mission, there will be a presentation of the preliminary findings for all stakeholders involved in this project. The tentative timelines are provided in Table 3 below.

After the evaluation field mission, the evaluation team leader will visit UNIDO HQ for debriefing and presentation of the preliminary findings of the terminal evaluation. The draft TE report will be submitted 4 to 6 weeks after the end of the mission. The draft TE report is to be shared with the UNIDO PM, UNIDO Independent Evaluation Division, the UNIDO GEF Coordinator and GEF OFP and other stakeholders for receipt of comments. The ET leader is expected to revise the draft TE report based on the comments received, edit the language and form and submit the final version of the TE report in accordance with UNIDO ODG/EIO/EID standards.

Table 3. Tentative timelines

Timeline	Tasks
February 2019	Desk review and writing of inception report
End of February 2019	Briefing with UNIDO project manager and the project team based in Vienna through Skype
March 2019	Field visit to South Africa
End of March 2019	Debriefing in Vienna Preparation of first draft evaluation report
April 2019	Internal peer review of the report by UNIDO's Independent Evaluation Division and other stakeholder comments to draft evaluation report
End of April 2019	Final evaluation report

VI. Evaluation team composition

The evaluation team will be composed of one international evaluation consultant acting as the team leader and one national evaluation consultant. The evaluation team members will possess relevant strong experience and skills on evaluation management and conduct together with expertise and experience in innovative clean energy technologies. Both consultants will be contracted by UNIDO.

The tasks of each team member are specified in the job descriptions annexed to these terms of reference.

According to UNIDO Evaluation Policy, members of the evaluation team must not have been directly involved in the design and/or implementation of the project under evaluation.
The UNIDO Project Manager and the project team in South Africa will support the evaluation team.

An evaluation manager from UNIDO Independent Evaluation Division will provide technical backstopping to the evaluation team and ensure the quality of the evaluation. The UNIDO Project Manager and national project teams will act as resourced persons and provide support to the evaluation team and the evaluation manager.

VII. Quality assurance

All UNIDO evaluations are subject to quality assessments by UNIDO Independent Evaluation Division. Quality assurance and control is exercised in different ways throughout the evaluation process (briefing of consultants on methodology and process of UNIDO Independent Evaluation Division, providing inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations, review of inception report and evaluation report).

The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality, attached as annex 5. UNIDO's Independent Evaluation Division should ensure that the evaluation report is useful for UNIDO in terms of organizational learning (recommendations and lessons learned) and is compliant with UNIDO's evaluation policy and these terms of reference. The draft and final evaluation report are reviewed by UNIDO Independent Evaluation Division, which will issue and circulate it within UNIDO together with a management response sheet, as well as submit to relevant stakeholders as required.

Annex 1: Project results framework

LOGFRAME MATRIX						
	Intervention logic	**Objectively verifiable indicators**				
		Indicators (quantified and time-bound)	**Baseline (incl. reference year)**	**Targets (incl. reference year)**	**Sources and means of verification**	**Assumptions**
Overall objective: Impact	**To provide solutions for cost effective GHG emission reduction in municipal waterworks.**	●Incremental CO2eq emission avoided ●Energy generated from renewable energy source (in kWh)·	Many municipalities in South Africa currently have insufficient systems in place to access and deploy EE/RE measures in their water infrastructure Limited commercially relevant data available to enable commercial decisions for Clean Energy deployment in the water and wastewater sector in South Africa.	Models and tools available for Municipalities in South Africa to access and deploy Clean Energy measures into their water infrastructure; Increased commercially relevant data is available to make decisions for Clean Energy deployment in the water and wastewater sector of South Africa.	South Africa relevant national reports; Formal stakeholder feedback that the program has contributed to the development of viable commercial pathways for deployment of Clean Energy in municipal water and wastewater treatment	Government of South Africa remains committed to Clean Energy in the medium and long term; Donors and financiers available to support the scale up of viable commercial pathways for deployment of Clean Energy technologies and services in municipal water and wastewater treatment facilities in South Africa.

LOGFRAME MATRIX						
	Intervention logic	Objectively verifiable indicators				
		Indicators (quantified and time-bound)	Baseline (incl. reference year)	Targets (incl. reference year)	Sources and means of verification	Assumptions
					facilities in South Africa.	
Specific objective(s): Outcome(s)	**To increase and promote energy use efficiency and renewable energy production while catalysing market-based approaches to reduce GHG emissions in targeted municipal waterworks.**	# of municipalities participating in the project (2) Institutional energy management systems enhanced in pilot municipalities; Key stakeholders (national government, municipalities, private sector, civil society) in South Africa provided with programme learnings to promote replication.	Municipalities participating in the project (2016): 0; Current institutional energy management systems in pilot municipalities; Limited interaction between municipal, governmental and private sector stakeholders regarding Clean Energy solutions in municipal water infrastructure.	Municipalities participating in the project (2017 – 2019); Institutional energy management systems enhanced in 2 pilot municipalities; Interaction between municipal, governmental and private sector stakeholders regarding Clean Energy solutions in municipal water infrastructure	Sub-committees established on Project Steering Committee in respect of each pilot municipality; Formal stakeholder feedback that the programme has contributed to the development of viable commercial pathways for deployment of Clean Energy in	• Willingness of state, industry and financial institutions to support the programme and invest time and money in its implementation • Interest by public and private sector stakeholders to promote market based deployment of clean energy solutions in municipal water infrastructure exists and can be maintained; • Pilot municipalities have political will to participate and translate lessons learned into tangible reforms; • Relevant private sector capacity exists; • Relevant private sector companies can contract with municipalities; • Municipal officials will seek to engage and establish knowledge sharing networks;

LOGFRAME MATRIX						
	Intervention logic	Objectively verifiable indicators				
		Indicators (quantified and time-bound)	Baseline (incl. reference year)	Targets (incl. reference year)	Sources and means of verification	Assumptions
				captured and promoted.	municipal water and wastewater treatment facilities in South Africa.	• Support for the project from the broader South African government stakeholder group.

Project Implementation						
Output 1	**Inception report developed and technical feasibility and commercial viability of clean energy in waterworks demonstrated.**	# additional Clean Energy interventions in water infrastructure; in pilot municipalities supported with tailored technical; assistance over the life of the programme that contributes to estimated energy savings (MWh), GHG emission reduction (tCOEe); -water savings (Ml), cost savings (ZAR/EUR),	Clean Energy interventions in water infrastructure in pilot municipalities supported with tailored technical assistance: 0 Indication of the baseline	Clean Energy interventions in water infrastructure in pilot municipalities supported with tailored technical assistance that highlight the potential opportunities for:	Technical feasibility studies and gap analysis conducted in pilot municipalities; Tailored technical assistance plan for pilot municipalities prepared; Surveys conducted within pilot municipalities.	Demonstration projects driven by demand from municipalities; Program relevant data is made available by municipalities Sustained buy-in and commitment from political

Project Implementation						
		private / public sector investment facilitated (ZAR/EUR). NB - this data is owned and managed by the municipalities and its availability will depend on the municipality's willingness to disclose this data.	data available in pilot municipalities : • Annual energy use (MWh) • Annual GHG emission (tCOEe) • Non-revenue water (Ml) • Electricity costs (ZAR/EUR) • Private / Public sector investment level facilitated (ZAR/EUR) • Human resources capacity enhanced within municipalities	• Annual energy savings (MWh); • GHG emission reduction (tCOEe); • Record of water savings (Ml); • Record of cost savings (ZAR/EUR); • Private / public sector investment facilitated (ZAR/EUR).		leaders in municipalities (despite local government elections in 2016); Procurement procedures are well planned and managed by municipalities, and any necessary procurement can be carried out within reasonable timeframes; Access to finance for necessary hardware is available from relevant funds and support programs, to the extent not covered by the project budget.

Project Implementation						
Output 2	**Public and private sector partnership established for scaling-up of the demonstrated waterworks technology solutions.**	# of institutional needs and capacity gaps addressed through knowledge sharing forums; Satisfaction of knowledge sharing forum participants; Overall # of forums / events at national / municipal level facilitated to promote interaction between governmental entities, the private sector and other stakeholders in the water and waste water sector; # of stakeholders engaged to understand needs and capacity gaps; Tailored capacity building plan developed according to needs identified in 2.1; # of tailored knowledge	Local capacity needs assessment is being conducted to create baseline.	Awareness program established to address needs assessment; Key decision makers and operational staff within each municipality engaged; Tailored capacity building plan designed for each pilot municipality; To be determined based on volume of priority capacity building needs assessed in Activity 2.1 and	Needs Assessment documented with proposed methods to address captured Forum attendance registers and summary of forums documented Feedback from stakeholders in attendance in forums; Excel database of stakeholder engagements; Documented capacity gaps within each municipality, as evidenced in municipal due diligence reports, to be addressed throughout the programme; Stakeholder type (categories TBD via stakeholder; Written tailored capacity building plan for each pilot municipality; Knowledge sharing forums registers	Links to ongoing training programs in South Africa (by UNIDO and other institutions) can be established and leveraged; Stakeholders are willing to engage.

Project Implementation						
		sharing forums facilitated at municipal and national levels; # of people in attendance at each municipal and national level knowledge sharing forum;		designed in Activity 2.2; To be determined based on outcomes of Activities 1.1 and 2.3.	maintained; Summary of Forum outcomes and attendees including: Geographic location, Stakeholder Type, Gender; % in attendance from public and private sector	
Output 3	**Lessons learned and policy recommendations on waterworks technologies identified, showcased and disseminated, replication of projects promoted.**	Market potential for Clean Energy solutions in municipal water infrastructure roughly estimated for South Africa Knowledge sharing pathways identified to facilitate commercial deployment of Clean Energy in municipalities in South and Southern Africa; 1 tailored and comprehensive monitoring and evaluation framework developed and suited to purpose; Comprehensive and	No Framework in place; No clean energy management plans in place in pilot; municipalities; No replication strategy in place.	Framework developed; Documented clean energy management plans in place in pilot municipalities; Replication strategy developed.	Guide to facilitate private sector engagement with municipalities in relation to energy efficiency and clean energy in water infrastructure; Summary market analysis of potential clean energy solutions for municipal water infrastructure in South Africa; Discussion paper outlining potential commercial pathways to assist municipalities in South Africa to implement energy efficiency measures and deploy clean energy, including	Private and public sector stakeholders willing to contribute data and resources to Monitoring and Evaluation and market and policy research.

Project Implementation						
		quality documentation of data and practices collected throughout the programme Directly aligned with gaps in market data and information; Directly aligned with outcomes from stakeholder engagement in Outputs 1 and 2; Directly aligned with outcomes of Output 3, related to number of public and private sector stakeholders engaged;			avenues for follow-on funding; High level market and policy recommendations as a result of the process - high level gaps in policy and regulation that could be addressed by decision makers (in a bullet point list format).	
Output 4	**Monitoring and evaluation performed.**	Summary of lessons learned, outcomes, and recommendations disseminated to targeted audiences in South Africa, the SADC region, and internationally; # of stakeholder groups identified;	Not applicable	1. Progress reports shall be submitted within 60 days after the period covered (12 months). 2. Progress reports shall consist of narrative and financial parts.	●Project progress reports ●Monitoring and Evaluation documentation ●Project Final Report ●Terminal Evaluation Report	●Interest by stakeholders to promote clean energy in municipal waterworks exists and can be maintained.

Project Implementation						
		Outreach strategy for replication opportunities developed and captured in Communication and Visibility Plan; # of peer to peer learning events between pilot municipalities and selected broader stakeholder group organized, conducted and documented; # of people in attendance at learning events; # of knowledge products developed and disseminated.		3. Reporting shall be provided in accordance with Annex 1 and Annex III. 4. Final Report shall be submitted within 6 months after the end of the 3 years since project start date. 5. Terminal evaluation is performed at the end of the project implementation .		

Annex 2: Detailed questions to assess evaluation criteria: See Annex 2 of the UNIDO Evaluation Manual

Annex 3: Job descriptions

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	International evaluation consultant, team leader
Main Duty Station and Location:	Home-based
Missions:	Two missions to Vienna, Austria and one field mission South Africa
Start of Contract (EOD):	1 February 2019
End of Contract (COB):	30 April 2019
Number of Working Days:	27-35 working days spread over 3 months

ORGANIZATIONAL CONTEXT

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Evaluation is an assessment, as systematic and impartial as possible, of a programme, a project or a theme. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. ODG/EIO/IED is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

Detailed background information of the project can be found the terms of reference (TOR) for the terminal evaluation.

The international evaluation consultant/team leader will evaluate the project in accordance with the evaluation-related terms of reference (TOR). He/she will perform, inter alia, the following main tasks:

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
Undertake a desk review of project documentation and relevant country background information (national policies and strategies, UN strategies and general economic data); determine key data to collect in the field and adjust the key data	• Division of evaluation tasks with the National Consultant • An adjusted table of evaluation questions, depending on country specific context • A draft list of stakeholders to be interviewed during the evaluation field mission	5 days	Home-based

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
collection instruments accordingly (if needed); Assess the adequacy of legislative and regulatory framework relevant to the project's activities and analyze other background info.	• A brief assessment of the adequacy of the country's legislative and regulatory framework		
Prepare an inception report which streamlines the specific questions to address the key issues in the TOR, specific methods that will be used and data to collect in the field visits, detailed evaluation methodology confirmed, draft theory of change, and tentative agenda for field work	Inception report submitted to the evaluation manager	3	Home-based
Briefing with the UNIDO Independent Evaluation Division, project managers and other key stakeholders at UNIDO HQ.	• Detailed evaluation schedule with tentative mission agenda (incl. list of stakeholders to be interviewed and planned site visits) submitted to evaluation and project manager	2 days	Vienna, Austria
3. Undertake evaluation field mission[10] to consult field project stakeholders, partners and beneficiaries to verify and complete preliminary evaluation findings from desk review and assess the institutional capacities of the recipient country	• Field mission conducted • Evaluation/debriefing presentation of the evaluation's preliminary findings prepared, draft conclusions, recommendations and lessons learnt to stakeholders in the country, at the end of the mission • Agreement with the National Consultant on the structure and content of the evaluation report and the distribution of writing tasks	6-10 days	S. Africa
4. Debriefing mission: Present preliminary findings, recommendations and lessons learnt to project stakeholders at	• Power point presentation • Feedback from stakeholders obtained and discussed	2 days	Vienna, Austria

[10] The exact mission dates will be decided in agreement with the Consultant, UNIDO HQ, and the country counterparts.

MAIN DUTIES	Concrete/ Measurable Outputs to be achieved	Working Days	Location
UNIDO HQ for factual validation and comments Hold additional meetings with and obtain additional data from evaluation/project manager and other stakeholders as required	• Additional meetings held as required		
5. Prepare the draft evaluation report, with inputs from the National Consultant, and in accordance with the evaluation TOR Submit draft evaluation report to the evaluation manager for feedback and comments	• Draft evaluation report submitted to evaluation manager for review and comments	6/8 days	Home-based
6. Revise the draft evaluation report based on comments and suggestions received through the evaluation manager and edit the language and finalize the evaluation report according to UNIDO Independent Evaluation Division standards Prepare a two pages summary of a take-away message from the evaluation	Final evaluation report submitted to evaluation manager Two pages summary take-away message from the evaluation submitted to the evaluation manager	3/5 days	Home-based
	TOTAL	27/35 days	

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced degree in environment, energy, engineering, development studies or related areas

Technical and functional experience:

- Minimum of 10 years' experience in environmental/energy project management and/or evaluation (of development projects), including social safeguards and gender
- Previous evaluation experience and knowledge of UNIDO activities is an asset
- Knowledge about multilateral technical cooperation and the UN, international development priorities and frameworks
- Working experience in developing countries

Languages: Fluency in written and spoken English is required.

Reporting and deliverables

1) At the beginning of the assignment the Consultant will submit a concise Inception Report that will outline the general methodology and presents a concept Table of Contents

2) The country assignment will have the following deliverables:

- Presentation of initial findings of the mission to key national stakeholders
- Draft report
- Final report, comprising of executive summary, findings regarding design, implementation and results, conclusions and recommendations

3) Debriefing at UNIDO HQ:

- Presentation and discussion of findings
- Concise summary and comparative analysis of the main results of the evaluation report

All reports and related documents must be in English and presented in electronic format.

Absence of conflict of interest:

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the UNIDO Independent Evaluation Division.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	National evaluation consultant
Main Duty Station and Location:	Home-based
Mission/s to:	Travel to potential sites within S. Africa
Start of Contract:	1 February 2019
End of Contract:	30 April 2019
Number of Working Days:	25-30 days spread over 3 months

ORGANIZATIONAL CONTEXT

The UNIDO Independent Evaluation Division (ODG/EIO/IED) is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Evaluation is an assessment, as systematic and impartial as possible, of a programme, a project or a theme. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. The UNIDO Independent Evaluation Division is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

Detailed background information of the project can be found the terms of reference (TOR) for the terminal evaluation.

As evaluation team member, the national evaluation consultant will evaluate the project according to the terms of reference (TOR) under the leadership of the team leader (international evaluation consultant). S/he will perform, inter alia, the following main tasks:

MAIN DUTIES	Concrete/measurable outputs to be achieved	Expected duration	Location
Desk review Review and analyze project documentation and relevant country background information; in cooperation with the team leader, determine key data to collect in the field and prepare key instruments in Russian (questionnaires, logic models) as required If need be, recommend adjustments to the tools in order to ensure their understanding in the local context	• A list of evaluation questions; questionnaires /interview guide; logic models adjusted to ensure understanding in the national context • A list of key data available; and to be collected • A brief assessment of the adequacy of the country's legislative	7 days	Home-based

MAIN DUTIES	Concrete/measurable outputs to be achieved	Expected duration	Location
Coordinate and lead interviews in local language and assist the team leader with translation where necessary Analyze and assess the adequacy of legislative and regulatory framework, specifically in the context of the project's objectives and targets	and regulatory framework in the context of the project • Input to inception report		
Coordination of evaluation field mission agenda, ensuring and setting up the required meetings with project partners and government counterparts, and organize and lead site visits, in close cooperation with project staff in the field Assist and provide detailed analysis and inputs to the team leader in the preparation of the inception report	• Detailed evaluation schedule • List of stakeholders to be interviewed during the field mission	6 days	Home-based (telephone interviews)
Participation in interviews during evaluation field missions	• Interview notes • Input to presentations of the evaluation's initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the mission	6-10 days	Home based, including in-country project sites
Draft evaluation report Prepare inputs and analysis to the evaluation report according to TOR and as agreed with the team leader	• Inputs to the draft evaluation report submitted to evaluation team leader	4 days	Home-based
Final evaluation report and summary take-away message Contribute to the finalization of the evaluation report on basis of comments and suggestions received through the evaluation team leader Contribute to the preparation of a two pages summary of a take-away message from the evaluation	• Inputs to the Final evaluation report submitted to evaluation team leader	2-3 days	Home-based
TOTAL		25-30 days	

REQUIRED COMPETENCIES

Core values:
1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:
1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):
1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in environmental science, engineering or other relevant discipline like developmental studies with a specialization in industrial energy efficiency and/or climate change.

Technical and functional experience:
- Exposure to the needs, conditions and problems in developing countries.
- Familiarity with the institutional context of the project is desirable.
- Experience in the field of environment and energy, including evaluation of development cooperation in developing countries and social safeguards and gender is an asset

Languages: Fluency in written and spoken English is required.

Absence of conflict of interest:

According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the UNIDO Independent Evaluation Division.

Annex 4- Outline of an in-depth project evaluation report

Executive summary (maximum 5 pages)

Evaluation purpose and methodology
Key findings
Conclusions and recommendations
Project ratings
Tabular overview of key findings – conclusions – recommendations

1. **Introduction**
   1.1. Evaluation objectives and scope
   1.2. Overview of the Project Context
   1.3. Overview of the Project
   1.4. Theory of Change
   1.5. Evaluation Methodology
   1.6. Limitations of the Evaluation
2. **Project's contribution to Development Results - Effectiveness and Impact**
   2.1. Project's achieved results and overall effectiveness
   2.2. Progress towards impact
      2.2.1. Behavioral change
         2.2.1.1. Economically competitive - Advancing economic competitiveness
         2.2.1.2. Environmentally sound – Safeguarding environment
         2.2.1.3. Socially inclusive – Creating shared prosperity
      2.2.2. Broader adoption
         2.2.2.1. Mainstreaming
         2.2.2.2. Replication
         2.2.2.3. Scaling-up
3. **Project's quality and performance**
   3.1. Design
   3.2. Relevance
   3.3. Efficiency
   3.4. Sustainability
   3.5. Gender mainstreaming
4. **Performance of Partners**
   4.1. UNIDO
   4.2. National counterparts
   4.3. Donor
5. **Factors facilitating or limiting the achievement of results**
   5.1. Monitoring & evaluation
   5.2. Results-Based Management
   5.3. Other factors
   5.4. Overarching assessment and rating table
6. **Conclusions, recommendations and lessons learned**
   6.1. Conclusions
   6.2. Recommendations
   6.3. Lessons learned
   6.4. Good practices

Annexes (to be put online separately later)

- Evaluation Terms of Reference
- Evaluation framework

- List of documentation reviewed
- List of stakeholders consulted
- Project logframe/Theory of Change
- Primary data collection instruments: evaluation survey/questionnaire
- Statistical data from evaluation survey/questionnaire analysis

Annex 5: Checklist on evaluation report quality

Project title:
UNIDO Project ID:
Evaluation team
Evaluation team leader:
National evaluation consultant:
Evaluation manager (IED):
Quality review done by: Date:

Report quality criteria	UNIDO Independent Evaluation Division assessment notes	Rating
A. Was the report well-structured and properly written? (Clear language, correct grammar, clear and logical structure)		
B. Was the evaluation objective clearly stated and the methodology appropriately defined?		
C. Did the report present an assessment of relevant outcomes and achievement of project objectives?		
D. Was the report consistent with the ToR and was the evidence complete and convincing?		
E. Did the report present a sound assessment of sustainability of outcomes or did it explain why this is not (yet) possible? (Including assessment of assumptions, risks and impact drivers)		
F. Did the evidence presented support the lessons and recommendations? Are these directly based on findings?		
G. Did the report include the actual project costs (total, per activity, per source)?		
H. Did the report include an assessment of the quality of both the M&E plan at entry and the system used during the implementation? Was the M&E sufficiently budgeted for during preparation and properly funded during implementation?		
I. Quality of the lessons: were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
J. Quality of the recommendations: did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?'). Can these be immediately implemented with current resources?		

Report quality criteria	UNIDO Independent Evaluation Division assessment notes	Rating
K. Are the main cross-cutting issues, such as gender, human rights and environment, appropriately covered?		
L. Was the report delivered in a timely manner? (Observance of deadlines)		

Rating system for quality of evaluation reports

A rating scale of 1-6 is used for each criterion: Highly satisfactory = 6, Satisfactory = 5, Moderately satisfactory = 4, Moderately unsatisfactory = 3, Unsatisfactory = 2, Highly unsatisfactory = 1, and unable to assess = 0.

Annex 6: Guidance on integrating gender in evaluations of UNIDO projects and Projects

A. Introduction

Gender equality is internationally recognized as a goal of development and is fundamental to sustainable growth and poverty reduction. The UNIDO Policy on gender equality and the empowerment of women and its addendum, issued respectively in April 2009 and May 2010 (UNIDO/DGB(M).110 and UNIDO/DGB(M).110/Add.1), provides the overall guidelines for establishing a gender mainstreaming strategy and action plans to guide the process of addressing gender issues in the Organization's industrial development interventions.

According to the UNIDO Policy on gender equality and the empowerment of women:

Gender equality refers to the equal rights, responsibilities and opportunities of women and men and girls and boys. Equality does not suggest that women and men become 'the same' but that women's and men's rights, responsibilities and opportunities do not depend on whether they are born male or female. Gender equality implies that the interests, needs and priorities of both women and men are taken into consideration, recognizing the diversity of different groups of women and men. It is therefore not a 'women's issues'. On the contrary, it concerns and should fully engage both men and women and is a precondition for, and an indicator of sustainable people-centered development.

Empowerment of women signifies women gaining power and control over their own lives. It involves awareness-raising, building of self-confidence, expansion of choices, increased access to and control over resources and actions to transform the structures and institutions which reinforce and perpetuate gender discriminations and inequality.

Gender parity signifies equal numbers of men and women at all levels of an institution or organization, particularly at senior and decision-making levels.

The UNIDO projects/projects can be divided into two categories: 1) those where promotion of gender equality is one of the key aspects of the project/project; and 2) those where there is limited or no attempted integration of gender. Evaluation managers/evaluators should select relevant questions depending on the type of interventions.

B. Gender responsive evaluation questions

The questions below will help evaluation managers/evaluators to mainstream gender issues in their evaluations.

B.1. Design

- Is the project/project in line with the UNIDO and national policies on gender equality and the empowerment of women?
- Were gender issues identified at the design stage?
- Did the project/project design adequately consider the gender dimensions in its interventions? If so, how?
- Were adequate resources (e.g., funds, staff time, methodology, experts) allocated to address gender concerns?
- To what extent were the needs and priorities of women, girls, boys and men reflected in the design?
- Was a gender analysis included in a baseline study or needs assessment (if any)?
- If the project/project is people-centered, were target beneficiaries clearly identified and disaggregated by sex, age, race, ethnicity and socio-economic group?

- If the project/project promotes gender equality and/or women's empowerment, was gender equality reflected in its objective/s? To what extent are output/outcome indicators gender disaggregated?

B.2. Implementation management

- Did project monitoring and self-evaluation collect and analyse gender disaggregated data?
- Were decisions and recommendations based on the analyses? If so, how?
- Were gender concerns reflected in the criteria to select beneficiaries? If so, how?
- How gender-balanced was the composition of the project management team, the Steering Committee, experts and consultants and the beneficiaries?
- If the project/project promotes gender equality and/or women's empowerment, did the project/project monitor, assess and report on its gender related objective/s?

B.3. Results

- Have women and men benefited equally from the project's interventions? Do the results affect women and men differently? If so, why and how? How are the results likely to affect gender relations (e.g., division of labour, decision making authority)?
- In the case of a project/project with gender related objective/s, to what extent has the project/project achieved the objective/s? To what extent has the project/project reduced gender disparities and enhanced women's empowerment?
