Scottish Government International Development Programme
End-Year Report

1. General project information		
1.1	**Project reference Number**	MAL/18/0-UoS
1.2	**Name of organisation**	University of Strathclyde
1.3	**Lead partner(s) organisation**	United Purpose and Community Energy Malawi
1.4	**Project title**	Rural Energy Access through Social Enterprise and Decentralisation (EASE)
1.5	**Reporting period**	**From:** 01/04/2019 **To:** 31/03/2020
1.6	**Reporting year**	Year 2
1.7	**Project start date**	01/10/2018
1.8	**Project end date**	31/03/2023
1.9	**Total project budget***	£1,332,533
1.10	**Total funding from Scottish Government***	£1,332,533
1.11	**Provide a brief description of the project's aims, highlighting which of the Sustainable Development Goals (SDGs) your project is working towards? (200 words)**	The EASE project works to address energy poverty in marginalised communities in Dedza and Balaka through the deployment of appropriate renewable energy infrastructure and service provision, developing sustainable social business models and supporting the delivery of national policy regarding energy access and decentralisation. Specifically, EASE aims to support SDG7 and SE4All targets by: - Deploying 2 solar PV microgrids with linked 'satellite' kiosks - Deploying 3 solar PV energy hubs - Placing Malawi's first District Energy Officers in Dedza and Balaka to undertake a range of capacity building and support activities to improve the enabling environment for energy projects.

2. Project progress and results

Please use this section to give an update on the progress the project has made during this reporting period.

2.1	Provide an update on the progress your project has made over the past 12 months. Use this space to update us on what has gone well and any challenges you have experienced, detailing how you have overcome these. (Max 500 words)

Microgrid Strand

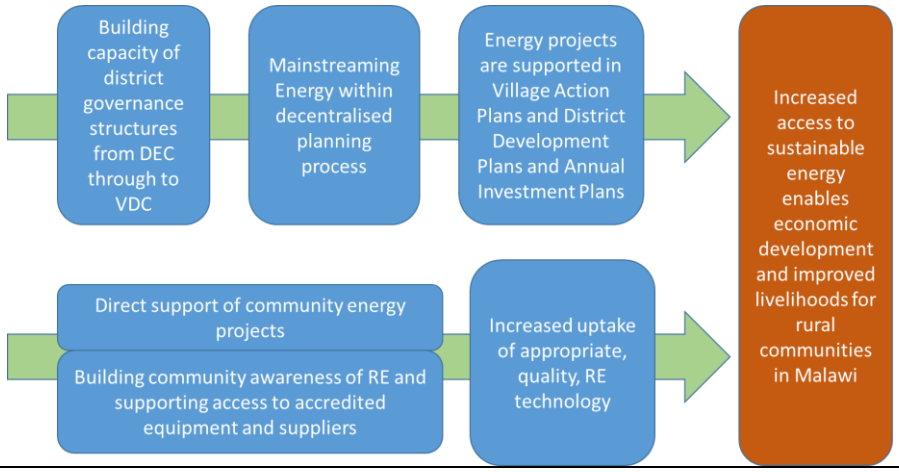
Our target for this year was to deliver microgrid and kiosk services in Mthembanji community. We finish the year 95% complete due to cumulative impacts of numerous small delays, and finally to the COVID-19 situation. Post mid-year, delays were encountered gaining necessary approvals for importation of RE equipment due to a newly launched tax framework. With the assistance of SG and GoM strand leads, we worked with GoM Ministry of Finance to gain the approvals. However, this delayed shipping until early 2020, causing knock-on delays due to bad weather. Despite rainy season challenges, all equipment was onsite and installations started by early February. International technical support was mobilised to reach site late February with installation on-track for successful completion. However, the COVID-19 emergency made it impossible for the international teams to travel. Adapting to a remote support model allowed the local team to achieve 95% completion. We are currently assessing options to complete final commissioning, the accompanying COVID-19 risk assessment and strategy give further detail.

During this period, extensive community capacity building has continued. Connection fee collection from customers has populated the microgrid operating bank account and paid for initial operating costs (site agents, security and land rental). Engagement with the local school and church resulted in their sign-up to the microgrid under 'social impact' terms.

Despite the delays, this (first of its kind for Malawi) microgrid is ready for 'switch on' and we are confident of a successful launch when the situation in Malawi allows.

DEO strand

The DEO work programme in Dedza and Balaka has progressed successfully, embedding CEM staff within both districts and building key relationships as they undertake activities around programme ToC.



	Comprehensive initial RE awareness training programmes have been delivered to: • 100 key stakeholders (local govt, NGOs, CSOs) in each district (Forestry, Community Development, Gender, Social Welfare, Agriculture, Health, Education and Water. • 140 extension workers from the sectors mentioned above plus frontline officers from Malawi council for the handicapped (MACOHA) and the National Initiative for Civic Education. In addition, nominated representatives from each TA (10 per district) were taken through initial technician training (foundation knowledge for maintenance and repair). The technicians and frontline officers form a network of actors in each district whom the DEO continues to support as they interact in the community. Community energy requirements are now being flagged for support through this channel (48 projects given initial support so far). DEOs also attend monthly ADC meetings (rotating through the 20 ADCs) 'backstopping' on energy issues. Preparation for CEM led Energy Hub deployment has continued with extensive engagement with two communities in Balaka. Training for Energy Hub entrepreneurs targeted 45 people with orientation to business concepts and PUE toolkits, and was delivered in collaboration with the office of community development. All project partners have been active with policy engagement and advocacy, briefing the Dept of Energy and representing the project at energy sector events and MaSP meetings. WASHTED have led on collaborative knowledge exchange events and built additional (self-funded) learning activities around project field activities.
2.2	Has the focus or plans for delivery changed significantly during the last year? Please highlight what issues or challenges prompted this change and how you anticipate any changes in focus will impact on the previously agreed outcomes (Max 500 words)
	The focus has not changed significantly in the course of the year. Plans for delivery had to adapt to the delays with installations, but this involved rescheduling activities rather than any significant change of focus.
2.3	Taking into consideration what you have achieved during the last 12 months, along with any challenges you have experienced, please highlight to us what lessons you have learned, and how these will be applied in the project in the future. (Max 500 words)
	Project engagement across Dedza and Balaka, from grassroots up to DEC, has provided a wealth of learning on the evolving energy priorities of rural communities and general awareness of Renewable Energy Technology (RET) at all levels,

confirming our project priorities and informing how planned capacity building and infrastructure deployments should be tailored going forward.

The other most significant learning this year has been on how to efficiently deploy decentralised RE under social enterprise business models.

The launch of Malawi's National Energy Policy and Renewable Energy Strategy in November 2019, meant an evolving operating environment for the project, including new frameworks for the regulation of mini/micro grids and importation of innovative technology. The project team made excellent progress with understanding the requirements as they relate to decentralised solar PV microgrids and further established good relationships with key institutions: MERA, the Dept of Environmental Affairs, and the Dept of Energy Affairs. Through the process of seeking approval for technical designs, tariff design, regulatory accreditation and licensing, key lessons have been learnt (our microgrid being the first of its type testing these processes) and captured to streamline future projects. Gaining the necessary documentation for wavier of import fees and tax was a major challenge and this area remains a concern for future projects and will be focus of ongoing project activities to improve efficiency. For future installations, several additional months will be included in the project plan for this stage.

Experience has been gained in procurement and sourcing electrical equipment locally, including identifying a network of suppliers and contractors for distribution networks. Standard prices for equipment, lead times and purchasing processes have been better understood to increase efficiency and reduce procurement time for future deployments.

A steep learning curve has been travelled in the integration of innovative RE technology (including pay-as-you-go smart meters and Li-Ion batteries) supplied by international companies. This is the first time some of this technology has been implemented in Malawi. The team has gained understanding in decision making on balancing technology options between higher cost and improved reliability prospects, as well as gaining knowledge in commissioning procedures, maintenance requirements, warrantees and troubleshooting of generation equipment, again essential knowledge directly applicable to future microgrid implementation

Regular discussion and design decision making with the generation hub suppliers Sustain Solar has provided learning on industry trends and technological considerations of batteries, PV modules, inverters and associated electronics.

The continuing development of the wider Social Enterprise business model for energy services has provided useful learning through planning standard operating procedures, understanding and adapting strategy based on feedback form community engagement, and financial forecasting. All the learning detailed above has been used to hone and refine the business model which will be used as a framework for the rest of EASE implementation as well as further scaling up of social enterprise operations.

3. Partnerships and collaboration

This section allows you to discuss how partnership working is progressing on the project, as well as wider collaboration and sharing of learning.

3.1	Provide an update on how partnership working has gone in the past 12 months. Let us know about any highlights, challenges or changes to roles and responsibilities. (Max 350 words)
	There have been no significant changes to roles and responsibilities. Scottish and Malawian partners continue to collaborate well in the existing partnership framework. Collaboration across the project strands has also developed this year through bi-annual knowledge exchange meetings where partners share updates and make comments/suggestions on fellow partners' activities. Rather than operating in silos, United Purpose and Community Energy Malawi are collaborating to deliver a Productive Use of Energy training to the community in Mthembanji using a tool kit which has been developed by CEM and UoS. Printed copies in local language will be made available to all participants. A key partner of the project is the GoM Dept of Energy Affairs (DoEA), in particular the member of staff acting as strand lead. Good communication between the project and DoEA is essential. We have responded to feedback in this area and in this reporting period DoEA staff have attended EASE workshops and supported various project delivery challenges. We believe that good working relationships are in place. CEM are also regularly in communication with DoEA and have held specific briefing sessions related to implementing policy targets on District Energy Officer roll out. District councils are our partners at district level. CEM has developed a good working rapport with the two councils, with clear recognition of CEM as a leading energy organisation in their respective districts.
3.2	Have any Scotland-based staff visited the project in the past 12 months? Give details including key activities and outputs of these visits.
	Yes

Date of visit	**Key achievements / outputs of visit**	**Follow-up actions**
Nov 19	• Project Monitoring and collaborative activities • EASE Bi-annual meeting	

	• MaSP meeting • DoEA briefings • Briefings with Malawi Energy Regulatory Authority (MERA)	

3.3	Please tell us about any dissemination and learning throughout this reporting period. How have you promoted effective learning across the project? Please explain what processes you have used both internally and externally to share learning from the project so far, and how this learning is being used. (Max 500 words)
	We have 3 core learning themes: **Social Impact Learning** In addition to M&E systems for gathering logframe relevant project monitoring data, we have implemented research frameworks around our MEL strategy to track customer journeys for all microgrid and energy hub customers. Detailed social impact MEL is in place and data is accumulating. **Techno-Economic Sustainability of Off-Grid Energy Systems** We continue to draw out learning on the process of developing renewable energy supply businesses and collect techno-economic data to facilitate analysis and estimation of the model sustainability. External match funding allowed a Strathclyde staff member to undertake a 'virtual secondment' with UP this year, working exclusively on microgrid development and social enterprise business planning. Additionally, the Strathclyde team has been supporting CEM develop their wider business plan and strategy. CEM's experiences of deploying and operating Sitholo mini-grid were shared and benefited the project. Developing the microgrid business plan, including tariff design and financial forecasting, has provided significant learning on future financial sustainability. Guidance and teaching was provided from the United Nations supported Green Minigrids Helpdesk through Energy4Impact, and MEGA minigrid in Malawi. **Local Energy Governance** Building on the confirmation of District Energy Officers in Malawi~~'s~~ as official GoM policy, CEM continue to update the learning gained through implementing the role, reflecting on experiences and providing recommendations to the DoEA for wider roll out.

More generally, production of learning and knowledge is embedded within project activities and reflected in our collaborative approach to project management and delivery. We promote good inter/intra team communication through regular WhatsApp (daily), email (daily) and skype (weekly) interactions, supporting continual informal learning and dissemination.

Scheduled bi-annual EASE team meetings focus on knowledge sharing and updates. Our November meeting in Balaka included national and local government stakeholders who provided presentations on decentralised energy governance.

WASHTED, as lead local partner for MEL have coordinated learning review meetings and promoted collaboration on data sharing and associated research. A key WASHTED contribution is targeted microgrid learning undertaken by an academic staff member (match funded by EASE). This is now underway following delays. In addition, both Strathclyde and WASHTED have linked research projects and student initiatives to EASE, laying foundations for future learning outputs.

All team members utilise our Strathcloud online system for shared access to documentation and data repositories.

We have established a devoted project website https://ease.eee.strath.ac.uk/ used to disseminate project progress and learning in addition to our general blog site https://strath-e4d.com/.

Wider dissemination of project learning has occurred through promoting and representing EASE at relevant conferences and participating in various fora:
Development Studies Association Conference, Scotland January 2020;
Global Humanitarian Technology Conference, Seattle October 2019;
UKERC conference Oxford, 2019;
Co-chairing the SMP Renewable Energy Forum;
Representation at SMP, MaSP and SIDA meetings.

Finally, project learning has contributed to 6 academic publications:
https://doi.org/10.1109/GHTC46095.2019.9033449
https://doi.org/10.20900/jsr20200008
https://doi.org/10.1109/GHTC46095.2019.9033449
https://doi.org/10.1186/s13705-020-0241-0
https://pureportal.strath.ac.uk/en/publications/assessing-the-feasibility-of-solar-microgrid-social-enterprises-a
https://pureportal.strath.ac.uk/en/publications/experiences-from-deploying-solar-pv-energy-businesses-in-rural-ma
https://hdl.handle.net/2134/12090702.v1

3.4	Has the project completed a mid-term project evaluation in the past 12 months (or is one planned for the next 12 months)? Please provide detail of the outcome of the evaluation. (Max 500 words)
	A mid-term evaluation is planned during the 3rd quarter of Year 3.
3.5	Please highlight how you are maintaining an awareness of others working in this region, giving details of collaboration, joint working or partnerships with others. (Max 500 words)
	The EASE project brings together leading organisations in the Malawian energy sector to work together formally in an example of collaborative working and collective action. In addition to the engagements mentioned above with respect to learning and dissemination, the project partners are engaged in a wide range of activities related to the energy sector in the region. CEM is a member of the Green and Inclusive Energy Partnership in East and Southern Africa and the IEEE Smart Village initiative. UP are a founding member of, and Secretariat to, the National Cookstoves Steering Committee. Both CEM and UP are independently leading prominent energy access projects funded by UNDP, HIVOS and Irish Aid, whilst WASHTED are active experts in the local energy sector and academic community. The EASE partners have excellent oversight of the sector and are regularly invited to attend and contribute to sustainable energy events, workshops and policy briefings. Partners are all members and regular contributors to the Renewable Energy Malawi WhatsApp Group. CEM and UP are both members of the Malawi Scotland Partnership Energy Strand and regularly attend MaSP meetings and events. Strathclyde initiated and co-chair the Scotland Malawi Partnership Renewable Energy Forum. These fora provide EASE partners the opportunity to network and seek collaboration with other SG funded partners, particularly CJIF projects and the CCPM. Through these routes, a formal collaboration has been established with the Turing Trust to deliver ICT to schools benefiting from EASE interventions. The activities of the DEOs in Dedza and Balaka are highlighting opportunities for collaboration with local actors. The DEOs are collaborating with technical companies to meet demand for energy arising from DEO capacity building. These include solar home system and lantern suppliers SONLITE, ZUWA, WETECH and Yellow Solar. DEOs have also established a relationship with local CSO in Balaka Azitona Development Services (ADES) to develop joint project proposals. They have also been collaborating with local representatives of the Nora Docherty Foundation who support a school campus in Dedza. Strathclyde participate in a range of international networks and research programmes that provide insights to energy access activities in Sub Saharan Africa: Modern Energy Cooking Services, Low Carbon Energy for

	Development Network, IEEE Smart Villages, African Minigrids Development Association, and Energy 4 Impact. After being linked via the organisation African Minigrids, Sokolo School (Peachtree Church) has assisted in linking United Purpose with service providers for cost effective installation of the microgrid, including generation and distribution system installers and freight and clearing agents for imported equipment. EASE is collaborating with Turing Trust to provide ICT equipment and training to a primary school which will benefit from the microgrid. UP is working collaboratively with the Social Enterprise Academy Malawi (SEAM) on developing their social enterprise strategy, business canvas and sustainability plan. SEAM will also work collaboratively with UP to provide a business training package for the community. As CEM build toward the first Energy Hub deployments, they have partnered very effectively with agriculture and irrigation officers working in the area. This has facilitated good community engagement, extensive data sharing, updating of local priorities and allowed fine tuning of the energy hub service offering.
4. Safeguarding and fraud *Please ensure you complete questions 4.1 and 4.2 even if you have no incidents to report.*	
4.1	Have there been **any** safeguarding incidents, either relating to staff/volunteers or beneficiaries of the Grant or the Project, in the last 12 months?
	No
4.2	Have these incidents reported at 4.1 been reported to relevant authorities, and if so, to whom?
	N/A
4.3	Describe what action has been taken, and highlight any lessons learned.
	N/A
4.4	Have there been any incidents in the last 12 months of financial mismanagement, theft, fraud etc, either relating to the Grant or the Project or which affects the organisation?

	No
4.5	Have these incidents reported at 4.1 been reported to relevant authorities, and if so, to whom?
	N/A
4.6	Describe what action has been taken, and highlight any lessons learned.
	N/A

5. Risk assessment

5.1	Have any issues materialised during this reporting period? If so, how were they addressed? *Please refer to risk assessment provided at application stage*.

Assumption	**Risk**	**Action taken**	**Was this included in the Risk Assessment Table in your application?**
Travel around country remains practical and safe	Civic disruption due to elections in 2019	Scheduling activities to avoid periods of potential unrest around elections. Disruption focussed on Lilongwe and Blantyre. Dedza activities unaffected.	Yes
Stable currency and tariff environment (fees for importing RET remain stable)	• Exchange rate losses generally increase the costs of purchasing and installing Renewable Energy equipment • New tariff frameworks create Project delays due to bureaucratic hurdles	• Continual monitoring of capital budgets and financial projections and exchange rates, innovating on design and working with suppliers to drive efficiencies • Progressed other areas of the project while waiting for approvals, preparing for rapid response installation.	Yes – in summarised form
Procurement processes through UP financial department conducted in a timely manner	Project delays due to administrative hurdles	Providing support, guidance and reminders where possible. Documenting processes to increase administrative efficiency in the future.	No – but various delays included in specific microgrid install risk register.
Travel around country remains practical and safe	Covid-19	Detailed Covid mitigation strategy – see accompanying document	The assumption, but not the specific risk.

6. Inclusion & accountability *Thinking specifically about the past 12 months, please use this section to tell us how you are mainstreaming through your project, ensuring that you are aware of and actively working to reach vulnerable and marginalised groups.*	
6.1	Is the project still relevant for the beneficiaries you are working with? Please highlight how you ensure accountability on the project, ensuring beneficiaries have the opportunity to feedback on the project and influence its development? (max 350 words)
	Yes, this project is still highly relevant. Our M&E surveying confirms the extent of the SDG7 challenge and the desire for modern energy access within the rural communities of Dedza and Balaka. The DEO work focusses on engagement from grassroots up to DEC. By attending monthly ADC meetings and building a network of frontline officers who are based in the field, the DEOs have both direct and indirect engagement with beneficiaries. Attending ADC meetings means DEOs are up to date with current activities in the community and can advise on energy issues. They are available in person to receive feedback and to discuss local priorities. Furthermore, as the trained frontline officers interact with their local communities, issues are fed back to the DEOs for advice and support. Regular engagement with the DEC provides an overview of activity across all sectors of the district and provides the opportunity for influencing local govt policy. DEOs also act as in interface to the DoEA, briefing on the energy issues of their districts at the highest level. The Dedza Microgrid programme ensures accountability through a village energy committee (VEC) set up to provide a feedback mechanism to the broader community around issues related to the project. Regular meetings with the committee keeps the community up to date on the project progress and any issues arising. The community is able to make suggestions and provide feedback to the project through the energy committee which are presented during the regular meetings conducted between the VEC and project staff. During delivery of installation materials to site there is always a representative of the energy committee or a site agent to check the quantities delivered and sign the goods received notes.
6.2	Do you have an awareness of particularly vulnerable or marginalised groups within the community in which your project is working? Please give details on how you are disaggregating data to recognise these groups across the project. (Max 350 words)
	In addition to our core SDG7 energy access targets, our baselining and follow up MEL monitoring is designed to also track the socio-economic impacts of energy interventions in the communities where we are working.

	The DEO engagement covers districts and gathers energy access data at an aggregated village development committee (VDC) level. In assessing the energy projects from specific communities that come forward, CEM use criteria which includes marital status (widow and divorced), income levels (low income levels), hunger situation, any health or body disability, and women having inadequate access to information. A combination of these indicators helps to separate and understand vulnerable and marginalised groups in the communities. Where we engage directly with communities to implement microgrids and energy hubs, or provide DEO support to externally funded projects, we conduct more detailed MEL that tracks who is utilising the energy services. By collecting data at a household level we are able to monitor not only direct customers (signatories to microgrid connections for example) but how others within the household are impacted too. Around our Mthembanji microgrid, our surveys tell us our customer households consist of: 336 people, 162 male, 174 female 66 young children (6yrs and under), 7 elderly (61yrs and over), 159 go to school Our surveying method promotes female participation (47% of respondents) and have allowed us to identify proportions of households with particularly high concerns around: employment (5%), financial security (17%) and access to even the most basic forms of energy (19%). We have further depth of data on how energy is being utilised, disaggregated by age and gender. Our first Energy Hub deployments (planned for Year 3) are engaging with communities where existing irrigation and crop diversification support is in place, that also targets increased gender participation. Our customers will be primarily irrigation scheme members from two neighbouring communities. The scheme membership comprises of 98 men and 125 women.
6.3	How is your project working to actively meet the needs of these vulnerable and marginalised groups, ensuring they are benefiting from the project? Please outline any mechanisms you are using. (Max 350 words)
	As we engage with specific communities for microgrid and energy hub deployments we are tracking detailed customer journeys as part of our MEL framework. We have designed and baselined a detailed customer journey MEL process. This is tracking changes in: energy use (by who, for what), economic impact (decreased/increased cost of energy plus new income streams), benefits to education (through modern electricity access and/or increased household incomes), reductions in use of lighting that causes indoor air pollution and increased access to information (via radio and TV). For these microgrid customers we are gaining a view of not just the signatory customer but all members of the household. Our MEL will track the impact of electricity access on all beneficiaries, disaggregating by gender and age.

	As we undertake these deployments we are undertaking a range of measures to promote social inclusion and gender equality. For the Mthembanji microgrid we have established a village energy committee that includes 4 women, with one of them being a vice chairperson so that the views of women in the community are represented. Additionally, customers are allowed to pay connection fees in instalments (a proposal that was made by the customers themselves through the energy committee). Contractors have been urged to employ casual labourers from the community, including women. A total of 34 labourers have been employed at different stages of the grid installation and 4 are women. We have also designed a tariff structure that caters for low income households and have include a 'social impact' tariff to subsidise connections for community institutions (school and church initially in Mthembanji) Once new energy infrastructure is in place, we have a range of capacity building and training activities planned. These will utilise existing PUE and gender mainstreaming toolkits and will specifically focus on enabling women and girls to benefit from the improved energy access.
6.4	Taking into consideration some of the challenges of mainstreaming, please describe any challenges you have faced in reaching vulnerable and marginalised groups, how you have overcome these or plans you have developed to support inclusion on the project. (Max 350 words)
	Microgrids and Energy Hubs need financially viable customers and these are not typically going to belong to vulnerable groups. We have a challenging balance to strike between ensuring a long term sustainable service and reaching vulnerable groups. However, using the detailed customer information we are collecting we will be able to fully understand the subtleties of the connected households and target community capacity building to promote inclusion and benefit marginalised groups. Distribution of solar lanterns through kiosks offers a lower entry point to the energy access ladder, and has been designed into the programme to address more vulnerable and marginalised groups in the communities. However, the cost of a PSP can also be unaffordable and instalment payments are being offered to further lower the entry point. The effective customer engagement frameworks and MEL built into our programme allows us to better understand the needs of vulnerable groups and we intend to use the information to improve the service offering to vulnerable groups through adapting the business plan to maximise social impact. In addition, we recognise that cooking with firewood is the largest use of energy in the communities we work with and that the burden for fuel collection and

	cooking lies predominately with females. Strathclyde are now a major partner in the £40m Modern Energy Cooking Services programme and plan to link EASE with opportunities to deploy appropriate electric cooking devices in Malawi.
7. Financial information *This section will be reviewed alongside your budget report, which should be included alongside your narrative and logframe. Please ensure this spreadsheet is completed with both a detailed breakdown of expenditure for this financial year, along with your projected spend for the next financial year.* *Please note carry-over of funds to the next financial year should have been agreed with the Scottish Government by January 31st of the current financial year.*	
7.1	With reference to your budget spreadsheet, please give a detailed explanation of any variances between planned and actual expenditure, including reasons for the variances and whether these are as a result of timing issues, price achieved, quantity etc. If these are temporary variances, please outline plans for expenditure. (Max 500 words)
	The project has a total underspend of £27,400 for Year 2 The majority of this underspend occurred in our implementation budget (£21,097) and In-Country Running (£4731) with the rest spread across T&S and Capital. Each partner has incurred currency losses during the year. However, these varied between partners due to timing of transfers and exchange rate fluctuations. United purpose XR loss: £9408 CEM XR loss: £6091 Washted XR loss: £165 **Staff Costs** In total, staff costs are overspent by £527.41. The breakdown highlights that: • United Purpose incurred a considerable overspend (£6906.42). This was primarily due to the XR loss they incurred, but also some unanticipated increases in costs. • CEM managed to absorb the XR loss by reducing support staff time billed to the project, in fact reporting a small underspend • Washted ended the year with a considerable underspend of (£5557.40) due to delay in starting one of their staff members responsible for microgrid learning (partly due to the delay in installing the microgrid) **In-Country Running** In total, this budget line is underspent by £4731. This primarily comes from United Purpose finding major efficiencies (£1731.74) in office costs (despite XR losses) and reducing their overhead charges (by £2220.13) to compensate for increased salary costs. There are some other small natural variances in the detailed budget lines that account for the total underspend.

	T&S In total this budget is underspent by £277. Strathclyde underspent by £666.64 as a trip for micorgrid commissioning in Feb/March was cancelled due to the COVID-19 situation (any additional T&S trip costs were to be covered by Strathclyde). Both UP and CEM encountered issues with their transport fleet that put vehicles out of operation for some time and meant additional cost on vehicle hiring (£1220 overspend). This was partially offset by finding efficiencies in T&S (£830.55) **Implementation** Output 1 is underspent by £13535.69. This primarily occurs due to the following March activities being delayed due to the COVID-19 situation: Environmental Impact Assessment, Recruitment and training of RE supply business staff and Site visits & feasibility assessments. In addition, planned spend on Technical design and business modelling and Procurement and installation were not required due to the additional input of the externally funded Strathclyde staff member working with UP. Output 2 is underspent by £3800. This is mainly due to delay of £2800 for awareness campaigns in partnership with MERA/MBA. The remaining underspend is due to some efficiencies found across the activities. Output 3 is slightly overspent due to a fixed $ price from the supplier and the impact of XR fluctuation. Output 4 is underspent by £1030.77. Reviewing of DDPs and Energyscaping were carried out in parallel during field trips as they were found to be complementary. There has been cross over in the way the costs have been billed, but in total for both activities, the spend is close to budget. The main source of underspend is in the delay of District wide renewable energy sensitisation campaigns due to the COVID-19 situation. MEL – some efficiencies were found in data gathering activities to create an underspend of £841.30 Dissemination – an underspend of £2047.11 is mainly due to the delay of our microgrid launch due to the COVID-19 situation. Capital – Due to increasing costs of RE equipment imported internationally, plus choosing longer life components for sustainability, the majority of the agreed capital contingency budget was utilised, with £1822.9 remaining.
7.2	Please give details of any capital expenditure in this reporting period. (Max 350 words)
	Capital expenditure in Year 2 has been £101,779.1 against an agreed budget of £103,602. This budget has covered our first energy infrastructure deployment in Mthembanji (as described above). The contractors for this project were Sustain Power from South Africa, Steamaco from the UK, BNG electrical contractors from Lilongwe and Kuwala Energy. Sustain Power provided a solution that combines a microgrid generation hub and energy kiosk service. The sustain power solution is containerised to provide a

	secure and environmentally controlled environment for state of the art lithium-ion batteries and power electronic control equipment. Solar panels are fitted to a fold out frame structure forming a generation hub that provides a connection to a local distribution grid via appropriate electrical protection devices. Battery specifications 48V, Lithium Ion Batteries, Battery Capacity (kWh) 19.2 kWh PV specifications Monocrystalline, 250W PV Array Size (kW) 11.52kW peak Battery Inverter Size (kVA) 8 kW PV Inverter 10 kW Steamaco provided a sophisticated smart metering system that enables the pay-as-you-go tariff approach being taken. The system consists of a central server that is located in the generation hub that can be accessed remotely by the EASE team and 60 individual meters that are installed at the customer point of connection. BNG electrical contractors installed a distribution grid that is anagolous to a 240V single phase Low Voltage feeder from a secondary substation on the ESCOM grid (i.e. it is compatible with grid extension) and electrical wiring and protection for the customer premises. Kuwala Energy supplied portable solar lantern stock.
7.3	Please explain how you have worked to ensure cost effectiveness on the project in the past 12 months, whilst maintaining the quality of delivery. (Max 350 words)
	With infrastructure being a key component, capital expenditure was the biggest risk to cost escalation for this year. A detailed procurement was undertaken, with bids from both local and international contractors invited. Technical sustainability was prioritised in the choice of equipment and supplier; however, robust cost negotiations brought some efficiencies. In addition, the team decided to avoid the additional cost of a full turnkey solution by taking on responsibility for the end to end architecture design of the microgrid. A single supplier was chosen to provide a turnkey containerised solution for the microgrid generation hub and main kiosk. However, the electrical distribution network was designed in-house and a separate contractor chosen to build this network under the coordination of the team. In addition, the smart metering solution was procured separately and installed as a bolt-on service. Compared to quotes by international companies offering full turnkey solutions, the cost savings are considerable, yet the final solution is state of the art and is the first of its kind for the country. Strathclyde bring a variety of resources to allow our contribution to be well in excess of our official budget. These include utilising institutional air miles, leveraging additional staff time and overheads not charged, and directing postgrad and undergrad student projects to the real world case study of the EASE project. More widely in the project, cost efficiency has been encouraged. Partners are encouraged to travel together where possible, including Strathclyde staff when

	visiting, to avoid unnecessary fuel and car hire costs. Within the implementation activities, there has been prudence in the choice of location for any gatherings, driving efficiencies in venue costs. Exchange rates are monitored with the aim of timing fund transfers optimally where possible.
8. Any other information Use this section to tell us any other relevant information regarding your project. (Max 500 words)	