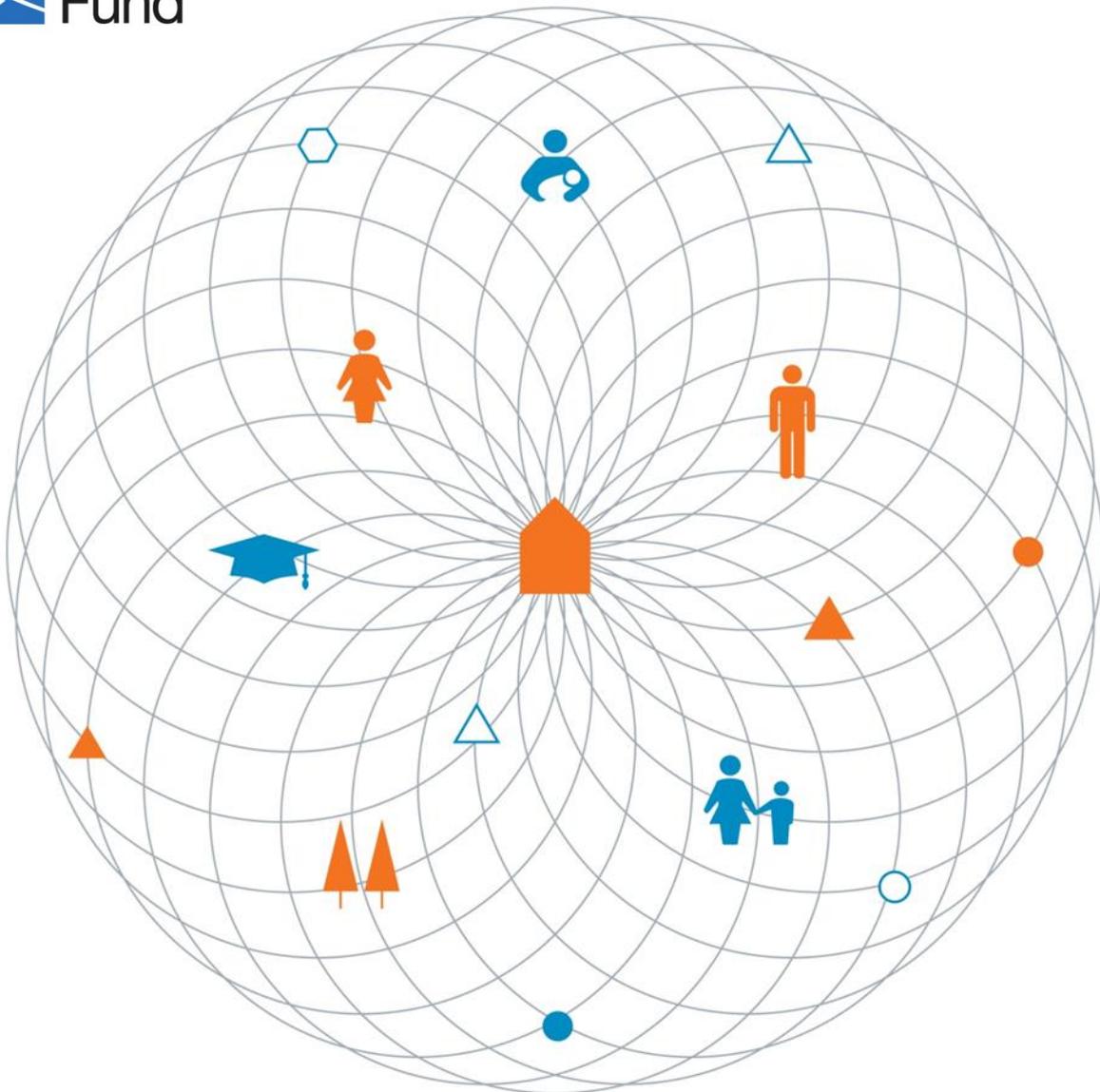


Thematic Impact Study Report - Malaysia

Newton Fund Evaluation
May 2018





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Newton Fund Evaluation

Department of Business, Energy and Industrial Strategy (BEIS)

Newton Fund Evaluation

CR150017BIS

Partners

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This document has been approved for submission by Coffey's Project Director, based on a review of satisfactory adherence to our policies on:

- Quality management
- HSSE and risk management
- Financial management and Value for Money (VfM)
- Personnel recruitment and management
- Performance Management and Monitoring and Evaluation (M&E)

Jamie Fotheringham, Project Director

A handwritten signature in black ink, appearing to read "Jamie Fotheringham", with a long horizontal flourish extending to the right.

Signature:



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Acronyms

ASEAN	Association of Southeast Asian Nations
ASIA-LINK	EU & Asia Link
ASM	Academy of Sciences Malaysia
BEIS	Department for Business, Energy and Industrial Strategy
DP	Delivery Partner
ERGS	Exploratory Research Grant Scheme
EU	European Union
FEC	Full Economic Costing
FRGS	Fundamental Research Grant Scheme
FWP	Framework Programme
GBP	Great British Pound
GCRF	Global Challenges Research Fund
GCSM	Global Conference on Sustainable Manufacturing
GSIAAC	Global Science and Innovation Advisory Council
HEI	Higher Education Institutions
IP	Intellectual Property
IT	Information Technology
LIF	Leadership in Innovation Fellowship Programme
LLP	Limited Liability Partnership
LRGS	Long Term Research Grant Scheme
MaGIC	Malaysian Global Innovation & Creativity Centre
MCMC	Malaysian Communication and Multimedia Commission
MIGHT	Malaysian Industry-Government Group for High Technology
MOHE	Ministry of Higher Education
MOSTI	Ministry of Science, Technology and Innovation
MRMG	Malaysian Research Management and Governance
MTDC	Malaysian Technology Development Corporation
NEM	New Economic Model

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NPSTI	National Policy for Science, Technology and Innovation
NUOF	Newton-Ungku Omar Fund
ODA	Official Development Assistance
PI	Principal Investigator
PlaTCOM	PlaTCOM Ventures (formerly “Platform for Technology Commercialisation”)
PMO	Prime Minister's Office
PRGS	Prototype Research Grant Scheme
RAEng	Royal Academy of Engineering
RCUK	Research Councils UK
REF	Research and Excellence Framework
RM	Malaysian Ringgit
S2A	Science to Action
SEA-EU-NET	South East Asia & European Union Network
SIRIM	Standard and Industrial Research Institute of Malaysia
SMS	Short Message Service
STEM	science, technology, engineering and mathematics
STI	Science, Technology and Innovation
TEIN	Trans-Eurasia Information Network
TN50	Malaysia's Transformasi Nasional 2050 (National Transformation 2050)
TRAC	Transparent Approach to Costing
TRK	Technology Readiness level
UKRI	UK Research and Innovation
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UTM	University Teknologi Malaysia

1 Introduction

1.1 Purpose of this report

This report presents the findings of the Thematic Study of Newton Fund activities in Malaysia, with a focus on three activities in the country. The findings emerged from an in-depth review of documentation, in-country interviews, and UK-based consultations, as outlined in [Section 1.2](#). Findings from this and the other seven country studies will help inform our Mid-term Evaluation report.

As outlined in our Evaluation Strategy, thematic impact studies were carried out in eight countries: Brazil, China, Egypt, India, Malaysia, Mexico, the Philippines and South Africa. Concentrating on these countries allows for a breadth of coverage across Newton partner countries and regions of focus. It also allows for broad coverage in terms of the existing innovation capacity and infrastructure of Newton partner countries.

As part of our thematic studies, we conducted a comparative analysis of the factors that contributed to the Fund's outcomes across different contexts (such as type of local funding agencies, size of universities, local research structures, among others). This helped us map the **pathways of change and capture early signs of the Newton Fund's impact**. By focusing on the factors which facilitate specific research activities, increase the quality of research outputs, enhance international collaboration and translate research into innovative practices, the thematic impact studies help us understand how sustainable solutions to economic development and poverty reduction have emerged so far from Newton Fund activities.

Case study selection

For each country, we shortlisted potential case study calls based on three measures: size, pillar and sector. The selection of projects took thematic areas of focus into consideration, aiming to include Newton Fund priority areas in the country. We sought to achieve a spread of Newton Fund delivery partners and activity types across the countries in our sample. We also consulted the in-country teams (ICTs) to identify potential impact 'stories'. Following additional consultations with delivery partners and the Newton Fund Central Team, we selected **three cases per country** to be explored in more depth.

In Malaysia, the shortlisted activities were:

- Next Generation Green Data Centres for Environmental and Business Sustainability;
- Leaders in Innovation Fellowship;
- Malaysian Research and Management Governance.

This allowed for inclusion of two Translation pillar actions and one People pillar action. Within those actions, the specific award-holders were selected to ensure as broad a geographical scope and diversity of partners as possible, within the short timeframe of the thematic study. When selecting the award-holders, we also considered the relevance of the specific project's research area to the Newton Fund's priorities in Malaysia. Two of the selected projects are based near Kuala Lumpur and one was delivered in the UK (with follow up in Malaysia). This has allowed the research team to include views and experiences of the Newton Fund in different geographies.

1.2 Research approach

Research scope

The thematic impact studies involved wide-ranging in-country consultations, with the inclusion of as many diverse interview respondents as possible within the short time-frame of our fieldwork activities. This was combined with consultations with UK-based partners and researchers involved in the actions included in the study.

This thematic study explored:

- The **development of each activity** – examining its origins, how engagement with the Newton Fund occurred, and an overview of the process of securing Newton funding

- The **relevance of each activity** to Malaysia's development needs and to Newton Fund and ODA goals
- The **additionality of each activity**
- The **results of each activity**: the outputs, outcomes and impacts generated in terms of strengthening the science and knowledge base, innovation capacity and influencing policy in Malaysia and beyond
- The **success factors (and barriers) of each activity**, and examination of possible benefits from each activity that might be expected to arise in the future.

We took into account that all of the activities included in this study are still ongoing, and that the impact of projects can often take years or even longer to unfold. Our research approach was adapted to reflect this, and also included signs of impact or intentions to achieve impact as indications of potential future impact.

Research methods and data collection approach

The thematic impact studies are central to our contribution analysis approach and involved an intensive period of in-country research by members of the evaluation team and local experts in science and innovation. Preparation for the in-country research included a country-specific document review on Malaysia's research and development context. Documents reviewed include the evaluation Malaysia Baseline Report, Country Situation Note, and findings from the Process Evaluation. We also conducted a literature review of additional documentation on Malaysia's science and innovation landscape, and existing UK-Malaysia collaboration activities. Project-specific documentation, such as application forms, mid-term and final reports were reviewed for each action included in the study, where provided by the delivery partner, local partners or researchers.

The document review was accompanied by **one week of intensive data collection in country**, as well as data collection in the UK prior to and following the fieldwork. During the week long in-country visit, three main categories of stakeholders were interviewed:

- i) In-country delivery partners (and Newton in-country team)
- ii) Funders;
- iii) Participating award holders.

A workshop was also held, with 24 individuals that are part of the Leaders in Innovation Fellowship. Our data collection both in-country and in the UK was complemented with an analysis of the pathway to impact for each action, which can be found in [Annex 2](#). In the analysis we assessed each project's trajectory to impact by placing it within the Newton Fund Theory of Change. This allowed us to visually represent the pathway to impact of each activity, and highlight its (potential) contribution to broader Newton Fund goals.

Limitations of the research approach

The timeframe for in-country research meant that we were only able to include three projects within our study. These are not representative of Newton Fund activities as a whole. The timeframe also limited the number of stakeholders we were able to interview in Malaysia.

Research findings have been triangulated across different stakeholder groups and across various sources of documentation (project documents and online resources such as the RCUK Gateway to Research portal¹). However, the research team was not able to independently verify statements by all the different contributing stakeholders or to verify what was reported in documentation. Where findings could not be verified we have made this clear in the text.

All of the projects were still on-going at the time of data collection. Therefore, the report focuses on emerging signs of impact for all three projects.

¹ Now UK Research and Innovation (UKRI)

2 The Newton Fund in Malaysia

2.1 Context and evolution of the Newton Fund in Malaysia

Malaysia – current situation

This report reflects the situation at the time of the case study trip in January 2018. We note that the Malaysian general election in May 2018 resulted in a complete change in government, which then caused significant changes to country priorities and the structure of Malaysian delivery partner organisations for NUOF. However, this report accurately reflects the country situation at the time of the case study visit to Malaysia in January 2018 and its findings were correct at the time of the interviews and report-writing.

Malaysia aims to become a “fully developed” country by 2020. This goal was initially set in the Wawasan (Vision) 2020 in 1991. The Vision outlined nine challenges Malaysia aims to overcome in order to achieve the plan:

- Establishing a united nation
- Creating psychologically liberated and secure society
- A democratically mature society
- Establishing a moral and ethical society
- Establishing a liberal and tolerant society
- Establishing a scientifically advanced and progressive society
- Have a family-based welfare structure
- Equitable growth
- A prosperous economy²

Many new policies and strategies have been implemented to achieve the 2020 vision, including five-year macroeconomic plans, which are tailored towards achieving the Vision 2020. Malaysia is currently delivering its 11th Malaysian Plan (2016 – 2020) but the Newton Fund will also be running through to the 12th Malaysian Plan (2020 – 2024). Since the launch of the Newton Fund in 2014, new political strategies have been put in place (aligning with Vision 2020).

Malaysia has a National Policy for Science, Technology and Innovation (NPSTI) 2013 – 2020. The policy identifies six ‘strategic thrusts’ to achieve their mission of advancing and mainstreaming science, technology and innovation (STI) at all levels. These include:

1. Advancing scientific and social research, development, and commercialisation
2. Developing, harnessing, and intensifying talent
3. Energising industries
4. Transforming STI governance
5. Promoting and Sensitising STI
6. Enhancing Strategic International Alliances

The policy sets the foundations to enhance knowledge generation, create wealth and societal wellbeing by setting out a well-functioning STI system and integrating policy into all ministries and agencies. The Academy of Sciences Malaysia (ASM) is currently conducting a performance review of the current NPSTI to identify issues and challenges and to help inform a new National Policy on Science, Technology and Innovation 2021 – 2030.

² Dato Seri Dr. Mahathir Bin Mohamad, Malaysian: The Way Forward (Vision2020), (1991) source: <http://unpan1.un.org/intradoc/groups/public/documents/apcity/unpan003223.pdf>

As for the next national agenda (2020 – 2050), the government aims to transform the economy's growth from resource driven to innovation driven. Innovation is recognised to contribute to economic growth by increasing the number of job opportunities, increasing industry profitability and increasing consumer spending capacity³. Malaysian Prime Minister Dato' Sri Mohd Najib bin Tun Haji Abdul Razak has introduced a new and more comprehensive policy known as Malaysia's Transformasi Nasional 2050 (TN50)⁴. TN50 will focus on building an innovation driven economy by seeking a 'bottom up' approach that considers public consultation and engagement with youth (aged between 15 to 40) in developing targets and milestones.

In addition to the various initiatives and policies in place, the Malaysian Industry-Government Group for High Technology (MIGHT) put in place the Science to Action (S2A) programme in 2014. Its aim is to intensify the application of science and technology for industrial development as well as to support the New Economic Model (NEM) introduced in 2010⁵. The S2A initiative seeks to ensure sustainable growth beyond 2020 and consists of three components:

1. Science to Industry: establishing innovation culture
2. Science to well-being: excellence in the education system, particularly in STEM subjects
3. Science to governance: strengthening public and private systems

Malaysia – UK relations

Malaysia is the UK's second largest trading partner in ASEAN. The top five sectors for trade between the UK and Malaysia are machinery and transport equipment, food, beverages and tobacco, chemicals and related products, crude and fuel, and manufactured goods. It is also becoming an 'Education Hub' of the ASEAN region; British products and services linked to education and training are worth over £280m a year⁶.

Some respondents highlighted that before the Newton Fund, there was a lack of a platform for Malaysia to work with UK agencies in general. Some Malaysian stakeholders had exposure to UK partners ahead of the programme (including the British Council, who have operated in Malaysia since 1947). The UK and Malaysia have a number of education ties: approximately 60 UK tertiary institutions have links or collaborative arrangements with Malaysian counterparts and Malaysia has the third largest Chevening programme in the world⁷. There are five existing UK University campuses in the country⁸. Reading University and Herriot-Watt University both set up campuses in Malaysia within the past three years. This follows on from the University of Nottingham which was the first British University to set up in Malaysia in 2000.

Other UK initiatives in Malaysia include the Global Challenges Research Fund (GCRF), aiming to strengthen capacity for research and innovation, and the Prosperity Fund. However, unlike the Newton Fund, neither require match-funding. The Prosperity Fund allocates funds in Malaysia for projects focussing on strengthening economic governance, anti-corruption, Islamic finance, education partnerships, healthcare and enhancing low carbon cities and energy.

Science and innovation landscape in Malaysia

The government's Science Adviser sits under the Prime Minister's Office (PMO), so that overall science strategy can be implemented across Ministries. The science, innovation and research remit sits between PMO, the Ministry of Higher Education (MOHE) and the Ministry of Science, Technology and Innovation (MOSTI). MOHE and MOSTI provide the majority of public research and development (R&D) grants covering several research priorities. Funding provided by MOHE tends to be for theory of concept, long-term research, and supporting researchers to reach a prototype stage. The Malaysian government also supports financing options from organisations such as the Cradle Fund (incorporated under the Ministry of Finance), Malaysian Technology Development Corporation (an agency under MOSTI), and PlaTCOM Ventures (the national technology commercialisation platform of Malaysia, a wholly-

³ Hasman A, Johnston W., The role of innovation in driving the economy: Lessons from the global financial crisis, 2013. Source: <http://dx.doi.org/10.1016/j.ibusres.2013.03.021>

⁴ <https://mytn50.com/>

⁵ MIGHT . myForesight. Malaysia's National Foresight Magazine, 2014 source: http://www.myforesight.my/wp-content/uploads/2014/04/myForesight_Issue06_web.pdf

⁶ <https://www.gov.uk/government/publications/exporting-to-malaysia/exporting-to-malaysia#malaysia-export-overview>

⁷ <https://www.gov.uk/government/news/uk-university-success-in-malaysia>

⁸ University Nottingham, Heriot-Watt University, University of Southampton, Newcastle University Medicine, University of Reading Malaysia.

owned subsidiary of Malaysia's National Innovation Agency, under the Prime Minister's Office). These organisations promote the commercialisation of technology by providing funding for start-ups and translational research.

The drive for industry and innovation-driven research comes from the Malaysian Higher Education Blueprint (2015-2025). MOHE established the blueprint for knowledge-based activities by focusing on the quadruple helix of academia, industry, government and local communities. The partnerships between the four parties aim to pursue collective ideas on innovation, development and commercialisation that will facilitate the development of new knowledge in strategic areas critical to the nation's economic growth. The approach encourages academia to intensify their role as providers of skilled research talent, development of knowledge-based enterprises and commercialisation of R&D products.

Recognising the benefit of R&D activities carried out by academia-industry collaboration, the government has launched various initiatives to establish supporting systems for the growth of R&D and the commercialization of ideas. Initially, the government established the Malaysia Technology Development Corporation (MTDC), Malaysian Industry-Government Group for High Technology (MIGHT) and an allocation fund for R&D and commercialisation of technology⁹. In addition, the government spent RM 285 million (GBP 52 million)¹⁰ in the 9th Malaysia Plan and RM 1.539 billion (GBP 282 million)¹¹ during the 10th Malaysia Plan for the Intensification of Research in Priority Areas (IRPA) grant, Fundamental Research Grant Scheme (FRGS), Long Term Research Grant Scheme (LRGS), Exploratory Research Grant Scheme (ERGS) and the Prototype Research Grants Scheme (PRGS).

Furthermore, other government agencies such as MOSTI provide funding that is open to all researchers including scientists and engineers, as well as companies that focus on new product development and commercialisation. These funds (known as TechnoFund, InnoFund, NanoFund and ScienceFund) are aimed at research and development projects that can contribute to the discovery new ideas and the advancement of knowledge in applied sciences, focusing on high impact and innovative research. The research funding and management is still largely fragmented, with no streamlined approach. The vast majority of researchers have been working in higher education institutions, as shown in Table 1.

Table 1: Number of researchers per sector

Data	Number	Source	Year
Number of researchers per million inhabitants	2908.8	UNESCO	2015
Percentage of researchers in business enterprise	12.3%	UNESCO	2015
Percentage of researchers in government	9.6%	UNESCO	2015
Percentage of researchers in higher education	78.1%	UNESCO	2015

Source: <http://uis.unesco.org>

International relations / research

Malaysia is a member of the ASEAN, and it's predicted that the ASEAN economy will become the fourth largest single market by 2030. According to interviewees, the collaboration and relations in the ASEAN network are strong and include other partners such as France and Germany. SEA-EU-NET was an EU-funded project that sought to "expand scientific collaboration between Europe and Southeast Asia" and was coordinated by the German Aerospace Centre. A successor, the four-year long SEA-EU-NET 2, was launched in October 2012, and involved 21 institutions, including the SIRIM Berhad research institution in Malaysia. The S&T projects specifically focused on the societal challenges of Health; Food Security and Safety; and Meteorology and Water Management. Project activities included workshops, knowledge exchange, fellowships and a bi-regional funding scheme.

⁹ Chandran, V, Rasiah R, Wad P, Malaysian Manufacturing Systems of Innovation and Internationalization of R&D,(2009)

¹⁰ Approximated using conversion rates April 25 2018

¹¹ Approximated using conversion rates April 25 2018

The EU has also had previous engagement with ASEAN countries on research through initiatives under FWPs, such as ASIA-LINK and the Trans-Eurasia Information Network (TEIN). There are also additional aims to bring more ASEAN countries into Horizon 2020 participation and the FP7 programme.

Newton-Ungku Omar Fund in Malaysia

The Newton-Ungku Omar Fund (NUOF) is part of the Science to Action (S2A) initiative and promotes science, technology and innovation collaborations between the UK and Malaysia, with some emphasis on the development of Science, Technology, Engineering and Mathematics (STEM) education. The overarching theme for the NUOF is climate change and sustainability across five research areas:

- Health and life sciences
- Improving environmental resilience and energy security
- Future cities
- Agritech
- Digital, innovation and creativity

The funds are offered through a series of structured and themed programmes, which are managed in partnership by UK and Malaysian organisations. The Malaysian Industry-Government Group for High Technology (MIGHT) is the central co-ordinating body in Malaysia and acts as both a facilitator and delivery partner. MIGHT is a unique government agency as it is an independent body, not a ministry of the government nor a company. Malaysian delivery partners often set their priorities against the national development plans, as the Malaysian funding for Newton projects uses developmental funding from the Economic Planning Unit. The scope is often geared towards projects as prescribed in the Malaysian Plans.

Management of the Fund

Since 2014, the Newton Fund team has operated out of the British High Commission. Initially, there was one Newton Fund Strategic Manager for the programme; however in 2016 a Programme Officer was also appointed to the team. The Manager and Programme Officer work together to manage relationships and promote the Newton Fund.

A large part of Newton Fund activities take place through MIGHT. Several award-holders highlighted that MIGHT are a supportive organisation and have assisted them in terms of facilitating initial meetings and providing accommodation. MIGHT focuses on areas of high technology across sectors, including: aerospace; energy; waste; smart cities; biotechnology; plantation crops and commodities; and more. In terms of matching effort, some projects have been funded in-kind by Malaysian partners. There are currently ten delivery partners in Malaysia, most of which are government ministries / agencies. The figure below outlines all Malaysian delivery partners for the 33 funded programmes in Malaysia:

Figure 1: Delivery partners



Partners emphasised the importance of the in-country team: in facilitating relations with BEIS, and also to facilitate wider liaison and cooperation between BEIS, MIGHT, and UK and Malaysian delivery partners.

Emerging impacts of the Newton-Ungku Omar fund

The Newton Fund was chosen by the Malaysian Prime Minister's Department as the key highlighted international collaboration in the 2016 Global Science and Innovation Advisory Council (GSIAC) annual convention. GSIAC is a Malaysian initiative to engage with the world's top global science and innovation organisations, with a formal annual meeting to discuss Malaysia's science and innovation priorities based on recommendations from GSIAC council members.

Malaysian ministries, agencies and funding organisations have been very enthusiastic about the idea of collaborating with the UK on research and innovation activities, even beyond what is offered under the Newton Fund. Early results can be demonstrated through the fact that valuable partnerships have been established between:

- Malaysia-to-Malaysia delivery partners, who traditionally work in silos but are now working together to help deliver activities, and
- Stakeholders in both the UK and Malaysia working together to support each other's activities.

There has been increasing interest and engagement from industry in working with academics (especially with international collaborations) on innovative solutions, as evident in the high application rates for several NUOF calls involving participation by industry and academia.

An emerging outcome of the fund is that it has allowed several individuals who had not previously participated in global networks to work and collaborate internationally. Respondents identified several benefits to the UK, these include:

- Opportunities to understand Malaysian research, systems, infrastructure, culture, and the challenges that Malaysia faces
- Knowledge and understanding of how research is applicable to reality in Malaysia
- A strengthened relationship with a South East Asian country ahead of Brexit

Remaining challenges

From interviews with stakeholders, no major complications or challenges were highlighted. However, minor difficulties still exist. For instance, the low currency exchange rate is deemed a problem but this has been resolved by match-funding in-kind for some projects. Additionally, the different financial years between both countries have caused minor problems to do with timing; Malaysian respondents seemed to have a lack of understanding of financing mechanisms of their UK partners.

3 Next Generation Green Data Centres for Environmental and Business Sustainability

3.1 Summary

Action title	Next Generation Green Data Centres for Environmental and Business Sustainability
Short description	This is a project under the Research and Innovation Bridges programme call. It is a industry-academia collaboration between Green Data Centers LLP, Universiti Teknologi Malaysia, Dearman Engine Company and Heriott-Watt Universty. Green Data Centers LLP are the lead for this project.
Objective(s)	This project aims to integrate existing technologies from the Green Data Center LLP and Dearman Engine in order to take heat / energy released from data servers and convert it into electricity. The intended results are: reducing noise and atmospheric pollution from data servers; and having energy security (without the need of a backup generator).
Pillar	Translation
Action value (total budget allocated in country, in GBP)	GBP 624,673 RM 9,158,899
Start / end date (Status: on-going or complete)	Start: 1 October 2016 End: 31 May 2019 Status: ongoing, on target
DP UK and overseas	RCUK, Innovate UK; MIGHT
Award-holders / grantee	Green Data Centre LLP; Dearman Engine Company; University Teknologi Malaysia; Heriott-Watt University

3.2 Description of the action

Background

The Next Generation Green Data Centres for Environmental and Business Sustainability project is one of the awarded projects under the Research and Innovation Bridges programme, which is the largest programme for NUOF in Malaysia. The initial concept (and its area of focus) pre-dated the Newton Fund. Green Data Center LLP began investigating how IT systems have an impact on the environment in 2008, and received initial Proof of Concept (PoC) funding in 2009 from the Malaysian Communication and Multimedia Commission (MCMC). Data Centres contribute to global greenhouse gas emissions and tend to take up large areas of space, which may be expensive in built up cities. The latency¹² of data had become an issue for the urban data environment, lower latency is better and it is increasingly important with emerging technologies such as those in virtual reality. The Green Data Center replaced air conditioning with a specialised coolant¹³, thereby reducing the heat emitted and

¹² Delay before a transfer of data begins following an instruction for its transfer

¹³ A liquid to remove the heat emitted from data centres

CO₂ emissions. The company uses shipping containers to store the data servers, so it uses minimal space in comparison to existing data centres. Their final product is named the KoolKUBE.

Green Data Center had an existing relationship with MIGHT, the Malaysian delivery partner, and was informed of a matching workshop. This consisted of 15 presentations from UK and Malaysian organisations. From meeting at that event, Green Data Center began initial discussions with the Dearman Engine Company, a global technology company that produces cooling systems and generators. The Green Data Center have a coolant that stores energy emitted from data servers (KoolKUBE), and the Dearman Engine's system requires a certain amount of heat to generate power. Therefore, the technologies seemed suited to one another. The aim is to have both pieces of technology working well independently, and to integrate them to create a cooling system that generates energy. Both companies went on to find institutions to collaborate with for the integration of their existing systems (they lend technical and analytical expertise to the project). The two technologies are due to integrate later in 2018.

Pathway to impact

The action fits very well with the Theory of Change for Translation pillar projects, as shown in its Impact Logic, which is presented in Figure 1 of Annex 2. This project uses existing technologies and expertise from industry, together with expertise from academia, to design and implement a product that uses minimal space and enables energy released from data servers to be re-used.

As shown in the activities section of Figure 1, the main inputs of collaboration under the NUOF included:

- The Research and Innovation Bridges programme call – requiring the collaboration to include parties from both academia and industry
- Focus on translation aligned with global challenges, targeting a reduction in greenhouse emissions
- Activities to strengthen and establish links and support an exchange of expertise (e.g. weekly conference meetings, strong communication)

This project particularly helped to form a link between industry and academia. For the companies involved, benefits include access to labs, equipment, and scientific expertise. For the academics involved, there is mention of increased understanding of the business world.

Although they do not anticipate applying for further Newton funding, due to the nature of the project, the academics involved in Malaysia are open to more collaborative projects under the Newton Fund. The UK was seen as an attractive partner, and has assisted the overall University ranking for Universiti Teknologi Malaysia (UTM).

3.3 Answers to the evaluation questions

3.3.1 Relevance

The main aim of the Research and Innovation Bridges call is to find new commercial solutions to challenges that Malaysia is facing by bringing together companies, research organisations, institutions, and / or academics from Malaysia and the UK for joint industrial research. The call intends to have a consortium approach, involving a research organisation and business from both countries in order to develop a product or service that provides a solution to Malaysia's challenges and that can be applied in a broader market.

The thematic focus of this collaboration has a clear link to the NUOF's priorities for Malaysia. The project objectives are working towards improving environmental resilience and energy security. This call closely responds to Malaysia's interest in energy and the environment, as well as tackling a global challenge. If successful, the project will result in the application of more efficient technologies, and reduce greenhouse emissions.

The project has improved researchers' understanding of industry and fostered international cooperation. Concepts were pre-existing, but the collaboration of the two technologies emerged from a matching workshop. The funding has created an opportunity to produce a high-quality technology which is very relevant to the growing technology industry. Indirectly, this has allowed Malaysian academics to improve their understanding, ability to disseminate research and to work with industry. This project identifies a solution through a final single product that will address broad market failures and may be a solution for various industry applications.

In terms of additionality, there is evidence that suggests the NUOF acted as a catalyst for this collaboration. If MIGHT had not facilitated a workshop at the time, it may have taken a longer period of time for the award-holders to establish a relationship. The timing of the Newton Fund worked to their advantage and working with UK partners has allowed them to address the issue of global warming and climate change collaboratively. Malaysian funding at a national level was described as “rigid and difficult”. This project could have gone ahead without the Newton Fund however, Malaysian stakeholders highlighted that Newton provides a good platform for joining up and co-ordinating both Malaysian and UK parties. MIGHT had previously collaborated with Innovate UK for catapult programmes however, the NUOF has helped develop the partnership.

3.3.2 Effectiveness

This project has led to a reportedly successful collaboration between Malaysia and the UK, after working through initial minor project implementation challenges. It was reported by UK stakeholders that being part of the Newton Fund has heightened the potential to collaborate with international and Malaysian partners. Although this project is at a relatively early stage, it has provided potential for new international partnerships. The outputs to date are:

- Project related workshops at Herriot-Watt University’s Edinburgh and Dubai campuses;
- A paper accepted for publication in the electronic journal Procedia Manufacturing;
- Attendance to the 15th global conference on sustainable manufacturing (GCSM);
- Sustainable and Resilient Data Centres: A review of existing and emerging cooling technologies (published in the Journal of Renewable and Sustainable Energy Reviews);
- Dearman Engine exhibit at Engine Expo in Germany;
- Recognition from MIGHT¹⁴.

Interviews indicate that these outputs served to also strengthen capacity at the individual researcher level. One respondent contended that participation in this particular collaboration allowed them to understand business concepts and how industry works. Now this knowledge is being shared with other students in the institution. Those award-holders from industry also learnt from academia. Initially, an award-holder from industry was unsure why the academic award-holders were not delivering outputs quickly and going through detailed analysis, design and methodology. After receiving the first output, he realised that this research could not have been produced by their company and it would help to avoid problems later down the line.

A unique aspect of this collaboration is that it began with existing commercialised products. For the Malaysian partners, engagement in the Newton Fund has helped establish new international links / partnerships. For instance, the Green Data Center’s existing product has received high interest from other countries. An Australian company have contacted Green Data Center to use their technology for a solar panel farm. They have just successfully completed the testing stage. There are two other potential opportunities internationally for Green Data Center, however these are at very initial stages. One respondent from UTM also noted that an outcome of collaboration is an invitation from Vietnam and Thailand to form an international collaboration working in a similar field. For the Dearman Engine, there has been scope for consultancy work which is recognised as a possible future benefit.

Respondents from all parties highlighted how well they are working together. There is close communication between UK and Malaysian award-holders and they have set out responsibilities for each party. The reporting requirements are different for Malaysia and for the UK. Although delivery partners operate differently, the Malaysian award-holders regularly call into a monthly meeting with Innovate UK to provide progress updates with their UK counterparts. This is not something they are required to do, but they thought it would be useful to keep Innovate UK updated about progress in Malaysia as well as the UK. For this collaboration, there is a Malaysia plan and UK plan – Heriot-Watt are working closely with the Dearman Engine and UTM work closely with Green Data Center. At this stage, the Universities are assisting each company with their technical and analytical expertise. The aim is to demonstrate the two technologies work well independently, and then to demonstrate they work well after integration.

¹⁴ MIGHT displays the KoolKUBE in the main foyer of its building

A Malaysian respondent said that the key to a collaboration like this is “integration and communicating really well from the first day, all books need to be open and you need to be on the same page”. The relationship between award-holders seems to be working well: it is clear that all parties are quite open with one another and make any frustrations clear. UK award-holders highlighted initial teething problems and communication challenges at the front end of the project. One respondent suggested that it would be better for work packages from both countries to align better in terms of design. At the start of the collaboration, the UK and Malaysian award-holders were working to different project plans. There were subtle issues and it took a little while to figure out why it was happening. One respondent suggested it would be easier to identify the issue if they were sat in the same room together. Once the different plans were realised, both sides tweaked their project plans to ensure they align. In the second quarter of the project, Green Data Center visited Dearman Engine, which allowed them to sit down and think about the project plan and various technicalities – this was very useful for planning ahead. Dearman Engine suggested if they were to do this again, they would send out a team to Malaysia at the start of the project. Award-holders from Heriot-Watt also had a technical visit in Malaysia and are in close communication with Malaysian partners to create a showcase of some sort. The time difference between the two countries has been noted as a minor challenge from all parties and it has been overcome quite easily. The award-holders organise conference calls on a weekly basis at a reasonable hour in both countries, in addition, a WhatsApp group has been created for communication purposes. Given the time difference, simple messages / updates can be useful.

The IP split between the Green Data Center and Dearman Engine was straightforward, as they understand who owns what technology / product already. Because of the way UTM is embedded in Green Data Center and Heriot-Watt with Dearman Engine, there will not be a conflict with the university and company across the two countries. The Malaysian award-holders noted the bureaucracy and red tape as a challenge because it could be complex at times.

In the UK, there has been some exposure to industry since the start of this project. One respondent said that they have had interest from five to six companies within the UK. The project has been showcased to local schools. Dearman Engine have made initial contact with a large Japanese multi-national on a generator project for consultancy work, which is linked to the work done under the Newton Fund. This is at an early stage.

For Malaysian award-holders, the project has been beneficial for students and researchers at UTM by enhancing knowledge about how the business world works. Newton funding has also helped assist the overall University ranking and increased collaboration internationally. The link between this project and the outcomes for UTM are not strong, as the individuals involved have been involved in several NUOF programmes prior to, during and after the funding was awarded for this particular collaboration. Another outcome of the Newton Fund, for one respondent from UTM, is that there are a number of public universities seeking help in applying for the Newton grant. As a result of being involved in a variety of Newton funded projects they are being approached for guidance on Newton fund applications and engaging with industry. The Malaysian award-holders have benefitted from the collaboration and it's possible a collaboration of this nature can be used for future learning.

3.3.3 Impact

In the long-run, the project is anticipated to help socioeconomic development in Malaysia. Once complete, the final product will help Malaysia and other countries move to environmental resilience, whereby noise pollution and atmospheric pollution can be reduced. It is anticipated that more jobs will be generated in the country by making Malaysia the manufacturing base. In the long-term, the goal is to target the global market, with the majority of data centres being located in Europe and America. The end-product will help the carbon footprint, not only from data centres, but other sectors too (e.g. cooling for vaccines).

A challenge for the project is the climate in Malaysia, the monsoon weather can cause delays when working on the product outdoors. There are also concerns that the Dearman Engine generator may have technical issues given that it has been developed in a different climate. The academic teams have included a certain amount of design and testing for this and it will be tested later in 2018 when the Dearman Engine generator arrives in Malaysia. Given the project is at a relatively early stage, there is potential for problems to occur as it progresses.

Overall, the respondents see benefits to both countries. Malaysian respondents highlighted that the NUOF is helping to improve the relationship between the UK and Malaysia. The perceptions of the UK in Malaysia have remained similar and positive. The Malaysian stakeholders think it is easy to work with UK counterparts because the countries share similar processes and systems.

3.3.4 Complementarity and coordination

Policy co-ordination and the influence of this project are limited at this stage. Malaysian award-holders have received regular contact and support from MIGHT when needed. MIGHT are seen as very flexible and operating differently to government agencies, in a more dynamic way.

3.4 Conclusions

- This is a clear example of cooperation from both sides, which is shown through their commitment to regular communication. The project had led to potential long-term institutional / industrial links – both through other grants and informally.
- The Newton Fund has acted as a catalyst for this project – respondents noted that the collaboration may have happened without the existence of the Newton Fund however, the process would have been very slow. Although there are other sources for funding in Malaysia, NUOF has provided a platform for the collaboration between the UK and Malaysia that would have otherwise been difficult.
- There have been lessons for working in a consortium of this sort in future. For example, having open communication between all partners and being transparent with one another. Respondents noted regular communication is important in a collaboration of this nature.
- This project has led to the wider outcomes of improved researcher and institutional capacity. It has helped both the Malaysian industry and academic partners to increase their international networks and gain knowledge about industry. For the Malaysian industry partner, this has allowed them to learn about how academia works.
- This project has potential to address socioeconomic challenges and to tackle climate change and global warming. The project aligns well with one of the five NUOF research objectives, improving environmental resilience and energy security.

4 Leaders in Innovation Fellowship Programme

4.1 Summary

Action title	The Leaders in Innovation Fellowship
Short description	The Leaders in Innovation Fellowship (LIF) Programme is aimed at researchers within Malaysia (and several other Newton partner countries) who are at the point of developing a business proposition for an innovation. This entails a two week residential programme in the UK, where cohorts of fellows from Malaysia (together with fellows from Mexico, Turkey, and Vietnam) benefit from a focussed period of training in entrepreneurship as well as time and access to expert UK coaches. Fellows are helped on several aspects of commercialising their research such as pitching, business plans, marketing and valuation. After returning to Malaysia the fellows continue to receive remote coaching support over several months.
Objective(s)	The primary objective of the LIF programme is to build the capacity of participants for entrepreneurship and commercialisation of their research.
Pillar	Translation
Action value (total budget allocated in country, in GBP)	£328,000 for two LIF cohorts The funding in Malaysia was matched in-kind through flights, accommodation, use of facilities, and subsistence for the fellows.
Start / end date (Status: on-going or complete)	Start date: February 2017 (on-going) The first cohort (LIF3) of the LIF have now completed the programme.
DP UK and overseas	Royal Academy of Engineering and MIGHT
Award-holders / grantee	Research fellows / academics from various institutions and Oxentia

4.2 Description of the action

Background

The LIF programme aims to build the capacity of researchers for entrepreneurship and the commercialisation of their research. The programme helps to create international networks of innovators and technology entrepreneurs. This project particularly helped improve individual capacity and knowledge for commercialisation of research. Some fellows have gone on to create business plans and contact industry. The participants in the programme from Malaysia are all research fellows, although other countries may have Technology Transfer Officers (TTOs) who also attend. The project has been operating since 2015, however, Malaysia joined the programme as part of the third batch (LIF3) in early 2017. Fellows took part in LIF4 in November 2017. The largest sectors for LIF3 fellows' projects are computing and communications, and civil and environmental projects¹⁵. The Royal Academy of Engineering have sub-commissioned Oxentia to deliver training / mentoring to Malaysian fellows through workshops.

¹⁵ Oxentia

Pathway to impact

As shown in Figure 2 of Annex 2, this project covers numerous Newton Fund outcomes and impacts. As shown in the activities section of Figure 2, the main inputs of collaboration under the NUOF included:

- Activities to support the exchange of expertise – fellows met other academics from Mexico, Turkey and Vietnam as well as academics from different institutions within Malaysia
- Focus on translation aligned with global challenges – some projects are a direct solution to climate change, agriculture, health, and natural disaster
- Capacity building for innovation and commercialisation via the 10-day programme in the UK and on-going remote mentoring support from coaches

Interviews indicate that these inputs served to also strengthen capacity at the individual researcher level. The majority of respondents from both cohorts noted an increase in knowledge and confidence when approaching industry. The academics involved in the LIF programme are open to more collaborative projects under the Newton fund and welcome any opportunities.

4.3 Answers to the evaluation questions

4.3.1 Relevance

Oxentia designed London based programmes of entrepreneurship training and coaching for early stage entrepreneur delegations in Malaysia in early 2017. The fellows receive interactive training on: leadership; business plans; intellectual property; marketing; licensing; negotiation; pitching; and presentation skills. The face-to-face training sessions involved interactive training and existing examples / case studies to teach participants about the risks and opportunities for their own ventures.

The programme does not explicitly target specific welfare and poverty issues in Malaysia, but most projects put forward by the fellows are focusing on solutions in NUOF priority areas. The programme has clear alignment with the NUOF research areas as well as the emphasis on STEM. The fellows in the first cohort (LIF3) had projects across a variety of sectors, including¹⁶:

- Civil and Environmental
- Computing and Communications
- Energy and Power
- Manufacturing and Design
- Medical and Bioengineering.

The programme received high demand, with over 100 applications which had to be shortlisted to just 15. The LIF programme differs across countries when sifting through applications. For Malaysia, MIGHT put out a nationwide call to the universities and have their own review panel to select the fellows based on different criteria. The application criteria are mainly about the product and technology readiness level (TRL). The fellows were made aware of the programme through various means including; SMS from friends / colleagues, SMS from MIGHT, word of mouth, and emails from their institutions / MIGHT. The LIF3 cohort enrolled in February 2017 and the LIF4 cohort in November 2017. In terms of project design, the Royal Academy of Engineering described the project as different to other Newton funded programmes, as the result is instant and tends to be a change in mind set rather than something physical. Respondents from RAEng found learning about and understanding in each country both rewarding and interesting.

When asked about the additionality of the Newton Fund, some fellows mentioned other programmes and training they had received on commercialising their research. Similar training is available at the Malaysian Global Innovation & Creativity Centre (MaGIC) and PlatCOM Ventures. However, according to some fellows the LIF

¹⁶ Oxentia, LIF3 Follow-on Interim Report (Nov 2017)

programme provides a platform for academics in commercialisation that did not already exist. One respondent who had experience of other existing entrepreneurial programmes outside of LIF said that they have never been very successful. Mentors on the LIF programme provide answers to technical questions and give direct advice. Several respondents have already engaged in Newton funded projects prior to LIF or had heard about it through their colleagues.

4.3.2 Effectiveness

For fellows, the project has helped to enhance knowledge about how the business world works and how to have an entrepreneurial mind set, rather than an academic mind set alone. Respondents highlighted that they gained:

- Understanding of marketing and business proposal writing – fellows reported they now know how to write a business proposal.
- A change in mind set. This enabled knowledge sharing with peers on commercialisation within their institution. A respondent noted that it has shown “a clearer direction on how you should expand your existing project”, and as a result, created a spin-off product from the original concept.
- A greater understanding of intellectual property and licensing, sales and marketing, costing, and value proposition.
- Better understanding of business and as a result, an improvement in negotiation skills.
- Confidence in general – some respondents highlighted that a drama teacher came in for one session to help provide tips on how to present themselves and look confident which was very useful.

For both cohorts, the fellows established initial links with academics at other Malaysian institutions. One respondent met an academic with knowledge in a particular sector that was relevant for their own work, they stated: “I’ve been looking for this person for years, and I found [him / her] on this programme”. For some respondents, discussions about collaborations with their peers from the LIF programme and their institutions are taking place. However, the two cohorts did not know one another and thought it would be useful to create a platform to interact with others who have also completed the programme.

In addition to Malaysian research collaborations, there has also been an interaction with other institutions on an international level for a minority of the fellows. It is clear that the LIF programme has facilitated the establishment of new research collaborations. One respondent went to the University of Cambridge during their stay in the UK and said that new links were established. Another had been contacted by an academic at Bangor University in Wales. As well as links to institutions in the UK, the programme itself allowed Malaysian fellows to connect with fellows from Vietnam and Mexico. One respondent managed to find a partner in Vietnam for a project relating to food security – directly addressing a key socioeconomic challenge for Malaysia and globally. Respondents highlighted that they established good relationships with Mexican fellows. One had received interest from a Mexican fellow in using their lab – it provided an opportunity to expand their lab outside of Malaysia. Several respondents mentioned that having Mexican fellows on the programme alongside Malaysian, allowed fellows from both countries to learn from one another and their ways of thinking. The programme for Malaysian fellows also allows them to engage with fellows from Vietnam. LIF4 fellows are in touch with their Mexican and Vietnamese colleagues however, they believe it is a bit early to collaborate.

The LIF3 Interim Report indicates that prior to engaging in the LIF3 programme, most projects were either a laboratory demo, prototype or final product. By the start of the follow-on programme, some fellows had moved into commercial production and final product stage, less were at laboratory demo stage and more had moved onto the prototype stage of development. Just over half of the cohort were speaking to potential customers or licensees¹⁷. One of the fellows had established a customer base and secured first sales / a license deal.

Some interviewees have had informal and formal meetings with local industry as a result of the programme. Others have established business links with companies on an international level, including Singapore, Hong Kong and France.

¹⁷ Oxentia, LIF3 Follow-on Interim Report (Nov 2017)

Although there was a highly positive response to the programme, fellows mentioned some challenges that they are experiencing now having completed the training - one of which is the lack of funds available to allow projects to develop. A few respondents highlighted that industry in Malaysia does not operate as it does in the UK, therefore it is more difficult to engage. One respondent said that “[industry] does not encourage the innovation system”. Others mentioned that the lack of links with industry are holding them back. The fellows seemed to have mixed experiences, as the remaining fellows also mentioned no improvement in terms of international collaboration.

UK participants noted that the coaches and mentors gain exposure to what’s happening outside the UK and highlighted the coaching component as an important tool for an individual’s development. Coaches and mentors themselves have been creating long-lasting connections and relationships with fellows from Malaysia and other countries. Another coach claimed to have introduced fellows to their UK network and intends to stay in contact with the group of fellows they are coaching, four out of six fellows decided to continue to engage.

4.3.3 Impact

The impacts of this programme on addressing the socioeconomic challenges Malaysia is facing are not yet clear. The fellows are already demonstrating self-improvement and increased entrepreneurship. In the long-term, the fellows believe that LIF is going to inspire the local community.

Although there has not been direct impact at this stage, one respondent described a side effect of the programme was that a minority of fellows were setting up meetings and connections with institutions while in the UK. Fellows from Malaysia have a real interest in collaborating with the UK. It is not certain what the long-term impacts are for the UK. Fellows think highly of the UK innovation and university system and welcome any future collaborations. Some respondents believe that exposure to the UK is a great way into collaborations with Europe. One coach mentioned they would gain value more from working with a local partner, as it would be beneficial for all parties to learn about in-country programmes in order to offer advice tailored to their environment.

4.3.4 Complementarity and coordination

To date, there has not been any policy impact as a direct result of the LIF programme, however there are actions being considered to improve the university system. During discussions with respondents, suggestions were put forward for future learning. The main point put across by fellows was to provide training for TTOs. The TTO was described as an important aspect of their commercialisation process. The fellows need TTOs to assist and support them when in the process of translation research. Some fellows felt they had more knowledge than members of their TTO and recommended that TTO staff should be put forward to undertake the training. One respondent, who was at a stage of commercialising with the Malaysian delivery partner, mentioned they would like to open the programme to TTO staff.

4.4 Conclusions

- There are some examples of successful training / mentoring for fellows, which has led to the creation of new industrial links with opportunities to showcase their technologies. Not all fellows have created new relations with industry. However, all have reported building and developing relationships with their peers in academia.
- Although there are other sources for funding in Malaysia, NUOF has provided a platform for collaboration between the UK and Malaysia’s researchers and academics. Fellows particularly enjoyed the international aspect of this programme and the opportunities to visit industry and academics in the UK. In addition, the LIF programme provided a platform to engage with Mexican and Vietnamese researchers that would have otherwise been difficult.
- This project led to outcomes of improved researcher and institutional capacity. It has helped Malaysian fellows increase their knowledge about industry and the commercialisation process. A side effect is that fellows will go back to their institutions and share their learning.
- Fellows provided highly positive feedback about the training. However, after returning to Malaysia they found it difficult to work with their TTO and often found that they now had more knowledge / insight into the commercialisation process. A recommendation is to enrol TTO staff onto the programme.

- An issue raised by fellows is the difference in industry between the UK and Malaysia. Although useful, the training is more relevant in creating links with UK industry. There is a general belief among fellows that Malaysian industry does not support an innovation ecosystem. A coach for Malaysian fellows suggested it would be helpful to work with a partner in-country to get a greater understanding of how academia and industry work in Malaysia.
- This project has the potential to address the socioeconomic challenges in Malaysia although this is not yet clear and should be explored in the long-run. Many products the researchers are commercialising do address socioeconomic challenges such as: climate change, agriculture, and natural disasters.

5 Malaysian Research Management and Governance

5.1 Summary

Action title	Malaysian Research Management and Governance
Short description	This project has comprised four work packages and involved 21 universities and Public Services Departments. The main aim of the project is to improve research management and research governance in universities for sustainability of the universities. This involves recognising the challenges the university research management system currently faces and gathering evidence on best practice in the UK and internationally and how it can be applied to Malaysia.
Objective(s)	<ul style="list-style-type: none"> • Improve research management by introducing research management profession • To have an effective data management system in selected higher education institutions (HEIs) in Malaysia by 2018 • To establish approaches to research costing in Malaysia that can strengthen research sustainability in HEIs • To strengthen research impact evaluation and monitoring in selected Malaysian HEIs by 2018
Pillar	People
Action value (total budget allocated in country, in GBP)	GBP 165,000 (UK) RM 902,640 ¹⁸ (Malaysia)
Start / end date (Status: on-going or complete)	Start date: April 2015 End date: 2018 Status: ongoing
DP UK and overseas	MIGHT (Delivery partner), MoHE (secondary partner) and British Council
Award-holders / grantee	Smith Institute, University of Malaya and taskforce members, Coventry University,

5.2 Description of the action

Pathway to impact

This action fits within the Theory of Change for People Pillar projects, as shown in the impact logic presented in Figure 3 of Annex 2. The activities and outputs align with those of the people pillar with the intention of developing a transparent research costing system, a national data management system, research management profession and an impact evaluation system in HEIs in order to cope with the increased research activities in HEIs. The overall aim is to improve research management and research governance in Malaysia for research sustainability, subsequently leading to sustainable HEIs.

¹⁸ Approximated using conversion rates April 26 2018

Background

The MRMG project falls under the British Council's Professional Development and Engagement programme. The programme supports the development of skills in researchers, research managers, and support staff as well as the creation of dialogue and knowledge exchange on research governance and strategic research policy development. The project is based on solving the existing lack of identification of impacts from research, which when coupled with increased research activity in universities is resulting in a struggle to allocate manpower and resources between academic teaching, researching and managing research. A taskforce of 25 individuals from universities, coordinated by the University of Malaya under the Ministry of Higher Education, are working together to look at fundamental aspects of building strong research management and governance in the universities. The project looks at four main areas, identified by the project taskforce:

- Research management profession
- Data repository and curation
- Full Economic Costing (FEC) and Transparent Approach to Costing (TRAC)
- Impact Evaluation and Monitoring

Without these elements in the Malaysian University system, there could be a barrier to UK researchers working with Malaysian researchers. The Smith Institute has been involved in the research management profession and impact evaluation and monitoring of the project since 2016, and Coventry University became involved in FEC and TRAC in June 2017. The project was set out in four work packages for the Smith Institute:

1. An initial workshop held in Malaysia with the project co-ordinator and taskforce (25 representatives from Universities across Malaysia). The workshop aimed to understand the impact evaluation and research management barriers that exist in Malaysia and what outcomes they would like to achieve.
2. The Malaysian delegation visiting the UK. This trip involved visiting universities in the UK to understand how the research management system works in the UK and to give the project taskforce an idea of what they may want to achieve / what gaps they would like to fill in Malaysia.
3. The Smith Institute putting together guidance for improving research management and impact evaluation.
4. A 'train the trainer' session designed to take the guidance and use it to inform a workshop in Malaysia to train researchers and staff from research management centres on research management and impact evaluation.

Coventry University were appointed to address FEC and TRAC only, and worked independently of the Smith Institute. The objective is to introduce these two costing approaches to Malaysian Universities and it is currently in the process of being rolled out in two pilot institutions. Coventry University got involved in June 2017, and delivered their first workshop to Malaysian colleagues in September 2017, followed by a second workshop in December 2017. They also prepared three reports between September and December 2017.

All the reports and guidance from both the Smith Institute and Coventry University will then be passed on to the Malaysian taskforce, who will have responsibility to put plans in place and implement accordingly.

5.3 Answers to the evaluation questions

5.3.1 Relevance

The main aim of this call is to improve the Malaysian Higher Education system, with a focus on costing; impact and monitoring; data repository; and research management. It is not clear that this project directly targets economic development, welfare or poverty issues in Malaysia. However, it is helping to address existing challenges in the University system which may ultimately increase the capacity and capability of Malaysia to respond to development challenges. The existing problems this project aims to address are:

- Lack of a national system / data repository platform that can be used by all Universities to capture research publications and other data.
- Research management teams are made up of existing staff who are academics, researchers and administrative staff. This has led to inefficiencies and staff who are over capacity.
- Research is budgeted without including indirect costs and staffing costs which takes a toll on institutions' budgets.

Interviews indicate that activities serve to strengthen and develop research infrastructures. The UK counterparts believe that changing university management systems will help Malaysian institutions improve their outputs and, in the long-term, they anticipate a change in policy and of university funding in Malaysia. Both UK and Malaysian partners already believe that this is helping to increase the internationalisation of researchers and institutions – the participants involved have already established UK-Malaysia relationships that may not have existed otherwise.

In terms of additionality, the Malaysian respondents think the project may still have happened without the Newton Fund. However, it would be a much slower process. One respondent commented that: “there is no fund like this fund ... it is a model to share best practice and experience to adapt in Malaysia”. The Ministry of Higher Education does offer funding for policy study however, it is not closely aligned with the scope of this project.

5.3.2 Effectiveness

The project has involved a lot of scoping work on UK and international university practices. Outputs and activities include:

- Scoping study reports on the UK research management profession, data management systems, and the UK Research and Excellence Framework (REF).
- Framework and guidelines on research and impact assessment, FEC and TRAC implementation, and then research management profession.
- Policy and guidelines on good data management.
- A cohort of 30 stakeholders who support the research management profession, good data management, FEC and TRAC, and research impact assessments in HEIs.
- Implementation, monitoring and evaluation plans for a pilot project.

For Malaysian award-holders, the project has been useful to gain knowledge of and exposure to the UK higher education system and put into practice what they think may be useful for the Malaysian higher education system in the future. Respondents highlighted that their visit to the UK was highly beneficial and they had learnt a lot about university processes. For Malaysian participants, this project has developed relationships with institutions in the UK. For instance, the University of Coventry mentioned that individuals from the Malaysian delegation came to revisit them when they were in the country for other business.

Some UK respondents found it difficult to work with the Malaysian delegation remotely. They also mentioned that it would be useful to receive feedback in other means as it is difficult to interpret over email. At times, they felt that the communication between the UK and Malaysia was not clear.

All parties involved highlighted that there is increased learning as a result of the collaboration. The stakeholders have gained more insight and knowledge into both the UK and Malaysian university system. There is now an opportunity to increase Malaysia-UK links building on the relationships that have been developed. The UK award-holders think there is more possibility to collaborate with Malaysian organisations in the future. There are discussions about research projects between senior leadership teams in Coventry University and Malaysian institutions.

UK respondents mentioned that in the past, it has been extremely difficult to find Malaysian partners to collaborate with. As a result of this project it is easier to reach out to contacts / find appropriate partners through recommendations. Coventry University mentioned that strong connections have been established (resulting in the visit from some of the Malaysian delegation mentioned above).

5.3.3 Impact

At this early stage, much of the impact is intended to happen in the future. There has been a pilot with two universities (University of Malaya and Universiti Tun Hussein Onn Malaysia) to date. Respondents noted there was some resistance initially, however, over time they understood the wider objectives and worked well with the project taskforce. It is not clear how well universities will take up the new research management systems or the time it will take to do so. Once piloted, the aim is to share the findings with the Ministry of Higher Education and to adapt depending on how the pilot goes.

There was initial delay in transferring funds to the project lead (University of Malaya) which went on to cause delays in the work packages. These were then altered slightly due to time constraints. At work package three, Smith Institute said there was not enough time to produce full guidance on what could be improved and how to implement it, therefore they did not feel they had a clear idea of what the work package four workshop will comprise. Instead of a train the trainer workshop, work package four was changed to establish what the guidance and recommendations would entail for universities. Three days were spent on detailed mapping of good practice in the UK and internationally and how it would map onto the Malaysian context. Work package four is still ongoing and is helping to anticipate what parts of best practice would work and what parts the Malaysian delegation would want to work.

The project is now near to completion. However, the critical element is yet to come. The expected impact will be clearer once the university pilots are complete. Respondents highlighted that an opportunity exists to follow up with research collaborations. For the UK award-holders there are potentially wider benefits, one respondent mentioned that there is now more opportunity to follow up projects in different countries and increase expertise.

Stakeholders in the Malaysian task force highlighted that universities were not considering all costs incurred from research projects. The MRMG project has produced a specific costing approach for them to follow. All respondents highlighted the future benefits for Malaysian researchers and institutions by improving the way they account for costs in projects. If universities go on to use this approach successfully, they can increase their income for research which will have a knock-on impact on sustainability. This creates potential for the institutions to reinvest in their infrastructure and facilities. UK respondents are keen for the university pilots to be used as case studies for a national roll out.

Malaysian institutions are expected to become more competitive. By putting in place a system to capture all data and impacts, the chances for international collaboration will be increase and international competitiveness will be increased. Institutions could improve university ranking and how they are perceived. Respondents also mentioned that institutions will be attracting students from around the world.

In terms of economic and social development, universities in Malaysia are seen as important for towns and cities; they are major employers, investors and land owners. One respondent believed the changes anticipated in higher education systems are important in making Malaysia a high-income country.

5.4 Conclusions

- Main activities have included extensive research into the UK university research management system and how to improve the capture of outputs, with the intention of improving the reputation of Malaysian Universities. Through research and discussions, all parties learned about how both the UK and Malaysia's Higher Education systems operate.
- It is not clear how successful the systems put in place by the project will eventually be in terms of leading to future bilateral collaboration and communication. However, the comments from Malaysian stakeholders and Coventry University highlight a positive relationship has been developed between them. It has given both parties the opportunity to extend their network, and potential for collaboration in future research projects.
- It is not yet clear whether a pilot of the designed research management system for universities in Malaysia will work successfully or how long it will take to be rolled out if successful. An initial pilot with two universities had

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some difficulties at the start however, once there was understanding of wider objectives, the research managers were happy to implement the changes.

6 Conclusions

Overview

The Newton Ungku-Omar Fund research areas align with Malaysian and Newton Fund goals. Of the case studies investigated, the Next Generation Green Data Centres for Environmental and Business Sustainability project identifies a clear link with the aim of improving environmental resilience and energy security. The selection process for the Leaders in Innovation Fellowship ensures the technologies from fellows involved in the programme align with one of the five research areas. Malaysian Research Management and Governance is a collaboration of a different nature to those typically funded by the NUOF. Although it doesn't directly align with the five research areas, it does fit wider country objectives to strengthen science, technology and innovation governance, through university research management systems.

Lessons learned

- The overall view from award-holders and delivery partners is that the Newton Fund has upheld the status of the UK as a partner in science and innovation. It was recognised that the Newton Fund is helping to strengthen and foster partnership between the two countries. Some respondents mentioned greater potential for the UK and Malaysia to support one another as a result of Brexit.
- Participation in the fund has helped several individuals to become more international, in some cases helping them set up new partnerships outside of the Newton Fund. Several respondents reported having built capacity at the institutional level, particularly those in the LIF programme.
- In terms of additionality, there was a mixed view from respondents. Several award-holders felt that their project could not have happened in the absence of the Newton Fund, others believed their project may have happened but at a slower rate. Most respondents highlighted that the Newton Fund provides an exceptional platform for joining up partners in the UK and Malaysia.
- Respondents spoke of the strength of the Malaysian Industry Group for High Technology. Malaysian award-holders highlighted that their strong relationships with MIGHT have enabled them to get the support they need (such as facilitation of relationships and provision of meeting space).
- The projects studied in depth, though not representative of the Newton Ungku-Omar Fund activities in Malaysia as a whole, have potential to generate impact after completion. It is not clear whether these impacts are certain, or in what time frame they would be experienced. For the Malaysian Research Management and Governance project, the long-term policy impact is uncertain.

Areas for improvement

- The delay of funding for Malaysian award-holders seems to be problematic at times. In this sample of case studies, two of the three experienced a delay in receiving funds from the Malaysian Delivery Partner. This may be due to the complex regulations institutions have to follow.
- There is a need for increased understanding of Malaysian industry by UK stakeholders. Respondents from the LIF programme highlighted that training may have been better tailored to the country, however, it is also important to note that there is a lack of support for innovation from industry, according to respondents.

Annex 1- Field Work Summary

Research Participants

Organisation	Name
Malaysian Industry-Government Group for High Technology	Datuk Dr. Mohd Yusoff Sulaiman
Malaysian Industry-Government Group for High Technology	Ida Semurni Abdullah Ali
Malaysian Industry-Government Group for High Technology	Ahmad Razif Mohamad
British Council	
Foreign and Commonwealth Office	
Royal Academy of Engineering	
Polaris Associates	
Oxentia	
Green Data Center LLP	
Dearman Engine Company	
Universiti Teknologi Malaysia	
Heriot-Watt University	
Various institutions across Malaysia (approximately 20 out of 23 attended)	Prof Shaliza Ibrahim Assoc Prof Dr. Chong Wen Tong Assoc. Prof. Dr. U. Johnson Alengaram Md Afendi M Yusuf Dr. Farhan Mohamed Dr. Noreen Izza Arshad Dr. Ching Yern Chee Dr. Muhammad Shamsir Mohd Aris Dr. Vimala Balakrishnan Prof. Sulaiman Wadi Harun Associate Professor Dr Suzana Yusup Associate Professor Dr. Sharifah Hafizah Syed Ariffin Associate Professor Dr. Hazlina Binti Selamat Dr. Amirrudin Bin Kamsin Assoc. Prof. Dr. Mohd Azree Bin Idris Dr. Risyawati Mohamed Ismail

	Assoc. Prof. Dr. Zainon Binti Mat Sharif Prof. Dr. Miss Laiha Binti Mat Kiah Assoc. Prof. Ir. Dr. Mohamed Thariq bin Haji Hameed Sultan Assoc Prof Dr Samsul Haimi Bin Dahlan Professor Ir. Dr. Fatimah Binti Ibrahim Dr. Jaspaljeet Singh A/L Ranjit Singh Dr. Yeong Che Fai Assoc Prof Rohayu Bte Che Omar
Universiti Malaya	
Malaysian Ministry of Higher Education	Prof. Dr. Raha Binti Haji Abdul Rahim
Coventry University	
Smith Institute	

References

- LIF3 Follow-on Interim Report, Oxentia (Nov 2017)
- Report: Policy, framework, processes and guidelines on TRAC and FEC for research that draws on the successes of financial research management in the UK and elements of the Malaysian HE context (Oct 2017)
- Impact Workshop Report, Smith Institute (Dec 2017)
- Work Packages for UTM
- UTM progress report
- UTM-MIGHT Agreement
- PowerPoint presentation on progress

Annex 2- Theories of Change per Action

Next Generation Green Data Centres

