BUSINESS CASE FOR PROJECT EXTENSIONS

SUMMARY INFORMATION	
Title: 2050 International Country Calculator Outreach and the Global Calculator	
Country/ Region: Worldwide, but with projects specifically in India, South Africa, Nigeria, Brazil, Mexico, Colombia, Bangladesh, Vietnam, Thailand and Indonesia	
Senior Responsible Owner: Pete Betts	
Start Date: August 2012	
(Original) End Date: December 2014 (already extended to March 2015)	**New Project End Date: December 2018**
Original Project Budget: £2,107,000 RDEL	**Cost Extension Value: £302,585 in 2015-16, with a possible budget up to £1 million over 2016-18, RDEL**
% Increase from Original Budget: 14% in 2015-16, and another 47% for 2016-18	

INFORMATION
What is the project's purpose? *(Max. 2 pages)*

Country Calculators

Background: The 2050 Calculator was originally developed by DECC in 2010 to help the UK plan and debate the country's low-carbon transition in a more open and interactive way. Following a successful joint DECC/FCO project to help China develop their own 2050 Calculator, DECC identified demand across other developing countries to use the methodology, but also a lack of technical knowledge to do so.

To meet this need, an ICF programme began to offer tailored technical assistance and funding to 10 developing countries to help them develop their own in-house version of the 2050 Calculator tool. This fits into DECC's objective to drive ambitious action on climate change at home and abroad, and particularly the International Climate Change directorate's strategy to build the political conditions for this action in key countries. Countries were selected based on their size, strategic importance, ability to complete the work, and demand from the governments themselves. The countries selected were India, South Africa, Nigeria, Brazil, Mexico, Colombia, Bangladesh, Vietnam, Thailand and Indonesia. Limited support and funding was also given to a team from Algeria, which expressed interest following a visit to DECC. DECC's approach was to be demand-led to improve the chance of buy-in from the countries themselves.

The purpose of this business case is to extend this project into the 2015-16 financial year and potentially beyond, so as to further improve the calculators that have been built and facilitate the key objectives of the original project.

Results: Overall we are very satisfied with the progress that has been made over the first two years of the project.

- **Seven of the 11 countries have launched finished 2050 Calculator tools**. Launch events have been successful, with press coverage and high-profile figures attending.
- It is too early to judge how influential these will be, as most have only recently launched, but **India and Colombia are already using their calculators to formulate their INDCs** (intended nationally-determined contributions), which are the post-2020 national emissions pledges put forward for the UN negotiations. There are also plans in all these countries to continue developing the tool and to promote its use.
- The four remaining countries (Brazil, Mexico, Nigeria and Algeria) have not launched theirs yet, but they have working models. It is expected that they will all have published them by the autumn of 2015. There has therefore been some slippage in timelines, but the project is on course to deliver all deliverables.
- DECC staff have trained people from **9 further countries** during the project period.
- Representatives of **30 countries attended the 2050 Calculator conference** in Taipei in February 2015, showing the flexibility and replicability of the model.
- Country teams funded through the ICF project are beginning to train new countries. For example, the Colombian team have been supporting new teams in Ecuador and Peru, and the Indian team has been helping Mauritius. This shows the **beginnings of a 2050 Calculator community**.
- The project has **promoted openness and transparency** in these countries. In many cases, the 2050 Calculator is the first time that energy data has been made available, or that stakeholders have been consulted openly by government.
- DECC and the FCO won the **Civil Service Award for Analysis and Use of Evidence in 2013** for their work taking the calculator to other countries.

Reflecting this progress, in the 2015 annual review the project scored an A (following a B in 2014), showing that the outputs are meeting our expectations, and in the spring 2015 results collection for KPI 15

(transformational change), it scored a 3 (tentative evidence of change – transformation judged likely).

Issues: Through the process of our annual reviews, results collection and independent research carried out by Ricardo-AEA, we have identified the following issues for the project at the end of two years:

- Country projects took longer to get going than expected, because of bureaucratic challenges and the amount of training required in some cases. This has had the knock-on effect that many calculators still require further work and they have had only limited use in policy so far.
- Some of the published calculators are not as open and transparent as was hoped, as this is a key pillar of the methodology. We are waiting for a few Excel spreadsheets and extra documentation to be published. We think this is mainly because of a lack of time to finalise these documents, rather than a reluctance to share the data, but it remains a concern.
- Some calculator teams have not been as ambitious in the "level 4" scenarios included in their models as they could have been. In the calculator methodology, these scenarios are supposed to be the technical limit of what could be done to reduce emissions, but many governments do not feel comfortable including them because of they are so far outside current policy.

We are building these lessons into this proposal and how we will work with countries in the future (for example if we work with new countries, we will have an extended timeline for completing their calculator models).

For more information on the project's results, please see the summary from the 2015 annual review in Annex 1.

The Global Calculator

Background: As well as these country calculator projects, the team in DECC also led work on the Global Calculator, which allows users to explore future scenarios and see the impact of different actions on emissions and the climate. This project was co-funded by Climate-KIC, and a number of other organisations formed part of the team[1]. The aim of the project is to help businesses, NGOs and governments in both developing and developed countries better understand the trade-offs and scenarios for low carbon development through using the tool, so that they engage more in the climate debate. This in turn would be expected to make politicians in developed and developing countries to feel more empowered to take action.

Results: We are very satisfied with the project so far.

- The tool **was launched on 28th January 2015 on schedule**, and independent research from Ricardo-AEA suggests that the model itself successfully matched the challenging brief.
- **Engagement with stakeholders during the build exceeded expectations** – for example, originally we hoped 40 experts would attend workshops, but over 100 did.
- Since its launch, **communications and outreach work has again exceeded expectations**, with the tool receiving over 20,000 hits, when only 1,000 were expected. A number of articles have appeared in the press around the world and online, including positive stories in most of the major UK papers.
- The tool is being **used in at least 10 universities** (mostly in developed countries) in teaching and will be included in the International Baccalaureate science syllabus.
- We have received example pathways from some organisations including **Shell, Friends of the Earth** and the World Nuclear Association.

In the 2015 annual review the project scored an A+, reflecting the successful completion of the build phase

[1] The partner organisations were: the Energy Research Institute of China, Imperial College London, Climact, EY India, the World Resources Institute, London School of Economics, Climate Media Factory, the International Energy Agency, Natural Environment Research Council (NERC), National Oceanography Centre, Rothamstead Research and the Walker Institute.

and launch. In the spring 2015 results collection for KPI 15 (transformational change), it scored a 2 (some early evidence suggests transformation likely).

Issues: The Global Calculator is in a similar position to the country calculators, in that it has had a very successful launch but there is little evidence that it has had its desired impact yet (that businesses, NGOs and governments have taken action on climate change because of its influence).

- Only a few businesses have engaged with the tool so far.
- The Global Calculator's usability has been raised as an issue by some users. While it is easier to use than other world energy models, the project team has found that most users require some initial explanation before they feel comfortable using the tool.
- The cost sector in the tool does not adequately reflect the true costs of potential climate change or the co-benefits of taking action, only the cost of the energy system.

For more information on the project, please see the summary from the Global Calculator's 2015 annual review in Annex 1.

How does the project address the need, what are the expected results, and how will it deliver VFM? *(Max. 4 pages)*

A budget of £200,000 for 2015-16 has already been agreed for the calculator work, which is covered by the underspend of the budget that was agreed in the original business case. We propose to use this to finish off work that was delayed, particularly on the final few calculators that need to launch, and to do some outreach work for the Global Calculator. This addresses some of the issues identified above, as it will complete the projects that have been delayed and help get the Global Calculator reach our target audience.

This proposal:

1. To receive additional funding in 2015-16 to support the further development of four of our 10 active ICF countries (India, Bangladesh, South Africa and Indonesia) and to hold another conference. This work totals £302,585.
2. To get permission to extend the country calculator and Global Calculator work further into 2016-17 and 2017-18 with a budget of up to £1 million, subject to further scoping of the need, potential benefits and value for money of further funding, and the availability of analysts to give technical support.

The decision whether to continue to provide funding beyond 2015-16 would be made following a formal assessment of what is required in early 2016. An updated programme document would be produced, and the Deputy Director for Policy and Finance in International Climate Change will decide whether to extend the project further.

Additional work in 2015-16

There are five projects that we propose supporting with extra funds this year. They are:

1. **India** (£40,000) – support the roll out of their new updated calculator around the country by holding workshops in five different states. Also supporting the development of their new National Energy Policy with knowledge exchange between DECC and the Indian Government, and producing resources to help schools use the tool.
2. **Indonesia** (£60,955) – developing a cost sector of the calculator so that the practical viability of each pathway can be explored by the government.
3. **South Africa** (£60,720) – improve the main calculator tool by updating the data and assumptions and adding in example pathways. Support the roll-out of the My2050 version aimed at school children by developing lesson materials, and holding workshops for curriculum specialists and teachers around the country.

4. **Bangladesh** (£70,910) – holding workshops to train government officials and academics in how to use and maintain the calculator so that it can be transferred from Cardiff University (which developed the calculator) to Bangladesh. Also developing an app version of the calculator for Android phones to improve access to the tool. The code could be used by other countries in the future.
5. **Conference** (£70,000) – holding another conference in early 2016 to build on the momentum of the Taipei conference, possibly in Delhi with support of the Indian Government. This would bring together project teams around the world to present their work, learn from each other, and to build relationships between teams.

The work in the four countries has been chosen based on demand from the teams themselves and advice from FCO Posts. The cost estimates have also been determined in conjunction with the FCO[2]. For detailed information on these five projects and how they address the needs of the projects, please see Annex 2. These projects will also give us more opportunities to promote the inclusion of ambitious scenarios in the calculators, and to encourage teams to publish documentation openly.

We have chosen to continue to support existing countries rather than to fund new countries this year because, given the reduced staffing capacity within DECC, we feel it is better to use our limited resources where they can have most impact rather than starting new projects that have higher risks involved. Using the existing and proven relationships in these countries, relatively small amounts of money could have a large impact by improving the integrity of the new calculator models, and by using them to engage stakeholders and the public in the energy and climate debate.

Potential work in 2016-17 and beyond

An extension to the ICF calculator project would include the following types of work:

1. Continuing to help develop the existing ICF-funded country calculators, for example adding cost, land-use and air pollution sectors to those that haven't got them. Sub-national calculators have also been suggested in a few countries (e.g. in Indian states).
2. Provide extra help to new developing country projects that have so far not received formal support from DECC, e.g. Peru, Ecuador and Kazakhstan. This could include giving money to support calculator workshops, further training from neighbouring teams, or support for their launch events.
3. Support completely new calculator projects. We have had expressions of interest from Ethiopia, Laos, Malaysia, the Philippines and for a regional calculator for Southern Africa. This could be lighter touch than the method used before, using the expertise of neighbouring country calculator teams rather than just DECC, now that the community is growing.
4. Improving the Global Calculator model in conjunction with our partner organisations to update the data, improve usability and better reflect the costs of climate change.
5. Further investing in the 2050 Calculator community, for example by developing the community online, developing regional networks (e.g. Central and South America, or South East Asia) or holding another conference.

These potential areas of work lie both within the scope of the original business case (making transformational change more likely in the existing 10 countries), and beyond (for example by extending the benefits to more countries and developing South–South learning). In addition, the team working on this could offer some informal technical support to non-ODA countries interested in building their own calculators (outside of this ODA budget). For example, we have received interest from Canadian provinces, US states, the EU and Russia,

[2] For the Indonesia, South Africa and Bangladesh cost totals, we have received quotes from the suppliers the FCO and calculator teams want to work with. For the India cost, we have received quotes for some of the work from a likely supplier, and some is estimated based on previous projects. For the conference, we have re-used the budget of the previous two conferences.

and some or all of these could come to fruition in the next year or two. The development of these tools fits into DECC and the FCO's wider work on climate change.

We estimate that there could be valuable work over the years 2016-18 worth up to £1 million. This is based on the 2015-16 annual budget of approximately £500,000 extended over another two years. The budget for the original business case was around £2 million over two years, but it is very unlikely that we would require this level of funding again. This could be carried out by a team within DECC that offers technical support, as in the past, or a partner organisation that could be funded to fulfil this role. However, it is likely that using a partner organisation would be more expensive than using DECC staff.

Whether or not DECC is willing and able to offer further support, both financial and staff time, will be dependent on a number of factors:

1. The demand for further calculator work from the countries themselves.
2. Whether this work would have an impact and represents value for money.
3. The availability of technical support within DECC or in other organisations – the project would not be viable without having at least one analyst dedicated to it.
4. The availability of FCO Posts in each country.
5. Whether the proposed work meets the requirements for ODA support.

This will all be formally assessed between January and March 2016. If it is decided that there is valuable work that could be supported, a new programme document will be drawn up to make the case for this. This will then go through the ICF quality assurance process, and the Deputy Director for Policy and Finance in International Climate Change will make a decision on how to proceed.

What would happen if we didn't extend the project?

Our original theory of change for the country calculators (see Annex 4) has now been tested and its assumptions have held well – we have adjusted them to take into account of some of the broader potential impacts of the calculators that we have become aware of, so that we can show the transformational change they could produce. The specific proposals for 2015-16 contained in this business case are about helping us build on the initial success of the projects and maximise their impacts towards the latter stages of the theory of the change by enabling countries to make improvements to their models and do outreach work that they would otherwise be unable to do.

For the existing ICF-funded countries, if we are unable to provide any additional funding the models would still exist, and are likely to remain online in the medium term. It is likely that work will continue on the models in some way for the next year or two in most of the 10 countries, and some new countries or regions may still begin calculator projects. However, the burgeoning 2050 Calculator community will likely peter out as it is not yet strong enough to maintain momentum without one organisation taking a leadership role, and offering advice, technical support and some funding where necessary. The UK government will also lose the calculator as a valued tool for climate diplomacy, as the FCO have found that it builds up not only knowledge in other countries, but also goodwill towards the UK (see Annex 3).

For the Global Calculator, the tool would remain online and would be available to users. The other partners could decide to update and improve the tool, but without the continuation of DECC's leadership and funding role, this would be less likely and the project could move away from the original aims and philosophy.

For more information on the impact of withdrawing support for the 2050 Calculator, please see value for money section below.

Poverty reduction

The statutory authority to spend on the original 2050 Calculator project and this extension comes from the International Development Act. This provides the power for the Secretary of State to provide "development assistance" if she is satisfied that it is likely to contribute to a reduction in poverty. The definition of development assistance can include assistance that furthers sustainable development within a country, and generates lasting benefits for their population.

The 2050 Calculator project has worked closely with developing country governments to improve their capacity to plan in an evidence-based way so that the development of their energy system can be well managed over the next few decades. This will provide their populations with lasting benefits like access to reliable electricity supplies and public transport. Because the calculator links planning decisions to emissions, air quality and other implications, it directly assists governments with making their development more sustainable. It can also be used to help the general public understand their energy system, and to influence the government plans.

The project contributes to poverty reduction in the following ways:

- The countries themselves are often more interested in using the calculator to improve energy security and access than to reduce emissions, so the calculator models can directly support governments to improve the living standards of their population.
- Climate change is one of the biggest threats the world faces, and it is likely to impact those living in poverty the most because of their vulnerability and lack of ability to adapt. If action isn't taken, climate change could also push more people into poverty. The 2050 Calculator projects aim to encourage governments to reduce their emissions and help them develop in a low-carbon way by showing the impacts of their choices on emissions and factors like air quality. This will reduce the severity of climate change and therefore its impacts on those living in poverty.

Most of the work included in this business case for 2015-16 is about improving the 2050 Calculators so that their power to make a difference can be enhanced.

The Global Calculator can also contribute to poverty reduction, but in a more indirect way. The report that was released with the tool has a positive message about development, as it shows that average living standards can continue to grow along a business as usual pathway (which in most areas is a significant improvement), while still avoiding dangerous climate change if we transform the technologies and fuels we use to power our lifestyles. This message is being promoted to influential stakeholders to encourage them to take action, which will in turn reduce the risks of climate change impacting on those living in poverty.

Gender equality

To meet the requirements of the gender equality provisions that have been added to the International Development Act 2002, we have considered the possible gender impact of the project.

As a planning tool, the finished calculator models have the potential to influence decisions that could have differentiated impacts on girls, boys, women and men, poor and marginalised groups. While it is not possible to include these social impacts in the models themselves because of their complexity, and we have limited control over the country projects, we have identified four actions:

- In the calculators we include a page of information on each mitigation option (we call these "one-pagers"). We will encourage countries to include more information about the potential social impacts and their differentiated impacts here to help people make more informed choices.
- When briefing new countries and in all our online material, we will specifically recommend that

countries consult women's groups, community groups and groups representing other marginalised groups.

- We will also recommend that once countries have a finished calculator, they should consider gender equality and other co-benefits when deciding which pathway to take and how to implement it.

Public sector equality duty

DECC is required by the Equality Act 2010 to give due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations between those who share protected characteristics (e.g. age, disability, sexual orientation, race) and those who do not. Consideration has been given to this issue, and we have concluded that this proposal raises no equality issues. The projects we are supporting have very limited scope to have any impact on equality in the countries in question, as they concern energy system planning with some education elements.

Balanced assessment of risks and uncertainties in extending the project

Risk description	Current rating	Target rating	Mitigating actions
Risk 1. Projects will overrun or fail to deliver. As this is the last year of the current spending review, we need to ensure that the money is spent before the end of March 2016 (ideally by the end of 2015). No further money has been agreed beyond this financial year. The impact of any overrun is lessened, however, as we will only pay after the completion of milestones and can make it clear that we will only pay for work done this financial year. If they overrun past a certain point, we will not pay for the work, reducing the financial risk to the project.	2	1	Draw up a schedule of milestones with each country, add these to the project's logframe and monitor their completion. Work with FCO posts to monitor work on the ground.
Risk 2: Lack of staff resource in DECC to manage the project. The 2050 Calculator team was downsized quite significantly in March 2015, and now there is only 1 SEO and 0.6 FTE AO working on the project. This limits the amount of support we can give country teams, particularly technical support. The proposed work plan will create more administrative burden. However, DECC has already agreed to extend the project this year, so there will be no "extra" monitoring and evaluation work needed, as it would be taking place anyway.	2	1	We have already chosen to support only a few large projects that will have a minimum of finance administration and project management because they will be carried out by trusted partners and paid for in large instalments. We will work with FCO Posts closely, who will be responsible for the day-to-day project management of the projects. The conference will be sub-contracted to a local partner and will utilise the support of the British High Commission to reduce the amount of time that DECC spends organising logistics.
Risk 3: Lack of technical knowledge in DECC	3	2	The lack of technical support in

to support the work. Staff turnover has meant the loss of knowledge within DECC, and reduced analyst availability to work on this project. If this not managed this could lead to delays, and also to models that are inaccurate and damage to DECC's reputation as a leader in the field. The country projects laid out for 2015-16 in this business case have been chosen because they do not require a lot of technical assistance, with only the Indonesian extension requiring training or significant quality assurance. However, some other countries are requesting technical assistance (ones who are still completing their models, and some that are continuing the work with FCO funding).			2015-16 will be mitigated by training more DECC analysts to understand the Excel calculator model so that they can help with quality assurance, securing ex-2050 team analysts to help where possible, and using analysts from other in-country teams to offer technical assistance where necessary. Some of these may be open to helping on a voluntary basis, which has worked well already in some cases, e.g. linking up the Colombians with the Ecuadorians, and has the added benefit of encouraging an international community to form. However, some will need to work as paid consultants. Because of the more significant requirements of the Indonesia project, we will provide extra funding for an external calculator expert from the existing 2050 Calculator budget. Future work in 2016-17 and beyond is likely to require more technical support from DECC or a partner organisation, especially if we want to further expand the 2050 Calculator community in a strategic way. We would not recommend that this work goes ahead without securing at least one dedicated analyst to do this work.
Risk 4: Work does not live up to the ideals of the 2050 Calculator. This could be by not being open and transparent, not involving stakeholders, or not including ambitious but viable low-carbon scenarios.	2	1	Ensure openness and transparency is included in all contracts so that the work can be published, and encourage governments of the value of these ideals whenever possible.
Risk 5: The work does not have the desired impact. For example because civil society doesn't engage with the work, or governments withdraw support.	2	2	Work closely with the FCO and the calculator teams to monitor progress and quality of outputs to make them more likely to have an impact. It is impossible to control the actions of external governments. However, we mitigate the impact of this by only paying for work that has been done. For the Bangladesh calculator, even if the work is still not taken on board by the government and academic organisations in the country, additional capacity building will have

			taken place which will benefit the individuals who attend the workshops.

Value for money

At the launch of the Global Calculator, then Secretary of State Edward Davey said of the calculator work: "I believe it has been the best value for money we've spent on climate change."[3]

In the project's original business case, the following indicators were identified to help measure value for money for the project:

1. Builds developing country government capacity
2. Facilitates low-carbon dialogue
3. Uses existing resources
4. Doesn't use consultants
5. Enhances UK co-operation as a leader on low-carbon development

These economic arguments in favour of delivering the projects have not changed since the approval of the original business case. However, many of our projects have used (and we propose continue to use) external consultants, which we originally said we would avoid. We have found that the political culture varies a lot from country to country and in many cases governments do not do modelling and analysis internally. Consultants were chosen in partnership with the countries' governments. By building up modelling capability in these trusted partners, we have indirectly improved it in the governments themselves. We therefore do not believe that avoiding the use of consultants automatically means the work represents value for money.

Work in 2015-16

For the work in 2015-16, the ICF has already invested substantially in the calculator projects of these four countries (approximately £470,000), so DECC has an interest in the success of the projects. The revised theory of change for the country calculators (see Annex 4) now includes the transformational impacts that the project could produce. It would be expected that enacting the upper levels of this theory of change would take longer than the original two year project timeframe. This extension would use new money to complete and extend some of the original elements of the programme in ways that couldn't be achieved in the first two years of the project (like adding costs to the Indonesia project), as well as going into new areas (like the school work in South Africa). This will add more value to the projects by helping move to the "outcomes" and "impact" parts of the theory of change, now that the original outputs have been produced.

Economy (Are we or our agents buying inputs of the appropriate quality at the right price?):
In the four countries where we propose extending the project and the conference, we will ensure economy in the following ways:

- If we work with consultants, we will only work with organisations that have been approved by the country governments involved and local FCO Posts (following FCO procurement guidelines). They must represent value for money by having relevant experience and comparable market rates of pay. See the commercial case section below for more information.
- We will use local partners because one of our aims and value for money indicators is that the work builds capacity within the country.
- We will also continue to work with existing partners where possible because they have a proven track record for the quality of their work and understand the projects already.
- We will always pay for work done rather than in advance to reduce financial risk to the project.

[3] See: https://www.gov.uk/government/speeches/launch-of-the-2050-global-calculator

Efficiency (How well do we or our agents convert inputs into outputs?):
The original project to produce 10 calculators is expected to come in around 20% under budget (once the last three have published) by working closely with local partners to assess what work is really needed to achieve the projects' aims. Some of this underspend is being used this year to promote the Global Calculator, link up calculator teams to introduce new countries to the calculator and extra promotion of the existing calculators. In this phase we will ensure to continue this efficiency in the following ways:

- We will work with existing partners where possible who have acquired expertise from the initial development of the calculators, saving time that would otherwise be needed for organisations to get up to speed.
- We will monitor progress closely with FCO Posts, drawing up a clear set of milestones for each country project.

Effectiveness (How well are the outputs from an intervention achieving the desired outcome on low carbon development?):
The full effectiveness of the project cannot be judged yet, but we have already seen some benefits of the country calculator projects and in holding the previous conference, for example building links between government departments and stakeholders during the creation of the models. Although there are early signs that the outputs of the project could have the desired outcomes (for example being used to formulate India's INDC), it is too early to tell the impact of the project on country policy. This extension is designed to make realising these ultimate goals more likely. In this phase we will ensure effectiveness in the following ways:

- The projects have been chosen because they are aligned to the value for money indicators, particularly building government capacity and facilitating low-carbon dialogue.
- We will continue to be demand-led, approving spend on a case-by-case basis in conjunction with climate attachés so that the work proposed has buy-in from the local actors and is more likely to have the desired benefits.
- This extension of funding would actually enhance value for money of the original business case by improving the effectiveness of the projects and facilitating the full theory of change.

Work in 2016-17 and 2017-18

There is no work plan yet for these years, so value for money cannot be determined. If this project extension is approved in principle, a value for money analysis will be included in the new project document so that the SRO can make an informed decision about whether to further fund the project. Receiving this approval in principle will allow more efficient scoping of future work and planning of resources, enhancing value for money, and minimising any delays in implementation.

What can be said at this stage is that continuing the 2050 Calculator project into 2016 and beyond would make it more likely for the momentum and value we have built up to be sustained. With DECC acting as a funder and central point of contact, the burgeoning community of modellers can continue to develop their skills, improve the understanding of stakeholders and the public in these countries, influence policy, and support new countries and regions to get involved.

How do we know that an extension represents better VFM than alternative options?

Option 1: Discontinuing funding completely
For the existing ICF-funded countries, if we are unable to provide any additional funding the models would still exist, and are likely to remain online for the use of governments and stakeholders. It is likely that work will continue on the models in some way for the next year or two in most of the 10 countries, as some countries have received funding from the FCO already this year, and some country governments have dedicated staff to work on them. Some new countries or regions may still begin calculator projects, using the documentation DECC has made available online, but they will likely run into difficulties and find it hard to get

support.

The specific proposals for 2015-16 contained in this business case are about building on the initial success of the projects and maximising their impact towards the latter stages of our theory of change. This is about enabling countries to make improvements to their models and do outreach work that they would otherwise be unable to do. It is possible that there are alternative sources of funding to support these available, for example the FCO's prosperity fund. However, the availability of funds varies from country to country, securing the money is not guaranteed, and application deadlines mean that work would not be able to begin until 2016 at the earliest. Please see Annex 2 for more on the specific impact of not extending the projects in each of the four countries and of not holding the conference.

DECC has built a burgeoning network of modellers around the world that are improving the evidence base for energy and emissions, and particularly in making this evidence more accessible. We have been spreading the values of open and evidence-based policy making to countries that have not considered it before, have built capacity, and are now also encouraging South–South learning. If the work stops, then this community will likely peter out. It is not yet strong enough to maintain the momentum we have built up without one organisation taking a leadership role, offering advice, technical support and some funding where necessary. The work post 2015-16 should consider long-term sustainability of the project, with the ultimate aim for work to continue without DECC support post-2018.

There is also the opportunity cost to the UK of not continuing to support the work. The calculator project feeds into DECC's objective to "drive ambitious action on climate change at home and abroad", and our joint effort with the FCO to build political conditions for increased ambition in key countries. The FCO have highly valued the 2050 Calculator for climate diplomacy, as it is something practical and useful that the UK can share with other governments (see Annex 3). The goodwill we have built up with these governments could end, and we will not have the opportunity to develop goodwill in new countries in the future by offering them the 2050 Calculator.

The future of the Global Calculator project and its potential benefits would be jeopardised, as after March 2016 there would be no guaranteed funding. DECC had a strong leadership role in the first phase of the project, and while the rest of the partners could continue the project without us, it could move away from the original aims and philosophy.

Option 2: Funding the four country projects plus the conference in 2015-16, and then give no extra funding in 2016-17 and beyond:

This would improve the projects in India, Indonesia, Bangladesh and South Africa, and the conference would provide value for money by encouraging all calculator teams to improve their work. However, after this, the 2050 Calculator movement could be jeopardised. Calculators that have already been built may have no further work done on them, leaving them without important aspects like costs or air quality, as the countries are unable to spend more money on them. Or they will have a very limited audience because stakeholders are unaware of them. The future of the Global Calculator would be particularly in jeopardy, as DECC had a strong leadership role in the first phase of the project.

Options 3: Give no further funding to the existing ICF-supported countries and start projects in new countries instead:

We have already invested in the 11 ICF countries and they have submitted proposals that increase the value for money of the original investment. Expanding to new countries would potentially widen the scope of the project and produce new benefits. However it is riskier, as building a calculator from scratch is labour intensive and it is possible that countries could pull out of project after it starts. We are already working with

many of the largest developing countries, so supporting them to improve their knowledge of their energy system and their emissions is valuable. Expanding to new countries could become part of the next phase of the project, but ignoring the existing countries could miss some good opportunities.

Option 4: Support an alternative programme of work in each existing country determined by DECC:

Rather than being demand-led, we could decide what the next steps in each project should be based on the theory of change. For example, we could hire an organisation to check all the models and make sure that there are comparable pathways in each, or do further analysis of the policy lessons that the tools show. This would ignore the opinions of those actually working on the calculators, and their understanding of the unique policy environment they are working in. It also discounts the findings of Ricardo-AEA, which stated that the demand-led approach taken so far has been valuable as it has opened up the project to novel modelling and outreach approaches that others could learn from in the future.

Describe any key changes to the original business case?

The overall rationale of the original business case remains relevant. The aims of the new work in the four countries proposed for 2015-16 is in line with the original objectives in the theory of change (see Annex 4), as in each case they relate to either improving modelling capability, the demonstration of feasible low-carbon development options in the country, or strengthening the mandate for a low-carbon transition. The theory of change is very ambitious and wide-ranging, so this extra work is about making the transformational change we want to see more likely in the four chosen countries, rather than getting any additional benefits outside the scope of the original business case.

However, based on DECC's experience over the last two years working with countries, and the research carried out by Ricardo-AEA, there has been a shift of emphasis since the original business case was written. We know that countries themselves value the calculator as a communications tool as much, if not more, than as a policy making one. We also know that in many cases country governments have chosen to work with local consultants or universities to build their models. Although we originally sought to avoid using consultants, we have found that the political culture varies a lot from country to country and in many cases this was most appropriate. By building up modelling capability in these trusted partners, we have indirectly improved it in the governments themselves.

The original business case included the case for the 2015 conference (which eventually took place in Taipei), with the aim of teams showcasing their findings and discussing on-going engagement plans. The additional conference included in this proposal would have very similar objectives.

There is no firm plan for work in 2016-17 and beyond yet, but the suggestions listed above include both work that will support the benefits laid out in the original business case, and some which would provide additional benefits (for example, expanding the calculator to more countries).

Changes to the Commercial Case

For the country-calculator work in four countries proposed for 2015-16, we will use the same contracting and payment model as used successfully over the last two years, and was laid out in the original business case. This minimises the risk of fraud, and ensures that we can receive value for money while also building capacity in the countries in question. The FCO and DfID's procurement standards are seen as best practice for the countries where we are working.

Our plan involves working closely with FCO Posts at every stage, using their internal procurement guidelines to ensure that we work with organisations that offer the best value for money. They will also help draw up

any memorandums of understanding or contracts, pay invoices via an OGD (other government department) swap and monitor progress on the ground.

However, in the case of Bangladesh, a different procedure will be followed. The grant funding to build the Bangladesh Calculator was originally awarded by DECC through a single tender action (STA) to Cardiff University, as Dr Monjur Mourshed is based there. It was felt that he was uniquely qualified and connected to the Bangladeshi government and academic community to carry out the work. He has proposed the extra work included in this business case to transfer the calculator to Bangladesh – to be carried out in conjunction with local partner the International Centre for Climate Change and Development (ICCCAD) at the Independent University of Bangladesh – after the ministry we were working with withdrew direct involvement in the project last year. We therefore propose writing a short business case so we can use an STA again or a contract extension (depending on what is most appropriate) to contract him and the ICCCAD for this work. As he developed the finished tool, he is uniquely qualified to train others in using it and to develop new interfaces for it. ICCCAD is a valuable local partner. The organisation was created and is run by Dr Saleemal Huq, a prominent British-Bangaldeshi climate scientist. ICCCAD and Dr Huq have been vocal champions of the calculator in Bangladesh. ICCCAD are already working with a number of government departments to encourage cross-government responses to climate risk, rather than siloed and self-interested interventions. This places them in a good position to secure greater government engagement.

For the conference, we propose working closely with the FCO Posts in India to find a local delivery partner who will offer value for money to organise the logistics and outreach activities involved in such an event. To do this, we will work with the FCO in India and NITI Aayog to identify some suitable organisations, work up a full proposal, and then get quotes from at least three so that we can make a proper comparison and choose the one that offers best value for money. Or if the FCO procurement guidelines require this, we will award the contract through open competition.

Changes to the Financial Case

We will use the same methods we have over the last few years. We will create a new budget spreadsheet based on that of last year. This allows us to see forecast and actual spend on each project. DECC's financial reporting requirements will be met in the usual way. The budget will be profiled over the rest of the 2015-16 financial year based on a series of milestones for each project that will be agreed with partners.

Invoices will be paid using the same method we have used throughout the project. The British Embassy or High Commission in the country in question will receive invoices as per the agreed schedule, and will then forward them to DECC using the OGD (other government department) swap form. This enables the FCO to bill our project code directly for the invoices received.

This method protects the Embassy or High Commission's budget, minimises bureaucracy by avoiding a complex transfer from DECC to the FCO and then finally to the organisation in question, and enables the DECC 2050 team to avoid making direct payments to non-HMG organisations outside of the UK. This ensures that DECC abides by FCO and DfID procurement standards which are seen as best practice for the countries where we are working. By working closely with the FCO to make foreign payments in this way, we will reduce the risk of fraud while also reducing the administrative burden for the DECC team.

Changes to the Management Case

For the work outlined for 2015-16, we will draw up a plan of work for each country when we organise the MoUs and contracts, which will contain delivery milestones that we can measure progress against. The main bulk of the work will be done by the government departments and partner organisations within the four countries that we are funding.

The day-to-day running of the ICF project within DECC will be managed by one SEO and 0.6 FTE AO within

International Climate Change's Engagement Team. They will monitor progress on achieving milestones across the four countries, organise technical support where needed, pay invoices, monitor budgets and carry out evaluation. Oversight will be provided by the Grade 7 and Grade 6 within the Engagement Team. The SRO for the project is the Director of International Climate Change.

FCO Posts within each of the four countries will be crucial to the success of the project, as they will liaise directly with the government departments and partner organisations involved to monitor progress regularly. DECC has built up good relationships with Posts in all four countries through the last two years of the calculator project, and they are very engaged. The proposals in this business case have been drawn up with their help. They will organise the paying of invoices by and OGD (other government department) swap, a system which has worked well in the past and avoids the need for DECC staff to deal with payments in multiple countries with different financial rules.

The technical support requirements for the proposals in this business case are minimal, with only the Indonesian project potentially requiring training or significant quality assurance. We are setting aside some funds from the existing calculator budget to fund experts from other countries to make sure this will be covered, given DECC's current lack of dedicated resources in this area.

When organising the conference, we will set up a working group from NITI Aayog, DECC, the British High Commission, the delivery partner organising the conference, and potentially the Industrial Technology Research Institute (ITRI) in Taiwan and the Institute of Global Environmental Strategies (IGES) in Japan who organised the Taipei conference. This group will determine the agenda, share out work where needed, and monitor the progress of the delivery partner.

The management case for any work in 2016-17 cannot be determined yet, as this is dependent on the results of the Spending Review and other factors that are not known at this time. However, the project will require dedicated analysts working on the project to make it viable, whether within DECC or in an external organisation. It is likely that DECC-based analytical support will only be available if the ICF team is able to use ODA money to pay for staff and can create some extra analyst posts.

Monitoring and Evaluation (Max. 2 Pages)

Originally it was agreed that KPIs 13[4], 14[5] and 15[6] would be used to judge the progress of the 2050 Pathways Analysis project. However, in March 2015 after reviewing with the M&E lead, it was decided that reporting again 13 and 14 would not be appropriate for these projects. This was due to a number of factors such as that these KPIs require detailed measurement of the national planning and institutional knowledge in a country, which is not feasible across the 10+ countries, and across the whole world in the case of the Global Calculator. Another reason was that they required the programme to conduct a baseline at the start of the project, which had not been completed. Instead, a more detailed and thorough assessment against KPI 15 was determined to be the most relevant and appropriate KPI for these programmes.

The theories of change and the logframes for the country calculator and Global Calculator projects have been revised to better reflect the priorities that have been highlighted by the Ricardo-AEA report and the work that is being carried out during 2015-16 so that progress against aims can be properly measured. The theories of change have had only minor changes to add more detail to the outcomes and impacts we expect the project

[4] KPI 13: "Level of integration of climate change in national planning as a result of ICF support."
[5] KPI 14: "Level of institutional knowledge of climate change issues as a result of ICF support."
[6] KPI 15: "Extent to which ICF intervention is likely to have a transformational impact."

to have. The log-frame has been revised to include some extra measures of success that were not previously included, for example the outreach work that countries are doing, and the policy impact they are beginning to have now that the project is aiming for the upper levels of the theory of change. The previous logframes also included some indicators that were no very measurable or clear, so this has been revised. Please see Annex 4 for the revised theory of change and Annexes 5 and 6 for draft versions of the logframes. Please note that the logframes are in draft form as they have not been checked by the ICF's M&E lead.

Results collection against KPI 15 will be carried out as per the ICF team's schedule. The existing methodology for monitoring KPI 15 will be revised to include new indicators that have been added to the log frame, but the overall theory of transformational change will remain broadly the same as before.

At the end of the 2015-16 financial year, an annual review will be carried out, or project completion review if the calculator work stops. This will be based on progress monitored using the log frames and also information gathered from country teams and partner organisations via questionnaire or interviews.

It has been decided in conjunction with the monitoring and evaluation lead in the ICF team that we will not pay for an external evaluation report in 2015-16 because the cost would be very high in comparison to the overall spend, so it is not proportionate. The process of tendering and managing this process is very time consuming. Also, transformational change and the other intermediate outcomes that the programme is attempting to achieve take time. It is unlikely that they will all be achieved in a year's time, so it would not be appropriate to schedule another so quickly. The M&E lead recommends that this be reviewed at the next Annual Review or Completion report to determine if an evaluation in the future would be beneficial for the programme or the ICF more generally.

Annex 1: Summary of the 2015 annual reviews

Country calculators

We are happy with the progress that has been made on the 2050 Pathways project, and believe that the projects have the potential to influence policy and public understanding of sustainable development in a very positive way, both in the countries we have supported and beyond.

Since the last review, all 11 countries that were trained using ICF funds have working 2050 calculator models, and seven have published their first version (South Africa, India, Thailand, Indonesia, Vietnam, Bangladesh and Colombia). All of these countries continue to work on the models, with plans to improve the tools, improve links with government and/or organise outreach activities. However, so far only a limited number of countries have published any additional documentation (for example, explanations of assumptions made in modelling). This is concerning for the DECC project team, as we are committed to openness and transparency.

At this time three of the models have still not been published (Brazil, Mexico and Nigeria), but they are in the process of finalising them and are due to publish by autumn 2015. In Nigeria's case this delay is mainly due to it taking longer to assemble and train the in-country teams than originally anticipated. In the case of both Mexico and Brazil the delays are due primarily to staff in the ministries being pulled onto other projects. Unfortunately we are not aware of any plans to publish the Algeria calculator at the moment.

It is too early to be able to judge the impact of the calculators on policy, but the Colombian and Indian tools are being used to develop the countries' Intended Nationally Determined Contributions

(INDCs) for the UNFCC negotiations, and the Indian project is well-placed to have influence on the new National Energy Policy that is about to be developed. Ricardo-AEA's research has shown that many countries particularly value the tool for outreach and communication, rather than for policy making, which is reflected in their plans. This also fits into our theory of change, as it builds a "strengthened mandate" for more sustainable development across civil society.

The projects are due to come in approximately 20% under budget once the existing work on the last few countries is complete. This is because an initial budget was estimated per country before the teams were formed, but project plans were demand led, and spend was approved on a case by case basis in conjunction with FCO climate attachés. For the majority of countries, the standard estimated budget was higher than necessary. India, in particular, cost less than expected as the government there was happy to donate staff time. DECC only played for travel for the training trips, workshops and launch activities.

In addition, the project has been able to have an impact beyond these 11 countries. DECC staff have trained people from nine additional countries. In-country teams trained by DECC are themselves now training and supporting new countries (e.g. the Colombians have trained the Ecuadorians, and the Indians are supporting the Mauritians). Representatives of 30 countries attended the 2050 Calculator conference in Taipei in February 2015. New countries and regions continue to approach DECC about starting new projects.

So much progress was made this year firstly because of the unique way in which in-country teams were supported by the DECC 2050 team. Independent research by the Ricardo-AEA found that calculator teams were extremely positive about the support they received. Their report stated: "The DECC team's willingness to try to address any problem that the countries encountered, and to be available at short notice to do so, was cited by almost everyone as absolutely crucial in the process of delivering the 2050 Calculators." While there have been delays, 10 teams are on track to meet their original objectives and publish the tool. The flexible approach taken was also very important, as it means that the models address each country's individual needs and interests.

We think that this progress has been good and has met DECC's expectations for the project because although there have been delays in some calculators, we have delivered training that builds capacity in 11 countries and are set to meet our goal of at least 10 finished models. Ricardo-AEA's research has found that the country teams themselves felt their expectations of the project have been met or even surpassed. We believe that allowing teams to build their models in their own way has been valuable because it builds ownership of the finished product in the country, and makes it more likely it will be used in the future. It also proves that we are building capacity in the countries, part of the theory of change, as they aren't just copying the UK's model but developing a new one. The process of building the calculator involves a lot of stakeholders and different government departments, and feedback in Ricardo's report shows that this was considered a valuable process as it brought together people that would not usually work together.

There isn't that much evidence of the finished calculators having an impact on policy yet, but all the launches have been high profile and work is continuing on them all. Many of the tools have only been launched in the last few months, so it would be surprising if they had made a big impact at this stage. Evidence suggests that they are well positioned to have an impact on the future, as per our theory of change, either by being used by the government themselves in planning or by being used in outreach with stakeholders and the general public.

One of the key pillars of transformational change is that our projects are replicable. The 2050 Calculator has proven itself highly replicable and flexible, as some ICF-supported countries are

considering developing extra calculator tools (e.g. at a sub-national level) and DECC has been able to help projects start in many extra countries over the last two years, both developed and developing. The development of a nascent "calculator community", spurred on by the Taipei conference, is starting to have tangible benefits by bringing new countries to the fold and by spreading good practice.

Over 2015-16 financial year, DECC proposes to continue the ICF project by offering advice and some technical assistance to our ICF-funded countries. We have had a budget of £200,000 approved to cover work that has been delayed and some work on the Global Calculator. This will cover some financial assistance to Nigeria, Brazil and Mexico, so that they can finish their initial project by launching their tools, and to India and Indonesia, who are re-launching improved versions of their models. We will do this because without this relatively small amount of support to complete the initial stage of the projects (which was already agreed but delayed from last year), it would not be possible to expect any of the positive impacts of our theory of change and our initial investment will have been wasted.

As previously mentioned, the in-country teams (apart from Algeria) plan to continue to work on all the models this year. Funding for this will come from a variety of sources. Some models are being directly supported by the country governments themselves, and some work has received prosperity funding from the FCO. The DECC 2050 team propose getting some extra funding from the ICF to support work in four countries (India, Bangladesh, South Africa and Indonesia), which the countries would not otherwise be able to do. The aim will be to improve the quality of the models and to use the models with stakeholders and the public. We also propose holding another conference in early 2016 to further build the community. This will require a project extension business case. Throughout this work, we will continue to stress the importance of openness and transparency to encourage teams to publish more documentation online.

We see a lot of potential to continue, and even grow, the project beyond 2015-16. There is scope to further improve and develop the calculators in the existing ICF-supported countries, as well as to do some innovative outreach work using them. We have also received interest from new developing countries about starting new calculator projects. However, at this stage we are not clear what impact the spending review will have on DECC's ability to deliver this work, and we have not been possible to properly scope the demand or impact of this work. We will therefore include a proposal in the business case to further extend the project, subject to a detailed plan of action being approved in early 2016.

Global Calculator

The Global Calculator project has been successful so far, and has achieved or surpassed nearly all milestones set out in the project logframe. The project was completed on schedule and an independent project evaluation from Ricardo-AEA states that the model itself is successful in terms of meeting the original brief, particularly given its very challenging nature.

Stakeholder engagement has been a particularly successful aspect of this project, both during the launch and build periods. Since its launch the tool has received a considerably higher number of hits we than we had anticipated - the website received 30,149 hits between the launch on 28th January 2015 and the end of March 2015, and the webtool received 17,785 hits with a total of 13,483 unique users. A number of positive articles appeared in the press around the world and online. The tool was well received by the UK domestic press with positive stories in most of the big national newspapers. In China, media activities reached an estimated audience of at least 2.3 million people. The work has been quoted in Parliament, and organisations like Shell, Friends of the Earth, the World Energy

Council and Mott MacDonald have actively engaged with the tool and built pathways that are published on the website. We know that universities around the world are already using the tool in courses, and it will be included in a new International Baccalaureate science course, showing its considerable potential use as an educational aid and proving an avenue through which the calculator can continue to be used.

At this stage, however, there is little evidence that businesses, non-governmental organisations (NGOs) and governments have taken action on climate change because of the influence of the Global Calculator (although we do know some people from these organisations have used it). There has been little engagement in some of our key target countries (e.g. India and South Africa, as well as influential countries like the USA), and despite positive feedback only a few businesses have really taken on the messages of the calculator. Also, feedback has shown that the finished tool is initially quite difficult for the average person to use, but that with a small amount of guidance most people find it simple to use and easily navigable.

We believe that the project was successful because of its uniquely collaborative nature. This was very challenging but ultimately had huge benefits because of the vast network of experts we could engage with, which built trust in the project and buy-in into our aims. It would not have been possible without strong leadership from the project manager and head modeller, and the use of digital communication and file sharing techniques, as the multi-organisation and multi-disciplinary team was spread across the world.

Engagement with our target audience and target countries has been limited so far firstly because there has been very limited time to do outreach work after the launch before the original end date of the project. To ensure that the calculator becomes an influential tool in policy making we must continue to communicate and promote the tool and its findings. It will be especially important to maximise the impact of the Global Calculator in the run-up to the UNFCCC negotiations in Paris in December 2015.

Over the next year, the DECC project team will focus on engagement with our target audience, particularly in our target countries (China, India, Brazil, South Africa and the USA). This will give us the best chance of broadening our reach while offering value for money. To do this we will utilise the vast networks of our partner organisations where possible and make the best use of available digital channels. We have secured a £200,000 budget for 2015-16 for this project and for the 2050 Pathways project (covering country-level calculators), which will cover this work. In early 2016 we will develop a framework to continue work on the Global Calculator model going forward, working with our funding partner Climate-KIC and other partners. The model will need to be updated to improve usability given the feedback we have received. The cost sector has also been identified as an area that could be further developed. This work will be the focus of the project team after COP and potentially into the next financial year.

DECC will be making a project extension request in mid-2015, which will include further funding for country calculators in 2015-16 as well as potential further funding for country calculators and the Global Calculator in 2016-17 and beyond. This will be subject to the outcome of the spending review, the enthusiasm of the wider Global Calculator team to continue the project, and an evaluation of the value for money of this further work.

Given the very ambitious ultimate goal, we need to consider if the indicators in the logframe were set high enough to be really stretching or if they accurately represent the spread of stakeholders the project team needs to engage to ensure we can achieve the goal of being influential in decision making. Few indicators in the logframe properly measure whether the tool is influencing users to

change their behaviour, or if the project is only reaching the “low hanging fruit”. The team will work to revise the logframe over the coming months.

Annex 2: detailed proposals for additional work in 2015-16

Work included in extension and additional results expected

India

Background: The team at NITI (National Institution for Transforming India) Aayog (the new name for the Planning Commission) will launch the second version of their calculator, called India Energy Security Scenarios (IESS) 2047, in August 2015. This has costs added, and revised scenarios in the industry and building sectors. The new version is poised to be used in the development of the next National Energy Policy, and was used to develop the BAU scenario for the country's INDC. The calculator project is one of the main bilateral projects in DECC and the FCO's strategy to aid India's low-carbon transition. DECC has signed a Statement of Principles with NITI Aayog to share information and ideas on calculator modelling, communication and policy, which involves three visits per year.

Additional work: This programme of work will be co-ordinated by a partner organisation or organisations chosen by the British High Commission in conjunction with NITI Aayog.
The work would cover:

- Convening four or five events in different states across India to showcase the new IESS model to stakeholders. Each of these full-day or half-day workshops will involve around 75 to 100 people, including from local government, NGOs and businesses. The aims are to spread awareness of the calculator, debate options for India's future using it, and take feedback from prospective users for the its further improvement (cost: £15,000)
- Facilitating knowledge exchange workshops between DECC and NITI Aayog in India and the UK, including travel and accommodation expenses for three to visit the UK (cost: £10,000)
- Developing resources for the use of the IESS tool in schools and develop a plan to roll it out as an educational resource. This will be led by information from a scoping project that is being carried out in the next few months (cost: £15,000)

Total cost: **£40,000**

Expected results:

- 300 to 500 key stakeholders in five states will become not only aware of the calculator, but will have taken part in a debate using it, and they will be trained in how to use it themselves.
- The calculator team will receive feedback on the model and the scenarios it contains from 300 to 500 stakeholders.
- The Indian government will have more understanding of how the evidence from the calculator could inform their new National Energy Policy, and how the UK has developed its own low-carbon policy.
- Schools will have access to resources to help educate young people on the energy challenge India faces and how this could impact their lives.

How this addresses the needs of the project:

- The workshops and school work link to the "strengthened mandate" section of the theory of change (i.e. that the calculators will make key players and civil society become more supportive of low-carbon development, and more convinced of its desirability and feasibility). Ricardo's research has shown that this is an area that countries themselves are very interested in pursuing.
- The knowledge exchange will enhance the "government capacity" section of the theory of change (i.e. that governments will improve their ability to build evidence based scenarios and to incorporate them into their planning).

- There will be more opportunities to encourage the calculator team to be more ambitious by exposing the model to a wider audience, as well as to improve the accuracy of the tool.

What would happen if we did not fund this?
The team at NITI Aayog would probably continue to use their model and update it, but would not be able to do high-profile outreach across the country on their own. They will develop their new energy policy without finding out how the UK develops there and potentially learning from our experience.

Indonesia

Background: The team at the Ministry of Energy and Mineral Resources and the Indonesian Institute for Energy Economics (IIEE) launched the second version of their model in April 2015, which includes land use and forestry. The ministry and the FCO Prosperity Fund is continuing to support the work, holding a series of events in five cities across the country, including a journalist briefing. WWF is also sponsoring the development of a regional calculator for Papua. The calculator project is one of the main pillars in the join DECC and FCO climate diplomacy strategy for Indonesia, as it can be used to stir public debate and encourage the development of a more diverse, secure and low-carbon energy mix.

New work: We propose granting extra ICF funding to develop a cost sector of the model, so that users can see the cost implications of their choices. This would make the model more useful, particularly for the government, by adding an important new dimension to the tool. Because of the limited amount of time available before the end of the financial year, this will cover just the energy sector and not land use, which is the same approach taken by the UK and all other calculators so far. Two rounds of stakeholder consultation and a launch event will be included.

There is interest in further developing the cost module next financial year to cover land use for the first time so that the true costs of climate change and co-benefits of mitigation in this forest nation can be included. This could be with FCO prosperity funding, or potentially with further ICF funding, and the methodology could be used by other countries in the future.

This work would be carried out by a local institute of non-governmental organisation (NGO) chosen by the British Embassy, and the project will consult the government of Indonesia during the build. The lead modeller of the calculator can continue to work during this phase on a freelance basis, so there will be some continuity whichever organisation is chosen. DECC will cover the cost of some external quality assurance and advice, covering three to five days work, from our existing 2050 Calculator budget. This may be needed because DECC now has no analysts dedicated to calculator work.

See Annex 5 for a quote from Pelangi, an Indonesian NGO.
Cost: **£60,955**

Expected results:
- Improved model for Indonesia including robust and useful cost information designed to help the government make more informed decisions.

How this addresses the needs of the project:
- The desired impact of the original theory of change is for countries to publish “viable low-carbon development pathways that are credible for investors and lead to emissions reductions”. Without a cost module, it is very difficult to determine which pathways are viable and credible for investors.
- There will be more opportunities to encourage the calculator team to be more ambitious and transparent, as well as to improve the accuracy of the tool.

What would happen if we did not fund this?
Work is continuing to promote the calculator without ICF help this year, funded by the FCO's prosperity fund. The addition of the cost sector is something that the government itself would not be able to finance, but that they will be very interested in using. In our experience, cost information is one of the main determining factors of which development pathways are "viable" – and the main aim of the calculator project's theory of change is to find viable low-carbon pathways.

South Africa

Background: The team at the Department of Environmental Affairs and the University of Cape Town launched their tool in March 2014. Since then they have held a series of workshops around the country with stakeholders to develop some example pathways that could be programmed into the tool (as currently none are included). They have also developed a "My2050" game version for children and plan to roll it out to schools across the country.

New work:

- Programming 3 or 4 example pathways into the website with explanatory material (cost: £4,400).
- Training for geography curriculum specialists in Gauteng province on climate change and the calculator. This will be certified by the University of the North West, and carried out by Delta Environmental Centre. Trained staff will then work with 15 schools to train teachers and test out the My2050 tool on students so that the impact can be assessed and the tool can be improved. The work will be co-funded by Fundisa For Change (a collaboration between a number of education partners that improves environmental learning in schools) (£9,920)
- Teacher training workshops in all nine provinces on how to use My2050 in lessons. These would be organised by Fundisa For Change, and would encourage teachers to cascade their knowledge to other teachers in their schools. Initial training carried out so far has shown that there is a lack of knowledge surrounding climate change among teachers (possibly because it was only added to the curriculum in 2012), so the training now includes a general grounding in the subject and all terminology before working with the calculator (cost: £13,000)
- In conjunction with Fundisa for Change, developing lesson material for the My2050 Calculator to assist teachers in the classroom (cost: £1,400), as well as a printed publication on teaching climate change in general that will feature the My2050 tool to meet the more general need that has been identified (cost: £32,000)

Total cost: **£60,720**

Expected results:

- Teachers throughout the country will have more knowledge of climate change and South Africa's low-carbon transition, and will use the My2050 tool in lessons to improve their students' understanding too. Target: 30 teachers trained by the end of March 2016.
- At least 3 example pathways added to the tool.
- Improved usability and relevance of the main 2050 webtool and My2050 schools versions, based on up-to-date data, policy options and user feedback.

How this addresses the needs of the project:

- The desired impact of the original theory of change is for countries to publish "viable low-carbon development pathways". Currently the South African calculator does not include any pre-programmed pathways, so this work would add them in. This will show different visions

of the future, possibly from different government and stakeholder groups, provoking debate.

- The risk that the tool will not be used to influence policy will be reduced if up-to-date information is added to the calculator, as it will be more relevant to policy makers in the energy, transport and industry sectors.
- The My2050 school work relates to the "strengthened mandate" section of the theory of change, and will provide teachers with a more engaging way of talking to their students about climate change. This will also address a need amongst teachers in South Africa that has been identified.

What would happen if we did not fund this?
The Department of Environmental Affairs would continue to use it, for example in meetings with other ministries or organisations. But they would not be able to afford to update the model, meaning that it will be out of date and other ministries and organisations will be less likely to use it themselves. As the ICF has already supported the development of the My2050 schools version of the model, the small amount of additional funding required for teacher training would make it much more likely that it is actually used to improve the education of children on climate change.

Bangladesh

Background: The Bangladesh 2050 Calculator was built by Dr Monjur Mourshed at Cardiff University in conjunction with the Government of Bangladesh. Although the government distanced itself from the project, the tool was launched in January 2015 with good news coverage. It has been well received by academia and NGOs in the country, particularly because this information has not been available for the country before, and government is now re-engaging. The tool has one of the best websites of all the calculators, along with India, as it includes documentation on the assumptions used.

New work: We propose giving further support to Cardiff University along with its partner the International Centre for Climate Change and Development (ICCCAD) of the Independent University. The primary aim of the project is to develop in-country skills in 2050 modelling in Bangladesh and to create a critical mass of skilled professionals and government staff so that the development and maintenance of the model can be transferred to Bangladesh through ICCCAD. The programme of work will include:

- Develop and run workshops for training government, academic and professional stakeholders in how the model works. This will include developing course materials that will also be placed online on the open source learning platform to enable self-paced learning after the end of the project (cost: £14,500).
- Develop an Android app version of the current webtool, which can be used by other countries in the future. This is particularly important in Bangladesh as most people can only access the internet through their phones. This will be supplemented by a social media presence and presentations at conferences to increase awareness in the tool (cost: £30,000).
- Public engagement activities including presenting the calculator at two professional conferences, further developing the tool's wiki, and developing the social media presence of the project (cost: £26,410).

See Annexes 6 and 7 for the proposal and budget from Cardiff University.
Cost: £70,910

Expected results:

- At least 100 people trained in using and maintaining the Bangladesh calculator, with materials available online to train more.
- Reach 1,000 members of the public in Bangladesh with the app version.
- Have code for an app version of the calculator which can be used by other countries.
- Transfer the calculator project from Cardiff to ICCCAD in Bangladesh.

How this addresses the needs of the project:

- This work aims to build a long-term future for the calculator within Bangladesh and to re-engage the government in the project now that the tool has been completed and is ready to use. This will make it more likely that it will be used for policy making in the future, as laid out in the business case.
- The workshops will aim to build up knowledge in Bangladesh on how the model works, which strengthens the "improving long-term modelling capability" part of the original theory of change within Bangladesh's government and academic community. Currently, the knowledge about this project is held outside the country, so this is not being fulfilled at all.
- The development of the app will encourage the "strengthened mandate" part of the theory of change by opening up the tool to a much wider audience.

What would happen if we did not fund this?

The team in Cardiff would promote the tool and secure greater government engagement where they can, but would be unlikely to be able to leverage funds to do this intense engagement with government and civil society. The model, which was financed with £126,000 of ICF money, would remain a tool of Cardiff University, with little ownership in the country and outside academia. The project would therefore have failed to improve modelling capability in the country or strengthen the mandate of government, two of the key parts of the theory of change.

Conference

Background: Two calculator conferences have been held so far – in Beijing in 2012 and in Taipei in 2015. The Beijing conference proved to be an important opportunity to "sign up" countries to the calculator approach, following the UK and China example. The Taipei conference in February 2015 was held in conjunction with the Industrial Technology and Research Institute (ITRI), who developed the Taiwan calculator. It included representatives of around 30 countries – most of which have developed models, some who were considering it – with over 200 delegates, including the Taiwanese premier. Delegates were able to share best practice and their experiences, and teams were able to build relationships with each other.

Representatives of Ricardo-AEA attended the conference and concluded in their report that there were very positive signs of a calculator community emerging at the event. Since then, the Colombian team has helped train the Ecuador team and will soon train the Peru team, and the India have supported the Mauritius. This firstly proves that the project has built modelling capability in Colombia and India, and secondly shows that this community can provide an effective way to spread the calculator methodology and its benefits (as laid out in the theory of change) to more countries, without direct DECC staff involvement and with minimal financial outlay for travel and subsistence.

New work:

We propose holding another conference in 2016 to build on this momentum, and have spoken to NITI Aayog and the British High Commission in Delhi about hosting the event in India. This would bring together project teams around the world to present their work, learn from each other, and to build relationships between teams. There are likely to be a number of new countries and regions who would be interested in attending (for example we are receiving interest from a number of Canadian provinces in starting calculator projects, and from the Philippines and Malaysia – again

showing the replicability and flexibility of the calculator approach). Holding another conference would have the added benefit of training some new teams while we are all together.

Possible sessions include:

- A focus on India, their energy challenge and possible solutions, all framed by the India calculator tool.
- Novel modelling approaches from countries that are pushing the boundaries of what a calculator can do, including China's work modelling water resources, and the South East Europe calculator, which is the first multi-country calculator.
- Workshops to allow established teams to present their problems and get solutions from the group, and introductory sessions for new calculator teams.
- Discussion on the future of the 2050 calculator movement and how we can build on the successes we've had so far.

We are proposing India because it is centrally located for our teams, and because the Indian team has been one of the most engaged and successful. The details have not been worked out yet, but the FCO Posts believe that this could be a high-profile event, with representatives of India's government, NGOs and businesses attending and learning more about the Indian 2050 Calculator, and low-carbon development more generally. This therefore has the potential to have influence beyond the calculator teams themselves within this major emerging economy, and to show the UK as a leader in green growth and sustainable development.

The FCO in India propose that we use a local partner organisation to organise the logistics of the event, which would be co-hosted by NITI Aayog and DECC. The funding would cover the organisation of the event, the venue etc., and also travel and accommodation for representatives of developing countries (with priority given to ICF-supported countries).

Cost: £70,000 (same as for the Beijing and Taipei conferences)

Expected results:

- Hold a high-profile conference between January and March 2016 with representatives of at least 15 countries, as well as India's government and key NGOs and businesses.
- Novel modelling approaches will spread between countries, and teams will help each other (including South–South and South–North learning).
- New countries and regions will have an opportunity to learn from existing country teams, and to have introductory sessions in the margins of the conference, which DECC would not be otherwise able to provide.
- It will be more likely that country teams will support each other with training and quality assurance in the future, rather than requiring DECC support.

How this addresses the needs of the project:

- Ricardo-AEA's research concluded that there would be benefit in the continued development of the 2050 Calculator community because there is a nascent community forming. They stated "Knowledge sharing between countries has the potential to leverage DECC's investment by reducing the need for direct support from DECC, while at the same time making countries feel part of a global effort rather than working in isolation." Another conference gives the opportunity for face-to-face communication between all the different countries, which would not be possible otherwise.
- There will be more opportunities to encourage all the calculator teams to be more ambitious with their scenarios, and to be open and transparent.

What would happen if we did not fund this?
If there was no further conference, it will be much less likely that a “calculator community” will develop. This community is key to the future life of the calculator methodology, as it has the potential to make the project self-sustainable without the need for further financial support from DECC. There are a number of countries that will have published their models, using novel modelling approaches, since the last conference, so this will be a chance to share these innovations (for example, the Balkan calculator is the first multi-country model). And there are a number of new countries/regions who are starting their projects who would benefit. As well as encouraging South-South learning, we would also be promoting the transfer of expertise from South to North as teams from developed countries like Japan, Canada, New Zealand and Australia could also attend.

Annex 3: Statements of support from FCO Posts

India

We have successfully developed the webtool and the website of the Indian Energy Security Scenarios (IESS) model and also added in cost in the new version. This is a very high value project for the Indian Government as well as the British High Commission in Delhi, as the projections and messages from the model will be used in climate negotiations (the INDC will use information from the tool) and also in framing the National Energy policy for India. Also this work is instrumental in implementing policies in a better way through public support.

This work is effectively helping the High Commission's Energy, Climate and Growth Unit frame its own strategy as well as in communicating the right messages to key stakeholders. For us this has produced a very high level of access in various energy departments and not just the NITI Aayog, e.g. the Ministry of Petroleum and Natural Gas, Ministry of Power, and the Ministry of New and Renewable Energy.

Since last year, because of the change of government and massive restructuring of the institute (erstwhile Planning Commission and now the NITI Aayog), the work suffered. Now is the time after the launch of phase 2 when we could take the project to the next level wherein we could not just penetrate our work to the right policymakers (in decision making) but also involve non-experts in decision making, educate college/school kids on the importance of energy conservation and sustainable development etc. This extra work will be valuable because it will help the IESS become more influential by getting it included in discussions around the National Energy Policy, INDCs and regional development.

Vaibhav Chowdhary
National Energy Adviser, British High Commission Delhi

Bangladesh

The British High Commission in Dhaka strongly supports additional funding for the Bangladesh 2050 Energy Pathways Calculator. We believe that it will be an invaluable tool and comprehensive data set that the Government can use to make evidence based policy decisions that take into account climate change impacts and future energy stresses. To date engagement from the Ministry of Power has been poor, but we are picking up signs that other parts of government (Finance, Economic Resource Division, Environment etc) want us to help them with data and evidence for policy making. We believe there is a window of opportunity for the UK to influence the government in this area and a project that aims to further embed the calculator would help us take advantage of that window. Dr Monjur Morshed as a British-Bangladesh is well placed to make this happen and Dr Saleemul Huq, from ICCCAD and another British-Bangladeshi, is the right interlocutor in Bangladesh to help us persuade and work with the government. In addition, the calculator is a great opportunity to further the British brand in Bangladesh and enhance our soft power, particularly given the strong British-Bangladesh links of the two main implementers.

Emily Summers
Political Section, British High Commission Dhaka

Indonesia

Climate protection and economic/energy development can go hand in hand; indeed they must for either to be successful. Economic activities using energy source give rise to flows of GHG emission and since emission will eventually hit back at the economy, any efforts to mitigate climate change and adapt to climate change impacts are hence necessary to ensure the sustainability of economic development.

Inaccurate climate change mitigation and/or adaptation measures, however, are likely to also hurt the economy. An example can be drawn from a policy trilemma faced by the energy sector in Indonesia. This policy trilemma consists of three prongs: energy security, climate change mitigation and energy poverty reduction. Achieving one of these policy goals, for instance, will entail compromise on the achievements of at least one of the others. If the country is merely endeavoring towards climate change mitigation goals, it may formulate a package of policies which totally promote and accelerate renewable energy development and the reduction of fossil fuel subsidies. An abrupt limitation to fossil-based energy consumption, as part of a climate change related policy, nevertheless, will likely have an adverse impact on the Indonesian economy, particularly where rapid industrialization and economic development have been fueled mostly by fossil-based energy sources over so many decades.

Should the country search for an easy answer for its energy security, the most probable path is likely to be heavily relying on its coal and gas reserves. Such option, however, may not lead to achieving Indonesia's pledge on climate change actions, to reduce GHG emission by 26% by 2020 and to increase the use of renewable energy so that it accounts for 25% of total energy production by 2025. In fact, this option may increase the country's GHG emission fourfold by 2030.

Therefore, the formulation of a policy or position that will bring Indonesia to a low carbon economy needs to be well-thought and planned. A comprehensive set of analyses is required, among others, on an economic and energy projection of the country and GHG emission resulting from the projected economic activities (taking into account price changes and other relevant factors), as well as on the country's current development and climate change related policies.

This is where Indonesia Calculator 2050 can play its role. Launched last April 2015, Indonesia 2050 Calculator is an innovative web-based computer model, showing Indonesia's energy demand and supply together with land use scenarios and how they interact to shape the country's future energy security, greenhouse emissions and land utilization. This is the first model available in the country that allows user to develop their own combination of levels of change in different technologies and sectors of the economy (energy, mining, transport, industry, buildings, agriculture, waste and forestry). This is an ideal tool to communicate to different actors in Indonesia the possible strategies which Indonesia may use to increase its energy security and reach development target; whilst at the same time de-carbonizing Indonesia's economy.

While the calculator has captured how the interaction between choices of all sectors of the economy on energy security, emissions and land utilization, it is not yet shown how much cost required to achieve certain development pathway. Without the cost-benefit comparison, any pathways produced by the model will not convey any message to policy makers. What Indonesian policy makers need are clear understanding of the consequences from each development pathways to Indonesia's economy, climate protection and energy development. Indeed, this cost-benefit option in Calculator 2050 is critical to demonstrate how Indonesia able to build lasting economic growth.

Relevancy to Post's Business Plan: British Embassy Jakarta has identified several priorities under Prosperity. One of them is to support Indonesia to achieve its emissions reduction targets and demonstrably move towards a low carbon and equitable economy. Calculator 2050 is well aligned to this priority and, indeed, an ideal tool to support our engagement with the strategic stakeholders in the country.

South Africa

The British High Commission continues to support the work on the Carbon Calculator in South Africa for the following reasons:

- The calculator has been a successful project in that it has positioned the BHC well in a collaborative partnership with the Department of Environmental Affairs, business, the Department of Higher Education, some Tertiary Education Institutions and civil society organisations in South Africa.
- The project is still in its infancy, but due to this project, the Geography curriculum in High Schools has been re-written to include the Carbon Calculator and details around emissions, etc.
- The South African Power Pool is currently researching how the Carbon Calculator could be of benefit, not only in South Africa, but in the Region.
- Some key players in business have used the model to design their own internal calculators in order to link current and projected statistics to their organisational strategies and budgets (Shell and Sasol).
- The Department of Environmental Affairs has employed a full time staff member as part of their projects team to work on national roll out of the calculator. Thus, DEA, has taken ownership of the calculator and have a long term plan for its use in South Africa.

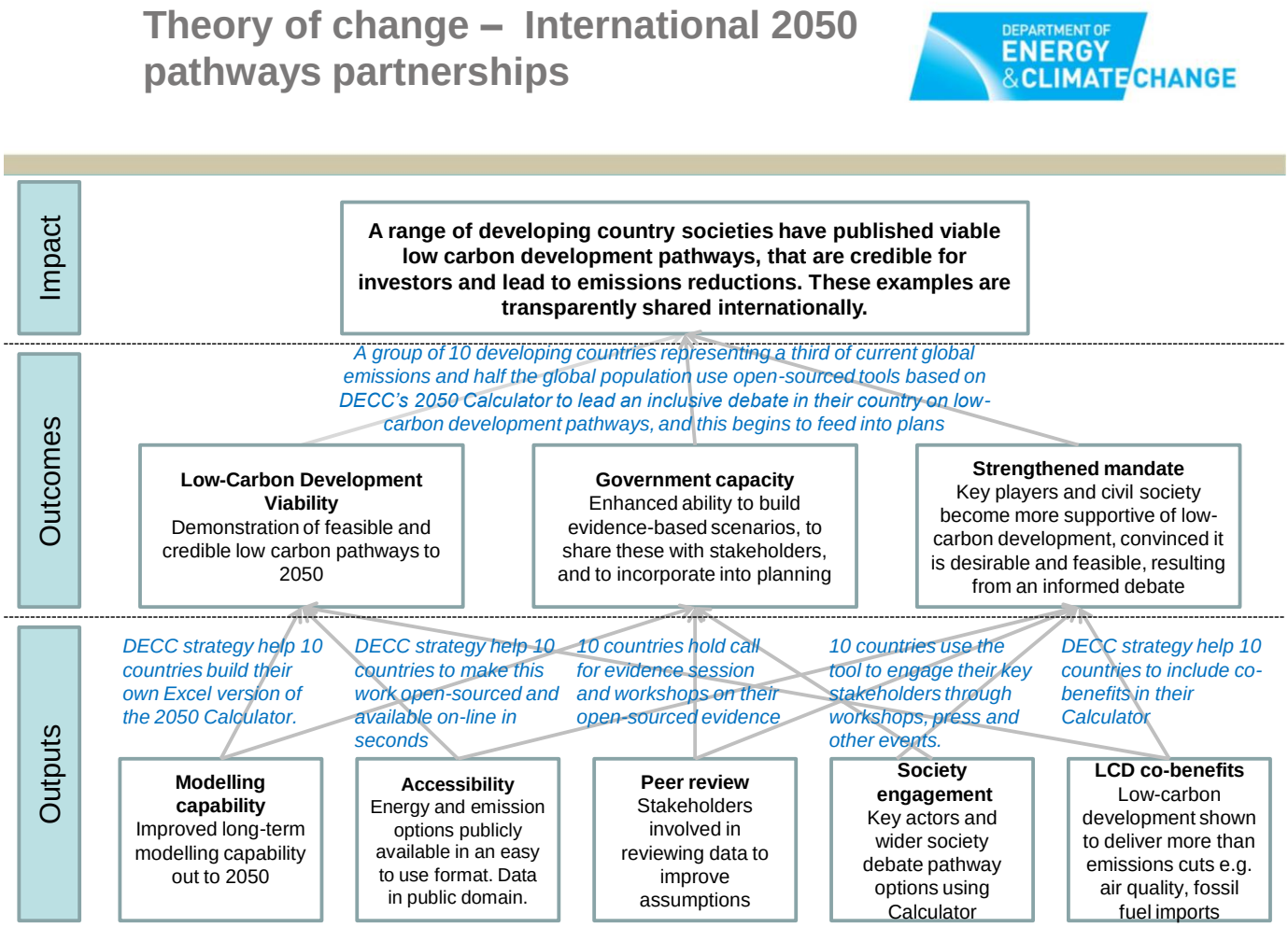
The value that this work would bring is as follows:

- Is a good mechanism for positioning of the BHC with Government and Private Sector partners.
- Forms an excellent basis for engagement with the Department of Environmental Affairs and the Department of Energy around INDC targets, pre-COP 21.
- Networks the BHC within the Department of Higher Education, Government and Private Schools in South Africa. Education in South Africa is an area where expertise and guidance is needed.
- Mauritius has as a result of this project, designed their own calculator and expertise from DECC, India and South Africa formed an integral part of this process.

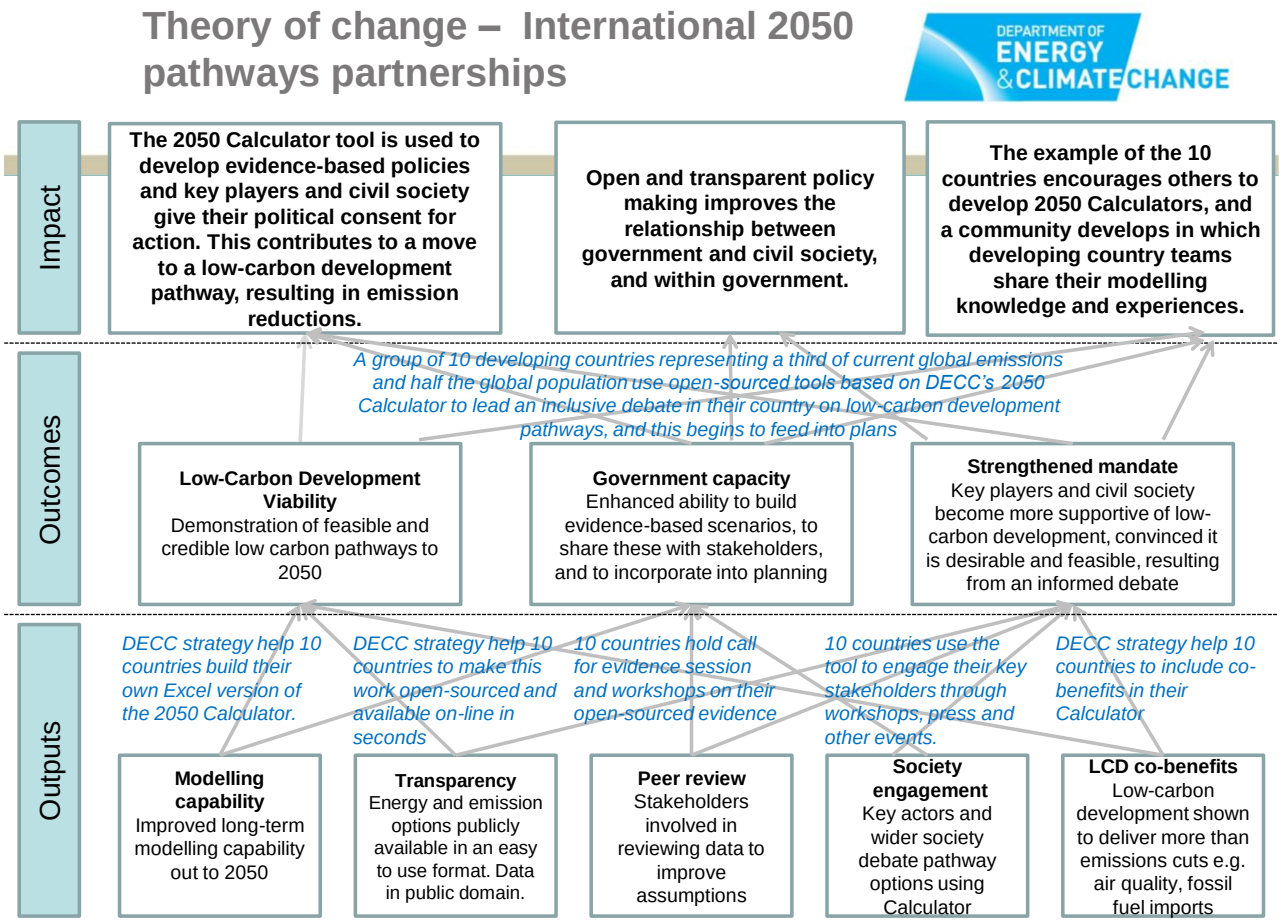
Vannessa Westcott
Programme Manager: Sub-Saharan Africa Regional Programme

Annex 4: Original and revised theories of change

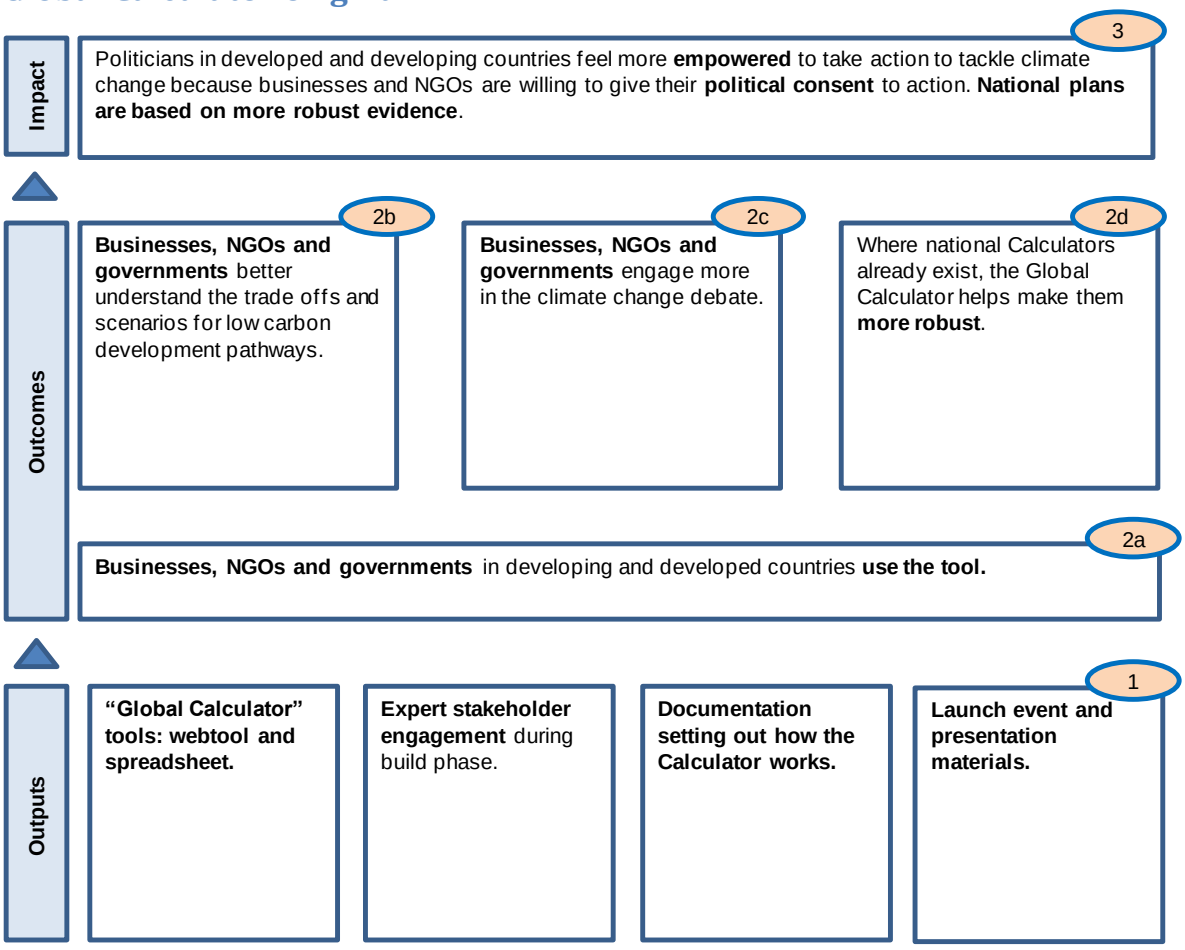
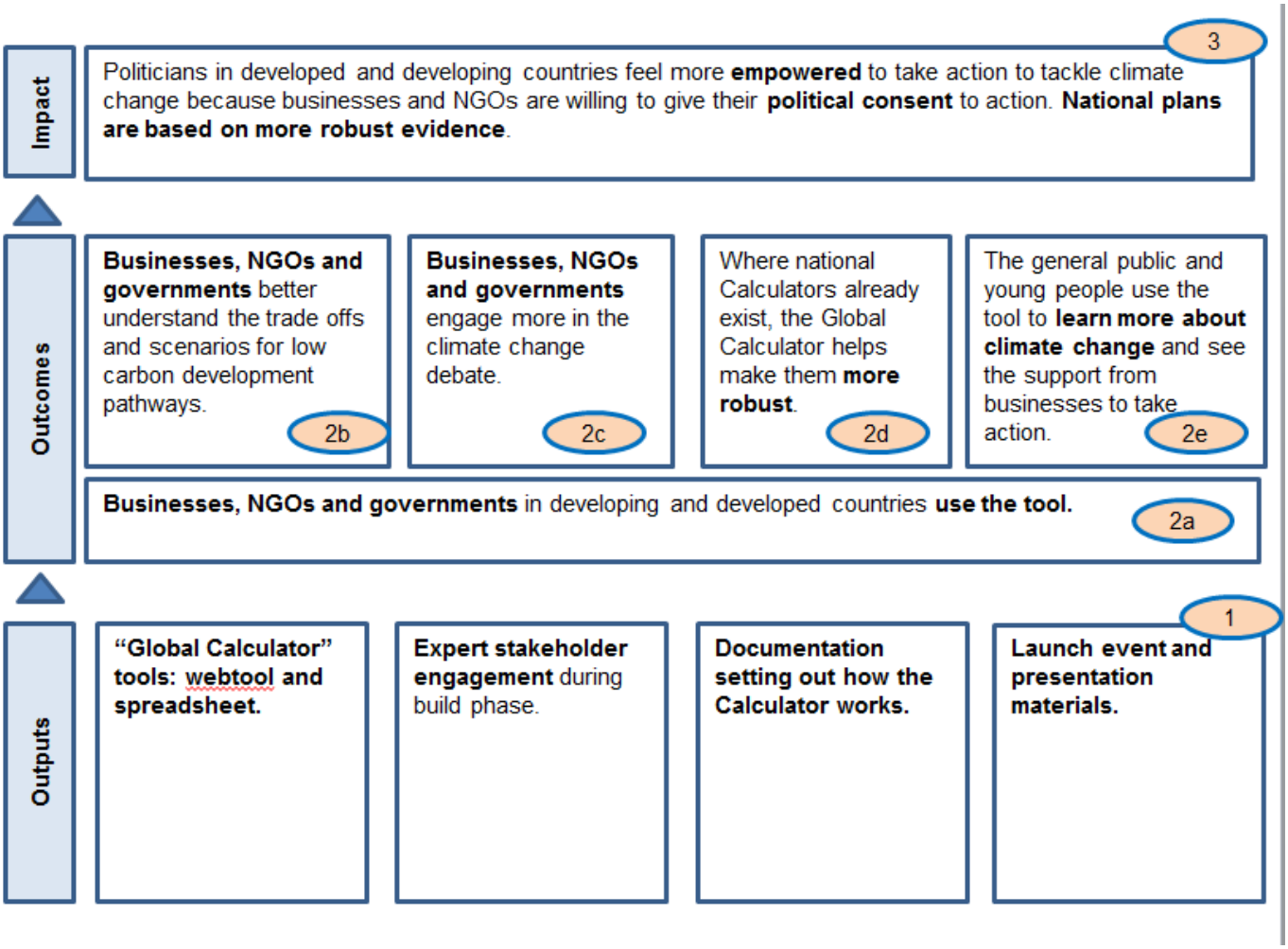
Country calculators original



Country calculators revised



Global Calculator original



Global Calculator revised