
A NEW NORMAL FOR GREEN GROWTH

**ANNUAL REPORT
2014/15**

REEEP invests in clean energy markets in developing countries to reduce CO₂ emissions and build prosperity. Based on a strategic portfolio of high impact projects, REEEP works to generate energy access, improve lives and economic opportunities, build sustainable markets, and combat climate change.

REEEP understands market change from a practice, policy and financial perspective. We monitor, evaluate and learn from our portfolio to understand opportunities and barriers to success within markets. These insights then influence policy, increase public and private investment, and inform our portfolio strategy to build scale within and replication across markets.

REEEP is committed to open access to knowledge to support entrepreneurship, innovation and policy improvements to empower market shifts across the developing world.

DONORS

Government of Austria
Climate and Development Knowledge Network (CDKN)
Climate Technology Centre and Network (CTCN)
Food and Agriculture Organization of the United Nations (FAO)
Government of Germany – German Aerospace Centre (DLR)
GIZ — Deutsche Gesellschaft für Internationale Zusammenarbeit
Government of Ireland
Government of Italy

GOVERNING BOARD

REEEP's Governing Board is responsible for the conduct of business in accordance with REEEP Statutes, and holds office for a period of four years. The Governing Board develops and oversees key strategic direction, targets, timeframes and priorities; prepares financial rules and accounting systems; and guides the operations of REEEP's International Secretariat.

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Government of the United Kingdom
United States National Renewable Energy Laboratory
The World Bank

ADVISORY BOARD

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Paul Savage, Nextek Power Systems / EMerge Alliance
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FOREWORD

Climate Change affects us all, and the reduction of greenhouse gases that cause climate change is one of the greatest challenges we will face over the decades to come. Austria has long been a leader in developing and realising advancements in sustainable energy to reduce emissions, and we are on track to generate 34% of our energy by renewable sources by 2020.

For many years Austria has followed a comprehensive strategy to protect the climate that includes efforts in green buildings, energy efficient systems, and intelligent mobility solutions, in addition to renewable energy. Several initiatives follow the idea of market transformation, a targeted effort to change the market that actively incorporates all relevant market players and stakeholders. Only through a market-oriented approach the monumental shifts necessary for our economies to address climate change will be achievable.

ANDRÄ RUPPRECHTER
Minister, Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management



Austria also understands that we share the responsibility with our fellow nations in the European Union and across the planet. To help developing countries fight against climate change, Austria has fulfilled its Fast-Start-Finance commitment, builds on that and also contributes to the Green Climate Fund.

Austria's cooperation with REEEP is a key pillar of our commitment to address climate change via market transformation. REEEP has been a clean energy market catalyst for over a decade, and acts as an essential first mover in scaling up markets for low-carbon solutions that reduce emissions and increase prosperity in the developing world. The 10th project call, supported by Austria, will contribute and showcase new approaches in this regard.

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INTRODUCTION

In the run-up to the UN Climate conference in Paris in December 2015, governments seem to be shaping up their climate action: in November 2014, the US and China agreed to firm reduction targets, and China and India recently assured the world that they will bring firm commitments to Paris. The EU and the US have already submitted their commitments under the UNFCCC process. Together, these four powers will shape the future climate regime, though it seems clear that from 2015 on, global action will be the sum of what individual Governments choose to do.

But many Governments still live under the false impression that climate action is in conflict with prosperity. This short-term thinking not only sacrifices long-term stability of the environment and the economy but it is a total misconception of business’ inventiveness and capacity to innovate. Government negotiators still base their tactics on business-as-usual while in the real world, new businesses and business models are taking shape at a radical and disruptive speed. This is true in the world of energy, where low carbon systems are pricing traditional utilities out of some markets, and it is true in the world of IT, which continues to revolutionise the ways in which we connect, finance, measure, and learn to deal with the world - including climate action and impacts.

So it is essential that all countries take steps to engage and encourage the private sector at all levels – from start-ups to



multinationals. Much remains to be done: straighten out bureaucratic and labyrinthine regulatory frameworks, reform outmoded, impractical and sometimes damaging public subsidies, and help local banks get the true measure of risk and innovation in the energy and climate fields.

The world needs innovative and risk-taking entrepreneurs; and it requires evidence and knowledge to help pave their way. REEEP is a unique global resource: it has embraced these two distinct pieces of the puzzle and managed to combine them in a single source of support. REEEP provides entrepreneurs with the space and help they need to perfect their business plans and scale up, while at the same time learning from their experiences on the ground - turning those lessons into public knowledge and the basis for further action, and in the process helping to de-risk entire business models, technologies and sectors for investors downstream.

The world needs more such pathfinders, and more upscaling of their achievements, to realise our climate and development objectives over the coming decades.

HENRY DERWENT
Chairman, REEEP Governing Board

MESSAGE FROM THE DIRECTOR GENERAL

Since REEEP’s start over twelve years ago, we have been at the vanguard of market development for clean energy technologies and services. Over the past decade this sector has grown rapidly in many parts of the world, bringing about a new normal in how we harness and use energy to create prosperity. In some parts of the world we now witness the effective decoupling of energy use from economic growth; some of the major players show marked progress toward integrating sustainability into the highest levels of economic policy making, a development to which REEEP is proud to have made its own contribution (see pages 68–69).

Over the past two years REEEP has made great strides in focusing its efforts at areas of need of investment in new technologies, new ideas and disruptive entrepreneurship. We have articulated these in our institutional theory of change and in our Focal Areas; we have described the scope of our action in the Pathways that fall within them. All this has happened in close cooperation with our partners: we are pleased to be able to include in this annual report guest articles to help explain why these areas are so important to achieving a new normal of green growth and a low-carbon future.

Our 2014/2015 Annual Report takes a special look at Cross Sector Systems, a REEEP Focal Area that embodies the concept of systems thinking so vital to addressing the complex challenges of green growth. Here we are working to



break down barriers in climate and development knowledge – described by our Connecting Climate Knowledge Pathway – and in investment and action – demonstrated by our Water-Energy-Food Nexus in Agrifood Pathway. We are especially proud to introduce in this report the participants of our current funding round, part of the Powering Agrifood Value Chains portfolio. It is the entrepreneurs behind Powering Agrifood Value Chains who are the lifeblood of REEEP’s vision and impact; it is they who are making green growth happen on the ground through the strength of their ingenuity and resourcefulness every day; it is they who will bring about the new normal.

MARTIN HILLER
REEEP Director General



ESSENCE

MARKET ACCELERATION FOR GREEN GROWTH

REEEP invests in clean energy markets to help developing countries expand modern energy services and improve lives; increase prosperity and economic dynamism; and keep CO₂ emissions in check – markets that accelerate green growth. REEEP's tools are modern clean energy technologies – renewable energy and energy efficiency – market forces, and knowledge management.

Our goal is to break business as usual and provide new development scenarios for middle and lower income countries; to create a new normal for market-led green growth worldwide.



In Nicaragua, low-pressure drip irrigation saves water and fertilizer, improves crop yields and income for minimal investment.
(Credit: iDEal Tecnologías)

THE CHALLENGE: CLIMATE + PROSPERITY

Current climate and emissions trends are bleak. This reality exists largely because of the consumption patterns that supported growth in developed economies. If developing nations follow this path, CO₂ emissions will continue to increase dramatically. However, development is the only option.

Today 870 million people worldwide are undernourished, one billion lack access to safe water, and 1.3 billion do not have access to electricity. Economic development represents the only pathway to reduce poverty and improve prosperity for those in low and middle income countries.

Industrialised nations have committed to raise \$100b/yr in financing by 2020 to help developing nations combat climate change and its effects. The question remains how to mobilise, distribute, and utilise this financing so that economies profit, development is enabled, energy access is widespread, and low-carbon principles become standard practice.



**870 MILLION PEOPLE
ARE UNDERNOURISHED**



**1.3 BILLION PEOPLE
DO NOT HAVE ACCESS
TO ELECTRICITY**



**1 BILLION PEOPLE
LACK ACCESS
TO SAFE WATER**

THE OPPORTUNITY: CLEAN TECHNOLOGY + ENTREPRENEURS

Access to energy is fundamental to generating prosperity in developing countries. Advancements in technology have made it possible to expand energy access while reducing emissions from fossil fuel. To be truly sustainable, these technologies must provide value and be market viable. REEEP's portfolio expands modern energy services to improve lives and increase prosperity, while reducing CO₂ emissions by supporting markets for clean energy in developing countries.

REEEP actively seeks out specific sectors, markets, business models and technologies – or Pathways – that represent low-investment, high-return opportunities for developing countries.

There are a number of reasons these opportunities are often underappreciated and underfunded. Often the returns in question are not financial per se, or they have not yet been sufficiently incentivised so as to represent financial returns to investors. In many cases the environments at hand are high risk – often due to gaps in information and understanding among the relevant local and international stakeholders – and opportunities harder to clarify.

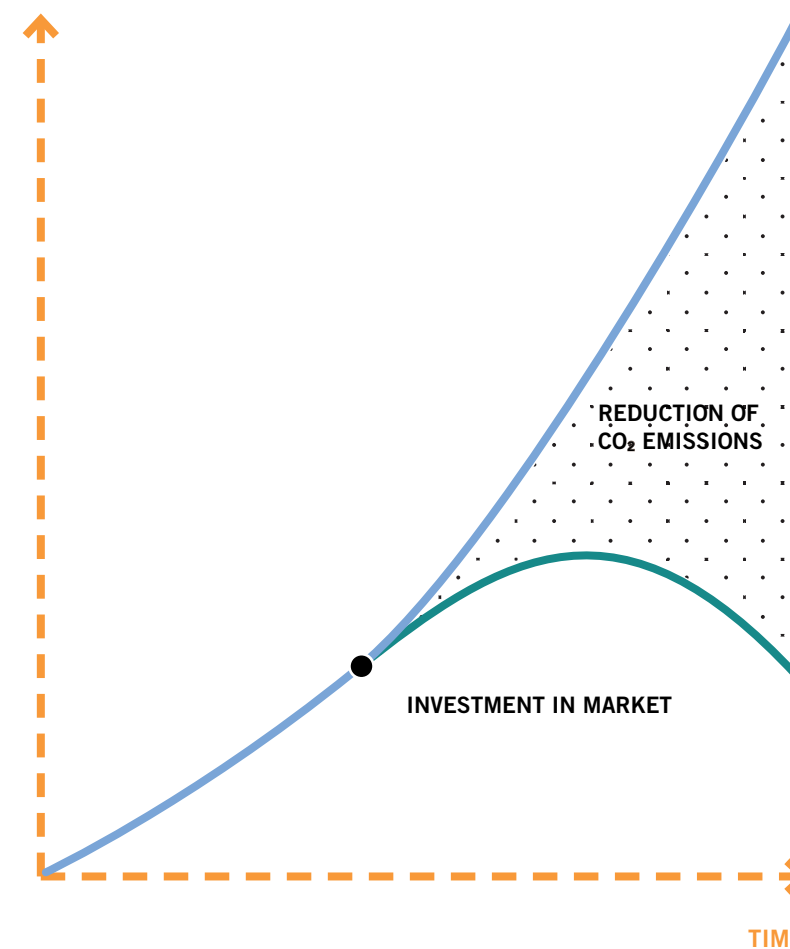
REEEP works to bridge these knowledge gaps, de-risk sectors and business models, and catalyse market chain reactions that will lead to broad sectoral shifts.

REEEP understands clean energy markets from a practice, policy, and financial perspective. We seek and support high potential entrepreneurs and ventures that can validate promising business models and technologies. We monitor and evaluate our projects to understand market opportunities and barriers to success. Our insight influences policy, increases public and private investment, and informs our portfolio of projects that can be shared and replicated within and across markets.

Access to knowledge is essential for growing markets from the bottom up. REEEP works to connect knowledge to drive entrepreneurship, innovation, and policy improvements that shift markets across the developing world.

THE THEORY OF CHANGE: ENERGY + MARKETS

CO₂ EMISSIONS



CURRENT TREND

REEEP targets sectors for which a Business As Usual scenario projects dramatic increases in CO₂ emissions

NEW TREND

REEEP targets markets where large scale take-up of clean energy will result in significant avoidance and reduction of CO₂ emissions

THIS NEW TREND FOSTERS PROSPERITY:

Natural, Environmental Benefits

Health, Education,
Quality of Life

Economic Development,
Employment, Investment,
Energy Access

THE SPACE: SMEs + VALUE CHAINS

The small and medium sized enterprise (SME) sector in emerging markets is a store of vast economic potential for improving prosperity. If that growth is fuelled by hydro-carbons, it is also a store of vast CO₂ emissions.

REEEP has developed an innovative multistage system to target key value chains at the SME level for market growth in clean energy solutions with high potential for large scale energy access expansion, sector-wide shifts and long term, sustainable, measurable emissions avoidance and reduction.

THE MSME POTENTIAL

The outsized role of Micro, Small and Medium sized Enterprises (MSMEs) in developing countries is well-known, making up around two-thirds of GDP and generating up to 85% of all employment.

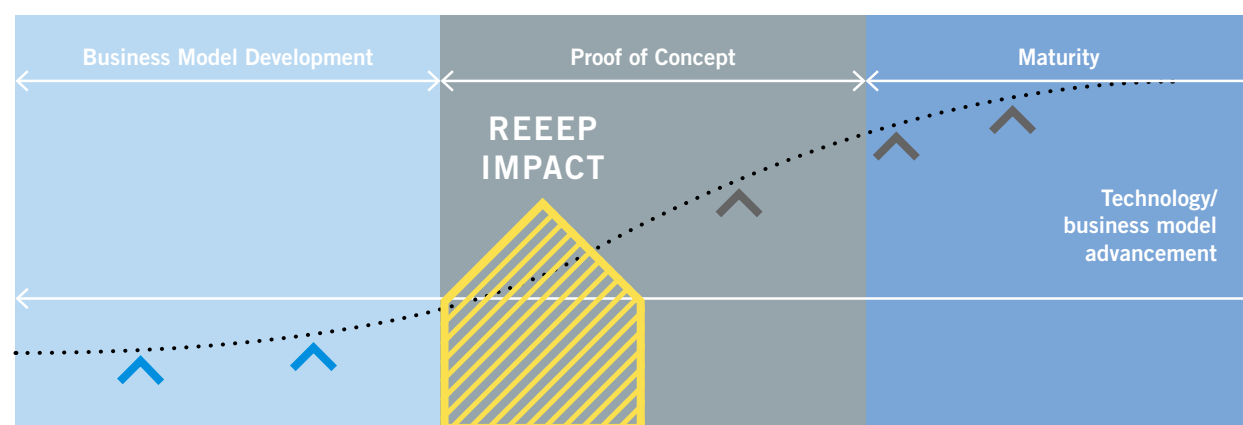
They are also crucial to diversifying economies and contributing to long-term inclusive and sustainable development. The agricultural sector is particularly dominated by MSMEs.

The challenges facing these businesses are multitude, yet the most daunting are the dual challenges of energy and finance: lack of access to energy is the single greatest obstacle to MSMEs in Sub-Saharan Africa and South Asia, and lack of access to finance in the top three obstacles across the developing world.

THE MISSING MIDDLE

Entrepreneurs seeking to disrupt their value chains face myriad obstacles, chief among them a mismatched financial services sector. These entrepreneurs are often able to raise very early-stage funding to generate a business model and prototype a technology only to stumble at one of the many road blocks to scale.

The International Finance Corporation has termed this phase of business and technology development, along with associated funding needs, the “missing middle”. REEEP’s multistage incubation programme addresses not only the immediate financial needs of entrepreneurs, but also the business and technical knowledge and expertise requirements of first-movers.



REEEP combines seed-level financing via grants and/or concessional loans with incubator-like support to scale-up promising business models.

REEEP bridges the gap to private finance by de-risking, matchmaking and flowing into higher-level pipelines for growth stage investment.

Insight gained from monitoring and evaluation informs policies to shape financing ecosystems and enable access to working capital for more mature enterprises and markets.

▲ CONCESSIONAL FUNDS

▲ COMMERCIAL FUNDS

.... PROFITABILITY

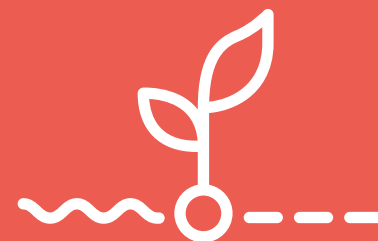


A SELCO portable solar electricity generation unit on a temporary dwelling in Bangalore (Credit: Mallikarjun Katakoti)

REEEP FOCAL AREAS + PATHWAYS

To best support the growth of clean energy markets in developing countries, REEEP focuses on creating impact in several key areas – REEEP Focal Areas.

Within these areas, REEEP works to close knowledge gaps and harness the transformational potential of SMEs, stimulating value chains in specific subsectors, technologies and business models that show great promise. REEEP selects and invests in those Pathways with the potential to ignite self-sustaining growth in markets and result in macro-level impact that can be monitored and accounted for within global climate and prosperity tracking frameworks.



CROSS-SECTOR SYSTEMS

Water-Energy-Food Nexus in Agrifood
Connecting Climate Knowledge



SMART CITIES

Sustainable Urban Transport
Urban Water Works
Efficient Affordable Housing



ENERGY ACCESS

Off-Grid Rural Electrification

CROSS SECTOR SYSTEMS

Our world is dominated by increasingly interconnected and interdependent complex systems. Yet many organizations and agencies from all areas continue to work in closed silos. We pursue holistic, cross-sector collaboration to better understand these systems and create comprehensive market shifts.

REEEP's work in cross sector systems concentrates on two different, yet equally important areas of enormous potential for improving systems thinking and application: the interrelations between water resources and management, energy production and use, and food security, also known as the water-energy-food nexus; and the sprawling and complex fabric of information and knowledge that underlies the global climate and development fields.



REEEP is applying systems thinking to both, building sustainable market-oriented solutions to specific subsets in each of our Cross Sector Systems Pathways: the Water-Energy-Food Nexus in Agrifood, and Connecting Climate Knowledge.

PATHWAY: WATER ENERGY FOOD NEXUS IN AGRIFOOD

The word nexus can describe many things depending on context; in every case, it represents a locus of connection within a system of distinct elements. For REEEP, the nexus has come to define and shape our work not only on the water-energy-food nexus *proper*, but on every aspect of our efforts to accelerate clean energy markets to achieve green growth in developing countries.

The nexus represents a philosophy as well as a policy or procedure, one in which societies, economies, markets, and ecosystems are understood to be complex systems whose boundaries – and influence – intrude well into those of the others. While our understanding of these complex systems and their interconnectivity is often limited, we can take steps to lower the artificial and bureaucratic barriers enacted to make them more manageable in the past, using new technologies and methodologies to explain and act upon inter-connectivity. REEEP has been working on breaking down such barriers in the data and information realms since 2007; in 2012 we expanded our Cross Sector Systems focal area to the physical domains of the water-energy-food nexus.

The water-energy-food nexus might be criticised for its obviousness – it is well-known that water, energy and food resources and management are deeply interrelated. Indeed, large corporations affected by them make little distinction between the three dimensions in corporate strategy and execution. But while large players in even developing markets are already managing risks and resiliency between water, energy and food systems, both smaller players, such as SMEs, and governments are lagging behind.

This state of affairs is perilous, both because of the irreplaceable role of governments in setting national and trans-border priorities and regulating activities in the water-energy-food nexus, and because of the outsized role the SME sector plays in economies of all types, especially those of developing countries.

For this reason REEEP has narrowed its focus of action while retaining the conceptual breadth of the water-energy-food nexus. With the Water-Energy-Food Nexus in Agrifood Pathway, we are working to accelerate markets for viable, profitable technologies and solutions that incorporate a nexus approach into SME value chains by supporting innovative business ventures. At the same time, we are carefully monitoring and evaluating the experiences of those ventures, translating them into the types of practical policy-relevant lessons that governments can use to improve evidence-based policy making and boost the resiliency and prosperity-generating potential of their economies.



PATHWAY: WATER ENERGY FOOD NEXUS IN AGRIFOOD

REEEP WATER-ENERGY-FOOD NEXUS IN AGRIFOOD

Water, energy and food systems are inextricably inter-connected. Water and energy are needed to produce food; water is needed for almost all forms of power generation; energy is required to treat and transport water. The relationships and trade-offs within this triangle of resources are known collectively as the water-energy-food nexus.

Understanding water-energy-food inter-linkages and managing them holistically is critical to sustainability. But while some private enterprises in the agrifood sector understand the significance of the nexus – and some have already seen competitive advantages in nexus-driven solutions for sustainable crop management, processing, distribution and retailing – most have not yet grasped this opportunity.

REEEP has since 2012 put special emphasis on tackling the nexus, focusing in particular on the agrifood sector – the most prominent single subsector within the nexus. With global food production expected to increase 70% by 2050, the sector is facing unprecedented resource pressures, with more on the horizon.

In 2014/2015 REEEP intensified its work on the water-energy-food nexus in agrifood, cooperating with the

Food and Agricultural Organization of the United Nations (FAO) on a study of business cases within the nexus, and designing a special round of financing for innovative SME-level ventures with business models addressing the nexus using clean energy.

The report, *Making the Case: How Agrifood Firms are Building New Business Cases in the Water-Energy-Food Nexus*, was launched at the September World Water Week in Stockholm. Making the Case featured experiences of several enterprises in the REEEP portfolio, including two in-depth analyses of SME-level nexus businesses in East Africa and Southeast Asia (see page 23 for more on *Making the Case*).

Making the Case was also presented at several nexus-related events, including a high-level round table hosted by the German Government, and contributed to a peer review of an International Renewable Energy Agency (IRENA) publication on “Renewable energy in the water, energy and food nexus”, which featured REEEP experiences in private sector efforts in the nexus.

The findings of *Making the Case* also informed the implementation of REEEP’s 2014/2015 project funding round, Powering Agrifood Value Chains.

POWERING AGRIFOOD VALUE CHAINS 2015–2017

The REEEP *Water-Energy-Food Nexus in Agrifood* Pathway stems from recognition of critical need for investment in agricultural value chains in development countries. The sector is hugely important for ensuring food security for rapidly growing populations, and providing economic security for numerous people participating at various stages of agricultural value chains, from farm to table.

Food-producing agriculture (agrifood) value chains can and must undergo innovation to increase efficiency and yields, enhance variety, and meet new dietary demands of growing middle-classes worldwide. To do so sustainably they must reduce waste and pollution, better manage and conserve water resources, and ensure that local prosperity is improved.

Energy will power the sweeping developments in agriculture that will happen over the coming decades, and while the potential for improving economic and human prosperity is great, so too is the potential for exacerbating climate change – if that energy is derived from fossil fuels.

The new agricultural revolution must be clean – powered by renewable energy and energy efficient systems. Specific renewable energy and efficiency solutions aimed at developing country agrifood value chains, particularly at the SME level, face myriad challenges of the sort that have also faced renewables and efficiency in developed countries: high up-front and investment costs, comparatively (to some other investment types) long payback periods, misunderstood or mistrusted novel technologies, lack of standards and quality assurance track records, and non-existent or outmoded financing availability (both in terms of investment as well as consumer finance). These challenges are often magnified by other policy-related “ecosystem conditions” that are unique to specific countries and business cases, such as unreliable or unpredictable regulatory regimes, taxes and duties, fossil fuel subsidies, and stretched purchasing power of target markets.

To ignite and accelerate self-sustaining market growth for these solutions REEEP designed a multi-stage incubation

programme for high potential ventures that pushes innovative business models forward while gaining critical insight into the ecosystem conditions that so highly influence success. The nine ventures of the Powering Agrifood Value Chains Portfolio 2015–2017 are shown on pages 24–33.

The potential benefits of clean nexus approaches are considerable in terms of avoided and reduced greenhouse gas emissions, and perhaps even greater in terms of prosperity and human well-being.

But how can we better understand these potentials: the capacities for benefit – or for harm – embodied in the various possible scenarios these immensely complex systems will follow?

MAKING THE CASE

In 2014 REEEP released *Making the Case: How Agrifood Firms are Building New Business Cases* in the Water-Energy-Food Nexus. The report describes four models of how businesses are taking the lead in creating sustainable solutions within the nexus: two examples from a large enterprise and two involving SMEs. The large enterprise featured, the beverage company SABMiller plc, is well on its way to creating value through nexus-driven solutions.

SMEs, however, still face tremendous challenges in recognising nexus opportunities, developing solutions, attracting investment and generating returns. Still, some SMEs are making strides, as REEEP partners **Futurepump Ltd** and **Mercy Corps** have demonstrated with their disruptive clean energy-based solutions for small-scale irrigation and soy processing, respectively. The experiences of both should cause policy makers to re-think how governments in most countries approach the water-energy-food nexus and give their businesses the building blocks they need to bring sustainable nexus solutions from classroom to community.

AGRIFOOD SECTOR



PATHWAY: WATER
ENERGY FOOD NEXUS
IN AGRIFOOD

CLIMATE: PREDICTING THE ALTERNATE FUTURE

Many developing countries are, at the moment, comparatively low emitters of carbon dioxide and other greenhouse gases because of slow economic development. Thus the true potential for alleviating the effects of climate change in many sectors comes not from addressing current emissions, but from avoiding those emissions that will come as a consequence of development using current technologies and practices.

Estimating the emissions that will likely result from business-as-usual development scenarios is exceedingly difficult and plagued with uncertainties; despite this the exercise is a vital one, because it drives to the core of green growth and the role of innovation in helping developing countries leapfrog polluting and unsustainable technologies and practices.

In looking for high-potential sectors, REEEP is seeking those sectors in which a specific development-related trend can be predicted to result in significant increases in greenhouse gas emissions over a period of 10 to 15 years. In the case of agrifood value chains, this trend is generally related to the introduction of a carbon-intensive energy source or wasteful practice. For instance, the rapid expansion of irrigation practices in Kenya, supported by incentive policies at the national level, is resulting in an accelerating trend toward diesel irrigation pumps to meet demand. Without an alternative, the transition to diesel-powered irrigation will lead to a significant amount of CO₂ and particulate matter pollution being emitted into the atmosphere in the coming decade.

REEEP creates 15-year baseline scenarios (to 2030) for the specific market cases in which it has preliminarily identified a potential for CO₂ avoidance based on current and/or expected trends in the sector. Where available, REEEP develops projections based on UNFCCC-approved methodologies with reasonable assumptions of market growth trends in existing carbon-intensive practices. REEEP then creates a reduced-emissions benchmark scenario to explore what is possible if a local or national market for a specific clean energy “fix” can be allowed to thrive.

REEEP continues to refine and improve the methodologies and processes behind this scenario modelling, and will be using data and knowledge gained through our enhanced monitoring and evaluation (see pages 54–59) to test our benchmarks and the key indicators used to define them.

PROSPERITY: FROM CO-BENEFITS
TO CORE-BENEFITS

The *growth* side of the green growth equation is equally important, yet even more complex and daunting than the climate aspect.

When most people talk about growth in an economic context, they mean growth in production and/or income and measured in gross domestic product (GDP). Yet there is increasing demand for a more complete – and sustainable – concept of well-being, one that would shift how we define growth from growth in production to growth in well-being, or prosperity.

This definition of prosperity is a composite one, incorporating several dimensions that are critical to quality of life and well-being:

- The **natural** dimension, which includes the environmental and ecological components of prosperity;
- The **economic** dimension, which includes the income, employment, and associated components of prosperity;
- The **human** dimension, which includes the health, education and other benefits to human experience that make up prosperity.

Over the past decade, REEEP projects have brought about not only economic and market benefits for the areas in which they were carried out; they have resulted in an array of what are often called “co-benefits”: improved health, reduced drudgery, improved educational opportunities, employment, changes in status for women and disadvantaged groups, reduced damages to the natural environment, and others. While these benefits are often chronicled anecdotally, they are not systematically recorded through monitoring and evaluation, nor can they be systematically analysed for meaning and utilised for strategic guidance.

Yet these benefits should be seen as more than just byproducts – indeed they are **core benefits** to those experiencing them firsthand. As a first step toward better understanding and measuring prosperity, REEEP is looking at ways to systematically record, quantify (where appropriate) and analyse changes in prosperity that occur throughout the project life cycle (see more about M&E on pages 56–59).

Our initial test will be an in-depth study in the coming year of three of our Water-Energy-Food Nexus projects using an innovative methodology to quantify and measure the benefits of climate adaptation projects.

The results will help us better understand inter-linkages between dimensions of prosperity at a project level, extrapolate and make predictions for market-level impacts, and direct funding, research and expertise into need areas for further study. What we learn about prosperity and core benefits will play a major role in our strategy and monitoring and evaluation framework for 2016.

POWERING AGRIFOOD VALUE
CHAINS: INDICATOR SUITE

CLIMATE

- Energy output – renewable (kWh) / efficiency (kWh saved)
- GHG mitigation/avoidance (CO₂)

ECONOMIC

- Employment (jobs)
- Market capitalization (€ of additional investment)
- Market share of clean energy (% increase)
- Debt/equity (D/E)
- Profit (% increase)
- Income (% increase among clients)

HUMAN

- Access to energy (number of individuals)

PERFORMANCE

- Production improvement (% increase)
- Loss/waste reduction (% decrease)
- Improved product life spans (% increase)

In addition, Most Significant Change tracking helps us monitor specific expected and unexpected developments that fall outside the boundaries of this indicator suite (see page 58 for more on how this is done).

POWERING
AGRIFOOD VALUE
CHAINS: PORTFOLIO

The following ten pages feature profiles of the nine ventures making up REEEP’s 2015–2017 Powering Agrifood Value Chains Portfolio



SOLAR POWERED IRRIGATION IN KENYA – PART I

POWERING AGRIFOOD VALUE CHAINS: SUNCULTURE

Powering Agrifood Value Chains is REEEP's 10th funding round, and includes nine ventures with innovative clean energy-based solutions to building prosperity through agrifood value chains. In recent years, the challenge of reducing poverty in the poorest parts of Africa has often been answered by calls for increased irrigation to improve crop yields, food security and nutrition. As in many developing countries, agriculture is the lifeblood of Kenya's economy, directly responsible for over a quarter of GDP and a fifth of formal employment (and over 70% of informal jobs in rural areas).

To improve productivity and wealth generation in the agricultural sector, irrigation will need to expand to cover the full potential of irrigable land, a trend already well underway. Currently, diesel engine irrigation pumps are powering this expansion, a reality that will – if unchecked – lead to considerable growth in CO₂ and particulate matter pollution. REEEP estimates that broad expansion of a market for a renewable alternative could result in nearly 3 million tonnes CO₂ of emissions avoidance per year by 2030.

THE SOLUTION, BY SUNCULTURE

With the tremendous solar potential in Kenya and the maturity of PV and electric pump technology, the agricultural sector, including smallholder-level farms, is an ideal candidate for rapid growth. The limiting factors are, however, largely socioeconomic.

SunCulture is focusing on addressing several barriers to market scale. On the demand side, SunCulture is utilising several strategies to uncover and cultivate existing demand for solar powered irrigation, leveraging new media opportunities together with success stories from early adopters and the reach of a high profile local partner in East Africa's largest microfinance-focused bank. This partnership is a crucial



element to reducing the perceived risk of the technology among a traditionally risk-averse market segment.

Further, SunCulture is developing its client base from a value chain perspective, combining the technology and financing offer with additional elements of market access and technical knowledge to help clients leverage improved productivity into improved incomes and quality of life.

MADE POSSIBLE BY:



SOLAR POWERED IRRIGATION IN KENYA – PART II

POWERING AGRIFOOD VALUE CHAINS: FUTUREPUMP

Irrigation in general – and Solar Powered Irrigation Systems (or SPIS) in particular – can provide substantial benefits to local prosperity in regions that adopt them. The most direct benefit is the increased revenue and income that come with the greater yields of irrigated cropland vis-à-vis rain-fed land. Stable water supplies allow additional growing seasons per year, massively increasing output. Drip irrigation (a central, although not unique, element of SPIS) can save around 80% of water compared to current practices, and improves crop quality thanks to more stable supply, often improving real yields by over 300%. In addition, SPIS offer significant cost savings over time on labour, fuel and fertilizer, a total value to smallholder farmers estimated at around \$14,000 per acre annually.

Economically, the benefits of increased use of SPIS translates into local opportunities beyond the agricultural boundaries, as small businesses arise to meet demand in manufacture, assembly, repair and sales of SPIS.

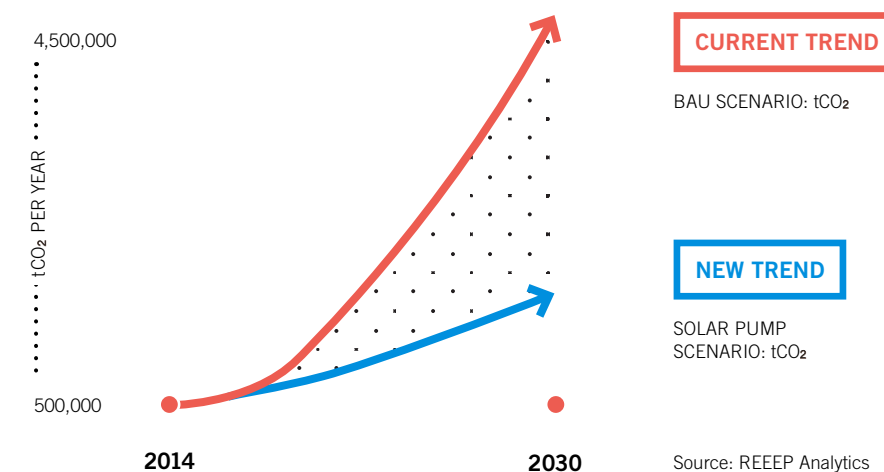
THE SOLUTION, BY FUTUREPUMP

Futurepump, now receiving its second round of financing from REEEP, has developed a new model to enable smallholder farmers in Kenya to adopt sustainable irrigation solutions with a proprietary solar powered irrigation pump, combined with an end-user finance programme that allows for flexible payments



at a time when the farmer is gaining the economic benefits from irrigating their lands.

With this innovative model, Futurepump is able to reach even very low income farmers with less than one acre of land – which constitute the majority of the agricultural sector in Kenya. By addressing a key barrier in up-front cost, and by targeting the market segment accounting for the majority of production (yet is most difficult to reach via conventional sales models), FuturePump's model holds great potential for transforming the sector in the country.



SOLAR POWERED MULTI-USE COLD STORAGE IN UGANDA

POWERING AGRIFOOD VALUE CHAINS: STATION ENERGY

Like many countries in Africa, Uganda's economy is highly dependent upon the agricultural sector, which contributes to over 70% of its export earnings and is the main source of livelihood and employment for over 60% of the population, and in some areas of the country up to 90%. At the same time, the agricultural sector suffers from inefficiency and low productivity, and the government has identified agriculture – and especially the development of key export areas such as horticulture and fisheries – as the pillars of a strategy for increasing Ugandan economic and social development.

The fundamental challenges in Ugandan agriculture are connected to high post-harvest losses, lack of access to affordable technology, and access to medium and long-term financing. In particular food wastage from poor post-harvest storage carry a heavy toll on economies and populations in Africa, where the FAO estimates food losses could feed 300 million people. These losses represent a “double” waste of energy, in that both the energy put into production, as well as the chemical energy stored in the food itself, are wasted in post-harvest losses.

THE SOLUTION, BY STATION ENERGY

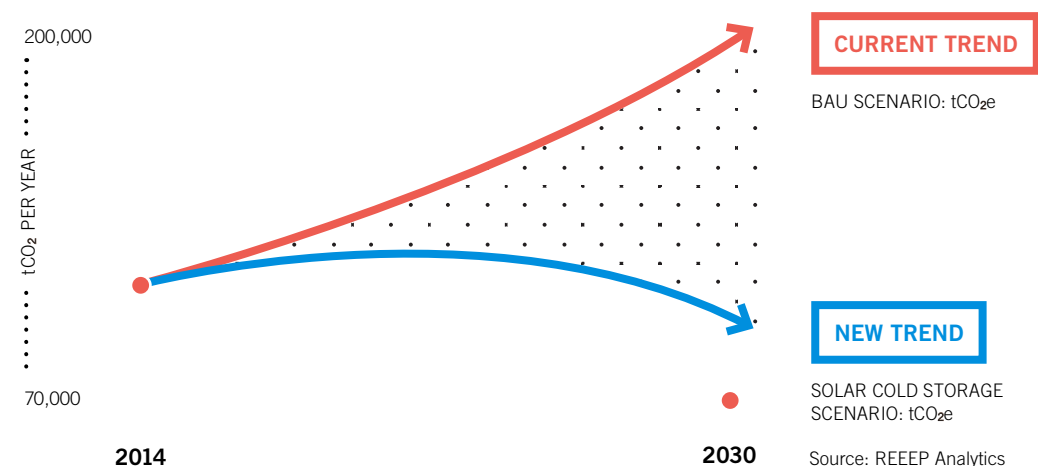
Given Uganda's solar potential and the necessity of distributed storage facilities to minimize transport distances between field and storage, off-grid solar PV powered cold storage represents a significant opportunity to improve agricultural production



and incomes, reduce waste and improve food security, and avoid the GHG emissions from fossil fuel-powered alternatives. REEEP estimates that market scale up of solar powered cold storage could save more than 100,000 tonnes (equivalent) of CO₂ a year by 2030.

Station Energy has developed an innovative concept for a solar-powered cold room that would provide refrigeration and freezing for fresh products of any type in isolated areas. This solution is especially adapted for agricultural cooperatives, fishermen associations, sanitary usages (conservation of vaccines) or for ensuring cold chain integrity in food processing and distribution.

Station Energy will offer use of the cold room as a service to farmers and households, rather than requiring them to put high upfront costs into ownership and maintenance. Station Energy will tap a pioneering equity crowdfunding platform to scale-up rapidly.



MADE POSSIBLE BY:



BIOGAS POWERED AGRICULTURAL PROCESSING IN CAMBODIA

POWERING AGRIFOOD VALUE CHAINS: NEXUS C4D

In Cambodia, the agricultural sector contributes to around a third of national GDP and about half of formal employment. The staple crop is rice, of which some 9.3 million tons were harvested and processed in 2014 alone, accounting for more than 3% of the world's exports after feeding the population of around 15 million people.

The rural areas home to the rice producing sector and 85% of the population also suffer from energy poverty, with most of the rural population not having access to electricity. With Cambodia's energy production capacity still recovering from war, there is great potential in utilising distributed off-grid electrification models to bring affordable electricity to rural households.

The Royal Government of Cambodia (RGC) has made it a priority to bring modern energy access to rural areas (at least 70% electrification by 2030), and a major potential lies in a primary waste component of the rice producing sector: the rice husk.

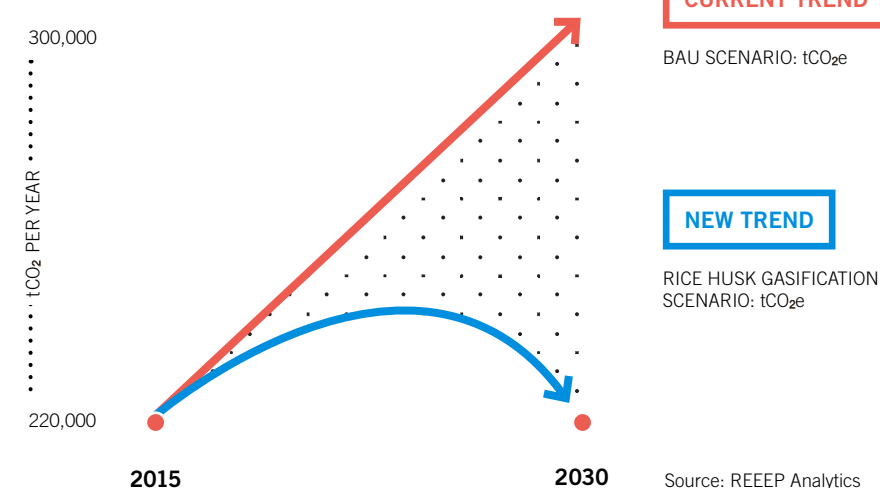
THE SOLUTION, BY NEXUS C4D

Rice husks are the indigestible coatings of rice grains, produced and discarded by Cambodian rice millers at the rate of more than 1 million tons per year. They are also potential sources of energy through bio-gasification processes. At current conversion



rates, Cambodia's rice milling waste could generate between 60–100MW of electricity per year. REEEP estimates that compared to diesel alternatives, a rice-husk gasification market could displace some 80,000 tonnes CO₂e per year by 2030.

The project is addressing a major barrier to market expansion: access to finance for the SME-level operators of rice mills. REEEP and NexusC4D, with deep experience in the renewable energy SME sector, will set up a revolving fund to provide affordable loans to rice mills to switch from diesel electricity generation to rice husk gasification. The programme will also help operators develop a bankable offer for ongoing investments from local banks.





An Improved Water Mill replaces a traditional wooden water mill in Nepal (Credit: SNV)

PICO HYDRO POWERED MILLS IN NEPAL

POWERING AGRIFOOD VALUE CHAINS: CLEAN ENERGY DEVELOPMENT BANK

MADE POSSIBLE BY:



Nepal is among the poorest and least developed countries in the world, with about one quarter of the population currently living below the poverty line. Agriculture is the predominant sector of the economy, employing over 70 % of the population and accounting for around 38 % of GDP. At the same time, Nepal is highly vulnerable to food insecurity, due in large part to market access inadequacies for Nepalese farmers, who are mostly subsistence farmers. Productivity levels remain low as a result of limited access to new farming technologies, inputs and extension services.

Nepal is also energy-poor, having no known fossil fuel reserves of any type and hindered by extremely difficult terrain upon which to build energy infrastructure. Electrification in Nepal was around 50% in 2010, with around two-thirds of Nepali citizens using locally-sourced firewood for cooking needs.

THE SOLUTION, BY THE CLEAN ENERGY DEVELOPMENT BANK AND SNV

For centuries Nepal's farmers have utilised the country's vast hydropower potential via Traditional Water Mills (TWMs), primarily to grind maize and wheat. This is a prime area for innovation and investment, and indeed solutions to upgrade them already exist.

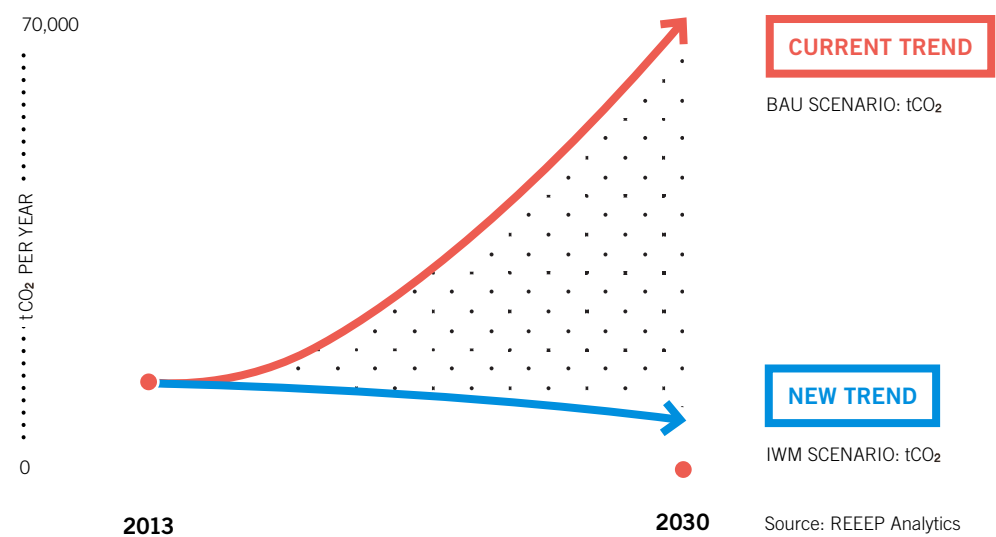
Whereas a typical TWM produces up to 0.5kW and manages 10–20kg of grain per hour, an improved version (known as an

Improved Water Mill or IWM) can produce between 1–5kW and process more than 50kg per hour, and new versions allow other uses such as paddy hulling, oil expelling, saw milling and electricity generation.

The potential benefits of large-scale market take-up of these new IWMs as a replacement for TWMs and displacement of encroaching diesel generators are significant. Compared to diesel, REEEP estimates that Nepal could avoid up to 60,000 tCO₂ annually, and drastically improve livelihoods of local farmers.

Standing in the way is a combination of high upfront investment costs, lack of financing opportunities and under-developed business models for add-on services.

The Clean Energy Development Bank and SNV have developed an innovative offer that incorporates a new IWM, capacity building and targeted financing to allow the formation of community-owned village electrification committees and agrifood processing enterprises to manage the IWMs. A major aspect of the venture is the simultaneous provision of credit to potential owner/operators, marketing and capacity-building on how to economically utilise the IWMs benefits for small-holder and subsistence farmers, the development of pay-per-use consumer financing model for processing services and an electricity tariff structure for the village.



SOLAR POWERED DAIRY REFRIGERATION IN BANGLADESH

POWERING AGRIFOOD VALUE CHAINS: ENERPLUS

Bangladesh's economy is predominantly agricultural, generating around 63% of total employment, with over 70% of the population living in rural areas. In 2010, the agricultural sector accounted for 20.1% of GDP. According to the FAO, the country's mixed farming system has led to close interdependencies between crop production and animal husbandry, with livestock having pronounced status as providers of food, nutrition, savings, draught power, manure, transport and other social and cultural functions.

Bangladeshi citizens also suffer disproportionately from malnutrition. Half of Bangladeshi children under five are chronically malnourished, leading to lifelong growth complications, and 30% of the population is below the minimum level of dietary energy consumption. Dairy products are important to providing caloric and essential vitamin intakes for both children and adults, and while bovine livestock is common, inefficiencies and waste lead to significant unmet demand, currently filled with expensive imported dairy in mostly condensed form.

Transitioning Bangladesh's mostly subsistence-level dairy production to market-oriented units requires improvements in knowledge and technology, and access to energy. Milk

Collection Centres, which act as hubs for smallholder dairy farmers and provide access to cooling units, essential for ensuring quality over the time necessary to transport products to market, have played a large role in this transition.

THE SOLUTION, BY ENERPLUS

Enerplus is working with the dairy firm PRAN Dairy, a pioneer of the "dairy hub" concept, to retrofit existing diesel-powered cooling units with solar PV units, and build new collection centres incorporating renewable energy.

The market for dairy cooling could be avoiding close to 12,000 tonnes of CO₂ annually by 2030 by shifting from diesel gensets to solar PV and other (e.g. biogas) renewable sources. At the same time, cooling provides a critical service to smallholder farmers and directly impacts dairy supply – and thus food security and related health and well-being outcomes in the country.

By offering excess electricity via mini-grids to surrounding villages, the collection centres also bring modern energy access to low-access areas.

MADE POSSIBLE BY:



SOLAR POWERED AGRIFOOD PROCESSING IN TANZANIA

POWERING AGRIFOOD VALUE CHAINS: REDAVIA

Agriculture is the backbone of Tanzania's economy, contributing around a quarter of GDP and employing three quarters of the labour force in this country of 44 million people. Tanzania's staple crop is maize, in which it is largely self-sufficient; however, increasing droughts and harvest losses are endangering this, further stressing the 34% of the population below the income poverty line.

Tanzania's rapid GDP growth of some 6–7% annually over the past decade has come in large part from the agricultural sector, including fibers (e.g. cotton), coffee, tea, sugar, fruits, nuts (particularly cashews) and oils. Much of this growth has come from advancements in farming and harvesting; for Tanzania to maintain its economic growth and generate prosperity it must concentrate on the potential in post-harvest value-added, which has received less attention from government programmes.

Adequate post-harvest processing to maintain added value within local agrifood value chains will require both energy and financing. Tanzania, which is one of Sustainable Energy for All's 14 African priority countries, is currently struggling to expand modern energy access, which is still not available to some two-thirds of the population. At the same time, only 9% of Tanzania's population has access to formal financial services, and only 4% has ever received a loan from a bank – a situation that has stifled investment in the agriculture sector.

MADE POSSIBLE BY:



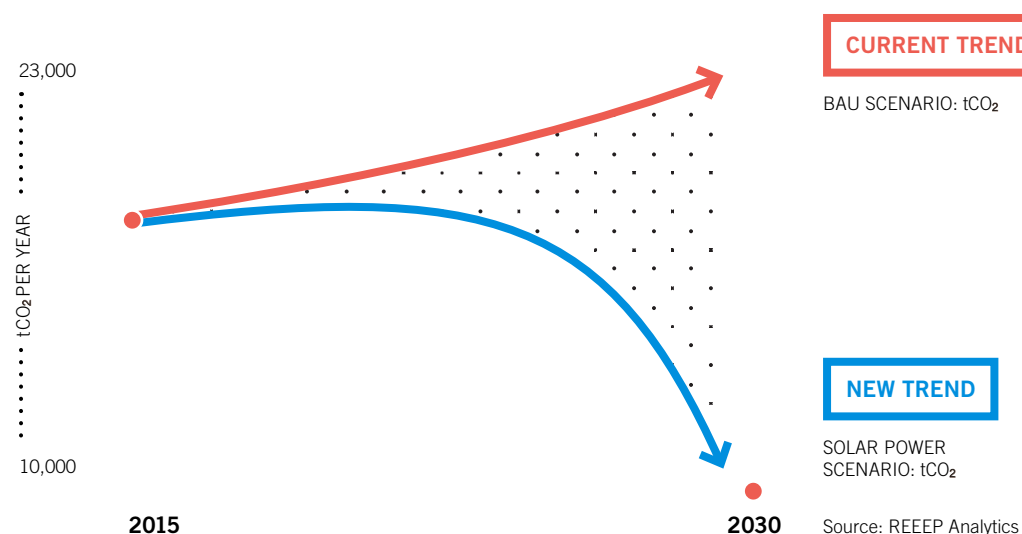
THE SOLUTION, BY REDAVIA

Redavia is a pioneer in multipurpose solar-diesel hybrid farms, standalone high-output solar PV systems that can be employed in a variety of end uses in frontier markets, and paid for via an innovative Pay As You Go model.

Redavia will replicate this product, which has already found success in sectors with similar energy demand (for instance, the mining sector), and does not require up-front investment, in the agricultural sector. Redavia's innovative business model will replace unreliable fossil fuel-based power from the electricity grid, resulting in 20–50% reductions in energy costs for agricultural processors, while expanding access to nearby communities via mini-grids.

Redavia will be focusing initially on coffee, tea, oilseeds and cashews processing firms, which suffer from frequent power outages and high costs of back-up-generator power.

This project is currently under consideration.



RENEWABLE ENERGY FARMING SOLUTIONS IN NICARAGUA

POWERING AGRIFOOD VALUE CHAINS: TECNOSOL

Nicaragua is Central America's poorest country, with about half the population of 5.68 million living on less than USD 1 per day, most of these in rural areas. According to the Central Bank of Nicaragua, the agricultural sector represents 20% of GDP and more than 60% of annual exports, while providing 30% of formal employment. As in many developing countries, the sector is dominated by small farmers, with three quarters of farmers owning less than 3.5 hectares.

Nicaraguan agricultural practices are highly inefficient. In the cattle livestock sector, which represents some 45% of the agricultural sector and is alone responsible for 10% of Nicaragua's GDP, Nicaragua trails its neighbors in per-cow production, fertility and growth. Smallholder cattle farmers generally follow unproductive and environmentally deleterious short-term pasture strategies to compensate for limited grazing areas, often triggering deforestation and land degradation. Forest conversion to pasture land has accounted for some 97% of total CO₂ emissions in Brazil, Chile, Nicaragua and Paraguay.

Much of Nicaragua has no access to electricity, with only 43% electrification rates in rural areas, where the majority of the agricultural sector is located. Nicaragua is home to significant renewable potential from various sources, including solar and biomass, and while the government is pursuing aggressive renewable energy goals (94% renewable by 2017), these goals remain elusive.

THE SOLUTION, BY TECNOSOL

Tecnosol has been a pioneer for clean energy technologies in Nicaragua for over 15 years. As interest in compact clean energy solutions is increasing, Tecnosol has expanded their product offering from distributed solar PV systems to include bio-gasifiers, solar water pumps and solar-powered electric fencing.



As part of Powering Agrifood Value Chains, Tecnosol will be tapping latent demand for multi-purpose energy solutions that fulfil a range of needs of small farmers in off-grid areas, including manure-based biogasification, solar powered electric fencing units, solar water pumps and standalone solar PV units.

The multipurpose farming solutions will impart a breadth of benefits to farmers and rural areas. Electric fencing and the associated training significantly improves pasture management techniques and limits land degradation and deforestation. Manure biodigesters improve waste processing and generate energy for household cooking and electricity needs.

Tecnosol is partnering with major micro-lender KIVA to meet demand for financing for these productivity-improving products that local banks are unable to meet.

MADE POSSIBLE BY:



EFFICIENT IRRIGATION IN NICARAGUA

POWERING AGRIFOOD VALUE CHAINS: IDEAL TECNOLOGÍAS

Nicaragua's agricultural sector represents 20% of annual GDP and 60% of exports.

Among the sector's most important products are basic grains, which is responsible for around 40% of agricultural-derived GDP, and coffee, as well as various fruits and vegetables. Like the livestock sector grain, coffee, fruit and vegetable farms are significantly less productive than farms in neighboring countries, a situation that represents a significant opportunity for improving the country's prosperity through technological and market oriented advancements.

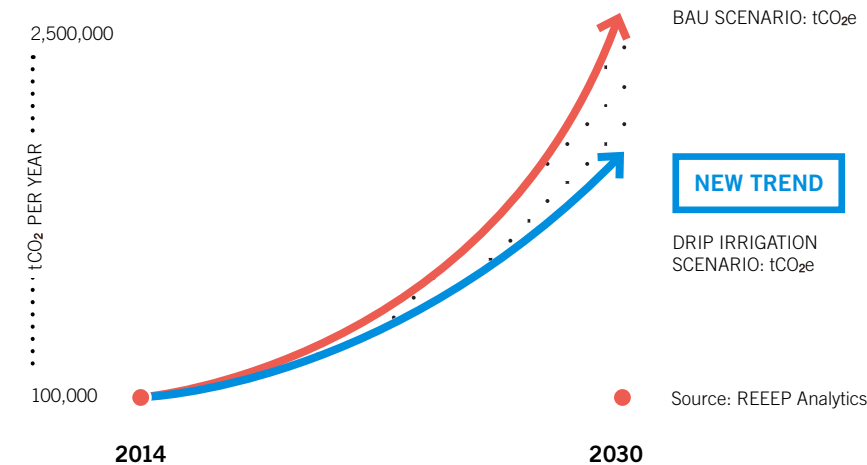
In Nicaragua, while only around 10% of arable land is irrigated, increasing droughts and extended dry seasons are exerting additional stress on farmers throughout the country. Crop management in Nicaragua is typically inefficient, characterised by field flooding and furrow irrigation, and using disproportionate amounts of fertilizers and pesticides. The sector is ripe for innovation.

THE SOLUTION, BY IDEAL TECNOLOGÍAS

Low-pressure drip irrigation holds tremendous potential to increase efficiency, reduce water and fertilizer use, extend growing seasons and improve productivity. By precisely delivering smaller amounts of water directly to plant roots, low-pressure drip irrigation increases output and can extend effective productive seasons.



In Nicaragua, barriers to this technology include a lack of financing, as well as a lack of understanding and risk aversion from both farmers and lenders. iDEal Tecnologías is addressing these with a combination of a specialised micro drip irrigation system to lower overall cost, a strategy to cultivate a retailer network of technicians who can both sell and conduct after-sales service, and a marketing plan focusing on opening doors for longer term agricultural practice transformation.



CONNECTING CLIMATE KNOWLEDGE: TALKING ABOUT A REVOLUTION

BY GEOFFREY BARNARD

GEOFFREY BARNARD

KNOWLEDGE MANAGEMENT STRATEGY ADVISOR –
CLIMATE AND DEVELOPMENT KNOWLEDGE NETWORK
(CDKN), AND CHAIR – CKB STEERING GROUP

A quiet revolution is happening in the climate information world, in what feels like a remarkable outbreak of collaboration, innovation and joined-up thinking.

It all began at an exploratory workshop in 2011 to test the appetite for collaboration between climate knowledge players. “Surely we can do this job better if we are talking to each other,” was the hypothesis. At the time it was not obvious that initiatives would be prepared to work together, given that they were in many respects competing for attention and user ‘clicks’. But four years on, this hypothesis feels like a ‘no brainer’. If we are not combining efforts how can we crack the huge challenge of getting reliable climate information into the hands of those who need it?

This is good news for climate information users, many of whom are drowning in a flood of reports, scenarios, tool-kits and other publications that are being produced each year, yet struggle to find what’s useful to them in their daily work as town planners, agricultural extension workers, energy policy advisors, and the host of other roles where climate impacts need to be factored into analysis and decision making.

Emerging from that workshop was the Climate Knowledge Brokers (CKB) Group. It began as an informal group of collaboration-minded climate websites and portals and has grown to become a thriving community of practice embracing many of the leading global, regional and national information players. Unusually, it cuts across all the different climate-related sub-sectors, from green growth to disaster risk reduction.

Rather than an information ‘free for all’ where everyone is doing their own thing, a new vision is emerging: It is of a connected climate information world where users are guided to what is relevant to them, where content flows between websites easily, and where information providers

work together and learn from each other, rather than operating in isolation. In a nod to demand-sensitive smart electricity grids necessary cope with future distributed energy generation and use, it has been dubbed the ‘climate knowledge grid’.

REEEP has been at the heart of this revolution, among a group of pioneers that has taken on a leadership role in championing collaborative approaches across the whole climate field. In 2014, REEEP took on the role of hosting the newly-created CKB Coordination Hub that is orchestrating efforts to make the vision of a joined-up information world a reality.

Progress is coming via a combination of technology and trust. Smart digital tools are creating new ways of to share information, allowing people to find what they are looking for quickly and precisely. ‘Climate Tagger’ is one of these. It allows online content to be automatically ‘tagged’ with a consistent set of key words so it becomes much easier to find. Developed by REEEP, it is fast becoming an industry standard, and in 2014/2015 alone was used to tag over a million documents.

Without the trust element, however, these clever tools would rust in the digital toolbox. Face-to-face meetings have been crucial in building a collaborative ethos within the CKB Group, particularly ‘knowledge clinics’, which have become staple items on workshop agendas. Participants take turns as ‘patients’, sharing challenges and getting practical advice from peers on how to tackle them.

Every good revolution needs a manifesto, and the CKB Group is working on just such a document. The aim is to present in simple and convincing terms the rationale behind the CKB vision and the principles that will guide the development of the knowledge grid concept. It is early days. It will need concerted effort and ongoing investment of resources for the full vision to be realised. But the signs are encouraging and the potential benefits for climate information users everywhere compelling. Bring on the revolution!

– Geoffrey Barnard

For renewable energy technologies like off-shore wind to be as efficient as possible, they must be seamlessly connected into a smart electricity grid. For knowledge, such seamless connectivity is equally important.



PATHWAY: CONNECTING CLIMATE KNOWLEDGE

The Connecting Climate Knowledge Pathway and Portfolio were borne out of our deep experience in global climate compatible development efforts, our understanding of the technical data and knowledge systems that characterise the landscape and our success in advocating, designing and implementing solutions based on the principles of Open Data.

The Pathway is designed to unleash the vast potential in efficiency gains and improved decision making possible by breaking down “knowledge silos” and barriers, and creating tools and support mechanisms to enable technology transfer between and among creators, brokers and users of knowledge.

THE ROAD TO A CLIMATE KNOWLEDGE GRID

Millions of people use climate-related information and data for a wide range of purposes, and those developing responses to climate change demand high quality data, information and knowledge to assess impacts and vulnerabilities associated with climate change, develop mitigation solutions, and improve resilience of vulnerable regions. Producing and providing this data, information and knowledge comes at a high cost for governments, businesses, international organisations, academia and NGOs.

Unfortunately these efforts are not always successful; information and knowledge products are often underutilised, duplicating existing material or simply misaligned with users’ needs. The system of knowledge resources itself is over-populated and disassociated, leaving users with bewildering arrays of alternatives, each of which is incomplete or even conflicting. This challenge increases when working in developing countries and when there is a need to tailor global data to local conditions.

As a core partner in the Climate Knowledge Brokers Group (CKB), REEEP’s Connecting Climate Knowledge Pathway is also working toward an ambitious goal being put forward by the CKB Group: the creation of a **Climate Knowledge Grid** – a “smart grid” for climate knowledge that can act as a backbone resource for any knowledge-focused organisation or portal active in the climate and development spaces.

The Climate Knowledge Grid (the Grid), will enable streamlined coordination of the activities of climate knowledge providers by providing – free of charge – the technical tools needed to tap

into the grid, as well as support in communicating effectively with their users while retaining the ability to tailor designs, structures, brands and specific offers.

There are two equally-important sides of this effort: people and technology.

PEOPLE

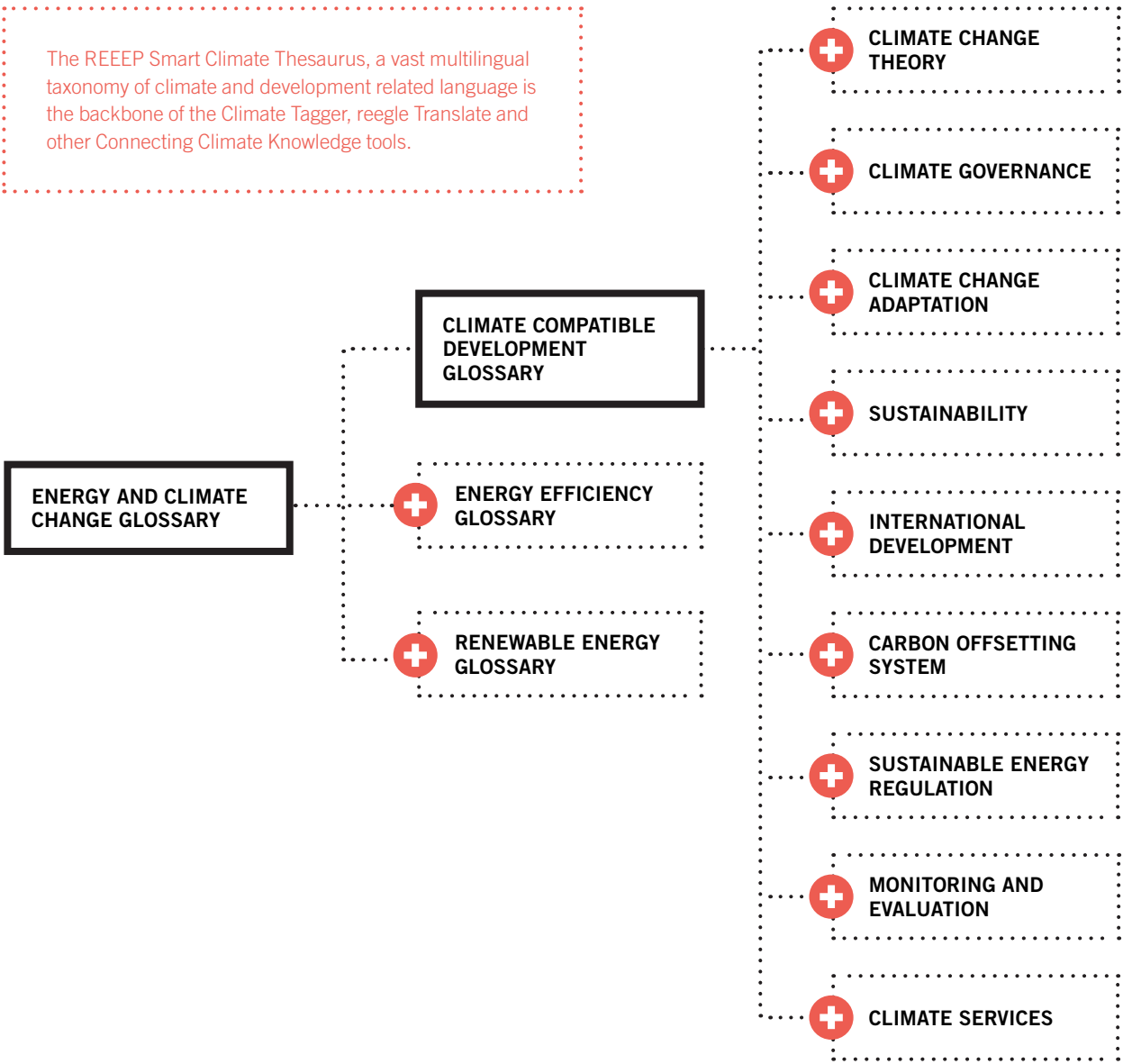
A Climate Knowledge Grid can only come about and be successful if it is driven by an inclusive community of “knowledge brokers” who have taken the role of collectors, curators, and providers of the data and knowledge at hand. This community of practice must be active in sharing knowledge, addressing coverage and quality, developing shared tools and services, building capacity and applying that capacity to new challenges.

The CKB Group is the home of the community of practice that will make the Climate Knowledge Grid possible. With the official launch of the CKB Group Coordination Hub in 2014, this emerging alliance of around 150 of the leading global, regional and national knowledge brokers from the climate and development spaces has made tremendous progress in convening and mobilising key players, catalysing collaborative efforts and new products, and providing a focal point and voice for the climate knowledge broker community as a whole.

The Coordination Hub began in earnest, organising the CKB Annual Workshop in Brighton, UK in October, bringing together 39 participants from 27 organisations and four regions. The Annual Workshop acted as a launch pad for the hub, generating buy-in and commitments from key players, as well as the outlines of a long-term strategy that would, among others, seek to create the Climate Knowledge Grid. The Coordination Hub, together with CDKN and ODI, held a special outreach session on the climate grid in London, including a panel discussion and meet and greet.

The hub’s outreach continued at COP20 in Lima, where it hosted a special Latin American Workshop involving 16 organisations, which focused on the specific needs and issues faced by organisations in the Latin American region.

CONTINUED ON PAGE 38 →



IMPACT

CKB GROUP, CLIMATE TAGGER AND THE GREEN GROWTH KNOWLEDGE PLATFORM

— Benjamin Simmons, Head of the GGKP

The Green Growth Knowledge Platform (GGKP) worked with the CKB Group throughout the development of its web platform (www.greengrowthknowledge.org).

In the initial stages, we brought our ideas to a 2012 meeting of the CKB Group, where we received expert advice and feedback that shed light on many of the challenges other knowledge platforms face, while also showing us tools to make knowledge more impactful.

One of these tools was Climate Tagger. Seeing first-hand the benefits the tool afforded to other CKB members, we integrated the Climate Tagger API into our resource library. Since then, it has helped us consistently and efficiently tag close to 1000 green growth publications.

Participation has also been key in helping us forge deeper relationships with other knowledge management experts. Throughout the development of our platform, the feedback and advice we received from members was invaluable. The CKB Group continues to expose us to new and innovative knowledge management tools, facilitates opportunities for us to gather expert advice, and instills in us the confidence to implement ambitious new developments.

PATHWAY: CONNECTING CLIMATE KNOWLEDGE

The hub also co-hosted a COP20 official side event on climate knowledge brokering, which included high level speakers from REEEP, CDKN, CTCN and CSE India, and participated in multiple related events around the conference.

In 2015, together with REEEP's monitoring and evaluation team, the hub created a CKB-specific monitoring and evaluation strategy and framework to set objectives and monitor outcomes, establishing a CKB M&E Panel of Experts to oversee and guide the process. At the same time, the hub is managing an in-depth multistakeholder process to create a Climate Knowledge Brokers Manifesto, a document that will describe the role and goals of the Climate Knowledge Broker community to audiences worldwide, and which will form the conceptual foundation for the years to come.

TECHNOLOGY

The other side of the Climate Knowledge Grid is technology. Technology can be a tremendous resource for knowledge brokers and users, or – if budgets, capacity, understanding and time are limited – it can be an insurmountable obstacle. REEEP, in cooperation with other organisations active in the CKB Group, is seeking to create an easy-to-use and affordable technological platform that will enable knowledge providers to become part of the Grid. This platform will effectively remove the technical barriers to integration, and provide state-of-the-art solutions built on the principles of openness and sharing, whilst, crucially, allowing use-specific tailoring for branding and other purposes.

While a flexible, modular technological platform is still to come, many tools of the Climate Knowledge Grid have already been developed. One of the most important for REEEP in 2014/2015 has been **Climate Tagger**.

Climate Tagger is a suite of software tools for strengthening and uniting organisations using knowledge to fight climate change, improve resiliency and further green growth across the world. It works by applying automated tagging to unstructured content in databases, websites or online libraries in French, English, German, Spanish or Portuguese. The result is a streamlined knowledge system, with key concepts connected to definitions and taxonomies created and vetted by experts and linked to related content within and beyond the system at hand. At the core of Climate Tagger is the multilingual Climate Smart

Thesaurus, a vast catalogue of specialised terminology, including mapped links to synonyms and related terms. In 2014, REEEP and the Climate Technology Centre and Network hosted by the United Nations Environment Programme (CTCN) worked together to further expand the Climate Smart Thesaurus to include new taxonomies for the fields of greenhouse gas emissions in industry and the economics of adaptation, comprising over 900 specialised terms each in three languages.

Climate Tagger is a *collaboration non plus ultra* – a truly joint global effort that emerged from the swirl of ideas exchanged in the CKB Group. REEEP drove the Climate Tagger effort in collaboration with the US National Renewable Energy Laboratory's Open Energy Information programme, the Stockholm Environment Institute's weADAPT programme and the Institute for Development Studies' Eldis programme. Climate Tagger would not have been possible without the generous support of key donors, including the Climate and Development Knowledge Network, the Federal Government of Germany and the Climate Technology Centre and Network (CTCN).

The Climate Smart Thesaurus is not only accessible to the organisations using Climate Tagger – REEEP also makes the definitions and taxonomies from the Climate Smart Thesaurus available to individual users via the Climate Smart Glossary (www.reeep.org/glossary), launched together with REEEP's new web presence in early 2015, and with reegle. In March 2015 REEEP launched a new service, *reegle Translate*, a simple and easy-to-use tool that provides expert translations in five languages for highly specialised and technical terminology from fields related to climate change, global development, clean energy and others (www.translate.reegle.info).



Technicians explain how a Station Energy solar PV unit works in Uganda (Credit: Station Energy)

SMART CITIES



Urbanisation has quickened in the 21st Century. Today, city dwellers account for about half of the total global population. With some 800,000 new urban residents every week, seven out of ten of the 9.6 billion people on the planet in 2050 will likely be living in cities.

Developing countries are expanding their role in global economic growth, driving up per capita incomes and enabling increasingly resource-intensive lifestyles. This places acute resource strains on concentrated (urban) areas.

Cities and metropolitan regions are the engines of this economic activity and resource consumption, already accounting for some two thirds of all greenhouse gas emissions. Globally, “business as usual” will increase demand for water, energy and food by 30–50% by the year 2030.

One challenge is how to secure adequate living conditions for the poor. There are currently 1 billion slum dwellers (projected to increase to 2 billion by 2030) who are especially food insecure and disconnected

from (or dependent on highly over-priced) government water and energy services.

But because cities are economic and knowledge centres, have lower per-capita infrastructure costs and more localized transportation needs compared to rural areas, there are tremendous opportunities for cities to move toward sustainability – such as improving efficiency and deploying renewable energy technologies and systems for water, food, housing and transport infrastructure and systems.

REEEP is building a portfolio designed to make cities more efficient and sustainable, while improving the health and livelihoods of urban residents.

PATHWAY: URBAN WATER WORKS

REEEP URBAN WATER WORKS 2014/2015

Urban water and wastewater systems are core elements of the infrastructure necessary to create safe, healthy and vibrant cities. Operating 24 hours a day, every day, municipal water works are also among the largest consumers of electricity in a community – and thus often also among a community’s greatest emitter of GHG emissions. With rapid growth of the urban middle class projected throughout the developing world, demand for urban municipal water and wastewater services is expected to rise by at least 40% by 2030.

In developing countries, electricity costs often make up to 40% of total operating costs for water and wastewater facilities. These systems are often riddled with inefficiencies, housing a tremendous potential for reducing costs and GHG emissions.

Clean energy technologies and systems can drastically improve efficiency and reduce and avoid GHG emissions in urban water and wastewater infrastructure, and do so cost-effectively, with investments often paying off within five years.

Advancements in technology are leading to new and novel ways to integrate clean energy into existing systems every year. In 2014, REEEP Project Partner eThekweni Water and Sanitation (Durban, South Africa) was awarded the prestigious Stockholm Industry Water Award for its work in assuring sustainability and access to the city of Durban. One example of this work is a REEEP-funded mini hydro-power project: instead of using pressure reducing valves in pipes running down steep hillsides, the company is installing mini turbines using the excess pressure to generate electricity for the city’s low tension grid. The project culminated in a full-day training workshop in March 2015 for 45 participants and involving similar utilities from neighbouring municipalities, hydropower developers, engineering firms, and financing agencies.

As part of the REEEP Urban Water Works Pathway, we are working with the United Nations Industrial Development Organization (UNIDO) and the European Commission on an innovative pilot initiative to ignite growth in markets for clean energy solutions in urban water works in Sub-Saharan Africa. Beginning in South Africa and in close partnership with the South Africa National Energy Development Institute (SANEDI), the host of REEEP’s Southern Africa Regional Secretariat, we will be working with the South African Department of Environmental Affairs, the South African Local Government Association, and other local players and global experts to create model pathways for market shift, invest in a portfolio of public-private demonstration projects that will be subject to our extensive monitoring, evaluation and learning framework, and use the insight and intelligence gained to catalyse regional replication of clean energy deployment in urban water works.

Beginning in South Africa and in close partnership with the South Africa National Energy Development Institute (SANEDI), the host of REEEP’s Southern Africa Regional Secretariat, we will be working with local players and global experts to create model pathways for market shift, invest in a portfolio of public-private demonstration projects that will be subject to our extensive monitoring, evaluation and learning framework, and use the insight and intelligence gained to catalyse regional replication of clean energy deployment in urban water works.

PATHWAY: SUSTAINABLE URBAN TRANSPORT

Mobility is a central challenge for city dwellers, planners and economies. While cities worldwide are seeing an explosion of transport demand, automobile traffic is costing them billions of dollars per year in lost productivity, pollution, accidents and management; meanwhile, the transport sector has become the fastest growing source of greenhouse gas emissions.

REEEP is working to accelerate markets for new technologies and services that improve efficiency and utilise renewable energy sources to reduce the carbon and particulate matter footprints of booming urban environments and improve quality of life and economic opportunities for urban citizens.

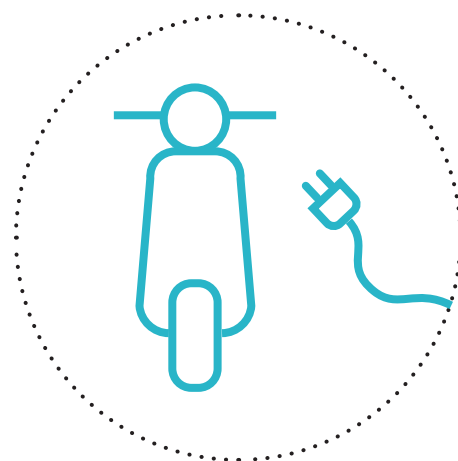
REEEP SUSTAINABLE URBAN TRANSPORT 2014/2015

REEEP is tackling the transport problem from the individual mobility alternatives perspective, as well as that of public transportation design.

In many booming cities around the world, a clean and efficient form of individual transportation – the lowly bicycle – is being gradually overtaken in popularity by motorized vehicles such as motorcycles, scooters, and small automobiles. Numerous factors are involved in this shift, from cultural trends (motor-bikes as status symbols) to physical ones (worsening smog making physical exertion increasingly difficult), and these factors need to be incorporated into market-oriented solutions to city mobility.

A REEEP venture in Vietnam is tackling these issues head on with a unique approach at promoting electric bicycles and scooters to a new generation of climate conscious customer. The Bach Khoa E-Bike Project (BK-Ebike), managed on the ground by Caritas Switzerland, launched in February 2015 its first solar powered e-bike station in Hanoi, in doing so beginning a trend of changing transport habits and transforming perceptions. BK-Ebike carried out extensive market research before launch, developing an impact-oriented business model that would integrate economically and socially disadvantaged into an innovative, for-profit business model targeting students and tourists for the high-quality affordable electric bicycles and scooters.

The other side of the mobility question is public transportation. For booming cities to meet the transportation needs of their

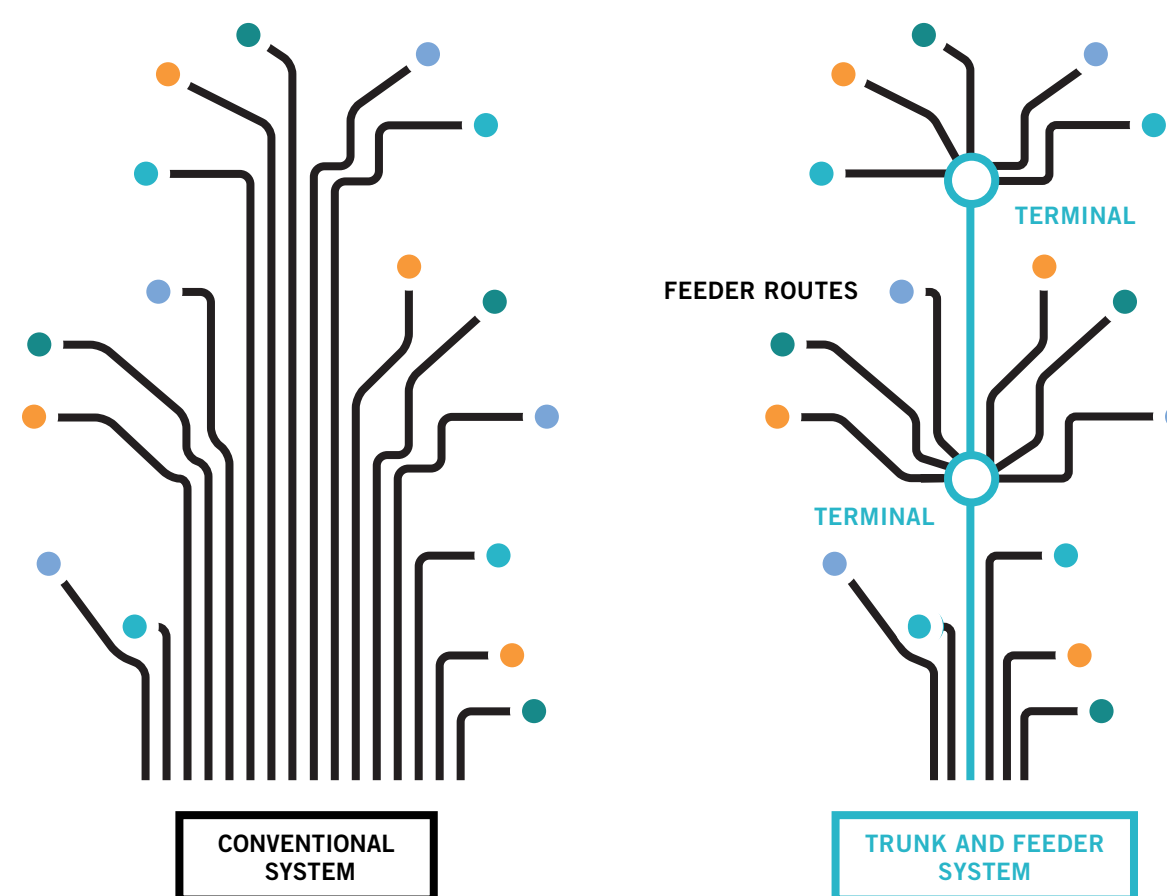


citizens they must provide effective, efficient public transport options.

Public transport reduces the need for individual vehicle ownership, preventing vast amounts of carbon and other pollution from being emitted into the atmosphere, while improving economic productivity and enhancing public health and safety.

REEEP is drawing on its expertise in the technologies necessary to connect and enhance data and knowledge across sectors and agencies (see the Connecting Climate Knowledge Pathway on page 36 for more), and its experiences in mobilizing and driving impact oriented clean energy projects on the ground to pursue cost-effective, data-driven solutions to the public transport challenges of growing cities in the developing world. Rather than focus on vehicle technologies, REEEP is looking at how city planners use information to design and evolve public transport systems.

A key example of this approach can be found in Indonesia, where a REEEP Project from partner Institute for Transportation and Development Policy worked with the Indonesian government and TransJakarta, a Bus Rapid Transport (BRT) system, to develop a highly efficient Trunk and Feeder system that would reduce emissions, lower costs and increase ridership in Jakarta. A REEEP Deep Impact Assessment (see



IN JAKARTA, A TRUNK AND FEEDER BUS RAPID TRANSIT SYSTEM HAS IMPROVED EFFICIENCY OVER A CONVENTIONAL SYSTEM

page 63 for more) found that the improved BRT services are already saving some 33,000 tonnes of CO₂ emissions annually.

How can city planners improve transport planning decision making? There exists a wealth of relevant data and information that could drastically improve this decision making, were it to be integrated and accessible. The concept of open data, in

which datasets are published on the Internet in a standardised, machine-readable format with licenses for re-use, has helped transform evidenced-based decision making in health care and other sectors, and has enormous potential to revolutionise the transport sector.

PATHWAY: EFFICIENT, AFFORDABLE HOUSING

With accelerated rates of urbanisation have come increased pressures for urban and suburban populations in meeting various needs, including housing and basic related infrastructure such as water and sanitation, transport and electricity. More than a billion city dwellers worldwide live in inadequate housing, in some cities up to 80% of the population. Fifty-five million people have moved to slums since 2000. This is a substantial market for improved and affordable housing.

At the same time, construction and the built environment are enormous contributors to energy consumption and CO₂ emissions (currently about a third of worldwide energy demand and CO₂ emissions). Housing also demands large amounts of natural resources and has often unforeseen impacts on the environment, particularly in cities with few resources for adequate city planning.

As part of our Smart Cities Focal Area, we are working to bring efficient building practices and technologies to the challenge of affordable housing development in emerging markets and developing countries.

Our initial housing-specific efforts have been in South Africa, which faces unique challenges in the low-income housing sector. REEEP co-hosted a series of high-level working groups on energy efficiency in the housing sector together with the South African National Energy Development Institute (SANEDI), with over fifty delegates representing governments, scientific institutions, financial institutions, and businesses.

In Western Africa, REEEP-supported work on efficiency in buildings is moving to the next level. Based on the success of an early partnership with Econoler Inc in developing efficiency standards for the West African Economic and Monetary Union (WAEMU) for lamps and appliances, REEEP financed a second phase that would expand the scope of the energy efficiency standards, and develop a new regional energy efficiency code for buildings. The impacts of these efforts, made possible by support from the Swiss government, will be substantial – a building code concept recently developed for Benin suggests that up to 35% energy savings can be achieved in target buildings as a result of such a code.

IMPACT

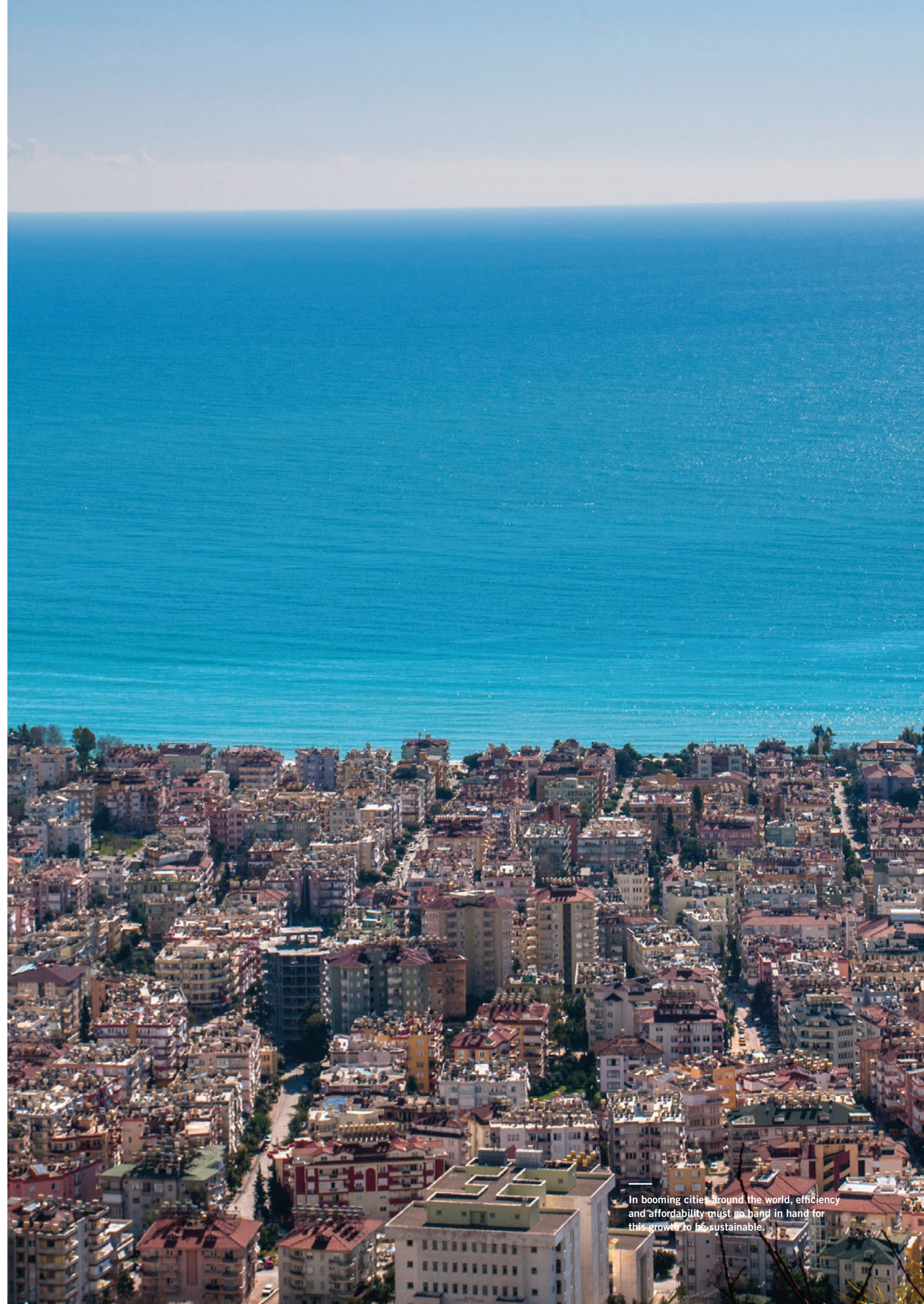
REEEP DEEP IMPACT ASSESSMENT: EFFICIENT BUILDINGS

The Changjiang River (CJR) Basin in China accommodates about 500 million people and new buildings are being constructed at a rate of approximately 5,000 million m² every year. According to IRENA's estimates based on IEA, the building sector consumes around 21% of China's total energy use. A REEEP roadmap for promoting the use of solar water heaters and ground-source heat pumps was critical to informing REEEP's Efficient, Affordable Housing Pathway, as well as acting as a core input into China's Ministry of Housing and Urban-Rural Development (MoHURD) work on building efficiency.

The report estimated that, by 2015, solar water heating in the CJR region could save an amount of 14,050,000 tCO₂e per year; and 1,450,000 tCO₂e per year for ground source heat pump water heating (geothermal) – equivalent to an energy saving of 626 terawatt hours (tWh) per year.

The report, which is expected to be integrated into China's 13th five-year plan, was also the basis for a high-level study in *Renewable and Sustainable Energy Reviews*, titled "Promotion of Building Integrated Solar Water Heaters in Urbanized Areas in China: Experience, Potential, and Recommendations".

In booming cities around the world, efficiency and affordability must go hand in hand for this growth to be sustainable.



ENERGY ACCESS



Energy is fundamental to generating prosperity. Yet worldwide nearly 1.3 billion people do not have access to modern electricity. Many more people throughout the world are not connected to formal energy grids. We are working to build a portfolio that capitalizes on innovative ways to increase energy access for the world's rural and urban populations to fight energy poverty and improve livelihoods.

In September 2011, UN Secretary General Ban Ki-moon launched Sustainable Energy for All (SE4All), a global initiative with three core objectives:

- providing universal access to modern energy services
- doubling the global rate of improvement in energy efficiency
- doubling the share of renewable energy in the global energy mix

SE4All is leading and mobilising the global response to the energy access challenge, and like REEEP understands the importance of clean energy in achieving universal access. REEEP supports the aims of SE4All through most of our work (including direct contributions as part of the Water-Energy-Food Nexus High Impact Opportunity), and nowhere more categorically than the Energy Access Focal Area.

"ENERGY IS THE GOLDEN THREAD THAT CONNECTS ECONOMIC GROWTH, INCREASED SOCIAL EQUITY, AND AN ENVIRONMENT THAT ALLOWS THE WORLD TO THRIVE."

— UN SECRETARY GENERAL
BAN KI-MOON

SUSTAINABLE ENERGY FOR ALL: AN IDEA WHOSE TIME HAS COME BY KANDEH YUMKELLA

KANDEH YUMKELLA

SPECIAL REPRESENTATIVE OF THE UN SECRETARY –
GENERAL AND CHIEF EXECUTIVE OF THE SUSTAINABLE
ENERGY FOR ALL INITIATIVE (SE4ALL)

The world faces two urgent and interconnected challenges related to energy.

One concerns energy access. Nearly one person in five on the planet still lacks access to electricity. More than twice that number, almost 3 billion people, rely on wood, coal, charcoal or animal waste for cooking and heating. This is a major barrier to eradicating poverty and building shared prosperity.

The other challenge is energy waste and pollution in places where modern energy services are plentiful. Emissions of carbon dioxide and other greenhouse gases from fossil fuels are contributing to changes in the Earth's climate that are causing widespread harm to lives, communities, infrastructure, institutions and budgets. Climate change threatens food and water security for hundreds of millions of people around the world, undermining the most essential foundations of local, national and global stability.

Competition for scarce resources is increasing, exacerbating old conflicts and creating new ones. As lands degrade, forests fall, and sea levels rise, the movement of people driven from their homes by environmental change may reshape the human geography of the planet. Climate change puts us all at risk, but it hurts the poor first – and worst.

The key to both challenges is to provide Sustainable Energy for All – energy that is accessible, cleaner and more efficient. Touching on so many aspects of life, from job creation to economic development, from security concerns to the empowerment of women, energy lies at the heart of all countries' core interests.

The Sustainable Energy for All initiative, launched by UN Secretary-General Ban Ki-moon in 2011 and co-chaired by the World Bank, seeks to achieve three ambitious goals by 2030: universal access to modern energy services, a doubling of the global rate of improvement in energy efficiency, and a doubling of the share of renewable energy in the global energy mix.

The United Nations General Assembly declared 2014 – 2024 as the International Decade of Sustainable Energy for All in recognition of the crucial role that energy plays in sustainable development. The first two years of the Decade are focusing on the connections between energy, women, children and health.

Sustainable energy is about new opportunities. It enables businesses to grow, generates jobs and creates new markets. Children can study after dark. Clinics can store life-saving vaccines. Countries can grow more resilient, building competitive economies. With sustainable energy, countries can leapfrog over the limits of the energy systems of the past and build the clean energy economies of the future, thereby improving overall quality of life for their citizens.

Energy is recognized as a fundamental enabler for the fulfilment of the future Sustainable Development Goals. Sustainable Energy for All is an idea whose time has come.

"REEEP HAS BEEN A SIGNIFICANT PLAYER IN DRIVING ENERGY TRANSFORMATIONS FOR OVER TEN YEARS, AND AN INDISPENSABLE ALLY IN THE GLOBAL EFFORT TO BRING SUSTAINABLE ENERGY TO ALL. SE4ALL LOOKS FORWARD TO A SUSTAINED AND FRUITFUL PARTNERSHIP AND COOPERATION IN ADDRESSING THIS IMPORTANT GLOBAL CHALLENGE."

— KANDEH YUMKELLA

PATHWAY: OFF-GRID RURAL ELECTRIFICATION

More than 1.3 billion people worldwide lack access to electricity, and reducing this number is critical to bringing opportunity and prosperity to developing countries. Many of the world's energy-poor are located in areas without connectivity to an electricity grid, some of which have few prospects for grid connectivity in the near term. While large-scale centralised power generation projects have dominated electrification efforts for decades, advancements in renewable and efficient technologies have made distributed, decentralized systems increasingly attractive to communities, consumers and even low-level industrial users.

REEEP invests in markets for off-grid electrification from the small-scale household to microgrid and minigrid applications. The provision of access to new customers, frequently from the so-called "Base of the Pyramid" (BoP), is often a central component even to those of REEEP's venture projects that are part of other REEEP Pathways. Several of REEEP's Powering Agricultural Value Chains ventures will be contributing to new or improved modern energy access to BoP customers, such as the pico-hydro agrifood mills in Nepal. While the Improved Water Mills in mountainous villages will provide a crucial energy input into the agrifood value chains of that country, they will also act to provide affordable electricity access to the villages in which they are located. With output of between 3–5kW expected per unit, enough electricity will be generated to supply small micro-grids serving villages that currently rely upon kerosene and biomass burning for lighting and cooking requirements.

In the case of Nepal, as in the case of so many markets throughout the world, the BoP suffers lack of access to modern energy not because of a lack of technological solutions or even lack of funding per se, but rather a lack of imagination, particularly when it comes to distribution. In 2014, REEEP venture partner PowerMundo was awarded \$100,000 as winner of the Inter-American Development Bank's IDEAS Energy Innovation Context, a very visible reinforcement to the conclusions of REEEP's Deep Impact Assessment (see page 63 for more). PowerMundo recognised, crucially, that the barriers to access in Peru were not technological. Rather, a lack of awareness about cleantech, high 'last mile' distribution costs, and especially the lack of efficient customer credit inhibit the rapid uptake of solutions.

To solve these challenges, PowerMundo introduced an innovative, digital Pay As You Go (PAYG) financing technology that allows end-users to digitally pay for energy in instalments. This pioneering, game-changing system eliminates the initial financial barrier to access to solar energy. Each payment can activate a solar light for a specific period of time, and ultimately, the customer owns the light after making a set number of payments.

PAYG is an example of a critical innovation not in the renewable or efficient technology itself, but in the way customers pay for – and take ownership of – that technology. It was also a central element in REEEP venture Angaza Designs' latest product, the Eco Easy Buy, the first commercially available PAYG entry level solar lamp and as such one of the world's first true, clean, direct competitors to the kerosene lamp. The lamp, offered together with Greenlight Planet and sold in a pilot phase by the social enterprise SunnyMoney, is purchased incrementally over approximately two months at a weekly price below a household's average kerosene expenditures. In addition, customers purchasing through SunnyMoney are granted an informal "credit score" in Angaza's system, allowing them to refinance or obtain new financing for more expensive products. This type of innovative de-risking activity is a critical element for spurring increased investment flows into markets and solutions that are slowed by onerous working capital constraints.

In India, long standing REEEP partner SELCO has been a pioneer of BoP energy access solutions since its founding by Harish Hande and Neville Williams in 1995. The underprivileged communities of India have suffered low access to reliable energy services due to skewed provision of these services to urban centres to meet growing demand, forcing the poor to rely on traditional (dirty) sources of energy to meet daily needs.

The main barriers to distributed renewable solutions are again not technological, but rather market gaps: unavailability of products designed to meet user needs, and the inability of end users to access appropriate financial schemes. With REEEP help, SELCO has been able to prove that financing pro-poor renewable energy services is financially viable and sustainable, and clearly show that renewable energy services have the capacity to enhance inclusive economic development and, in

doing so, lift millions of people out of poverty. REEEP's 2015 Deep Impact Evaluation found that SELCO generated key tools for demonstrating and disseminating activities and also to serve as a handbook to assist financial institutions in developing micro-finance products targeting the rural poor for the provision of renewable energy services. SELCO's impact stretches well beyond the boundaries of SELCO itself.

IMPACT

POWERMUNDO

One PowerMundo customer told us her solar lamp is much safer than candles, which can cause a fire. "I can leave it on all night without a problem. I can also sew better at night ... In the evenings I can walk around safely, to check on the animals or water the crops."

In Peru, distributed solar lamps are popular even in villages with access to the electricity grid because many families do not yet earn enough to be connected by utilities. (Credit: REEEP/PowerMundo)

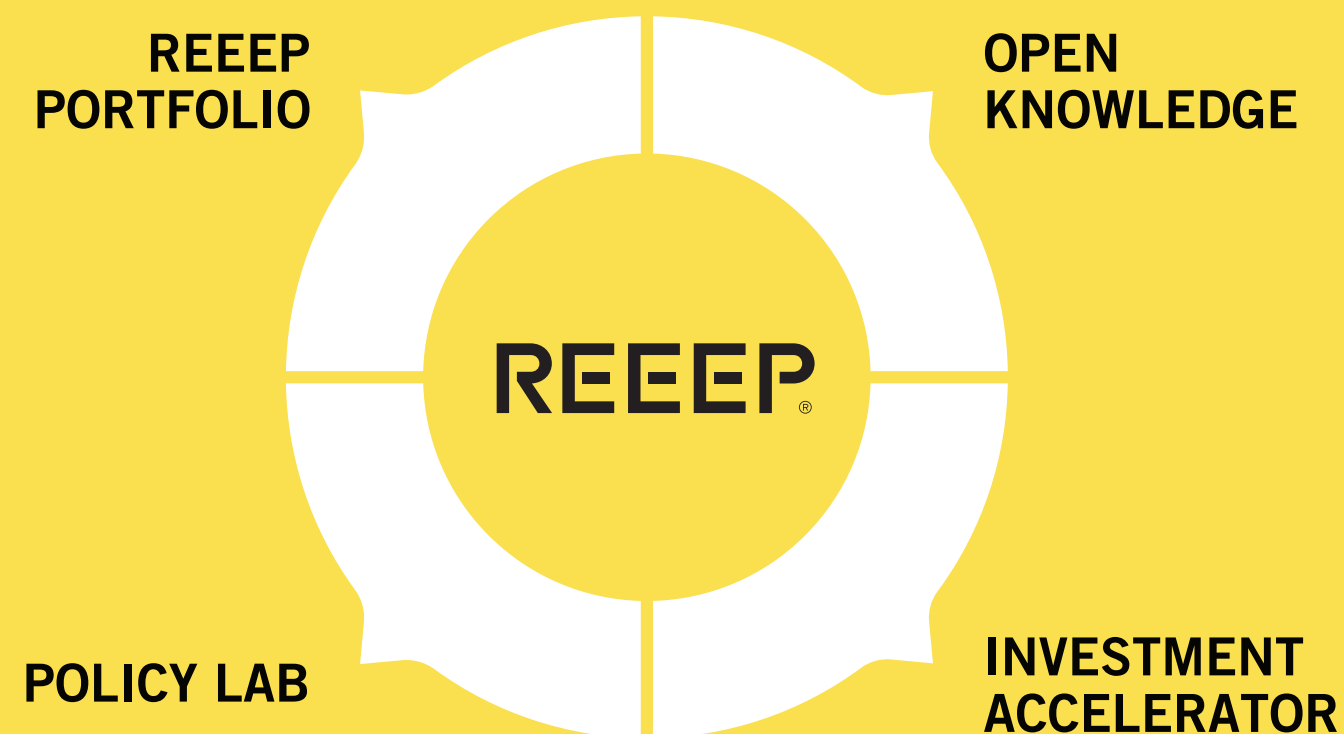


PRACTICE

PROCESS AND PRACTICE 2014/2015

REEEP invests in clean energy markets to help developing countries expand modern energy services and improve lives; increase prosperity and economic dynamism; and keep CO₂ emissions in check: a paradigm commonly known as green growth. REEEP's tools are modern clean energy technologies – renewable energy and energy efficiency – market forces, and knowledge management.

REEEP has developed a unique structure to meet the specific requirements of our approach. We operate in four key **pillar activities** which are interconnected and interdependent in our work to build sustainable markets in the developing world.



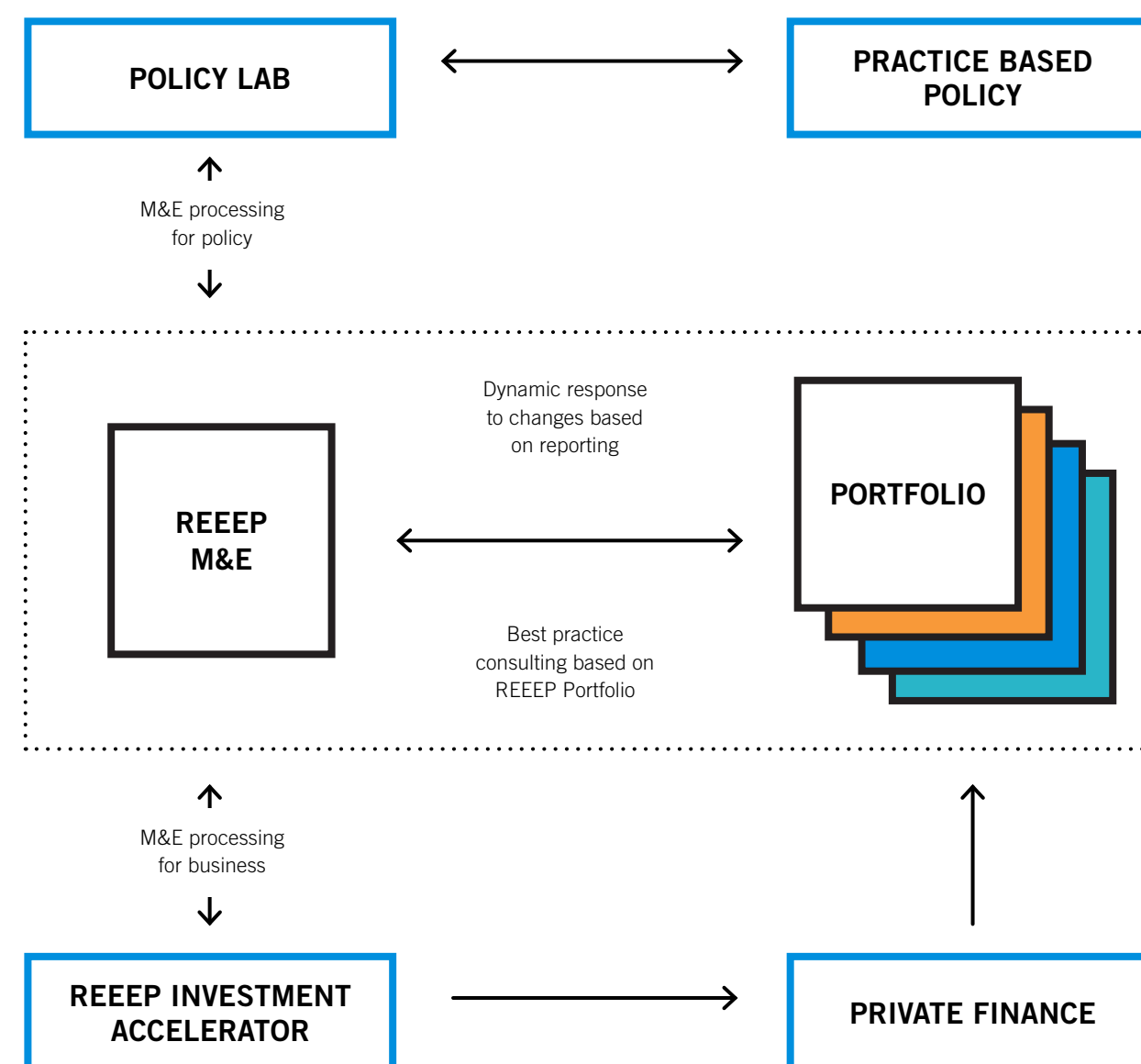
REEEP PORTFOLIO + ENHANCED M&E

REEEP's family of high-impact ventures is a catalyst for clean energy market growth in the developing world. REEEP actively scouts and recruits among entrepreneurs, vets entries and performs due diligence, and invests donor grant funding into promising endeavours.

The 2014/2015 year was significant for REEEP's Portfolio and its monitoring, evaluation and learning engine, the framework upon which REEEP's strategy and operations are built, culminating in the development of the Powering Agrifood Value Chains funding round and the selection of the nine projects making up this pioneering effort.

For some organisations, monitoring and evaluation (M&E) is an instrument for tabulating and verifying results; for REEEP it permeates and expresses the full spectrum of our strategy for accelerating clean energy markets.

REEEP's Enhanced Monitoring, Evaluation and Learning framework is our unifying approach. It begins when we articulate our institutional Theory of Change; it sets the parameters for our research and development into clean energy Focal Areas and Pathways; it informs the methodologies for our climate and prosperity scenario modelling; it describes the mechanisms through which we select, vet and collaborate with Portfolio Projects; it maps out our approach for gathering information and insights from the Portfolio; and it determines how we learn from – and act upon – those insights.



LEARNING IS NOT OPTIONAL

BY JANE CLARK

JANE CLARK

HEAD OF LEARNING: CLIMATE CHANGE – UK
DEPARTMENT FOR INTERNATIONAL DEVELOPMENT

For decades, the world has known of the climate change challenge. In response, organisations worldwide have started taking action to reduce GHG emissions and adapt economies and societies to the effects of climate change.

It is not enough. These actions have not resulted in the progress necessary to keep global temperatures within 2°C of pre-industrial levels and, more importantly, we are not adapting our responses enough to grow with the scale of the climate change challenge. For organisations, as with individuals, learning is critical to adaptation, resilience and the creation of a low-carbon economy.

At DFID, we have begun to take the role of institutional learning more seriously, creating a new team focused on what we are learning through our programmes on climate change, and what we need to change to close the gaps between individual learning and what we do as an institution.

We have found that one of the questions at the core of this effort is how to systematically link monitoring and evaluation processes with institutional learning in order to capture and share the lessons of work on the ground, measure and demonstrate the impact of that learning, and create a free flow of learning between practice on the ground and higher level policy making.

The status quo is not enough: to address climate change we need better answers and better questions, and we need them now. When we continuously learn from what works and what doesn't, our decisions and actions become increasingly effective. And when we understand learning to be an essential component of business strategy at all levels, we begin investing the necessary time and resources to grow our impact.

– Jane Clark

THE START, THE JOURNEY AND THE DESTINATION

For REEEP, learning is essential to achieving impact. For this reason, the REEEP Portfolio and Investment Accelerator are subject to a rigorous proprietary monitoring, evaluation and learning framework (or “enhanced M&E”) designed to integrate entrepreneurs into a climate smart development process with clear prosperity impact.

REEEP's overarching strategy revolves around the hypothesis that if targeted investments are made into specific subsectors of a marketplace for clean energy; if those investments are closely monitored and evaluated; and if the unique insight gained through the evaluations are reapplied into both the investment strategy and a learning and policy-generation and delivery system; the targeted investments will have disproportionate impacts on the trajectories of two macro trends: CO₂ emissions and “composite” prosperity (see page 22 for more on composite prosperity).

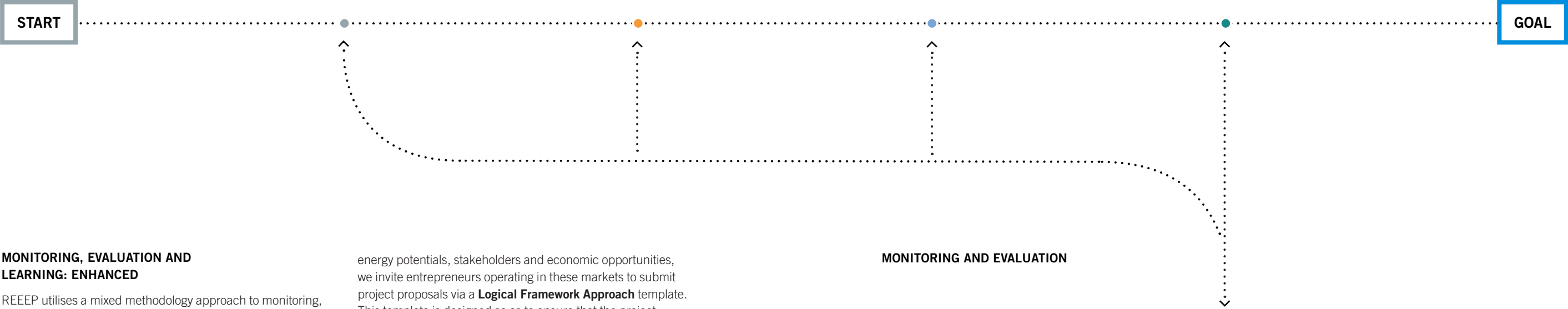
REEEP has designed a novel monitoring, evaluation and learning framework to help in understanding the sectors in which work and our theory of how change can be brought about, as well as in carefully monitoring and evaluating outcomes and impact to gauge progress toward scenario benchmarks (see page 22 for more) on climate and prosperity. This system is designed for flexibility, and the ability to integrate into existing and expected impact accounting mechanisms and methodologies, such as UNFCCC, SE4All, and Sustainable Development Goal tracking and accounting frameworks.

REEEP also processes and translates results of enhanced M&E into policy-relevant insight which is channelled to appropriate actors for improved knowledge and decision making in policy development and investment strategies.

In 2014/2015, REEEP consulted with the Climate Knowledge Brokers Group (CKB) to employ a tailored version of its innovative monitoring, evaluation and learning framework to the needs and objectives of the CKB strategy (see more about CKB on page 38).



As part of a REEEP-supported programme by RONGEAD, entrepreneurs in Tanzania receive training on how to use compact biogas systems, helping to relieve strain on over-used water resources. (Credit: RONGEAD)



MONITORING, EVALUATION AND
LEARNING: ENHANCED

REEEP utilises a mixed methodology approach to monitoring, evaluation and learning designed to handle the complexity of the situations our projects are facing on the ground, and help us manage the various types and volumes of information flowing in and out of the project environment.

Because REEEP is a pathfinder organisation, we are operating in countries and markets with imperfect and often unreliable data and information on target markets, financial institutions, policies, key stakeholders, competition, and other elements necessary for success.

Each REEEP Pathway begins with extensive background research and analysis into a specific subsector, technology or business case, drawing upon experience and insight gained through prior REEEP Portfolio projects. This analysis looks for broad stroke evidence regarding potentials for GHG emissions mitigation and/or avoidance, and for prosperity generation. The next step is determining the modalities of action in pursuing market growth within the Pathway, whether through a REEEP-driven consortium activity (such as Climate Tagger), a request for proposals for an Enabling Portfolio project to better understand or shape relevant ecosystem conditions (such as REEEP and Econoler's efforts to mainstream energy efficient building codes in West Africa – see page 44 for more), or a targeted call for SME-level entrepreneurs to participate in the REEEP Enterprise Portfolio (such as the Powering Agrifood Value Chains funding round).

After a decision is made to enter a Pathway, REEEP carries out a sector-level **Theory of Change** analysis to set Pathway objectives and determine what a logical chain of events and outcomes should look like to arrive at those objectives. The Theory of Change is designed to guide high-level strategy, taking into account market context and cross-cutting considerations. For an Enterprise Portfolio, the REEEP call is designed to seek out entrepreneurs and business models in specific sectors and regions whose business objectives are compatible with REEEP's Pathway objectives.

With the understanding of the logical chain of outcomes necessary to meet key objectives, combined with knowledge regarding economic and market opportunity, technology,

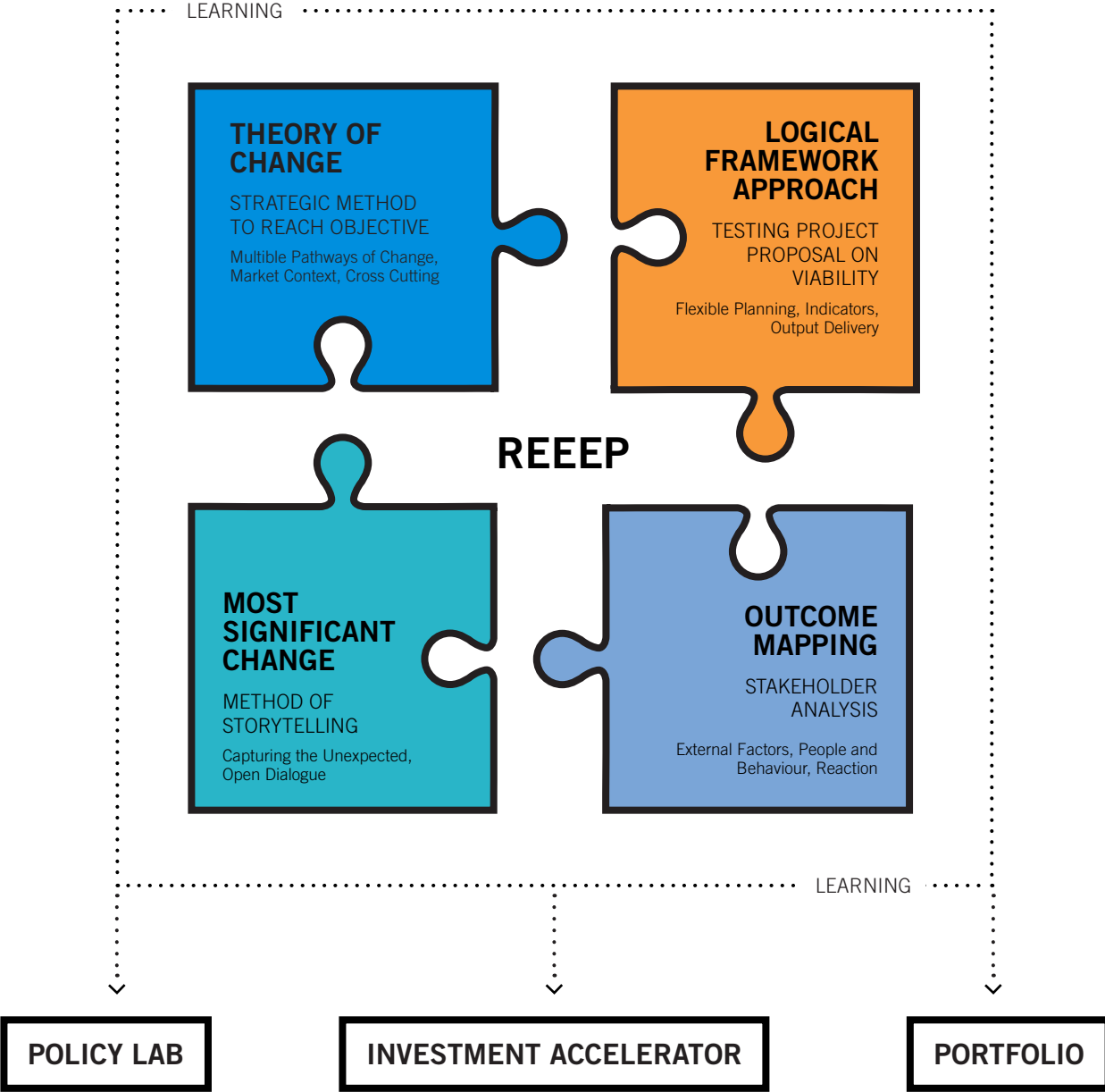
energy potentials, stakeholders and economic opportunities, we invite entrepreneurs operating in these markets to submit project proposals via a **Logical Framework Approach** template. This template is designed so as to ensure that the project proposal is built on a business plan that incorporates key steps and outcomes necessary for reaching REEEP and donor objectives. REEEP internally tests the business plan, including activities, structure and strategy for growth, to confirm they have been adequately planned to deliver a high probability of success. In cases where intelligence and evidence from similar projects would suggest altering the business plan, REEEP consults with the submitter on making appropriate changes.

REEEP then works with entrepreneurs to perform **Outcome Mapping**, a critical element of any project that relies on specific actions or behavioural changes from a broad group of stakeholders amid imperfect market settings. The Outcome Mapping begins with an analysis of stakeholders – individuals, organizations, government bodies, etc. – who influence the ability of a project to reach an objective. REEEP tests entrepreneurs' understanding of the stakeholder landscape: Are they aware of existing and potential competitors? Do they understand customer needs and unique characteristics? Are they relying upon a policy change in the future for their business model to be viable, and if so what are they doing to bring the change about? REEEP makes sure that the human element is a primary focus of the project and entrepreneur, and we track identified behavioural changes (or non-changes) that occur throughout the project. By understanding people, relationships and behaviours we can allow for real-time reflection and rapid reaction.

Finally, REEEP captures significant changes and impacts through a method of storytelling with an open format and open dialogue. These changes – known as **Most Significant Changes** – can be planned or unplanned, positive or negative, and the precise nature of these changes may be equally unknown beforehand. By recording and processing these elements we can adjust the business plan, project scope or overall strategy if necessary.

Combining these components leads to a holistic framework greater than the sum of its parts, which captures a broad range of key information and variety that make up the complex systems we are attempting to understand and influence.

MONITORING AND EVALUATION



ANATOMY OF DEEP IMPACT



In 2014 REEEP completed a detailed Deep Impact Assessment of 62 former and ongoing projects (see pages 62–63 for more), expanding the scheduled assessment requirements significantly to test, and gain insight into, elements of our new enhanced M&E framework, including the four methodologies noted above and the ways in which they are brought together in the framework. The Deep Impact Assessments unearthed a trove on-the-ground realities and experiences that we have begun processing; early analysis has already yielded critical information that has informed the direction of our ongoing research into measuring prosperity benefits of clean energy markets.

The utility of the Deep Impact Assessments – insights from which are spread throughout this report – is best illustrated through a case study: an anatomy lesson, of sorts, for monitoring, evaluation and learning.

CASE: TOFU AND TEMPEH IN INDONESIA

In urban Jakarta and other cities in Indonesia, tofu and tempeh are staple sources of protein for the population, and are provided by way of a vast system of approximately 85,000 informal micro, small and medium enterprises (MSMEs) employing some 285,000 workers. The tofu and tempeh processing sector is characterised by vast inefficiencies, inadequate waste water disposal, air pollution, lack of hygiene, insufficient access to credit, low awareness of new technologies, and low-paid employees. The case study illustrates an example where a straightforward clean energy technology fix – in this case a fuel switch from firewood to liquid petroleum gas (LPG) or biogas – can provide suitable, scalable and sustainable solutions to improve access to clean energy and water while mitigating environmental damage and reducing urban poverty.

REEEP financed two efforts to push this switch forward, a policy development project by the Agency for the Assessment and Application of Technology (BBPT), and a direct market acceleration programme by Mercy Corps targeting around 100 SMEs on the ground as demonstrations for the fuel switch.

PEOPLE AND POLICIES — MAPPING OUTCOMES

REEEP found that the space of agrifood processing fell within a “nexus gap” in environmental legislation – that is, while Indonesian environmental legislation is extensive and detailed, it does not address transversal themes that involve combinations such as climate change mitigation/adaptation and waste water treatment/pollution abatement, among others. The challenge for the market in this fragmented sector is a combination of political – i.e. consistent and coherent policies and regulatory incentives/dieincentives – and financial – i.e. financial solutions tailored to the unique situation of these local producers.

REEEP discovered specifically that while the Ministry of Industry gave its support to the Mercy Corps project, other political developments – particularly the reduction of LPG subsidies – have weakened it.

On the business side, REEEP also found that incentives were not always internalised into decision making. For instance, because fuel is often included as a fixed cost in rents to the renter/operators leasing factories, the economic gains from a fuel switch are not passed to the operators (who are the intended customers of the technology). Another key behaviour is that of the financial institutions responsible for enabling producers to finance the fuel switch. Although many producers are from outside city limits, the local bank involved in the tailored loan product insisted on only loaning to local residents. After investigation, it was found that this is due to a government policy aimed at preventing mass rural exodus toward large cities.

CAPTURING THE UNEXPECTED — MOST SIGNIFICANT CHANGES

REEEP projects uncovered a multitude of benefits in the fuel switch offer, including time (producers saved around 1.5 to 2 hours per day, a gain that will subsequently be included into cost/benefit calculations for value propositions); reputation (producers were able to gain government hygiene certification after the fuel switch, opening up new markets such as restaurants, hotels, supermarkets, etc.); and health (producers and workers experienced improved health after the fuel switch). Even smell played a role, as local communities

embraced the possibility of removing the foul odor associated with traditional means of processing tofu.

These benefits formed part of the impetus for our current expanded study into quantifying and measuring prosperity benefits systematically, and illustrate the importance of not only recording such outcomes, but learning from – and acting upon – them. The value of these benefits to key stakeholders, including the government and legislature, may play a critical role in designing the policies necessary to improve the business case for the biogas fuel switch and accelerate growth in the market, one that with some 85,000 SMEs in operation employs around 285,000 workers and generates USD 78m per year in revenue, as well as an estimated 29m tonnes of CO₂.

CAPTURING THE EXPECTED — LOGICAL FRAMEWORK INDICATORS

REEEP was able to measure and validate key indicators in Indonesia, particularly those regarding GHG emissions reduction, expenditures, energy output and efficiency gains – results that help us refine our baseline and benchmark scenarios, understand the market and improve our focus. One major variable – the cost of LPG – has been shown to greatly affect the viability of the programme due to its volatility, and has led us to explore other alternatives (for instance biogas), which REEEP partner Mercy Corps has already begun road-testing in Indonesia.

REEEP PORTFOLIO INNOVATION

As REEEP further examines its impact in both the climate and prosperity arenas in detail, it is building mechanisms to connect that impact to those stakeholders for whom this intelligence is relevant – policy makers and financial market players.

In addition to the forerunner collaboration in the Phased Financing Facility, we are building impact and sustainability accounting into the Portfolio, enabling REEEP to deliver the quantifiable and verifiable results that impact investors and results-based financing mechanisms demand.

We are also enhancing our ability to offer our ventures financial support using vehicles other than traditional grants. For our Powering Agrifood Value Chains financing round, REEEP and the OPEC Fund for International Development (OFID) have developed a innovative revolving capital pool instrument, from which identified businesses receive long-term soft, concessional loans in the form of “repayable grants”. These soft loans are subject to a zero percent interest rate, and entrepreneurs are required to begin repayment of the initial funds only after profitability has been reached.

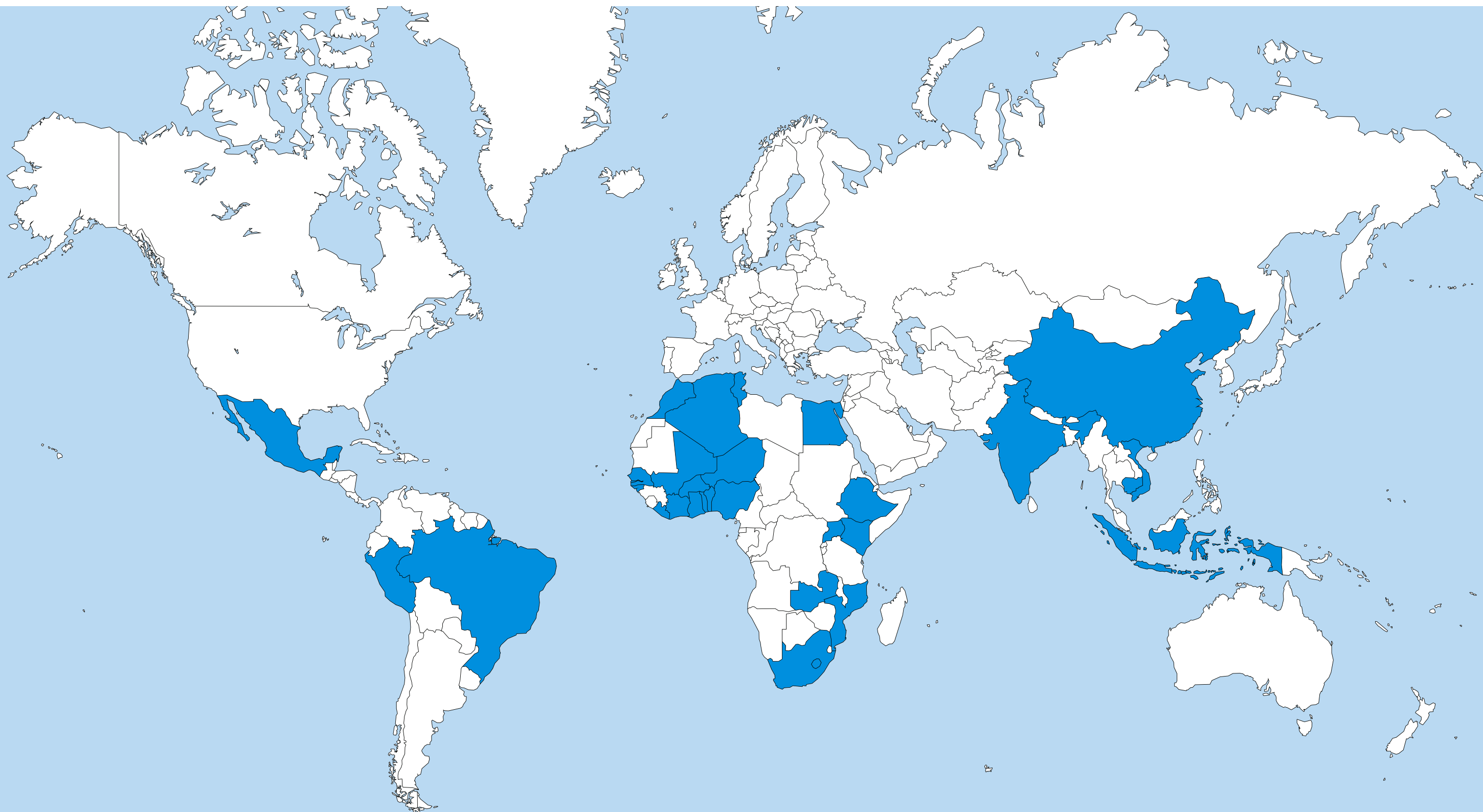
OFID and REEEP will reconvene periodically to assess the performance of the revolving capital pool and develop ideas for using the remaining balance for adding social impact where possible to the businesses receiving funding.

Another revolving fund is being set up in Cambodia together with Nexus C4D (see page 27 for more).

ANATOMY OF DEEP IMPACT: PORTFOLIO MAP

DISTRIBUTION OF REEEP DEEP IMPACT ASSESSMENT

In 2014 REEEP undertook a systematic Deep Impact Assessment of 62 former and ongoing projects with impact across 32 countries to test REEEP's enhanced monitoring, evaluation and learning framework and gain insights into how the components of REEEP's learning machine fit together with realities on the ground. Many of the initial findings of this assessment can be found throughout the Annual Report, and are already helping shape our future planning for measuring prosperity impacts from clean energy markets.



REEEP PORTFOLIO DEEP IMPACT DATA

In our 2013/2014 Annual Report, we took a look at how REEEP ventures are approaching the various elements that determine a business model's – and market's – success in the energy sector, and specifically those dealing with energy access, based on the International Finance Corporation (IFC) report *From Gap to Opportunity: Business Models for Scaling Up Energy Access*.

This year we have expanded our set to include 62 projects with impact across 32 countries.

REEEP analysed 94 projects (from 2007 to 2015) using the IFC methodology to provide a better understanding of how REEEP projects are utilising financing to scale up clean energy markets – what are our ventures investing in themselves?

ECOSYSTEM CONDITIONS

LEGAL & REGULATORY
Tariffs, legal requirements, and other policy-related factors

CORPORATE FINANCE
Accessing investment and working capital to fund growth and operations

SUBSIDIES
Using public monies to break even or produce profits

CARBON FINANCE
Securing income from carbon credit



FUEL

Supply of cooking fuels, procurement of fuels / foodstock for mini-utilities or central utilities

DESIGN / R&D

Development of product or service offerings for the market

PRODUCTION / GENERATION

Manufacturing of products or generation of electricity

MARKETING

Creating awareness of new offerings

SALES & DISTRIBUTION

Finding customers and delivering the product or service

BILLING / PAYMENT

Collection of revenues from customers, product payment, or fee for service

CONSUMER FINANCE

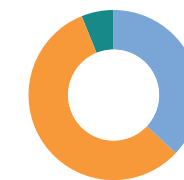
Providing a means to reduce the up-front cost of purchase

AFTER SALES

Service, maintenance, and repairs

VALUE CHAIN

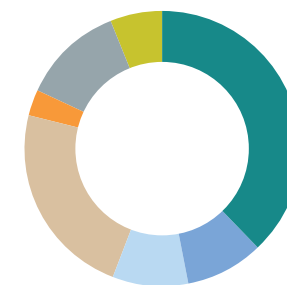
REEEP PORTFOLIO ANALYSIS



- 37% Value Chain
- 57% Ecosystem Conditions
- 6% Others

REEEP expanded its portfolio analysis based on the IFC methodology from 53 to 94 projects using information from the Deep Impact Assessment.

VALUE CHAIN

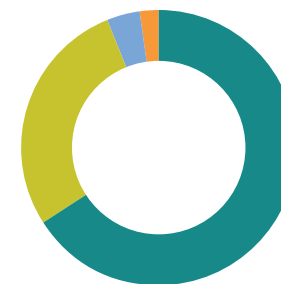


Of the 94 projects, 33 (36%) used funding specifically to develop or improve commercial processes with the value chain. Of REEEP's enterprise portfolio 39% used REEEP financing to address sales and distribution, billing and payment, and consumer finance aspects of clean energy services, while 37% used REEEP financing on developing new mechanisms for integrating productive uses of clean energy.

SUCCESS

For each of the 62 REEEP projects analysed, the Deep Impact Evaluations issued a grade of successful or unsuccessful, depending on whether projects achieved the outcomes set out in their initial proposals. 79% of projects were deemed successes, while 8% were cancelled due to unforeseen circumstances and 13% were considered unsuccessful.

ECOSYSTEM CONDITIONS



- 66% Legal and Regulatory
- 28% Corporate Finance
- 4% Subsidies
- 2% Carbon Finance

Of the 94 projects, 53 (58%) used funding specifically to address the ecosystem conditions to facilitate an enabling environment for clean energy markets. The vast majority (66%) used REEEP financing to address legal and regulatory issues.

LEGAL AND REGULATORY



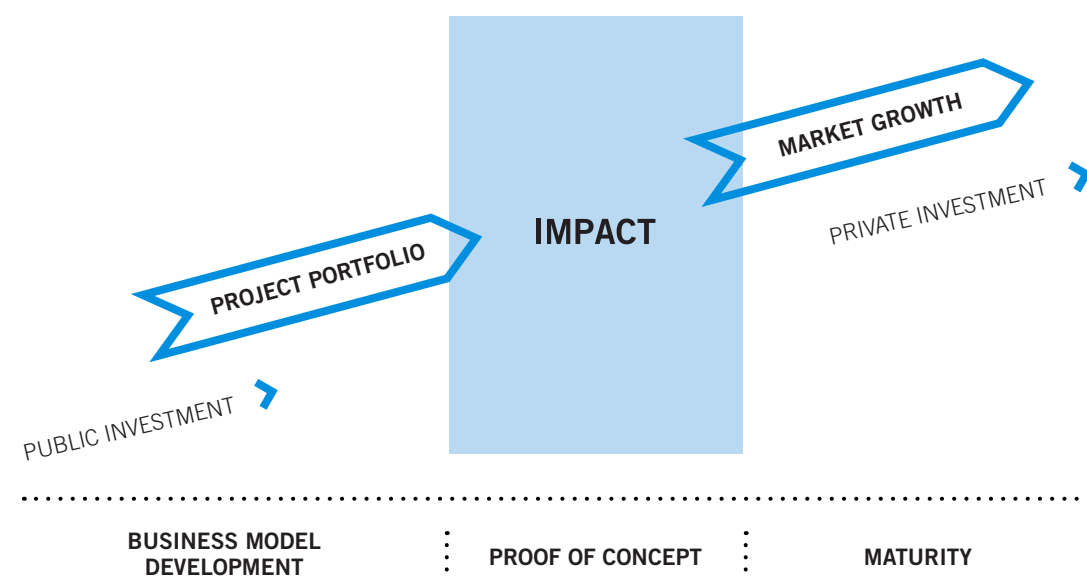
- 13% Taxes, Tariffs and Duties
- 27% Standards / Quality Assurance
- 11% Licensing and permitting
- 14% Legal frameworks, contracts
- 16% Infrastructure
- 19% Investment / financial policy

Within the legal and regulatory subset, REEEP projects focused greatly (in 27% of projects) on addressing standards and quality assurance regulations, and setting up appropriate information and technical infrastructure to enable clean energy markets to thrive.

INVESTMENT ACCELERATOR

The topic of private sector mobilisation for addressing climate change is not new; indeed the issue of private investment in clean energy was featured prominently in climate policy discussions even before the Copenhagen Accord in 2009, at which countries agreed to mobilise \$100 billion in public and private money for climate change-mitigating efforts in developing countries. But while there is no shortage of private funds for investment per se, there continue to be too few bankable projects in which to invest.

This is where the REEEP Investment Accelerator comes in. REEEP is working to address what the International Finance Corporation has termed “the missing middle” – the valley of death transition from concessional funding to growth-stage commercial investment. REEEP’s investment accelerator bridges the gap between early project viability and sustainable market success. The accelerator strengthens entrepreneurs – through business training, mentoring and best-practice consulting drawn from the project portfolio – and enterprises – through targeted financial injections to “de-risk” projects.



WHY GRANTS ARE NOT ENOUGH: THE NEED FOR FINANCIAL TRANSITIONS BY SAMIR IBRAHIM

SAMIR IBRAHIM

CEO AND CO-FOUNDER – SUNCULTURE

There are a number of risks associated with running a start-up anywhere in the world, and the best start-ups have teams that understand these risks and mitigate them. To understand these risks, people need to understand the social, economic, and political climates of the market they are investing in. One of the most difficult things we’ve seen is that investors do not understand Africa, and are therefore either (1) reluctant to invest in the continent, or (2) willing to invest but with a Western approach, which does not always fare well in Africa. This can be frustrating for an entrepreneur because you are often times faced with a difficult decision: do I take money that could harm my business or do I take no money at all?

Fortunately, there are organisations that help with this process. We have had the pleasure of working with REEEP partner CTI PFAN for about a year. CTI PFAN, a multi-lateral public private partnership, initiated by the Climate Technology Initiative and the United Nations Framework Convention on Climate Change, connects clean energy businesses and projects with private sector financing. SunCulture went through CTI PFAN’s Africa Forum for Clean Energy Financing, and through that process met a number of investors and organisations who not only understand investing in Africa, but understand how to scale renewable energy companies on the continent. The combination of capital and know-how is invaluable, and CTI PFAN provides that to its network.

We’re looking forward to continuing to strengthen our relationship with REEEP and CTI PFAN and its members, and look forward to connecting with other investors and bringing SunCulture to the next step.

– Samir Ibrahim

PHASED FINANCING FACILITY

REEEP has taken up this challenge and teamed with CTI PFAN (Clean Technology Initiative – Private Finance Advisory Network), a network of private developers and investors active in the clean energy sector, as a key partner. Together we are running a “Phased Financing Facility.” Entrepreneurs selected for the REEEP portfolio are brought into a multi-year incubator programme, including seed-level grants of up to €250,000 and access to the REEEP network. Entrepreneurs are provided with business training and mentoring by CTI PFAN, and best-practice consulting by REEEP drawn from our portfolio. Projects are vetted by CTI PFAN investment professionals, and receive targeted “de-risking” support to ensure bankability. CTI PFAN will facilitate direct connections to private investors.

.....

“[THE PHASED FINANCING FACILITY] IS AN INNOVATIVE BLEND OF PUBLIC AND PRIVATE FUNDING THAT TARGETS CLEAN ENERGY INITIATIVES WITH COMMERCIAL PROMISE, AND BRIDGES THEIR FUNDING GAP THROUGH THE ACCELERATION STAGE...”

— NORAD, *Review of REEEP*

.....



CLIMATE SMART POLICY: PRACTICE MAKES PERFECT BY MARK LAMBRIDES

MARK LAMBRIDES

SENIOR ENERGY SPECIALIST FOR LATIN AMERICA
AND CARIBBEAN, WORLD BANK

It is indisputable that data and evidence are preconditions for truly effective decision making in all walks of life. In order to make informed policy decisions this is equally true. Yet the reality is more complicated, as policy making in practice is influenced by myriad factors, not the least of which can be tens or hundreds of years of tradition and political evolution. But such influencers aside, what is often standing in the way of evidence-based policy making in many countries – particularly developing countries – is simply a lack of quality data and evidence upon which to base it.

Generating practice-based policy insights that flow from practical evidence is thus a crucial step toward improving policy making, even more so when we begin to consider the interdependencies between economic activity, societal changes, natural resources and the global climate – all of which are, to some degree, governed by political decisions.

REEEP's focus on learning from practice at a project-level, and extrapolating and applying that practice-based learning to policy at macro levels, is a piece of the puzzle that will help provide decision makers in the developing world with the evidence and the tools they need to replicate markets, build prosperity and achieve a sustainable future.

– Mark Lambrides

FROM DYNAMIC INTELLIGENCE TO PRACTICE-BASED POLICY

For any organisation such as REEEP, it is crucial not only to utilise monitoring and evaluation to analyse and assess the efficacy of strategies, actions and outcomes, but also to learn from that assessment and apply the lessons, good and bad, into future activities. For REEEP's monitoring, evaluation and learning framework (see pages 54–59 for more), this final step of processing and application is split into three information flows: the first is a dynamic feedback loop into the Portfolio itself (at regular intervals) and the design of the Theory of Change governing the Pathway in question; whereas the second two flows are outward-looking.

For the investment accelerator, intelligence on commercial processes or business-specific information relevant for investment worthiness from a private sector standpoint is processed together with REEEP Partner CTI PFAN and directed toward private sector investors via CTI PFAN's matchmaking facility or toward other financial service companies or impact investors seeking to operate in those spheres.

The Policy Lab represents the third stream of Portfolio learning related to the ecosystem conditions – the legal, regulatory, economic and political circumstances that act as external influencers on a project's – and market's – success.

The Policy Lab was designed to generate practice-based policy based not simply on academic or desk studies, but from hard data, information and insight gathered from on-the-ground practical experience. This practice-based policy is of critical importance not only for local and regional-level policy making, but for testing how macro-level policies are playing out on the ground, in the process uncovering interdependencies and knock-on effects unforeseen in the decision making processes that developed them.

The form of REEEP's practice-based policy varies on a case-by-case basis, just as policy making systems and mechanisms vary considerably from country to country.

As our Deep Impact Assessment confirmed, some of REEEP's most powerful policy delivery took place in China, an economy whose role to both climate change and human development can hardly be overstated. Equally well known is China's top-down policy making apparatus, characterised by a relatively

small number of key actors with well-defined roles (although there can be considerable dynamism in the interrelationships between these actors) operating within the parameters of well-defined processes, such as the five-year plans or guidelines.

REEEP was able to play, as an international NGO, an unprecedented role in shaping Chinese policy making at the highest levels on clean energy issues. In the Changjiang River (CJR) Basin, a REEEP-financed study on energy efficiency and renewable energy potentials in buildings produced eye-watering assessments of savings potentials, and – with the support of the key Ministry involved – is expected to be included in the 13th 5-year plan (see page 44 for more). Another programme, the REEEP Greening China Supply Chain programme has created a credible platform to help Chinese suppliers in global supply chains to not only meet China's energy and carbon reduction objectives, but also to better align Chinese factories' energy efficiency practices to international standards and best practices. This programme was strongly supported by the relevant Government Agency (CNTAC) and in line with the PR China national policy on energy efficiency and energy intensity target reduction.

REEEP also collaborated with the Energy Research Institute of National the Development Reform Commission (NDRC) to develop a comprehensive set of indicators and scoring table for assessing the results and effectiveness of GHG mitigation and efficiency policies. According to a third party assessor, this project “ranks very high on the agenda of the National Development and Reform Commission (NDRC) of the People's Republic of China and is fully aligned with China's policies, and it is remarkable that REEEP has been associated as a partner to participate in such high profile initiative, providing first-hand insights and access into China's policymaking.”

A REEEP project with the Centre for Renewable Energy Development (CRED) resulted in the publication of a Renewables-driven roadmap for energy generation in China. According to a third-party assessor, “we expect it will have a very big impact in setting the renewable energy roadmap 2030 for China.” That same assessor's initial projection for impact is an astounding “14.5 GtCO₂e. For comparison, in 2010, the global energy related carbon-dioxide emission was 30.6 GtCO₂ (IPCC figure in OECD Environmental Outlook to 2050).”

In another project, REEEP helped government agencies in Chongqing in establishing energy baselines, as well as year-on-year energy/water consumption quotas, for monitoring energy and water saving targets. A REEEP joint study on Market based Mechanism for Large and Medium-Sized Biogas Projects Operation was found by the Deep Impact Assessment to be a significant success: “not only have key objectives been met within the required budget and timeframe, but also the main recommendations have been adopted by the Beijing municipal government (BMBA) and disseminated to other agricultural provinces by the Ministry of Agriculture (MOA),” resulting in an emissions reduction of around 31,000 tonnes CO₂ per year.

REEEP's practice-based policy on the Water-Energy-Food Nexus in Agrifood not only contributed to the Food and Agriculture Organization of the United Nations' (FAO) extensive work on the Water-Energy-Food Nexus, but also found use in subsequent work of the International Renewable Energy Agency (IRENA), German Development Cooperation (GIZ), and of course the Nexus High Impact Opportunity (HIO) of Sustainable Energy for All (SE4All), among others. The report (see page 23) also informed REEEP's *Powering Agrifood Value Chains* financing round.

REEEP is also utilising its role as a proven, reliable and independent broker of knowledge on clean energy to provide policy makers with key information. In 2014, REEEP developed 35 clean energy country fact sheets with the REEEP Latin America and Caribbean Secreatariat and the Organization of American States for the International Renewable Energy Forum hosted by Mexico. And through the Renewable Energy in International Law (REIL) network, REEEP brought together policy makers, financiers and business leaders at two high-level meetings, including at the University of Cambridge in the United Kingdom to discuss resource efficiency within the water-energy-food nexus, and at the Bloomberg Foundation in New York City where participants looked at the role of smart cities – with a focus on transport challenges – in addressing climate change.

OPEN KNOWLEDGE

REEEP believes that sharing insight and best-practices is instrumental to building scale and replication across sustainable markets. We provide tools and support for organisations of all types to better share and connect information and knowledge, and to create an environment where information is open and accessible to all.

Since the launch of reeple.info in 2005, REEEP has been a leader in global efforts to promote and publish climate and development data as Open Data to facilitate this access.

OCEANS OF INFORMATION

The picture today is vastly different from that of 2005, when REEEP first launched reeple.info, and with it the first climate and energy information portal to utilize Linked Open Data. Today we are no longer challenged by a lack of data, but are overwhelmed with oceans of information.

But how to navigate and make sense of this information? To meet this challenge, REEEP is focusing not on individual information pages and portals, but on the architecture and philosophy underlying global knowledge brokering and curation.

KNOWLEDGE IS POWER: CONNECTING CLIMATE KNOWLEDGE

Sufficient and sound information is vital to every level of decision making across the complex and interconnected climate smart development landscape. The potential for efficiency gains across this landscape are immense given the volume of data and information theoretically available to policy makers, practitioners and the public.

As part of our broader efforts to promote interdisciplinary thinking and problem-solving (housed in our Cross Sector Systems Focal Area), we developed the Connecting Climate Knowledge Pathway to realise that potential. Read more about Connecting Climate Knowledge on page 36.

CREATING TOOLS AND SETTING EXAMPLES

The internet now makes the entire storehouse of human knowledge available to anyone, anywhere, via a computer or mobile device. Reflecting this reality, many organisations are taking their existing data sets – many of which are in principle in the

public domain already – and making them freely available for use and re-use by anyone.

Opening up public climate, energy and other related data for public use can unleash vast new potential for clean energy markets. REEEP is already applying Open Data thinking and instruments to its own portfolio, improving categorisation and contextualization of portfolio data and making it freely available to all. As a leader in Linked Open Data, we are also supporting organisations seeking to open up their own data sets.

In 2014/2015 REEEP worked with the German Aerospace Center (DLR), the Regional Center for Renewable Energy and Energy Efficiency (RCREEE) and the Observatoire Méditerranéen de l'Energie (OME) on an effort funded by the German Environment Ministry (BMU) to help RCREEE and OME up key socioeconomic data sets for use in the Solar Atlas for the Mediterranean (Solar Med-Atlas), an interactive solar atlas for the Mediterranean Region containing data on solar energy potentials and applications, as well as socioeconomic information. The data sets will not only be published in the Solar Med-Atlas, but also be made available in Linked Open Data (LOD) formats for free and open use by all. REEEP provided OME and RCREEE with crucial analysis, capacity building and strategic input into transferring data into Linked Open Data formats. REEEP also consulted other organisations, including the Clean Energy Solution Center, managed by the United States Department of Energy's National Renewable Energy Laboratory (DOE-NREL), on use cases and enhancements for specialised Climate Tagger applications.

To facilitate use of Open Data among purveyors and brokers of data and knowledge – not only in the climate and development sectors but across the entire spectrum of relevant arenas – REEEP pursues both people-centred efforts, such as the Climate Knowledge Brokers Group, and technological solutions, including the Climate Smart Thesaurus and Climate Tagger, a growing suite of tools to help organizations better structure and link their data within and across sectors. In 2014/2015, REEEP and the Climate Technology Centre and Network hosted by the United Nations Environment Programme (CTCN) worked together to drastically improve the scope and usability of Climate Tagger. Read about Climate Tagger and the Climate Smart Thesaurus on page 37.



Once challenged by a lack of data, climate and development experts today are facing oceans of information

CLIMATE KNOWLEDGE BROKERS GROUP

To help knowledge brokers across various sectors connect and collaborate, REEEP took a lead role in creating the Climate Knowledge Brokers (CKB) Group, and was in 2013/2014 selected by members to host the official CKB Group Coordination Hub. The CKB Group, supported by a three year grant from the Climate and Development Knowledge Network (CDKN) will lead capacity building, knowledge sharing and coordination efforts between members. Read about CKB on page 36–37.

SPECIFICS

ACCOUNTABILITY, GOVERNANCE AND FINANCIAL

REEEP is an international non-profit organization, registered in Austria as a non-profit association. This status, which has been extended until 2018, is subject to only limited taxation, as well as an annual statutory audit in accordance with Austrian law. REEEP qualifies as an international NGO for official development assistance (ODA) contributions according to the Organization for Economic Co-operation and Development (OECD).

OUR ACCOUNTABILITY

Since its launch in 2002, REEEP has managed a portfolio of nearly 200 clean energy projects, resulting in success rates significantly above industry average. It has set the standard for Open Knowledge technical expertise and innovation, and has become a global force in igniting markets for green growth. In 2014/2015 REEEP's historical accountability was bolstered by positive reviews, in the form of REEEP's Deep

Impact Assessments, which covered 62 projects stretching across seven years and 32 countries, and an evaluation of REEEP by the Norwegian Agency for Development Cooperation (NORAD). At the same time, REEEP took steps to improve future accountability through one of the industry's most rigorous and pioneering monitoring, evaluation and learning frameworks (see page 54).

NORWEGIAN AGENCY FOR DEVELOPMENT COOPERATION (NORAD) EVALUATION OF REEEP

The governments of Norway and Switzerland, two of REEEP's largest funders, commissioned a review of REEEP operations, Project Call Facility, 8th and 9th Project Calls, and the Phased Financing Facility; it was conducted between March and June, 2014.

REEEP is pleased at the findings of the Review, which recognised REEEP's ongoing efforts to ensure efficient and effective operations and solid financial accountability; confirmed REEEP's specific impact on the market; validated REEEP's extensive strategic review and advancement over the 2013–2014 period; and encouraged productive discussion over REEEP's future activities.

The Review includes an evaluation based on the OECD's Development Assistance Criteria. Reviewers accord high levels for relevance as an important “catalyst and risk-taker in small-scale ventures outside the mainstream”, and efficiency, again recognizing that the “administration is extraordinarily lean,

which also reflects high administrative efficiency in project management, as well as the knowledge management system reeple”. REEEP is important as a catalyst and risk-taker in small-scale ventures outside the mainstream. Its programmes are in in harmony with the UN Sustainable Energy for All (SE4All).

The Review recommended that REEEP “connect [activities] to institutions like the international development banks, the UN system, or CTI PFAN... to ensure a longer term impact.” This validated REEEP's unique role as risk-taking, seed-level market investor (albeit of grant funding), in collaboration with partner institutions to transition project outcomes into long-term, sustainable impacts, specifically CTI PFAN.

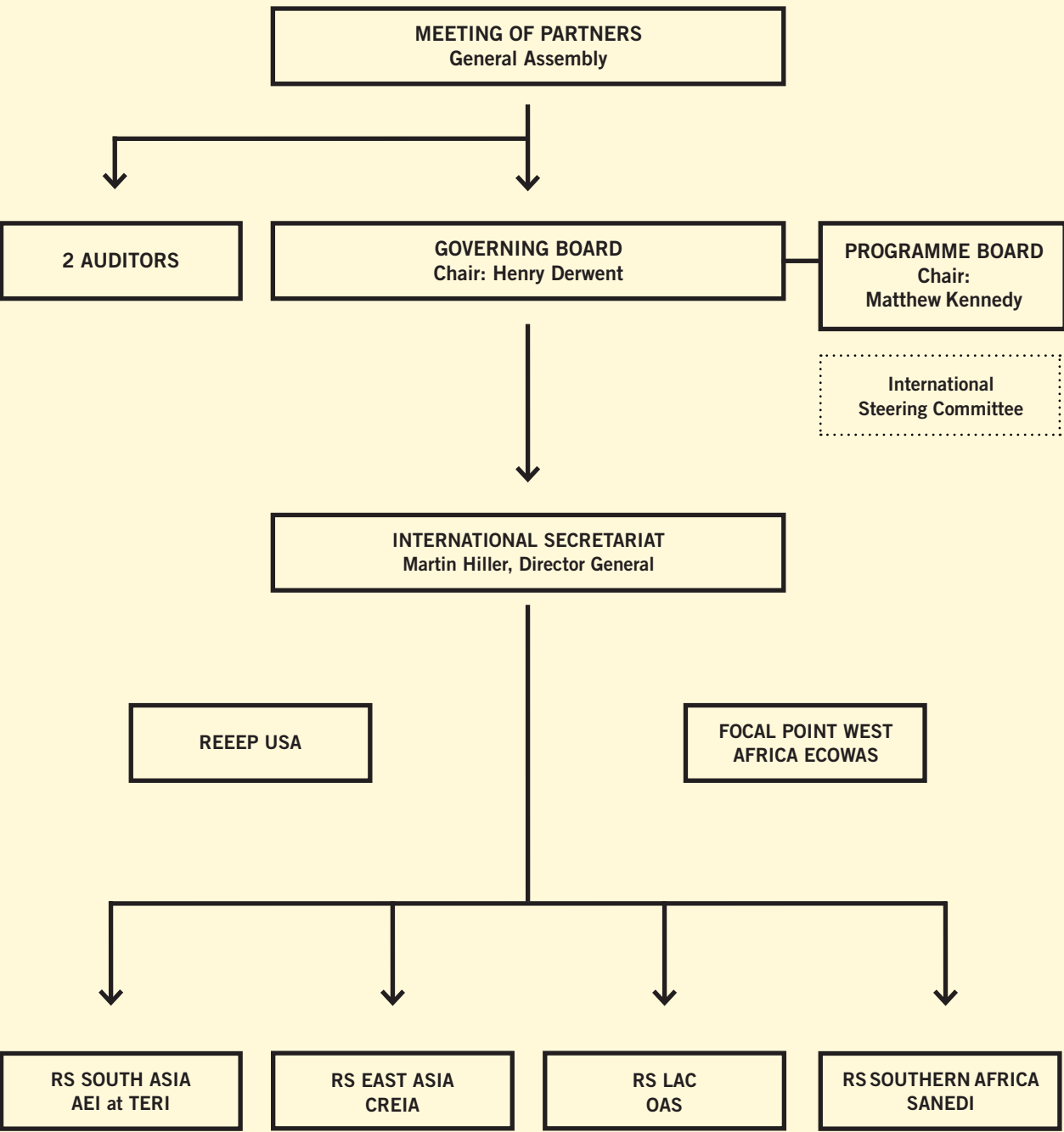
The Review noted that “the main effects ... are expected down the road through new policies and replication projects”. This both validated REEEP's revised strategy and encouraged new thinking on partnerships, which has already led to increased engagement with key institutions on leveraging REEEP project outputs into greater downstream impact.

**“ A HIGH PERFORMANCE ORGANIZATION WITH
A HIGH LEVEL OF INTERNAL EFFICIENCY.
PROCESSES ARE HIGHLY DEVELOPED AND
STREAMLINED.”**

— NORAD

GOVERNANCE

REEEP’s governance structure comprises three acting bodies: the Governing Board, the Programme Board and a general assembly of Partners. REEEP’s Meeting of Partners, held at least once every two years, functions as the general assembly of the Renewable Energy and Energy Efficiency Partnership (comprising all REEEP Partner organisations). This assembly has ultimate approval of the REEEP Statutes.



GOVERNING BOARD

REEEP's Governing Board holds office for a period of four years, and is responsible for the conduct of business in accordance with REEEP Statutes. The Governing Board develops and oversees key strategic direction, targets, timeframes and priorities; prepares financial rules and accounting systems; and guides the operations of the International Secretariat.

- Henry Derwent, International Emissions Trading Association — *Chair and Treasurer*
- Alfred Oforu-Ahenkorah, Energy Commission, Ghana — *Deputy Chair*
- Elfriede More, Ministry for Agriculture and Environment, Austria — *Rapporteur*
- Martin Schöpe, Federal Ministry of Economic Affairs and Energy, Germany — *Deputy Treasurer*
- Amal-Lee Amin, E3G, United Kingdom
- Maher Chebbo, SAP AG, France
- Mark Fogarty, First Energy Asia, Australia
- Philipp Ischer, State Secretariat for Economic Affairs, Switzerland
- Pradeep Monga, United Nations Industrial Development Organization (UNIDO)
- Piotr Tulej, DG Climate Action, European Commission
- Martijn Wilder, Baker and McKenzie, Australia

REEEP PARTNERS

REEEP embodies a global public-private partnership, and counts as its official Partners 385 governments, international and multilateral organisations, non-governmental institutions, foundations and private sector actors. The full list of REEEP partners can be found at www.reeep.org/partners

REEEP REGIONAL SECRETARIATS

Across the world, REEEP is represented locally by its four Regional Secretariats, each hosted by a regional institution active in the climate smart development space:

- REEEP RS Latin America and the Caribbean at Organisation of American States (OAS)
- REEEP RS Southern Africa at South African National Energy Development Institute (SANEDI)
- REEEP RS South Asia at The Energy and Resources Institute (TERI)
- REEEP RS Southeast Asia at Chinese Renewable Energy Industry Association (CREIA)

ADVISORY BOARD

The REEEP Advisory Board comprises eminent experts and thinkers in the clean energy and related fields, who provide the organization with high-level expertise and strategic guidance. Members are invited by the Director General and approved by the Governing Board.

- James Cameron, Climate Change Capital — *Chair*
- Harish Hande, SELCO
- Aled Jones, Global Sustainability Institute, Anglia Ruskin University
- Mark Lambrides, The World Bank
- Kevin Nassiep, South African National Energy Development Institute (SANEDI)
- Leslie Parker, Renewable Energy and International Law Project
- Paul Savage, Nextek Power Systems / EMerge Alliance
- Steve Sawyer, Global Wind Energy Council
- Sven Teske, Greenpeace International
- Richenda Van Leeuwen, United Nations Foundation

PROGRAMME BOARD

The REEEP Programme Board comprises one representative from each regional secretariat area, up to five donor representatives, at least one representative from an international non-governmental organization, and two representatives each representing the private sector and REEEP staff. Representatives of related partnerships are also invited in a consultative capacity.

- Matthew Kennedy, Programme Donor Representative, Ireland — *Chair*
- Gertraud Wollansky, Programme Donor Representative, Austria
- Shen Longhai, Regional Representative, East Asia
- Debashish Majumdar, Regional Representative, South Asia
- Aurelio Souza, Regional Representative, Latin America & Caribbean
- Antonio Saide, Regional Representative, Southern Africa
- Steve Sawyer, NGO Representative, Global Wind Energy Council (GWEC)
- Stephan Singer, NGO Representative, Worldwide Fund for Nature (WWF)
- Peter Dickson, Business Representative, Glenmont Partners
- Huang Ming, Business Representative, Himin Solar
- John Christensen, Observer, United Nations Environment Programme (UNEP)
- Simon Collings, Observer, Global Village Energy Partnership (GVEP)

FINANCIAL

In April 2015 REEEP appointed PricewaterhouseCoopers to perform the annual audit of its financial statements and perform assurance services – including verification of compliance – in accordance with Austrian Association Act requirements.

The audit found REEEP's accounting system to be fully in accordance with generally accepted accounting procedures and an internal control environment.

The audit determined that:

.....

No objections to REEEP financial procedures were found.

.....

REEEP financial statements comply with legal requirements and give a true and fair view of its financial position and performance for 2014/2015.

.....

REEEP funds were used in accordance with its statutes.

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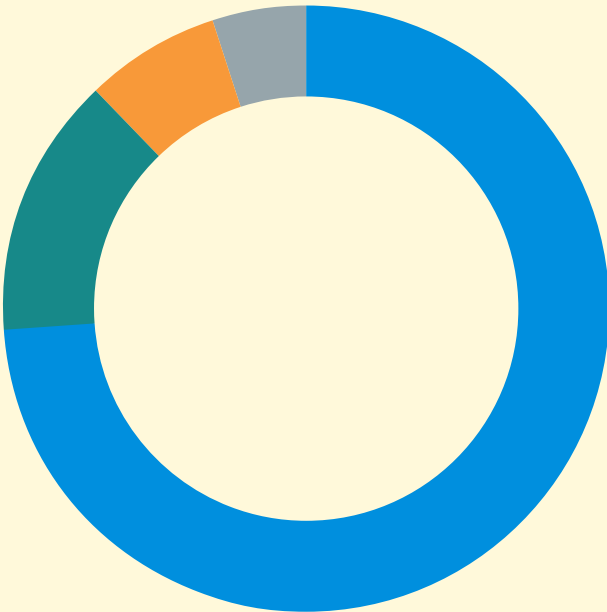
No unusual income or expenses were noted.

REEEP EXPENDITURES 2014/2015

In 2014/2015 REEEP expenditures amounted to €3.64 million, including €2.02m in Project Funding, which together with REEEP Portfolio Management made up 74% of total outlays. REEEP operations were 14% of total outlays. REEEP Open Knowledge efforts, including reegee.info, as well as strategic projects, made up 7% of the total, while communications and outreach represented 5%.

At the start of the 2014/2015, REEEP held a total of €5.99m in project funds under management.

- 74% Project Funding and Portfolio Management
- 14% REEEP Operations
- 7% Open Knowledge and Strategic Projects
- 5% Communications and Outreach



REEEP FUNDING OVERVIEW 2012/2015

Over the three-year period from 2012/2013 to 2014/2015, REEEP received €6.99 million in donations, including €5.39m for Project Funding and Portfolio Management, and €0.75m for Open Knowledge and Strategic Projects.

DONORS in kEUR	OPEN KNOWLEDGE + STRATEGIC PROJECTS	PROJECT FUNDING + PORTFOLIO MANAGEMENT
.....		
NORWAY		1,370
AUSTRIA		1,680
GERMANY	177	
SWITZERLAND		2,000
EUROPEAN UNION	123	
CDKN (UK)	246	
IRENA	31	
IDS	9	
OFID		343
CTCN	94	
FAO	14	
WORLD BANK	16	
PRIVATE SECTOR DONATIONS	40	

In addition, REEEP would like to thank the governments of the United Kingdom and Austria for their generous contributions to REEEP Operations of €636,000 and €215,000, respectively, from 2012 to 2015.

OVERVIEW OF ASSETS AND LIABILITIES

The table summarizes REEEP's consolidated assets and liabilities as of 31 March 2015:

	MAR 15	MAR 14	MAR 13	MAR 12	MAR 11	MAR 10	MAR 9	MAR 8
	KEUR	KEUR	KEUR	KEUR	KEUR	KEUR	KEUR	KEUR
ASSETS								
FIXED ASSETS								
Intangible assets	80	115	152	65	25	98	189	227
Tangible assets	5	9	18	27	17	7	9	13
CURRENT ASSETS								
Accounts receivable	114	8	30	99	91	104	107	184
Cash	5,920	9,135	11,998	11,953	12,881	12,546	12,249	10,159
DIFFERENTIALS CARRIED AS ASSETS	9	13	7	6	1	0	12	12
	6,128	9,281	12,204	12,150	13,015	12,756	12,567	10,594
LIABILITIES								
EQUITY	1,377	1,797	2,249	2,341	1,908	1,838	1,718	1,610
PROVISIONS	868	1,104	1,066	786	628	1,028	524	1,022
LIABILITIES ON ACCOUNT OF EARMARKED FUNDS	3,659	5,989	8,312	7,946	9,219	8,833	9,804	6,934
LIABILITIES								
Accounts payable	35	92	181	282	164	49	99	299
Other liabilities	189	299	395	814	1,096	987	422	730
DIFFERENTIALS CARRIED AS LIABILITIES	0	0	0	0	0	20	0	0
	6,128	9,281	12,204	12,150	13,015	12,756	12,567	10,594
Financial Assets	6,043	9,156	12,035	12,058	12,973	12,65	12,368	10,355
Liabilities	4,751	7,483	9,955	9,809	11,107	10,917	10,849	8,984
NET FINANCIAL ASSETS	1,292	1,673	2,080	2,249	1,866	1,733	1,519	1,371

OVERVIEW OF INCOME AND EXPENSES

The following table summarizes REEEP's consolidated income and expenses for the years ended 31 March, 2015, 2014, 2013, 2012, 2011, 2010, and 2009:

	2014/15	2013/14	2012/13	2011/12	2010/11	2009/10	2008/09
	KEUR	KEUR	KEUR	KEUR	KEUR	KEUR	KEUR
NON-EARMARKED CONTRIBUTIONS	70	70	712	85	79	105	160
EAMARKED CONTRIBUTIONS	268	1,679	3,805	2,729	4,685	3,327	6,304
ALLOCATION TO LIABILITIES ON ACC.	2,330	2,323	-366	1,273	-386	971	-2,87
OTHER INCOME	15	27	5	0	0	0	0
EXPENSES FOR PROJECTS	-1,694	-3,083	-2,734	-2,267	-3,067	-2,923	-2,272
EXPENSES FOR REG. SEC.	-217	-288	-630	-377	-307	-388	-449
COST OF STAFF	-851	-763	-720	-707	-546	-522	-477
DEPRECIATION	-53	-54	-47	-27	-81	-96	-96
OTHER OPERATION EXPENSES	-308	-381	-450	-368	-372	-434	-435
SUBTOTAL	-440	-471	-154	341	5	41	-133
INTEREST INCOME	27	25	83	122	86	106	320
OPERATING SURPLUS/LOSS	-413	-446	-71	464	91	147	187
TAXES FROM INCOME	-7	-6	-21	-31	-22	-27	-80
ANNUAL SURPLUS/LOSS	-420	-452	-91	433	70	12	107

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