



ROUND TABLES WITH UNEP

FACILITATING PUBLIC PRIVATE PARTNERSHIPS FOR CLEAN ENERGY TECHNOLOGY APPLICATIONS IN DEVELOPING ECONOMIES

11-26 March 2013



FINAL REPORT



Executive Summary

This series of Round Tables was conducted in March 2013 in European financial centres by UNEP in association with the European Energy Centre, Geocapita and the Frankfurt School – UNEP Collaborating Centre. The aim of these discussions was to raise awareness of UNEP's energy finance activities, to encourage feedback from knowledgeable stakeholders regarding UNEP's planned programmes and to establish a contact network for future energy finance consultation.

Small groups (maximum 30) were invited to each of the Round Tables to ensure that everyone present would be directly involved in the discussions. Every effort was made to avoid one-way presentations, but rather to seek the experience and opinion of those present at the Round Tables to help tailor UNEP's planned activities according to lessons already learned.

Four key areas of future UNEP energy finance focus were presented at each of the Round Tables, addressing the installation of hybrid mini-grids, the development of a policy risk insurance mechanism, bringing end-user finance for access to clean energy technologies in Africa and considering financing mechanisms for energy efficient buildings. The feedback from discussions at all Round Tables was very useful and the key points raised have been recorded for reference in this report.

In addition to these four focus areas, participants were given the opportunity to present briefly any proposed energy finance related activities that they felt would benefit the target countries and may be of interest for UNEP to consider future involvement. A range of useful initiatives were highlighted, with the opportunity for some reaction and discussion with stakeholders present. UNEP has noted these submissions and we will follow-up those that seem most appropriate.

The main outcome from the Round Tables was the conclusion that the broad themes raised by UNEP were considered of value and likely to achieve positive developmental as well as environmental benefits. The current frameworks should however be adapted according to the issues raised by participants in the Round Tables, based upon their far-reaching expertise in these areas and practical experience in the implementation and financing of such interventions.

The wide range of participants invited to the Round Tables provided an excellent mix of complementary capabilities, with the chance for all involved to consider differing perspectives for the achievement of key clean energy applications in developing countries. The feedback from participants was very positive, with much interest in further engagement through similar future consultation platforms.

These Round Table discussions and the issues raised are intended to be a starting point for the practical implementation of relevant activities in target countries. The feedback from participants will be carefully assessed and the relevant points incorporated into future programme design. The contact details of all participants are included in this report and will be circulated with the intention to form an expert community regarding the practical implementation of energy finance activities. It is hoped that this group can interact regularly, and so maximize the potential for future joint activity.

On behalf of UNEP and our collaborators for these Round Tables, I would like to thank you once again for your contribution to this initiative. Please do not hesitate to contact me for any additional information. I look forward to further engagement with you regarding future UNEP energy finance programmes.

Dean Cooper
Energy Finance Programme Manager
(dean.cooper@unep.org)



Contents

1. Introduction
2. Key Discussion Points
 - 2.1 Hybrid Mini-Grids
 - Policy
 - Technology'
 - Awareness
 - Experience
 - Model/Design
 - General
 - Financing
 - 2.2 Policy Risk Insurance Mechanism
 - Demand
 - Concerns
 - Related Experience
 - Issues to Address
 - General
 - Model/Design for PRIM
 - 2.3 End-user Finance in Africa
 - Financial Mechanism
 - Technology Issues
 - Market Development
 - Preparation
 - Capacity/awareness
 - Experience
 - General

2.4 Financing mechanisms for Energy Efficiency Applications in Buildings

- ESCOs
- Financing
- Standards
- Market development
- Experience
- Technology
- Issues

3. Other Project Ideas

4. Conclusions from Issues Raised

4.1 Hybrid Mini-Grids

4.2 Policy Risk Insurance Mechanism

4.3 End User Finance to Access Clean Energy Technologies in Africa

4.4 Financing for Energy Efficiency in Buildings

5. Way Ahead

Annex A: Feedback from Participants

Annex B: Round Table Contacts

Annex C: Projects Proposed by Participants

Annex D: Presentations

Annex E: Information Sheets



1. Introduction

From 11 March to 26 March 2013, the United National Environment Programme (UNEP), in co-operation with the Frankfurt School – UNEP Collaborating Centre for Climate and Sustainable Energy Finance, the European Energy Centre and Geocapita, hosted a series of five Round Tables in key European finance centres. These events – in Edinburgh, London, Frankfurt, Milan and Paris were intended to fulfill three main objectives:

- To raise awareness of UNEP's energy finance¹ activities
- To provide the opportunity for input from energy finance specialists into UNEP's programme development
- To establish contacts with energy finance stakeholders with a wide range of perspectives, and so form the basis for further interest and consultation

UNEP's programme development is often an extended process that must conform to internal and external priorities and programming frameworks. Despite stakeholder engagement at the outset of this process, there is a danger that the market conditions related to energy finance activities will change – sometimes significantly – before programmes can be finally implemented. This was a key motivation behind this series of Round Tables – to ensure direct consultation with a range of relevant experts regarding the details of some planned UNEP initiatives. Relevant comments from the discussions can now be integrated into the final programme design to ensure the most appropriate focus and to avoid any conflict or duplication with other ongoing initiatives.

Only 20-30 participants were invited to these Round Tables; this number was intentionally small to ensure direct and detailed engagement with those experts that voluntarily provided their time to assist with this consultation. A wide range of stakeholders was invited, including researchers, policy makers, project developers, public sector funders and private investors. These range of perspectives provided for very interesting debate and useful outcomes regarding the need to tailor some of UNEP's planned energy finance initiatives. Participants also welcomed the opportunity to discuss issues with parties holding a different viewpoint, and expressed appreciation to consider such a range of interests.

Four particular areas of programme development were considered in some detail, with the opportunity for participants to raise other projects for discussion based on specific interests. The four focus areas were:

- Hybrid mini grids for application in remote areas of Africa and Asia
- Policy Risk Insurance Mechanism for clean energy investors
- End-user finance for access to clean energy technologies in Africa
- Financing mechanisms for energy efficiency applications in buildings

The programme concepts for the first three of these issues were already quite well developed prior to the Round Table consultations, though they are still in draft format so can be amended as necessary to incorporate and comments agreed at the Round Tables. The fourth area, concerning energy efficient buildings, is a more recent addition to the energy finance programme development priorities, based upon a recent International Energy Agency report that highlighted the significance of this sector. For this subject, a request was issued to the Round Table participants for any inputs that would be relevant to UNEP's consideration of how best to focus its resources in this area.

¹ Energy finance refers primarily (though not exclusively) to activities that address on climate change mitigation, with a focus on renewable energy and energy efficiency applications. Climate change adaptation is relates to UNEP's broader climate finance work, which was not addressed at the Round Tables

2. Key Discussion Points

Following brief introductions to each of the four focus areas (see Annex 3), and questions of clarification, the participants were divided into small working groups to discuss in detail what were the perceived strengths and weaknesses of the approach being formulated by UNEP in each case. Participants were also encouraged to provide input from their own experience, including other issues not yet raised that UNEP should take into account for effective project implementation.

The following is a brief overview of the key points raised by participants from all five of the Round Tables, as highlighted by the working group rapporteurs.

2.1 *Hybrid mini grids for application in remote areas of Africa and Asia*

This session was introduced by Dean Cooper (UNEP) who highlighted the growing international attention to the area of mini-grids, though the number of sustainable or commercially-viable mini-grid applications remains very limited. Low customer awareness and the high cost of energy storage are two of the most significant barriers faced, though a key challenge is to successfully address the local conditions in targeted remote communities. The high up-front costs and long-term revenues associated with mini-grid applications present particular challenges for an effective mini-grids business model. On this basis, there is an important role for the public sector in creating a local market to attract private sector investment.

The initiative proposed by UNEP involves an assessment of market demand, and the demonstration of mini-grids based upon biomass and other locally-sourced renewable energy. The intention is to target 3-5 countries in Africa and Asia and to implement a range of possible financial mechanisms to enable end-user access to energy supplied via mini-grids. The increased consumer and investor awareness regarding mini-grids in remote locations is expected to stimulate greater levels of investment and growing customer demand, resulting in improved energy access and social, gender and economic upliftment in the targeted communities.

Policy

- 1) Policy framework still not in place in many countries. Need to address ability to connect policy with bill payment and collection
- 2) What level of policy intervention is required? Minimum good governance and transparency was agreed. There is less agreement on the requirement for FITs etc.
- 3) Policy and regulatory framework are both important
- 4) Need agreement at different levels - national, regional and local
- 5) Policy planning process should identify mini-grids as part of the strategy
- 6) Established policy to allow mini-grids has to be in place before any private sector funding will be committed, otherwise it will be limited to an 'off-taker' model
- 7) For local governments, the priority is urban electrification rather than rural electrification
- 8) Policy constraints are a significant risk
- 9) Policy backs the required revenue stream

Technology

- 1) Technology must be appropriate to local needs

- 2) Technology selection is very much site dependent
- 3) Technology selection is important
- 4) Technology standards are necessary for “future proofing”
- 5) Potential to leap frog technologies for remote area applications
- 6) Standards developments should be fully integrated in the future
- 7) Technology considerations should include local capabilities for ongoing operation and maintenance
- 8) Good technologies include steam machines fed by local biomass
- 9) Consider virtual grids e.g. solar charging points, rather than physical wired grids
- 10) Mini grids can use a mix of technologies. There is no single solution
- 11) Need to consider maintenance required and associated cost

Awareness

- 1) There is lack of understanding how all the elements link together including technology, policy, finance etc.
- 2) Need awareness and customer buy in related to the cost/benefit of the systems – customers must understand and want what is being offered
- 3) Appropriate level of community involvement and investment is very important
- 4) Need alignment of interests of all parties involved - technology, financially, morally
- 5) Need to deal with uncertainty
- 6) The world does not need another pilot study, so perhaps centralise and re-use existing knowledge base
- 7) Education of people for ongoing operation, 5-10% of project cost
- 8) Start with community engagement to ask what is needed / wanted.
- 9) Important for community to have ownership in project
- 10) Difficult to have a common view – greater awareness is required
- 11) Do people need power? Is there a false demand?!
- 12) Need to understand what works here – what applications are locally appropriate

Experience

- 1) Example of Tunisia given, mix of solar PV, mini-wind 40kW each for one village of 1000 people. Also battery storage system. ENI paid for project study. Project cost €2m! Power used for irrigation, domestic power, refrigeration
- 2) UNEP’s investigation found only two commercially viable mini-grid installations: one project of 35 households, the other in Isle of Eigg, Scotland
- 3) Ghana example where refrigeration for local fishing industry was driver
- 4) Italy project in mountains bordering France, local acceptance was an interesting challenge; no one-size-fits-all technology solution. 6 installations over 60km, meant grid was a significant proportion of overall cost. Project never implemented. Insufficient public funding and support due to unwanted turbines

- 5) Typical western house uses 9kw but a small mini grid may have a peak demand of 3kw
- 6) Example of gleracydia biomass gasification plant in Sri Lanka
- 7) Solartech example given of donation-funded solar project
- 8) Example of rural mini grids in Mali - financing 80% public grants, would not have been commercially attractive

Model/Design

- 1) Does starting small with opportunity to grow make sense?
- 2) New grid or replace / substitute diesel?
- 3) Does the mini grid supplement the main grid? What is the long term plan and integration with larger grid? Are mini-grids a temporary or long terms solution?
- 4) What is the scale being considered? What is the minimum project size to be commercially viable and so attract investment- 10MW?
- 5) Demand studies are critical
- 6) Develop a number of models including technology, operational, policy and financing to allow replication in similar regions / countries
- 7) Demand: who will be the users, what is the population density, will it be big utilities doing small things or will it be entrepreneurs who develop grids?
- 8) What size of project is required?
- 9) Useful to prepare a toolkit of demonstration models and demand studies
- 10) Do we know what the practical population density requirements are? Need to consider population distribution
- 11) Google map data being developed by Stuart Crane for self identification as being off grid (also see Reiner Le Monde)
- 12) Mini grid should be used for cold chain, medicine, food, irrigation. Consider the 'cold chain' i.e. refrigeration both at production and then transportation of goods. E.g. Milk and fish, getting good to market. This may allow a virtual mini-grid to emerge
- 13) Schools and industry are key targets but food production and supply has to come first
- 14) There is no single definition for mini grid. What is a mini grid? A complete package including generation, distribution, metering. Example of mobile phone transmitter based system where kiosks are established to allow locals to charge appliances. Definition depends on size which ranges from 30 houses to 10s of thousands
- 15) Not just an issue of supply but also demand side management
- 16) Energy storage is also an important consideration. Including energy storage significantly increases costs. Example of new lead acid battery being used. As this is well established technology but improved, the cost of storage can be reduced
- 17) Long term commitment and scalability are key requirements
- 18) Customers' needs gradually increase as power becomes available. Is the mini grid therefore temporary?
- 19) It is important to define the success criteria of any project
- 20) Need of people, population density, climate etc. mean that all projects are very local in design.

- 21) Projects need to be transformational, scalable, technology transfer
- 22) Different perspective ranging from end goal of rural electrification through to financially sustainable aims
- 23) Feasibility to map needs and sources is critical
- 24) There are risks associated with the use of biomass concerning the nexus between food and fuel
- 25) Important to have a combination of different purposes within any system e.g. residential and commercial, helps support sustainability of the model
- 26) Bridge gap between “build and they will come” approach and the pure profit led investment
- 27) This approach only works where power replaces expensive energy use, e.g. diesel, as opposed to competing with free energy sources such as animal waste
- 28) Need the flexibility to start small and then scale up
- 29) Integrate with other providers such as micro finance, equipment suppliers, etc. (after assessing how appropriate they are)
- 30) As a first step, assess what has been successful to date
- 31) Need to assess affordability and the track record of payment and money collection
- 32) Ability to grow with demand (ensure a level of scalability)
- 33) How does the distribution model work?
- 34) Useful to have a case study of a brown field development with a power purchase agreement in place

Financing

- 1) Financing - public funds are required but where are they best deployed?
- 2) Energy co-operative approach seems to be the best - community involvement is required for demand and skills development and to reflect local knowledge for technology selection and risk sharing
- 3) Anchor customer is important. Anchor client off-taker model should be considered i.e. based around one key off-taker. Credit risk of the anchor is key
- 4) An insurance mechanism needed to address the prospects of the national grid takings over a mini-grid and therefore impacting the FIT level allowed
- 5) Finance gap between entry level projects and pilot studies, bridging this gap will be valuable
- 6) Seek to tap local public sector funds not just international ones
- 7) Business model also critical with respect to original investment and payback
- 8) Consider the use of development financial institutions
- 9) Role of commercial bank role and link with local banks, using partial guarantees from local bank.
- 10) Returns are insufficient / payback period too long to attract investment as they tend to be start up businesses
- 11) No exit strategy for financiers, including currency controls
- 12) Link pricing of renewable energy to diesel prices
- 13) Important to build business case, use market based approach. Include analysis of productive use of energy

- 14) Consider stage of development of different entities involved and match financing to this
- 15) Difficulty finding funding
- 16) Business model should be market orientated
- 17) Useful to build a local financing network
- 18) Role of subsidies, how to ensure returns and affordability are appropriate
- 19) Specific FIT for mini-grid required
- 20) Costs of meters are very high relative to the power used
- 21) Need to understand the relevance of the local barter system rather than cash economy
- 22) Use of mobile money platforms
- 23) Understanding risk allocation
- 24) Project finance bankability criteria still apply. Credit worthiness of a power project only as good as that of the off-taker
- 25) Loan guarantees: contrast US, Europe and Developing countries
- 26) It is questionable whether the returns on investment are sufficient

General

- 1) Mobile populations must be accounted for
- 2) The countries already identified by UNEP are appropriate
- 3) Impact assessment - are mini- grids the solutions? What is the duration for which a project is judged as relevant
- 4) There is already reasonably high energy use from wood, biomass, diesel
- 5) Is UNEP's role too broad?
- 6) Build and they will come?
- 7) Link UN Clean Energy for all programme and UN Foundation activities
- 8) UNEP should develop some reference case studies, database of what works and what doesn't
- 9) O&M of any mini-grid system is crucial
- 10) A holistic approach is key
- 11) Development process is slow
- 12) How "mini" is a mini grid – what is the definition?

2.2 Policy Risk Insurance Mechanism for clean energy investors

This session was introduced by Julian Richardson (Parhelion Underwriters) who highlighted their actual market experience of numerous requests from investors for an insurance solution to policy risk. Based on this demand Parhelion has helped UNEP to develop the proposed public / private Policy Risk Insurance Mechanism (PRIM).

The drive to a low carbon future currently relies on a range of policy incentives intended to create additional revenue streams which will allow investors an appropriate rate of return for investing in the low carbon sector. For these revenue streams, and indeed the policies that support them to be considered investment grade they need to have Transparency, Longevity and Certainty (TLC).

Governments have made progress in both Longevity of policy (e.g. by offering 25 year Feed-in-Tariffs), and Transparency (e.g. by establishing the policy targets). However the nature of most constitutions makes the last of these 3 conditions, 'Certainty', the hardest to establish. Without the final condition of 'Certainty' the market does not consider many of the policy backed revenues streams as fully bankable. Therefore significant 'policy risk' remains.

Unlike many other risks that can be managed by existing market mechanisms such as insurance, Policy Risks currently cannot. This is because of a lack of alignment of interest between the risk controller i.e. legislator / regulator, and the risk carrier, making the risk unattractive to investors and insurers alike. If investors are unwilling to accept this risk or unable to transfer it to insurers, they will seek to either mitigate the risk by significantly increasing the required return on capital, often making the project uneconomic, or avoid the risk altogether.

Assisted by Parhelion, UNEP has therefore developed a proposal for a public / private green Policy Risk Insurance Mechanism (PRIM). By helping to provide specific insurance coverage for Policy Risk, thereby building confidence in the countries low carbon policy frameworks and playing a key role in enabling investments to happen at reasonable cost, significant benefits can be quickly delivered. These include:

- Attracting private sector re/insurers, 'crowding in' a huge pool of capital that is being under-utilised for clean tech investment.
- Efficient use of public funds
- Enhance the regulatory competitiveness of the participating countries creating a race to the top
- Support the delivering of low carbon policy objectives
- Create a revenue and profit stream for participating countries
- Aligning use of public funds with risk the government has control over i.e. avoiding 'Solyndra' type events.
- Improve the attractiveness of the member country as a country for low carbon investment
- entrenchment of policy objectives without loss of government flexibility / infringement of parliamentary sovereignty

As such PRIM could play a powerful role in unlocking £multi-billion investment in to the green economy and delivery of government decarbonisation policy objectives.

The main points raised by participants at the Round Table included the following:

Demand

- 1) Are there other ways (to PRIM) of achieving the same thing? None identified
- 2) It's very clear (a 'no brainer') why this insurance mechanism is required
- 3) Policy risk is one of many but it is a serious and significant risk
- 4) The proposed PRIM is a good thing
- 5) Useful to have funding for the development of pilots to prove the need
- 6) A pilot is required to demonstrate the principles
- 7) The decision to invest is often binary rather than marginal and PRIM will deal particularly well with the binary decision
- 8) Which investors are worried about policy risk? Credit risk is often a bigger issue
- 9) Really needed for investors

- 10) Not all projects will require it
- 11) May be product of last resort depending on cost
- 12) Where is the demand coming from - developers and/or investors?
- 13) Is there demand for the cover? Or is it sufficient to combine with other policies?

Concerns

- 1) Governments might not want to be bound by participation - would governments buy in to providing it?
- 2) Using the insurance market in this way is relatively sophisticated and is it realistic to expect this to work in emerging markets?
- 3) Need more details around the operation of the proposed mechanism
- 4) Customer demand should be the driver not the outcome
- 5) This policy insurance mechanism presents a subjective view of risk
- 6) Private sector insurer appetite limits wider alignment of interests
- 7) To support the required operations, how do countries raise funds? (Or are Governments paying for risks already?)
- 8) Will the coverage be broad enough
- 9) Sometimes PRIM will not cover the key risks
- 10) How much does it cost? Policy risk is not predictable and therefore could be difficult to price
- 11) PRIM might not be suitable for mini-grids due to scale
- 12) The devil is in the detail
- 13) Calculation of premium pricing will be difficult
- 14) Alignment of interest: may not be fully aligned as there could be an economic trade off to trigger a loss

Related Experience

- 1) Hermes export credit agency - very expensive , short term and export only
- 2) Cornwall case studies - change in policy but project may still be relevant
- 3) Tanzania risk associated with credit risk of off taker
- 4) Judging from the Italian experience, it would be beneficial to have this mechanism

Issues to Address

- 1) It may help make information available to governments about take up
- 2) How would an enforcement mechanism work?
- 3) Moral hazard management is needed
- 4) Very appropriate for FITs, but FITs are expected (and preferred) to fade out
- 5) An early warning system is required to help governments to understand level of demand and up take
- 6) Risk is best taken by entity who understands and controls it

- 7) What does the region need?
- 8) Who owns the risks?
- 9) Back door policy change
- 10) Will financial exposure be sufficient for disincentive to avoid policy change?
- 11) Use PRIM pre-financial close, but by how much before close? Is risk after financial close a political risk? Need to clarify timing pre and post investment.
- 12) How relevant is it to big projects, since the size of host country commitment may be large?
- 13) Policy risk is often a credit risk issue as well and therefore this needs to be covered
- 14) There is a big need to educate the government, up and downside of involvement
- 15) Why would the mechanism cover future changes? OPIC will not include this
- 16) How to manage conflict with the IMF? In the event of country financial trouble, the first action of the IMF is to request the country to reduce policy financial support
- 17) Mixed view about covering future and retroactive policy change
- 18) Distinction between political and policy risk? Policy risk is not available enough. Political risk may be more of an issue than policy risk
- 19) Distinction between what is legitimate or illegitimate
- 20) It is important to consider the relative risk of all investments
- 21) Need clearer definition of product to understand where it will fit, what it will or won't do
- 22) Time scales need to be clarified

Model/Design for PRIM

- 1) Not only local policies may be relevant
- 2) Consider applying to non-revenue related risks
- 3) Make sector specific
- 4) Assess the country rating relevance
- 5) Local knowledge important
- 6) Awareness building and including local insurers are key elements
- 7) Retrospective changes as well as gradual development policy covered by itself may not be enough
- 8) What measures need to be taken around this mechanism, e.g. standardised PPAs, enabling environments, self sustainability
- 9) Also include subsidies as well as tariffs, avoid over subsidies issue of scale, good to include ability to cover small and medium size projects
- 10) Need to specify the risk ownership
- 11) Need to specify and clarify the ultimate goal of the policy
- 12) Important to have local insurance market participation
- 13) may need to be linked with other risk issues
- 14) Useful to involve development partners
- 15) On risk pre-financial close is helpful; main exposure is at time of close and shortly thereafter

- 16) Call it public sector risk - include policy, political and credit risk
- 17) Tailor the solution to make it easy and accessible
- 18) Crowd in local insurers
- 19) Start by aiming for small projects
- 20) What is the tenor of the policy?
- 21) Link to refinancing opportunities for member countries
- 22) Each country and risk will need to be underwritten on its own merit
- 23) Some technologies should not be covered in view of payback periods
- 24) Ultimately want the policy to expire once grid parity is reached (and gradual reduction up to that point)
- 25) PRIM should cover both political and policy risk
- 26) Some existing mechanism can be used e.g. partnering with sovereign wealth funds
- 27) Need to specify what is covered: lost profit, debt service, capital cost?

General

- 1) Underlying project and underlying policy needs to be solid
- 2) How PRIM impacts sovereignty: does not affect sovereignty but does help entrench policy
- 3) How PRIM impacts corruption : reduces incentive for corruption
- 4) Relevant for refinancing
- 5) There is a menu of risks associated with all developments
- 6) Policy risk is one of many risks investors face
- 7) Policy risk issue is real
- 8) Policy risk may be low relative to some other risks depending on project etc

2.3 End-user finance for access to clean energy technologies in Africa

This session was introduced by the Frankfurt School – UNEP Collaborating Centre (Torsten Becker or Susie Shuford), who described the ongoing FACET activity in South East Asia where only a small percentage of end-users can afford to purchase clean energy technologies. Since most clean energy technologies are too capital-intensive to be affordable on a cash basis, some form of financing is generally needed to overcome the hurdle of up-front costs. The main goal of FACET in Asia is to help overcome these financial barriers to implementing such technologies. In general terms, the programme aims to initiate and increase domestic bank lending to end-users of small-scale clean energy applications.

Two types of assistance are being provided from FACET to local stakeholders in order to demonstrate the great potential for clean energy applications, and so stimulate a sustainable local market for relevant technologies:

- **Technical assistance** including market research to assess potential local markets, training and business planning of local banking partners, and marketing support for new lending products to raise customer awareness

- **Financial incentives** including the design of appropriate lending programmes under local conditions, temporary interest rate subsidies with a view to prime the market, business coaching and advisory services for lenders and consideration of partial guarantee funds

In Asia, following extensive consultation with key stakeholders across the region, FACET activities are now focused upon Indonesia and Vietnam, supporting the uptake of biogas digesters and solar water heaters. In Africa, it is recognised that local conditions are very different though there may still be value from the introduction of similar technologies. The target for FACET-Africa will be 10-15,000 loans established in each target country, depending upon the mix of technologies demanded by end-users. Over time, the goal will be to phase-out the financial support mechanism, in the hope that bank lending will continue to grow even as the market intervention is withdrawn.

The development of the necessary financial support mechanisms for FACET-Africa must involve consultation with local governments, public and private financial institutions, state utilities, and private sector suppliers. By demonstrating relevant financial mechanisms, FACET-Africa will aim to prepare local stakeholders to lead successful renewable energy market transformation programmes that:

- Strengthen local financial institutions' overall technical capacity and create an enabling environment for sustainable growth in the financial sector;
- Establish new market links and fill information gaps, allowing banks to better understand consumer demand for clean energy technologies and, in turn, encourage market-oriented policy reforms;
- Identify barriers to renewable energy project financing, suggest practical ways to overcome them, and show how appropriate financial mechanisms can support renewable energy investment.

As well as helping to supply basic energy services, FACET-Africa will also make a significant contribution to broader economic and social development in the countries of implementation including economic growth, poverty reduction, education and improved health of the population.

With this background, the Round Table participants raised the following issues that should be considered by UNEP in the development and application of FACET-Africa:

Financial Mechanism

- 1) Important to have borrower guarantee repayment. Consider use of co-operatives to take the credit risk and address non-payment issues. (Make loan to community / co-operative rather than to the individual)
- 2) Consider the spirit of the community when developing financing model, use co-operatives etc.; consider social frameworks to encourage repayment
- 3) Useful to pool loans for refinancing.
- 4) Interest rate level is key but the interest rate buy down is not the only issue - also the tenor; scheme needs to allow products over an appropriate length of time
- 5) Use expat remittances as a source of funding - gives ability to pay in hard currency or expat has access to local banking system
- 6) Use local banking system; make sure the right banks are selected; but need to consider how to finance - often low banking penetration for the target market.
- 7) Transaction costs are quite high; need to know the true level of the financial transaction costs

- 8) Need to think about payment / charging model
- 9) Use mobile phone for payment; useful to establish a credit history; re-payment mechanisms should include mobile payment systems
- 10) Consider a lease finance model, link to mobile phone payment system.
- 11) Consider different models including remittance from diasporas, mobile phone repayment
- 12) Find which repayment structures are already in place locally. Copy those that are successful
- 13) Link finance with product delivery
- 14) Certainly a need for donor support but doubt about the model, country selection etc.; need the early involvement of public funding organizations; but note that subsidy regimes can distort the financing decision
- 15) Concern about default rates in Africa; work with local micro finance organisation who may have some local knowledge
- 16) End users focus on the cheapest technologies. Therefore subsidy or public finance may be required to encourage focus on value not price
- 17) Need the ability to pay in small increments
- 18) Calibrate payment based on opportunity cost / what spending will be diverted from to repay loan e.g. less spent on diesel will make it easier to pay for solar.
- 19) Typical loan size \$200-1000
- 20) Ability to repay should be assessed on range of criteria
- 21) Client needs to see the economic benefit
- 22) Important to compare legalised cost of energy to determine payback
- 23) Important to get incentives for an appropriate distribution system e.g. reward staff linked to repayment rate not how many loans they can get out the door.
- 24) How to stimulate the market, competition between lenders, ensure price point is lower
- 25) Can securitisation be used to create an exit strategy?
- 26) Do not over stretch the borrower
- 27) Combine a clean energy technology loan with insurance

Technology Issues

- 1) Renewable energy has a bad name because of for quality products
- 2) No certification of the technologies that come in to a country
- 3) Need to use appropriate technology and local partners.
- 4) Should have warranties for technology with additional warranties through finance.
- 5) Technologies already selected also seem appropriate to Africa
- 6) Concern regarding maintenance, what if the system breaks down? Need O&M contract in place at time of sales.
- 7) Technology may be used in very different way to that originally intended e.g. pay as you go for lights.
- 8) Quality of asset is important; some technology can be installed for 20 years without maintenance

- 9) Appropriate technology may not be available, challenges regarding imports
- 10) Can use local manufacturing to reduce cost. Costs need to come down by 80%
- 11) Technology selected must be locally relevant and appropriate
- 12) Technology selection should be site dependent
- 13) how does the technology satisfy current demand
- 14) System design should be based upon the needs of the client

Market Development

- 1) Develop a project pipeline. Build and they will come!
- 2) Need to stimulate demand - end user finance could do this
- 3) Useful to have an anchor load
- 4) Important to understand cultural dynamic
- 5) Need product warranty to match loans
- 6) Model seems well suited to Africa; appropriate for Africa; but Africa is very diversified and therefore identifying specific opportunity for country selection is important; focus on countries with high diesel usage
- 7) Large market size for loan size - will allow larger value items to then be sold
- 8) Sales distribution need
- 9) Most elegant where no grid
- 10) Use for medicine, cold chain requirements to allow industry to develop e.g. milk
- 11) Local fuel subsidies are a barrier
- 12) Commercialisation of these technologies can be difficult.
- 13) Should consider follow-on community impact, product life cycle and maintenance
- 14) Consider how the cultural barriers will impact the adoption of the technology
- 15) Look for regions where palm oil plantations already exist as they produce significant biomass waste
- 16) market development and demonstration must be self sustaining; should aim to create a business with any intervention
- 17) Could other side benefits be factored in?
- 18) Avoid creating a monopoly in the banking market
- 19) Should include the ability to scale-up

Preparation

- 1) It is an uphill task to do country assessment which is really needed.
- 2) It's essential to recognize that local culture and knowledge is relevant
- 3) Need to be certain that people want to repay loans; use peer pressure / reputation to encourage this
- 4) Beware knock on effects - who will the client blame if something goes wrong and what impact will this have?

- 5) Need to be sure that the technology is suitable
- 6) Biomass resource availability must be considered
- 7) Partners are critical; need to assess partnership opportunities with either technology provider or the financing institutions
- 8) Government should be consulted but, if involved in implementation, needs to have sufficient resources to deliver project

Capacity/awareness

- 1) High costs are a consequence of using higher quality products, but have built reputation. Education is therefore important. Value proposition.
- 2) Local technical capability
- 3) Educating banks and connecting finance with projects
- 4) Awareness building is helpful use of donor funding
- 5) Be clear that the programme is intended to show the finance sector that this can work and then let it be self sustaining. It is not about providing finance.
- 6) Trained local technical people as installers
- 7) How do you sell the advantage of making the changes

Experience

- 1) Mobile banks now account for 25% of Kenya GDP via Mpesa
- 2) Might be worth waiting for results from Asia programme
- 3) Solar ice maker case study discussed, uses absorption / desorption of methanol vapour on active carbon. No need for electricity, low tech (flat plat solar thermal), also easy maintenance, low cost (estimated €4500) . Temperature inside was consistently 2-8 degree. System operates well.
- 4) Project approach can be similar to micro finance schemes but for renewable
- 5) Desertech technology selection given as an example.

General

- 1) Define end users finance: "A way of providing financial support to client to acquire renewable energy device for their own use"
- 2) Difficult to manage interest rates and inflation in emerging markets
- 3) There are significant practical challenges in implementation.
- 4) Consider possible country focus on Burkina Faso, use of biomass. Model may use micro transformer of biomass to gas, balance with efficiency. Alternatively model to collect large amount of biomass to support larger scheme

2.4 Financing mechanisms for Energy Efficiency Applications in Buildings

This session was introduced by Douglas Prentice, CEO of Geocapita who have been engaged by the European Energy Centre to assist with the preparation of the UNEP Round Tables. The area of

energy efficiency in buildings has recently been recognized as a key opportunity for the reduction of greenhouse gases worldwide, so UNEP is keen to maximize this potential. The financial mechanisms required to stimulate the uptake of energy efficiency applications in buildings is a particular focus. This area has not yet been well-developed by UNEP, so the Round Table discussions provided an ideal forum to help direct any future programme development.

It was noted that 40% of global energy consumption can be linked to buildings, which accounts for one third of GHG emissions. The rate of construction in some developing countries currently accounts for upto 40% of GDP, with GHG emissions set to double in the next 20 years. On this basis, there is enormous potential for improved energy efficiency.

There are a range of possible financing schemes for energy efficient new-build and retrofit activities related to buildings. These include Government support schemes, private developer financed schemes, PPP concessions, ESCOs, community-led finance and hybrid schemes. ESCOs and community models were seen as having particular relevance in the facilitation of energy efficiency for buildings in developing countries.

Appropriate financing mechanisms to assist energy efficient applications for buildings are being considered by UNEP, including lighting, air conditioning and refrigeration, transformers and motors. Energy efficient building design is another area of potential focus, including a range of planning and design-related issues in the context of energy distribution, infrastructure, sustainable cities as well as building materials and new energy efficient design features for buildings.

With this background participants at the Round Tables raised a range of issues that will be relevant for UNEP to consider in the future design of any financial mechanisms for this sector:

ESCOs

1. ESCO model questioned due to capital intensity. ESCOs work well in a context of a stable policy regime but generally do not work so well in the absence of such policy.
2. assumption of an ESCO relies on ability to identify energy usage and that there is significant usage, therefore they are generally more relevant to urban centres
3. For ESCO finance the technical parameters are critical due to there being no supporting revenue streams from other business activities. E.g. for Renewable Heat for buildings issues such as heat load, pellet/chip supply (and forward contract terms) and warmer weather risks are typical risk issues that need mitigated
4. What exactly is an ESCO? In fact there are several possible models and attention should be given to the local policy regime and energy supply markets.
5. Where is the ESCO model most relevant? Probably in environments where there is a stable policy regime upon which investors can be confident of the cash flows
6. ESCOs - still not clear if they work. May be less agile than private investors. Energy price often subsidised therefore it can be difficult for an ESCO to work; this is especially the case where there is subsidization of grid electricity but no or relatively poor support regime for renewable energy. Reaching grid parity in such circumstances can be very challenging and ESCOs especially where set up by SMEs or community groups will find it very difficult to achieve any significant market penetration.
7. The ESCO is typically capitalized by the investor and the investor is paid back either by the tariff on the energy or in the case of the UK Green Deal by energy cost savings with repayments met through utility bills. This supports the capital financing for the ESCO
8. The ESCO sector not well developed. UNEP could therefore do demonstration projects

Financing

1. Lots of small changes aggregated to make large saving.
2. Payback period is an issue, although this can vary enormously depending upon the tariff regime (where there is one)
3. Need to consider local tax regime e.g. Stamp duty on house sales
4. Link with PRIM by getting a FIT policy in place in the first instance
5. Financing of new building less of an issue; therefore need for innovative finance more required for retrofitting
6. Pay back periods are too long, typically 10-15 years, but project structuring can reduce this period significantly
7. Energy cost too low, usually due to subsidies and other costs such as security, not being fully included in energy cost
8. Local banks often have limited or no funds for energy efficiency. There may be a need for state led initiatives to provide energy efficiency funding, e.g. Green Investment Bank in the UK.
9. Where such state led initiatives provide state aid funding there are opportunities for the state to co-invest with private sector funds
10. Micro finance can work even in Italy, LED lights have fast payback

Standards

1. Reliability of equipment an issue. Warranties only replace equipment not the revenue associated with the saving.
2. Minimum building standard /code for building are not in place for developing countries.
3. Building standards are important but often to protect the construction industry rather than drive efficiency. Often not applied.
4. Standards required
5. Need also for good regulation of installers and possibly also of the financial sector

Market development

1. Start with the construction and fabric of the building – fabric first
2. Need to identify relevant opportunities
3. Important to get right partners to take relevant risks and understand local needs. Use diaspora
4. Integrated resource management strategies
5. In developing countries the priority is to get access to energy
6. Necessary to understand how local market works
7. Need to link action for both new builds and retrofits
8. More difficult in Africa as energy is used for cooling rather than heating (although much work has been done in other countries, in Italy for example, on renewable cooling and refrigeration)
9. Retrofitting brings smaller advantages than better new buildings, although the scope for overall reduction in CO2 emissions in existing stock is far larger – however this is generally more costly per kgCO2 abated

10. Due to population growth, better to focus on urban areas
11. Should engage all stakeholders, particularly with utilities

Experience

1. DECC doing some work in this area
2. UK Green Investment Bank debt financing and co-investment with private sector funds
3. EU scheme recently approved
4. UN Habitat initiative in Malawi
5. In Italy 55% tax benefit for energy efficiency spend
6. Example of 400 apartments that used individual heat sensors, gave 4 year pay back
7. Other policy mechanisms also being implemented. Housing Energy Performance Certificate system in place
8. Libya example, suggest rather than focus on training local workforce, focus should be on reducing involvement on local workforce
9. Financial mechanics can be complex e.g. UK Green Deal and it is necessary to consider changing use over time

Technology

1. Technical solution is different between heating and cooling
2. Dynamic energy management technologies should be considered for e.g. weather, level of occupancy and sun movement. Reduces overheating or cooling. These techs may have a shorter payback period. This can also be effective to reduce overall cost of energy.
3. Consider solar submersible pumps for irrigation in sub-Saharan region; solar ice maker
4. Heat pumps are seen as a very effective technology
5. Build on existing technologies that are locally relevant

Issues

1. Building stock is important as this limits what can be done
2. Trade off between building design vs internal measures
3. Should focus on the cultural aspects of energy usage
4. All very much a function of political and economic situation
5. For developing countries, consider some form of concessional financing for industrial projects
6. Contracting is often complex
7. How big is the scope, does it include life cycle to include construction or focus on retrofit?
8. What is the definition of energy efficiency, building materials or consumption of electricity?
9. Should the focus be on industrial and urban environment, energy usage in developing countries is low

3. Other Project Ideas

In addition to the four main focus areas presented by UNEP for further discussion, participants were also asked to describe any project ideas that they felt, after now learning more about UNEP's focus, would be useful for UNEP to consider in future programming. Below are brief outlines of some of those concepts that will be followed-up subsequent to the Round Tables (see Annex C for more details of selected initiatives):

EDINBURGH

<u>Project Originator</u>	<u>Contact email</u>	<u>Location</u>	<u>Concept</u>
Szent Istvan University	fogarassy.csaba@gtk.szie.hu	Hungary	Sustainable Housing and Energy - disseminating European Best Practice
Daima Energy Solns	joyce@daimaenergy.com	Kenya	Various RE projects to be developed using PPP methodology together with govt. of Kenya
ARPEDAC	blaise.mempouo@nottingham.ac.uk	Various Central Africa	Low Carbon Buildings; integrated resource systems
McDermid Energy	gbradford@mcdermidenergy.com	Scotland	RE for the Island Community of Great Cumbrae
East Cape S Africa	gbranston@btinternet.com	S Africa	East Cape RE projects
SHFCA	nigel.holmes@shfca.org.uk	Scotland and various	Disseminating hydrogen fuel cell and storage technologies internationally and in pilot projects
GR Property Consultants	geoffrobotham@mac.com	Scotland	Energy Efficiency in Buildings/Urban Energy Efficiency
Edinburgh Napier Univ	t.muneer@napier.ac.uk	Various	Solar modeling, light-pipes in buildings, LED lighting, community scale wind, energy cooperatives
Glasgow Caledonian Univ	Branka.Dimitrijevic@gcu.ac.uk	Various	Dissemination of work of 7 Scottish Universities in energy efficiency and carbon reduction in the built environment
Scottish Government	jonathan.guthrie@edinburgh.gov.uk	Edinburgh & Scotland	De-risking projects in order to attract/secure capital investment into projects

LONDON

<u>Project Originator</u>	<u>Contact email</u>	<u>Location</u>	<u>Concept</u>
Solar Aid/Solar Century	charlie.miller@solar-aid.org	Africa	Individual house solar lighting, carbon reduction
SPISSIA	maria.lacerda@spissia.com	Brazil	Sustainable Housing and Energy
Avonge	raj@avonge.com	Ghana	Rice farming
Green Cities Foundation	ashley@greencitiesfoundation.org	London & various	Sustainable cities; sustainable urban redevelopment
Venture Renewables	joseph@venturerenewable.com	Nigeria & Ghana	RE projects and sustainable communities in West Africa
Home Builds	logboru@hotmail.co.uk	Nigeria	Large scale affordable housing development

FRANKFURT

<u>Project Originator</u>	<u>Contact email</u>	<u>Location</u>	<u>Concept</u>
Cygielman & Co	mc@cygielman.com	Greece and DRC	Micro hydro
Wirsol	marie.berger@wirsol.com	Various	Solar
PowerHive	rik@powerhive.com	var Africa	Solar
Ecovision	ecovision@kate-stuttgart.org	Various	Solar; housing dev.
Africa Enablers	schuller@africa-enablers.com	Africa	Various RE projects

MILAN

<u>Project Originator</u>	<u>Contact email</u>	<u>Location</u>	<u>Concept</u>
Eco Waste & Energy Soln	ray@ewes.biz	Philippines	Biomass - growing Miscanthus
Rossovivo Design	porta@rossovividesign.it	Italy	Electric Vehicle design and prototype manufacturing

GreenTech	m.moglie@greentechsrl.com	Various, Africa	RE ice-production system
New Cold System	<a href="mailto:madi.sakande@newcoldsyste
m.it">madi.sakande@newcoldsyste m.it	Various, Africa	RE cooling and refrigeration
Climate Policy Initiative	gianleo.frisari@cpivenice.org	Various	Climate change policy
FERA	b.gustinetti@ferasrl.it	Various	Solar
Margot Rendall	margotrendall@gmail.com	Italy, Europe	Solar, biomass, wind, biogas

PARIS

<u>Project Originator</u>	<u>Contact email</u>	<u>Location</u>	<u>Concept</u>
Eco-capital	tauni@eco-capital.co.uk	Various	Various
Irena	SHeld@irena.org	Middle E/Africa	Various
Alliance for Rural Electrification	c.miro@ruralelec.org	Af/S America/SE As	Rural electrification
Solartec	j.waschke@solartec.lu	Various	Integrated solar solutions

4. Conclusions from Issues Raised

From the large number and wide range of comments provided to guide the development of programmes in the four target areas, there are several issues that will need to be addressed by UNEP when developing these programmes further for practical implementation. The following summaries related to the programme concept presented outline some priorities that must now be taken into account, based upon the feedback from the Round Tables.

4.1 Hybrid Mini-Grids

One of the fundamental observations was the lack of any common definition of “mini” grids, and the need to clarify the scale that can be commercially viable. Some of the key issues raised in the discussions of mini-grids included the need to consider local realities in terms of dispersed and mobile populations. A demand-driven approach will be essential, taking account of the financing arrangements that are already tried and tested locally – on this basis, the use of co-operatives seems attractive, including involvement of the target communities in the design of any financing mechanisms, implementation, skills development and deployment. Starting with small-scale applications as a basis for future scale up was a key message from the discussion groups, as well as the need to integrate activities with existing relevant local service providers such as s micro-

financiers. The effective collection of revenues is a particular issue to be addressed and could make use of enabling technologies also appropriate for local users (such as smart phones).

It was agreed that there is no single solution to the provision of energy via mini-grids, with each application needing to be modified to local conditions. As a first step it was suggested that remote brown-field sites (already having some self-contained grid infrastructure) should be targeted for an initial demonstration, with isolated green field applications to be addressed in the future. And before commencing any new activity, information is required about what already exists in terms of systems implemented or demonstrated. This market analysis will be essential, particularly to determine the likely storage requirements and match local needs to local resources. How to guarantee maintenance over time must be addressed. Affordable tariffs need to be assessed and appropriate financing mechanisms designed to ensure access to the new energy supplies. The level of associated policy interventions should also be determined.

There is a need to develop local business as well as to increase energy access, since this will create local demand for energy and generate a viable market. External support will be required in the short term to complete a successful demonstration, which can then attract commercial investment based upon the local demand that becomes evident. Experience elsewhere should be assessed and built upon, with the ownership model applied in the Philippines providing a good basis for the use of biomass as an energy source supplemented by other renewable energy. However, the issue of fuel vs food must be resolved to ensure the appropriate use of biomass. Training should also be a focus for local communities to develop and use new technologies, and for local bankers to become familiar with lending for such clean energy applications.

There is a clear role for UNEP involvement, in particular to find options for bridging the financing gap that currently exists for any new approach to energy provision. UNEP needs to clarify the target locations for future interventions, consider anchor customers (though these may not always be available) and assess the comparative cost between the new and existing supplies of energy, since this will determine the practical market uptake. Given the range of local environments, a toolbox of demonstration models should also be considered. The potential for such local solutions to be replicated elsewhere must also be carefully investigated. There are certainly generic issues that can increase certainty for investors though, similar to target local communities, investors are not homogeneous and their motivations must be understood before they can be positively influenced by UNEP interventions.

4.2 Policy Risk Insurance Mechanism

The issue of policy risk was widely acknowledged as a significant issue for investors and there was consistent support for the fundamental PRIM concept. The feedback received during the breakout discussion groups did highlight a range of questions, many of which related to technical structuring and operations of the PRIM entity. These were often at a level of detail beyond the scope of the roundtable discussions but did demonstrate that the PRIM concept, whilst elegant, is also complex. It was felt that the devil will be in the detail; specifically issues related to the pricing and scope of coverage, these can only be addressed through the implementation of a pilot programme.

More generally it was noted that every project has a different risk profile and policy risk is only part of that bundle of risks. Equally investors each have a different risk appetite. It is therefore important to recognise that the PRIM proposal will not suit all renewable energy investments.

Furthermore it was recognised that PRIM is focused on the specific issue of policy risk which may manifest itself in a number of different ways, such as credit risk. Participants were keen to see the PRIM concept expand beyond the focus of underwriting policy backed revenue streams to include

other policy related risk issues such as boarder tax adjustments and import tariffs. Additionally the ability for PRIM to provide coverage against future changes as well as retroactive changes was seen as valuable but would need careful detailing.

There was widespread recognition that many existing facilities such as Partial Risk Guarantees, MIGA wraps, Export Credit Agency products etc. are either limited in scope or operationally difficult to implement, and as such failed to address policy risk. They could however play an important role in supporting PRIM either through a wholesale / retail structure or alternative sources of capital contribution by participating host countries. They also provide a useful model for the development of PRIM. Similarly the interaction between PRIM and other multilateral agencies such as the IMF should also be considered.

Participants identified the need for underlying projects and host country policies to be robust before they will be capable of benefiting from PRIM. PRIM will not be a substitute for a poor policy environment since will not attract private sector capital; an important element is leveraging the use of public sector funding. Each country and project will have to be underwritten on its own merits.

The public / private dynamic of PRIM was seen as critical in creating an alignment of interest between risk influencer and risk taker. However it was recognised that this alone may be insufficient and at a certain stage an economic decision could be made by the host country to default.

Wider benefits of PRIM, such as reducing the opportunity for corruption and providing leading information to governments about how investors were responding to particular policy signals, were also identified by participants.

In conclusion the roundtable discussions recognised the importance of policy risk and the role PRIM could play. However it also highlighted the numerous questions of detail that will need to be resolved, preferably through a pilot program.

4.3 End User Finance to Access Clean Energy Technologies in Africa

It was broadly agreed that the general principles applied for the FACET programme in Asia will be relevant in Africa, though the approach must be modified to reflect local conditions, which will differ between countries and even within the same country in Africa. Much attention was given to the type of financing mechanisms that might be appropriate, with particular attention to reducing the risk of payment default by engaging co-operatives and communities. It was recognized that much attention must be given to the capacity of the target market to meet the financial conditions set for repayment. The use of existing facilities and repayment structures, such as payment via mobile phones, was seen to be an effective basis for such activity.

The ability of customers to repay must be clearly assessed in advance of any intervention, with small local sizes requiring the provision for repayment in small increments. To encourage such payment, potential customers must understand the long-term economic benefits, so a focus on awareness-raising is required (probably more than in Asia). The need to move away from the typical end-user focus on the cheapest technology was seen as a key factor, probably requiring public sector funding to encourage a focus on value rather than solely price.

Regarding the potential technologies to be targeted in Africa, it was noted that renewable energy has a poor reputation due to low-quality products imported to the African market. Some attention to product reliability through warranties or certification should be considered. Local manufacture was seen as a good way to ensure that appropriate technologies were adapted to local needs, and to bring cost reduction. Building the capacity of local producers should therefore be a target of any

intervention. The selection of technologies must be site-specific and will vary according to the local resources available.

To develop the market for clean energy technologies in Africa, it was agreed that access to end-user finance could be a good way to stimulate demand. It is important to understand the cultural dynamics when assessing the potential market, and the associated cultural barriers to adoption of such technologies. It was accepted that commercialization of such systems can be difficult and must take account of long-term community impact, product life cycle and maintenance costs and opportunities (such as job creation).

The potential for bio-energy use was highlighted based on both local agricultural and waste resources, though the availability of such supplies (including conflicting food and water demands) must be carefully considered. It was also recognized that local fuel subsidies can be a barrier and the impact must be factored in when assessing likely demand. Side benefits from new energy supplies should also be considered since greater access to health and education, and potential productive activity or job creation, may have significant additional value to the target customers.

Discussions also highlighted the need for careful preparation before identifying the most appropriate energy technologies for intended customers. Assessment of country resources and local demand, including knowledge of local culture, are key requirements to be certain that people will be willing to pay for new and unfamiliar services. This need to build awareness of the benefits from clean energy applications should be given high priority in Africa – not only for target end-users but also local suppliers, installers and financiers. The best local selling methods for new energy generation need to be determined and implemented. Lessons from other initiatives highlighted should be acknowledged and built upon.

The main conclusion from Round Table discussions of FACET-Africa was that there is great potential for positive benefits from a similar approach to that taken in Asia, though local conditions and culture must be carefully addressed in the selection of appropriate technologies. Stakeholder awareness, including government, financiers and end-users will be a key factor in the success of this initiative.

4.4 Financing for Energy Efficiency in Buildings

There is a very great need for reductions in CO₂e emissions from buildings as is clear from the many independent research reports done into this area. There is a clear leader role opportunity for UNEP in this area. The Frankfurt School – UNEP Collaborating Centre now has some resources available to tackle this important area.

Some of the highlights raised at the Round Tables included the following:

- there is a need for a combined technical-financial solution set. One without the other will not be very effective and may well in fact misallocate resources
- there needs to be a (UNEP) procedure which allows differential approaches in different countries (and one which allows the approach to change over time as the country situation changes both economically and in emissions)
- work should integrate activities of the power generation sector and hence there is a need to engage further with this sector
- there is a strong interest in the cooperative approach to energy efficiency in buildings

- ESCOs met a mixed reception with some people being strongly in favour but others arguing they had not worked over many years.
- ESCO funding by bilateral and multilateral facilities perhaps needs to be expanded through the use of hybrid structures in involving local Community Cooperative ESCOs
- Consumer resistance to do anything about improving energy efficiency of their buildings was raised as actual experience. Therefore work needs to be done on the behavioural aspects of how people use buildings
- there may be a lack of public understanding of how large the scale of CO2e emissions in buildings is (people think more of energy generation, cars, planes etc). Thus there may well be a need for an education/awareness programme
- there are many models of how to finance energy efficiency in buildings and work needs to be done on researching all of these and a consolidated set of best practice technical and financial procedures in the built environment needs to be produced
- the UK Green Deal and especially the self-financing mechanism under the Golden Rule was of general interest. However critics pointed out that take up was very slow. Hence some independent work on what was succeeding and failing with the Green Deal should be carried out and learning from this UNEP could perhaps assist both the EITs with an adapted model
- regarding retrofit generally there is very great potential to achieve both significant energy and CO2e savings in existing buildings given the generally extremely poor energy performance of existing buildings compared to new buildings built to best international standards
- investment in energy efficiency in buildings typically produces substantially savings, which help offset the additional costs of the EE measures, thus reducing the payback period and helping improve investment returns
- there is a need for education to bring constructors, owners and occupiers to understand the lifetime carbon cost of the building they build, own or use
- the current (and likely to remain for some-time) low price of carbon means there is no market signal to reduce emissions from buildings
- energy prices should be a much stronger signal and perhaps a UNEP approach to improving the carbon performance of buildings needs to focus on helping owners and occupiers to reduce their energy costs
- given the very high percentage of GDP coming from construction and maintenance of buildings there is a clear opportunity for UNEP to achieve a double bottom line delivery in terms of both promoting CO2e reductions and (sustainable) economic growth in the earlier stage transition economies
- a good way for UNEP to start on a planned programme of improving EE in buildings would be to carry out research but also to support some pilot projects in EE newbuild in Africa coming out of those who attended the RTs
- given the expected scale of increase of CO2e emissions from buildings there is a pressing need for UNEP to commence a programme at an early juncture.

5. Way Ahead

At the end of the Round Tables, sign-up sheets were made available related to each of the four key programme areas discussed. Participants were asked to sign any sheets for which they would like to receive follow-up communications from UNEP regarding progress in these areas. Additional names can be added to these circulation lists at any time.

For the three programme areas that are most developed, UNEP will incorporate all relevant comments and finalise the programme concepts before submitting them to donor organizations to ascertain interest and potential funding for implementation. With regard to financing mechanisms for energy efficient buildings, the Frankfurt School – UNEP Collaborating Centre will conduct a review of all the issues that need to be considered, including comments from the Round Tables, before UNEP can define a focus for its activity in this area.

These Round Table discussions should mark the start of a process to define and implement new areas of energy finance activity that can have meaningful results in terms of stimulating private sector investment into clean energy technology applications in developing economies. The awareness raised amongst Round Table participants regarding UNEP's energy finance activities will hopefully be just the starting point for further outreach through the networks of participants. The contacts established by UNEP, and between Round Table participants, are also intended to mark the start of extended interaction. Since UNEP is an independent and neutral body, such interaction is not intended to provide a platform for future project partnership. However the increased awareness of Round Table participants, and subsequently of their own contacts, will provide a useful basis for further interaction. Overall, it is hoped that this Round Table series will be the first step to follow-up activities.

The success of the Round Tables in terms of positive feedback from participants may present good motivation to repeat such a consultation process in the coming years. Further comment from participants will be considered by UNEP before making this decision.



Annex A: Feedback from Participants

Below are some quotes from communications received after the Round Tables were completed:

Edinburgh

Sarah Boyack, Member of Scottish Parliament

“The Round Table was an excellent opportunity to engage in discussions about how Scotland can help support clean energy projects in developing countries..... it was fitting that the round table came to the city”.

Antonio Di Cecca, Project Manager for Climespace - GDF SUEZ

“Thank you very much for the invitation to the Round Table and for the useful and interesting information.... Hoping to participate to the next clean energy issues and program development at UNEP”

Andrew Mason, Standard Life Investments

“Thank you for inviting me to what was a very useful event yesterday. Please do keep me informed of progress”.

London

Wim Verheugt, Development Director – Mott MacDonald Ltd, Europe

“I truly enjoyed participating at the Round Table meeting in London on Friday 15th March. Good luck with your other Round Table events and I look forward to hearing from you”

Professor Poopathy Kathirgamanathan, Brunel University, UK

“It was good to meet you yesterday and I enjoyed the discussion”

Nick Willson, Nick Willson Architects

“It was lovely to meet you on Friday and thank you for inviting me to a great discussion, I found the day very informative and knowledgeable”.

Frankfurt

Rik Wuts, Powerhive Inc

“It was a pleasure meeting you at the UNEP event in Frankfurt recently. I hope you found the input that was given helpful – I for one learned a lot and appreciated the opportunity to meet interesting people as well”.

Marie Berger, Wirsol

“It was a great pleasure to meet you last week in Frankfurt. This roundtable was a good moment to think about the specific financing challenges in energy projects, thank you for giving us this opportunity”.

Martin Cygielman, Rechtsanwalt

“Thank you very much for having had the opportunity to attend the inspiring UNEP-Roundtable Meeting in Frankfurt on March 20th, 2013”.

Milan

Ashley Dobbs, Founder, Green Cities Foundation

“Many thanks for a superb roundtable on Friday. I got so much from the event in the form of new knowledge, new contacts and new friends”.

Margot Rendall, Lanco Solar

It was a pleasure to meet you yesterday at Politecnico di Milano. You did an excellent job in leading the round table, drawing out most of the participants—not an easy access, as people are generally quite reserved in such settings.

Enrico Buoni, Centro Galileo

“Thank you very much for the collaboration. I am very pleased that the round table went well”.

Paris

Tauni Lanier, EcoCapital Ltd

“Thank you for the invitation to yesterday's event. I found it inspiring and took home a number of issues to ponder. Please consider me a keen participant in any future events”.

Larisa Dobriansky, General Micro Grids

“Thanks very much for the invitation to participate. I found the Round Table to be very productive and really enjoyed talking with all of the participants. Look forward to continuing the dialogue.”

Stefanie Held, IRENA

“Thank you very much for presenting your work about risk guarantees funds PRIM at the UNEP meeting last week. I would certainly be interested in remaining in contact about this for mutual exchange of what works and what does not and how applicable the ideas are that exist in this area”

Annex B: Round Table Participants and Interested Parties

Name	Organisation	Location	E-mail Contact
Aileen Lothian	Young SET Ambassadors	Edinburgh	aileen@youngsetambassadors.com
Andrew Mason	Standard Life	Edinburgh	andrew_x_mason@standardlife.com
Ateeq Hussain	EPC Kirklees - Energy Consultants	Edinburgh	info@epckirklees.com
Blaise Mempoou	NottinghamUniversity, ARPADAC	Edinburgh	blaise.mempoou@nottingham.ac.uk
Branka Dimitrevic	Glasgow Caledonian University	Edinburgh	Branka.Dimitrijevic@gcu.ac.uk
Consul General Carfagnini (contact: Anna Alonzi, secretary)	Italian Consul-General	Edinburgh	consolato.edimburgo@esteri.it
Csaba Fogarassy	Szent Istvan University	Edinburgh	Fogarassy.Csaba@gtk.szie.hu
Dale Caton	Narvida	Edinburgh	dcaton@narvida.co.uk
David Gordon	Own Energy	Edinburgh	david@ownenergy.co.uk
Dean Cooper	UNEP	Edinburgh	Dean.Cooper@unep.org
Dory McIntosh	iPower	Edinburgh	dory.mcintosh@ipoweruk.com
Douglas Prentice	Geocapita	Edinburgh	djpp@geocapita.net
Duncan McLean	A & D McLean Ltd	Edinburgh	duncanmclean@talktalk.net
Gavin Donoghue	Scottish Renewables	Edinburgh	gdonoghue@scottishrenewables.com
Geoff Robotham	GR Property Consulting	Edinburgh	geoffrobotham@mac.com
Gordon Bradford	Mcdermidenergysolutions	Edinburgh	gbradford@mcdermidenergysolutions.com
Gordon Branston	Branston	Edinburgh	gbranston@btinternet.com
Ian MacDowall	MacDowall	Edinburgh	macdowallk@aol.com
Jay Singh	Alva Northern	Edinburgh	jay.singh@alvanorthern.co.uk
Jonathan Guthrie	Scottish Government	Edinburgh	jonathan.guthrie@scotland.gsi.gov.uk
Joyce Onuonga	Daima Energy Solutions Ltd,	Edinburgh	Joyce@johnwhiteandson.com
Julian Richardson	Parhelion Underwriting	Edinburgh	JHR@Parhelion.co.uk
Laura Susanne Shuford	Frankfurt School UNEP Collaborating Centre	Edinburgh	L.Shuford@fs.de
Liam Forbes	Babcock	Edinburgh	Liam.Forbes@babcockinternational.com
Marcel	Strathclyde University	Edinburgh	marcel.azubuike@strath.ac.uk

Azubuike			
Marco Buoni	EEC - Centro Studi Galileo	Edinburgh	buoni@centrogalileo.it
Martin MacAdam	Aquamarine Power	Edinburgh	Martin.McAdam@aquamarinepower.com
Martin Ruzicka	Edinburgh Napier University - Stovemason Masonry	Edinburgh	martin@stovemason.co.uk
Mo Cloonan	Community Energy Scotland	Edinburgh	Mo.Cloonan@communityenergyscotland.org.uk
Nathan Goode	Grant Thornton	Edinburgh	Nathan.Goode@uk.gt.com
Nigel Holmes	Scottish Hydrogen Fuel Cell Assoc	Edinburgh	nigel.holmes@shfca.org.uk
Paolo Buoni	European Energy Centre	Edinburgh	paolobuoni@EUenergyCentre.org
Rafael Arribas	ALSTOM-AREVA,	Edinburgh	rafaelarribas@hotmail.co.uk
Sarah Boyack MSP	Scottish Parliament	Edinburgh	Sarah.Boyack.msp@scottish.parliament.uk
Steven Hunt	DFID	Edinburgh	s-hunt@dfid.gov.uk
Susanne Mueller	Vento Ludens	Edinburgh	Susanne.Mueller@ventoludens.co.uk
Tariq Muneer	Napier University	Edinburgh	t.muneer@napier.ac.uk
Tony Buari	Afrobased Solar	Edinburgh	afrobasedsolar.com
Torsten Becker	Frankfurt School UNEP Collaborating Centre	Edinburgh	T.Becker@fs.de
Vivi Asprouli	Global Energy Solutions	Edinburgh	vivi@global-energy.eu
Abdul W Raaj	Sukagroup	London	abdul@sukagroup.co.uk
Adrian Calvert	WindRose Capital Ltd.	London	adrian@windrosecapital.co.uk
Amlan Bhusan	Garden Webster Bhusan	London	amlan.bhusan@gardenwebsterbhusan.com
Andy Oldroyd	Oldbaum Services	London	andy@oldbaumservices.co.uk
Andy Oldroyd	Oldbaum Services	London	andy@oldbaumservices.co.uk
Ashley Dobbs	Green Cities Foundation	London	ashley@greencitiesfoundation.org
Ben Forster	Mitsui	London	B.Forster@mitsui.com
Cameron Cook	Amber Infrastructure	London	cameron.cook@amberinfrastructure.com
Charlie Miller	Solar Aid	London	Charlie.miller@solar-aid.org
Chim Chalemera	Turner and Townsend	London	chimwemwe.Chalemera@turntown.co.uk
Colin Hunter	Green Fibre Communications	London	Colin@gfc.uk.net
Dana Kupova	EBRD	London	KupovaD@ebrd.com
Daniel Brutto	Sea Survey	London	dan@seasurvey.co.uk
David Altabev	Technology Strategy Board	London	davidaltabev@gmail.com
David Cousland	Triodos Bank	London	David.Cousland@triodos.co.uk
Dean Cooper	UNEP	London	Dean.Cooper@unep.org
Derek Skinner	Bruce Stevenson	London	Derek.skinner@brucestevenson.co.uk
Douglas Bennet	Frontier Markets	London	douglas.bennet@frontiermarketsfm.com
Douglas Prentice	Geocapita - European Energy Centre	London	djpp@geocapita.net

Elizabeth Vega	Informed Solutions,	London	mercedes.sanchez@informed.com
Emma Howard Boyd	Jupiter	London	ehowardboyd@jupiter-group.co.uk
Eric Keogh	Impact Global Emission Solutions	London	eric@impactglobalemissionsolutions.com
Jerry Biggs	NAREC Capital	London	jbiggs@nareccapital.com
Joseph Olutunmogun	Venture Renewable Energy Limited	London	joseph@venturerenewable.com
Julian Richardson	Parhelion Underwriting	London	JHR@Parhelion.co.uk
Karen McClellan	Solar Power Capital	London	soubiranne@hotmail.com
Laura Susanne Shuford	Frankfurt School UNEP Collaborating Centre	London	L.Shuford@fs.de
Liesbet Peeters	D Capital Partners	London	liesbet.peeters@dcapitalpartners.com
Louise Ogburu	Home Builds Ltd	London	logboru@hotmail.co.uk
Marcus Postlethwaite	Marcus Build	London	marcusbuild@gmail.com
Maria Lacerda	SPISSIA	London	maria.lacerda@spissia.com
Mary Roach	GSMA	London	mroach@gsma.com
Maxine Fawcett	The Sophia Centre	London	maxine@thesophiacentre.com
May El Tabbakh	May El Tabbakh Architects	London	mayeltabbakh@yahoo.com
Medoune Niang	Ecocossan	London	medoune2520@gmail.com
Murray Birt	Caio Koch-Weser	London	murray.birt@db.com
Neal Dickinson	Meldan	London	neal@meldan.co.uk
Nick Willson	Nick Willson Architects	London	nickwillsonarchitects@googlemail.com
P Kathir	Wolfson Centre, Brunel University	London	P.Kathirgamanathan@brunel.ac.uk
Paul Morris	Tocado Tidal Energy	London	pmo@tocado.com
Paul O'Donnell	Greencoat Capital	London	Paul.ODonnell@greencoat-capital.com
Pete Southwall	Eco Energy Installations	London	pete@ecoenergyinstallations.com
Philippe Adriaenssens	European Business and Technology Centre	London	adriaenssens@eurochambers.eu
Raj Mahapatra	Avonge	London	raj@avonge.com
Richard Kuunaah	Ghanecare	London	kuunaarichard@yahoo.com
Richard Williams	finance	London	richard@mercantileinvestors.com
Rob Bowen	HVAC & Sustainable Facilities	London	rob.bowen@facilitiesintegration.com
Robert Fisher	Vision 2020	London	information@vision2020group.com
Sepideh Golzari	DECC	London	sepi.golzari@decc.gsi.gov.uk

Silvie Kreibiehl	Frankfurt School UNEP Collaborating Centre	London	s.kreibiehl@fs.de
Stephen Beckett	Vital Energi	London	Stephen.Beckett@vitalenergi.co.uk
Susie Allison	Trident Energy	London	susie.allison@tridentenergy.co.uk
Tracy Elner	Fajr Investment Advisory	London	telner@ashtoncommodities.co.uk
William Hu	China Development Bank	London	donghuihu@cdb.com.cn
Wim Verheugt	Mott MacDonald	London	Wim.Verheugt@mottmac.com
Amelie Dsouza	KfW Entwicklungsbank	Frankfurt	amelie.dsouza@kfw.de
Anders Sjøstedt	La Compagnie Benjamin de Rothschild S.A	Frankfurt	asjostedt@ctbr.ch
Binod Koirala	ISE	Frankfurt	bkoirala@ise.fraounhofer.de
Brindusa Fidanza	Weforum	Frankfurt	Brindusa.Fidanza@weforum.org
christopher cosack	DEG Invest	Frankfurt	Christopher.Cosack@deginvest.de
Claudia Loy	KfW Entwicklungsbank	Frankfurt	Claudia.Loy@kfw.de
Dean Cooper	UNEP	Frankfurt	Dean.Cooper@unep.org
Douglas Prentice	Geocapita - European Energy Centre	Frankfurt	djpp@geocapita.net
Dr. Andreas Wiese	Lahmeyer International	Frankfurt	andreas.wiese@lahmeyer.de
Elena Angelova	Deutsches Biomass Centre	Frankfurt	elena.angelova@dbfz.de
Ernst Rauch	MunichRe	Frankfurt	erauch@muenichre.com
Felix Holz	DB	Frankfurt	felix.holz@db.com
Franziska Mueller-Langer	Deutsches Biomass Centre	Frankfurt	Franziska.Mueller-Langer@dbfz.de
Jan Andreas	KfW	Frankfurt	jan.andreas@web.de; Jan_Gerald.Andreas@kfw.de
Jan Kappen	KfW	Frankfurt	jan.kappen@kfw.de
Julian Richardson	Parhelion Underwriting	Frankfurt	JHR@Parhelion.co.uk
Kai Buntrock	DEG Invest	Frankfurt	Kai.buntrock@sowitec.com
Kai Buntrock	DEG Invest	Frankfurt	Kai.buntrock@sowitec.com
Laura Susanne Shuford	Frankfurt School UNEP Collaborating Centre	Frankfurt	L.Shuford@fs.de
Manfred Engelhard	MW Zander	Frankfurt	manfred.engelhard@mw-zander.com
Marie Berger	Wirsol	Frankfurt	Marie.Berger@wirsol.com
Martin Cygielman	European Investment Bank	Frankfurt	mc@cygielman.com
Martin Schröder	KfW Entwicklungsbank	Frankfurt	martin.schroeder@kfw.de
Martin Wald	Allianz	Frankfurt	MARTIN.EWALD@allianz.com
Martin Wald	Allianz	Frankfurt	MARTIN.EWALD@allianz.com
Max Gutbrod	Baker & Mackenzie	Frankfurt	max.gutbrod@bakernet.com
Michaela Pulkert	UniCredit Bank AG	Frankfurt	michaela.pulkert@unicreditgroup.de

Mike Enskat	Giz	Frankfurt	mike.enskat@giz.de
Peer Ederer replaced by Peter Shuller	Innovation Growth	Frankfurt	peer@innovationgrowth.com
Peter Gutman	Standard Chartered Bank	Frankfurt	Peter.Gutman@sc.com
Philip Mann	EUEI	Frankfurt	philip.mann@euei-pdf.org
Philip Schuller	Africa Enablers	Frankfurt	schuller@africa-enablers.com
Philip Schuller	Africa Enablers	Frankfurt	schuller@africa-enablers.com
Rik Wuts	Powerhive	Frankfurt	rik@powerhive.com
Sabine Dietrich	Ecovision	Frankfurt	ecovision@kate-stuttgart.org
Silvie Kreibiehl	Frankfurt School UNEP Collaborating Centre	Frankfurt	s.kreibiehl@fs.de
Sopna Sury	EON	Frankfurt	sopna.sury@eon.com
Tino Mahler	Fichtner	Frankfurt	Tino.Mahler@fichtner.de
Tom Prosy	Fichtner	Frankfurt	Thomas.Prosy@fichtner.de
Torsten Becker	Frankfurt School UNEP Collaborating Centre	Frankfurt	T.Becker@fs.de
Barbara Buchner	Climate Policy Initiativestitute	Milan	barbara.buchner@CPIVenice.org
Carlo Paglia	ENI Corporate University	Milan	carlo.paglia@enicorporateuniversity.eni.it
Carloandrea Malvicino	FIAT CENTRO RICERCHE SPA	Milan	carloandrea.malvicino@crf.it
Dean Cooper	UNEP	Milan	Dean.Cooper@unep.org
Douglas Prentice	Geocapita	Milan	djpp@geocapita.net
Eng. Mirko Conti	Energie Del Sole	Milan	mirko.conti@energiedelsole.com
Enrico Buoni	European Energy Centre	Milan	enricobuoni@centrogalileo.it
Francesco Colelli	Angelantoni	Milan	francesco.coelli@solarlight.it
Gianleo Frisari	CPIVenice	Milan	gianleo.frisari@CPIVenice.org
Giovanni Puglisi	ENEA	Milan	giovanni.puglisi@enea.it
Jiri Dobiasovsky	Volny	Milan	dobiasovsky@volny.cz
Julian Richardson	Parhelion Underwriting	Milan	JHR@Parhelion.co.uk
Laura Susanne Shuford	Frankfurt School UNEP Collaborating Centre	Milan	L.Shuford@fs.de
Lia Maranto	Fabbrica Energie Rinnovabili Alternative Srl	Milan	relazione_esterne@ferasrl.it
Madi Sakande	Cold System	Milan	madi.sakande@coldsystem.it
Marcello Collantin	Studi Collantin	Milan	marcello.collantin@tin.it
Marco Buoni	European Energy Centre - Centro Studi Galileo	Milan	buoni@centrogalileo.it
Marco Masoero	Politecnico di Torino	Milan	MARCO.MASOERO@POLITO.IT
Margot Alexander	Lanco Solar International Ltd	Milan	margotrendall@gmail.com

Rendall			
Marino Bassi	Lecturer	Milan	marino.bassi2012@gmail.com
Matteo Moglie	Green Tech Srl	Milan	m.moglie@greentechsrl.com
Natali Alberto	ICIL sas	Milan	alberto.natali@icilsas.it
Prof. Gabriele Comodi	Universita Politecnica delle Marche	Milan	g.comodi@univpm.it; gcomodi@mta01.univpm.it
Prof. Giulio Santori	Università degli Studi e-Campus	Milan	gsantori@mta01.univpm.it
Prof. Macchi Ennio	Politecnico di Milan	Milan	ennio.macchi@polimi.it
Ray Nair	EWES	Milan	ray@ewes.biz
Roberta Davisod	Lamoro	Milan	direzione@lamoro.it
Simone Porta	Rossa Vivo Design	Milan	s.porta@rossovivodesign.it
Umberto Fava	Lamoro	Milan	direzione@lamoro.it
Adam Brown	International	Paris	Adam.BROWN@iea.org
Allison Archambault	Earth Spark International	Paris	aarchambault@gmail.com
Amit Bando	IPEEC	Paris	amit.bando@ipeec.org
Antoine Graillet	Trana TecnoAmbiental	Paris	antoine.graillet@tta.com.es
Antonio Di Cecca	Climespace	Paris	antonio.dicecca@mines-paris.org
Carlos Miro	Alliancefor Rural Electrification	Paris	c.miro@ruralelec.org;
Caroline Nijland	FRES	Paris	caroline.nijland@fres.nl
Cesar Ortiz Sotelo	GDF Suez	Paris	cesar.ortizsotelo@gdfsuez.com
Christophe Marvillet	CNAM	Paris	christophe.marvillet@cnam.fr
Christophe Poline	Schneider Electric	Paris	christophe.poline@schneider-electric.com
Claire Berge	Ministry for Environment	Paris	claire.berge@developpement-durable.gouv.fr
Colin Moody	Pera Consulting	Paris	colin.moody@peraconsulting.com
Daniel Magallon	BASE	Paris	daniel.magallon@energy-base.org
David Elzinga	International Energy Agency	Paris	david.elzinga@iea.org
Dean Cooper	UNEP	Paris	Dean.Cooper@unep.org
Delphine Eyraud	developpement-durable	Paris	delphine.eyraud@developpement-durable.gouv.fr
Douglas Prentice	Geocapita	Paris	djpp@geocapita.net
Elena Nekhaev	World Energy	Paris	nekhaev@worldenergy.org
Erwin Spolders	Radavia	Paris	e.spolders@redaviasolar.com
Frank Benassis	Climespace	Paris	franck.benassis@climespace.fr
Friedrich	UNDP	Paris	friedrich.barth@undp.org

Barth			
Gunter Fischer	European Investment Bank (EIB)	Paris	g.fischer@eib.org
Gunter Fischer	Global Energy Efficiency and Renewable Energy Fund	Paris	j.murgia@eib.org
Hauke Michel Petersen	Ferrostaal	Paris	hauke.petersen@ferrostaal.com
Henry Tanui	Ecobank	Paris	htanui@ecobank.com
Joerg Waschke	Solartec	Paris	joergwaschke@hotmail.com; j.waschke@solartec.lu
Julian Richardson	Parhelion Underwriting	Paris	JHR@Parhelion.co.uk
Julie Poirier	DG Tresor, Government	Paris	Julie.POIRIER@dgtresor.gouv.fr
Larisa Dobriansky	General Micro Grids	Paris	larisadobriansky@generalmicrogrids.com
Marc Darras	GDF Suez	Paris	marc.darras@gdfsuez.com
Marco Buoni	European Energy Centre - Centro Studi Galileo	Paris	buoni@centrogalileo.it
Martin Darcy	Inv Adviser to World Bank	Paris	mdarcy@ntlworld.com
Martina Turner	Accessible Clean Energy	Paris	martina@accessiblecleanenergy.com
Michael Quigley	ESB International	Paris	Michael.Quigley@esbi.ie
Nicholas Dunlop	Climate Parliament	Paris	nicholas@climateparl.net
Nicola Armacost	Arc Finance	Paris	niki@arcfinance.org
Nicolas Rohrer	Asantys	Paris	nicolas.rohrer@asantys.com
Otto Gomm	GIZ	Paris	otto.gomm@giz.de, otto.gomm@gmail.com
Peter Dickson	Glenmont	Paris	peter.dickson@glenmont.com
Petra Lloyd	MFCR	Paris	petra.lloyd@mfcrcz.cz
Richard Opoku		Paris	eyat100forp@yahoo.co.uk
Ron Benioff	NREL	Paris	Ron.Benioff@nrel.gov
Silvie Kreibiehl	Frankfurt School UNEP Collaborating Centre	Paris	s.kreibiehl@fs.de
Stefanie Held	IRENA	Paris	SHeld@irena.org
Sudo Tomonori	Japanese Intl Cooperation Agency	Paris	Sudo.Tomonori@jica.go.jp
Tauni Lanier	Eco Capital	Paris	tauni@eco-capital.co.uk
Torsten Wetzel	Siemens	Paris	torsten.wetzel@siemens.com
William Avrillon	GDF Suez	Paris	william.avrillon@gdfsuez.com
Wim van Nes	SNV	Paris	wvannes@snvworld.org

Annex C: Projects Proposed by Participants

A number of clean energy project concepts were highlighted by participants to supplement the four focus areas addressed at the Round Tables. The main themes of some of the activities described are summarised below:

Blaise Mempoou, ARPEDAC

- focus on low carbon buildings in developing buildings. How can they research, identify and establish minimum standards?
- Central Africa centre for training and promotion of renewable energy and efficiency, including market and policy development

Nigel Holmes, SHFCA

- quantify carbon benefits from technologies deployed?
- technology monitoring to identify opportunities for deployment. Observe and track.

Joyce Onuonga, Daima Energy Solutions

- solar mini grids, consortium finance
- access to finance for renewables as an enterprise, develop start up kits for entrepreneurs.

Gordon Bradford, McDermid Energy

- Eastern Cape, South Africa - an economic development zone, link to down load available information developed to date.

Steven Hunt, UKDFID

- cities agenda,
- electrical waste equipment

Csaba Forgassy, Szent Istvan University

- find best practice and develop hand book with focus on energy for sustainable housing
- policy risk and harmful impact of European subsidies

Gordon Branston

- ideas for energy efficiency and renewable energy to tackle poverty in E Cape, South Africa

Jonathan Guthrie, Scottish Government

- Renewable Energy Investment Fund

Geoff Rowbotham, Property Consultants

- promotion of energy efficiency in buildings

Sarah Boyack, MSP

- development and energy efficiency
- Malawi special relationship
- technology investment and guarantees

Ashley Dobbs, Green Cities Foundation

- 10,000 new cities expected by 2050 (30 of largest cities will be underwater by 2050)
- Stimulating building of green cities (energy/food/oxygen positive city development)
- Energy generation using landfill from urban waste

Charlie Miller, SolarAid

- Current focus on lights in Africa but rapid growth
- Concerned about affordability of mini-grids, so focus on individual households

Maria Lacerda, SPISSIA

- Combination of recycling and energy use for sustainable housing
- Current focus on Brazil, Namibia, Angola
- Interest to motivate large scale applications

Raj Mahapatra, Avonge

- Particular experience from farming sector in Ghana
- Developed import and export of rice (staple food locally)
- Good framework for similar approach to sustainable energy use

Louise Ogburu, Home Build

- Eco-buildings using concrete panels, looking for finance
- Current financing structure: 55% company, 20% Government, 25% other (required)
- UKP2m is the amount required for the facility

Joseph Olutunmogun, Venture Renewables

- Involved with biogas in Africa and Europe
- Opportunities for venture capitalists in biogas projects
- Possible focus on sustainable communities in West Africa

Sabine Dietrich, Ecovision

- Solar and wind applications for housing developments
- Using German experience for international applications (Brazil and other)

Marie Berger, Wirsol

- PV solutions for end users and solar parks
- Expansion of 600kW supplies in 6 islands in the Maldives; already invested \$2m
- Interested to develop innovative business model (e.g. leasing); need revolving fund

Rik Wuts, Powerhive

- Small/micro grids for power supply to households and schools with solar focus
- Purchase of electricity through cellphones
- Expansion of activities in Kenya and new activities in Indonesia

Philipp Schuller, Africa Enablers

- Focus on renewable energy supplies, 1-20MW range, mini-grids possible
- Looking for credit risk insurance or other mitigation facility in Africa (link to PRIM?)
- Need a political solution for smaller investors (not enough local money to cover risks)

Martin Cygielman, Cygielman & Co.

- Focus on making clean energy projects bankable and attracting funding
- Experience with reforestation in Africa, 13.7MW mini-hydro in DRC, solar in Greece

Ray Nair, Eco-Waste & Energy Solutions

- Bio-energy options with experience in Indonesia and the Philippines
- Waste-to-energy for developing countries e.g. from end-of-life tyres

Simone Porta, Rossovivo Design

- Experience with use of electric cars in Europe, with broader international potential
- Involved with design and manufacture of prototype

Matteo Moglie, Green Tech

- Solar cooling applications in developing countries
- Prototype being demonstrated in Sicily

Madi Sakande, New Cold System

- Refrigeration technologies for Africa (Burkina Faso)
- Renewable energy applications for cooling

Margot Rendall, Independent (ex. Lanco Solar)

- Submersible pumps for water wells in the Sahel region (much drought)
- Use aluminium containers from Europe; solar panels drive control systems
- Target in isolated villages, possibly northern Nigeria

Carlos Miro, Alliance for Rural Electrification

- Use network of networks in Africa

David Elzinga, International Energy Agency

- Hybrid mini-grids based on local conditions and understanding local demand
- Road mapping for smart grids and distribution networks
- Possible for UNEP to adapt to mini-grids

Tauni Lanier, Eco Capital

- Involved with private and public sector funds
- Guidance for finding relevant funding sources for renewable energy activities

Stefanie Held, IRENA

- Involved with financing clean energy activities
- Current project with smart/mini-grids with ECOWAS
- Involved with political risk guarantees so interested to link with PRIM

Joerg Waschke

- Providing solar power for buildings in Tanzania; experience with Nepal and Cape Verde
- Solar power for telecoms applications has great potential

Annex D: Presentations

Here are the main presentations made to address the four areas of focus during the discussions at the Round Tables. Please see attached PDF documents:

- Introductory slide UNEP-EEC-FS-GC (1)
- UNEP RT Presentation 1 – mini-grids (Mar 13)
- UNEP RS Presentation 2 – PRIM (Mar 13)
- UNEP RT Presentation 3 – FACET
- UNEP RT Presentation 4 – EE buildings (Mar 13)

Annex E: Information Sheets

This Annex contains brief overviews of the four main project concepts under development by UNEP and discussed at the Round Tables. Please see attached PDF documents:

- UNEP Info sheet – EE Buildings
- UNEP Info sheet – FACET – Africa
- UNEP Info sheet – Hybrid-mini-grids
- UNEP Info sheet – PRIM