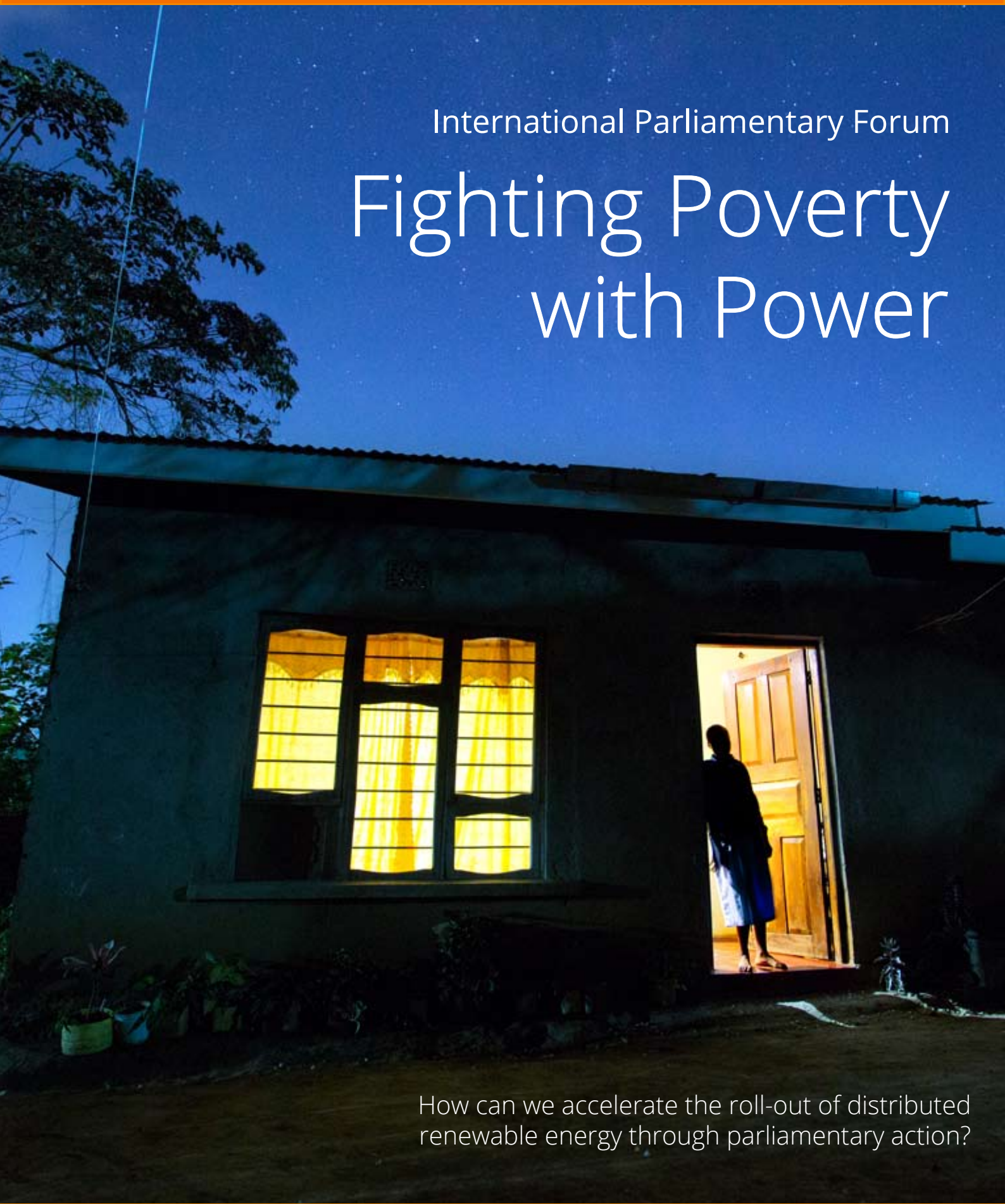
Climate Parliament

United Nations Development Programme



International Parliamentary Forum

Fighting Poverty with Power

How can we accelerate the roll-out of distributed renewable energy through parliamentary action?

Kunduchi, Tanzania

December 13 - 15th 2013

Climate Parliament
Legislators working worldwide to combat climate change

Empowered lives
Resilient nations.

Contents

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Introduction

Dear Colleagues,

1.2 billion people around the world still live in energy poverty, without access to the modern energy services that could provide them with reliable lighting, fuel, and energy for development. Women must trek for miles to gather traditional fuels such as wood and dung to run dirty and dangerous cooking stoves that belch poisonous smoke into their homes. Children have no light in the dark evenings for reading or study. Mobile phones cannot be charged; entrepreneurs cannot power their businesses; potentially life-saving medicines cannot be properly refrigerated.

Access to energy could revolutionise these people's lives, but if we rely on carbon-intensive coal and gas to bring electricity to the world's poorest, we risk condemning present and future generations to living in a world scarred by droughts, heat waves, famines, and disease epidemics brought on by climate change.

To address these intertwined problems of energy, development, and climate change, in December 2013, the Climate Parliament and the United Nations Development Programme (UNDP) co-hosted a 3-day Forum for Parliamentarians, focusing on the challenges and opportunities for bringing clean, sustainable electricity renewable energy around the world. The forum, entitled Fighting Poverty With Power, was held in Kunduchi, Tanzania, and brought MPs from across Africa, Asia and the Middle East together with experts and analysts with first-hand experience of bringing modern energy services to those who need it most.

Although making the transition to renewable energy will not be easy, parliamentarians are in a unique position to take action. Elected legislators are the one group of people in the world who have all the tools we need to solve the climate problem: they vote on laws, taxes and budgets, oversee the operations of government, and have direct access to Ministers, Prime Ministers and Presidents. All that is required is understanding, personal commitment, and political will.

Thus, the work of the Climate Parliament continues. If you would like any more information on our work, or are interested in attending any of our future events, please do consult our website – **http://www.climateparl.net** - or contact ben@climateparl.net.

Sir Graham Watson MEP

Chairman
The Climate Parliament

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Jasmin Fraatz	GIZ Uganda
Ansgar Keine	World Future Council
James Knuckles	Cass Business School
Dr. Alastair K Livesey	Africa Power
Mandisa Mashologu	Deputy Country Director, UNDP Tanzania
Eco Matser	Hivos
Naeem Mawji	CarbonX Energy
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Xavier Vallve	Trama TecnoAmbiental
George Wadsworth	Kisiizi Mini Hydropower

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Agenda overview

Millions of people around the world live without access to the modern energy services that could provide them with reliable lighting, fuel, and energy for development. Expansion of mainstream electricity grids is often not economically feasible for dispersed or poor settlements, but off-grid renewable energy projects could provide power at a fraction of the cost. Although traditionally associated with rural electrification, off-grid renewables can actually be used anywhere the grid doesn't reach or where the existing supply is unreliable – such as the outskirts of cities, informal settlements, and regions where political or regulatory barriers block grid expansion.

Off-grid renewables meet three key development goals simultaneously. They provide energy access to dispersed or impoverished citizens; they reduce carbon emissions and thus mitigate climate change; and they improve a nation's energy security. Inspiring examples of successful projects, such as the Bangladeshi solar home system roll out which has electrified more than 2.5 million homes in just three years, can point the way.

The Climate Parliament / UNDP Tanzania Parliamentary Forum explored how parliaments can help to catalyse mini-grid projects through legislative action. Several challenges must be addressed:

1. **Technical**: Is interconnectivity of mini-grids to nearby national or city grids possible? How can variability of supply best be managed? Can existing diesel systems be easily converted to renewable sources?

2. **Financial**: How can community-level finance, state investment, and international / development agency assistance be best coordinated to unlock seed capital for distributed generation?

3. **Design**: Can we identify self-sustaining business models for mini-grids? What pricing models are most appropriate in each local context? Who should own and maintain the systems? How can local social structures be taken into account?

4. **Regulatory**: What reforms to existing energy market design are required to allow mini-grids to operate effectively? Can such systems co-exist with a state-run monopoly on electricity? What kind of regulatory frameworks best support mini-grid entrepreneurship?

Programme

Friday 13th December

09:00 – 09:40 **Welcome and opening remarks**

Mandisa Mashologu, UNDP Dep. Country Director, Tanzania
Nicholas Dunlop, Secretary-General, Climate Parliament

09:40 – 10:05 **Inaugural address**
Hon. Prof. Sospeter M. Muhongo, Minister of Energy and Minerals, Tanzania

10:10 – 10:45 **High stakes: the climate threat and the benefits of renewables**
Nicholas Dunlop, Secretary-General, Climate Parliament

Session 1: Green Technology and Intelligent Policy

11:15 – 12:45 **Panel Discussion:** Overview of the main renewable energy technologies; costs, transmission, and technical issues.

Naeem Mawji, CarbonX Energy
Xavier Vallve, Trama TecnoAmbiental
Heinz M. Pape, Innovation, Energie Développment (IED)

14:00 – 14:15 **Welcome** from Climate Parliament Chairman, Sir Graham Watson MEP

Session 2: What works? Case studies for innovative policy design

14:15 – 15:45 **Panel Discussion:** Lessons for policymakers from mini-grids and solar home systems in Africa and Asia

Mohamedrafik A. Parpia, Zara Solar Limited
Zacharia Mselle, Sincronicity Power Ltd
Ronald Schuurhuizen, SolarNow
George Wadsworth, Kisiizi Mini Hydropower

16:05 – 16:45 **Empowering women and families:** the role of women in the renewable energy transition
Presentation from Mary Swai, TATEDO

Saturday 14th December

09:00 – 09:30 **Themes and challenges for 21st century electrification**
Stefan Schurig, World Future Council

Session 3: Creative policy design for rural transformation

09:30 – 11:00 **Panel Discussion:** business models, regulatory frameworks, ownership and operation, pricing models, capacity-building

Mohamedrafik A. Parpia, Zara Solar Limited
Naeem Mawji, CarbonX Energy
Ronald Schuurhuizen, SolarNow
Jasmin Fraatz, GIZ Kenya

Session 4: Mainstreaming renewables

11:30 – 13:00 **Panel Discussion:** national policy to trigger investment in mini-grids and incentivising private investment

Jansenio Delgado, Ecowas Center for Renewable Energy and Energy Efficiency (ECREEE)
Ansgar Keine, World Future Council
Heinz M. Pape, Innovation, Energie Développment (IED)

Session 5: Reeling in the big fish

14:15 – 15:45 **Panel Discussion**: attracting international finance and accessing climate/carbon financing

James Knuckles, Cass Business School
Alastair K Livesey, Africa Power Ltd.
Eco Matser, Hivos International
David L. Ross, Statera Capital

Session 6: The power of Parliaments

16:15 – 16:30 **Re-energising India**: Climate Parliament MP Shashi Bhusan Behera MP presents their strategy to accelerate India's renewable transition

16:30 – 17:30 **Building model legislation to accelerate the energy transition:** a process for modual policy design
Rudolf Rechsteiner, Swiss Development Cooperation Agency

Day 1: Opening session

The Forum was formally opened by **Ms Mandisa Mashologu**, UNDP's Deputy Country Director for Tanzania, who welcomed the assembled MPs and experts and congratulated the Climate Parliament on organising the Forum and bringing together such a distinguished audience of legislators and project implementers. The theme, she argued, could not be more important or relevant today; the challenge is to reduce carbon emissions while simultaneously increasing the supply of energy to meet spiralling demand – so that economies can continue to develop while simultaneously protecting their citizens from climate change.

As Ms Mashologu pointed out, every law and every budget must be approved by a national Congress or Parliament. Elected legislators are the one group of people in the world who have all the levers they need to solve the climate problem: they vote on laws, taxes and budgets, oversee the operations of government, and have direct access to Ministers, Prime Ministers and Presidents. By informing them about the dangers of climate change and the opportunities for action, and by providing those who are ready to act with staff support and expert advice, events such as the Tanzania forum can have a major impact.

Access to modern energy is a vital prerequisite to social and economic growth. Renewable energy investment can boost the affordability of energy, as well as improving its reliability and commercial viability. For this reason, Ms Mashologu argued, the UN family believes that investing in sustainable energy is indispensable. However, a full transition to renewable energy requires a paradigm shift in institutional capacity, policy and financing. Ms Mashologu suggested three key interventions that MPs could make: strengthening policy and legislative frameworks; mobilising financing options for renewable energy developers; and developing effective approaches for scaling up energy service delivery. Ms Mashologu concluded by welcoming the MPs and other delegates to Tanzania, and invited them to form parliamentary alliances across both national boundaries and party lines.

Ms Mandisa Mashologu

The keynote address was then delivered by **Hon. Prof. Sospeter M. Muhongo**, Minister of Energy and Minerals for Tanzania. In his speech, Professor Muhongo outlined the challenges that lie ahead for the global community – rising populations, dwindling fossil fuel resources, and rapidly growing demand for jobs, prosperity, and energy. He pointed out the strong correlation between the wealth a

Hon. Prof. Sospeter M. Muhongo

country generates and the amount of power a country generates, with rich countries almost always being those which generate a lot of electricity, and vice versa.

Overshadowing this already difficult future is the threat of climate change. Professor Muhongo suggested that, with many countries already experiencing temperature rises of over 3-4% - climate change is already progressing beyond the limit of survivability of many organisms. Parts of Tanzania, he said, have already seeing climate change on this scale, with average temperatures increasing by +2˚C.

Renewables therefore have a huge role to play, the minister argued, in meeting tomorrow's energy challenges without exacerbating the climate problem. With the UN's Millennium Development Goals due to expire in 2015, now is the time to examine where we have succeeded, and where we have failed – and, the Professor suggested, all too often, when Millennium Development Goals (MDGs) have not been met, the reason is that there has not been enough energy to power the development. Indeed, access to energy is, in many ways, the "Missing MDG".

The growth of energy demand around the world is staggeringly rapid; the Minister estimated a growth rate of 10% per annum in Tanzania alone. Pointing out that, by 2030, the less-industrialised world will account for 30% of the global demand for energy, Professor Muhongo calculated that the supply infrastructure necessary to meet that demand would cost around $16 trillion USD.

Mr Muhongo concluded by reminding the assembled delegates of a few key facts: 75% of Africa's citizens still having no access to electricity, while, in East Africa, no country can boast more than 30% access to energy. The policy and legal framework for renewable energy is missing in most of developing world, and very few countries have policy documents in place or a cogent strategy on sustainable development. Therefore, he argued, the MPs who are gathered here today by the Climate Parliament and the UNDP are a vital part of the fight for energy access in the developing world; they can, and must, take real action to ensure sustainable development for present and future generations.

The Chairman of the Climate Parliament, **Mr Nick Dunlop,** then gave an introductory presentation to open the Forum by laying out the threat of climate change and exploring some of the scientific and political issues surrounding the international response to global warming. There are two compelling reasons, he argued, why the less-industrialised world would be well advised to adopt renewable energy: firstly, because most developing nations have considerable reserves of sun, wind or hydro power; and secondly, because not taking the low-carbon pathway will leave the world in real trouble.

Outlining the IPCC's recent report into likely

Mr Nick Dunlop

climate impacts, Mr Dunlop catalogued the impacts that have already begun to take their toll – parts of the world already experiencing temperature increases of more than 2˚C, sea level rises of over 20cm compared to pre-industrial times, significant changes in rainfall patterns, and ever more frequent and more powerful storms. These impacts, he argued, will overwhelmingly fall on those countries which have made the least contribution to the problem - the developing world.

Mr Dunlop then sketched what would be required to avoid this dark future: global carbon emissions will need to peak in this decade and then fall by 5% per annum thereafter. Technically, this is feasible, but no government is currently seriously considering action on this scale. This needs to change, Mr Dunlop insisted. With a raft of recent reports from analysts and investment institutions arguing that renewables will be cheaper than traditional sources of energy long before 2020, MPs now have the chance to introduce legislation that will allow renewables for rural areas to become financially self-sustaining, without relying on government money or development assistance.

The example of other parliamentarians in this regard is a useful one – Mr Dunlop reminded the delegates of the huge impact that just a handful of German legislators had on Europe when they introduced a new feed-in tariff in Germany in 2005. Concluding, he suggested that the time had come to move beyond the situation where MPs sit in national capitals endlessly reinventing the wheel and making the same mistakes; it's time, he argued, to move instead to a network where good ideas can be shared and inspiration pooled. Ultimately, Mr Dunlop argued, the issue of climate change is up to legislators. If the renewable energy transition is going to happen, it will happen because of MPs like the ones gathered in Kunduchi.

Session 1: Green technology & intelligent policy

The first session of the Forum was centered around an introduction to the main renewable energy technologies as well as costs, transmission options and technical issues. It opened with brief presentations from three renewable energy experts with considerable experience of developing and installing off-grid renewable energy projects around the world: **Naeem Mawji**, the CEO and founder of CarbonX Energy; **Xavier Vallve**, the Associate Director of Trama TecnoAmbiental; and **Heinz M. Pape** from Innovation Energie Développment (IED).

Mr Vallve opened the panel with an explanation of his company, Trama TecnoAmbiental, which has been pioneering off-grid renewables in rural and mountainous areas of Spain since 1994, specialising in low-capacity systems of around 100kW that can provide 24/7 power to 200 – 500 households. Three key issues were identified that must be resolved so a mini-grid can function well: ownership and management; invoicing and payment collection; and future expandability and interconnection.

Mr Vallve argued that the revenue from tariffs alone cannot pay for mini-grid infrastructure, and that some seed money from public funding will always be required to overcome the initial finance hump. He went on to outline the innovative concept of the energy daily allowance, or EDA, where customers are given an allowance of energy according to contract; if you want more, you have to pay more. This is key to making mini-grids financially viable

Mr Xavier Vallve

Mr Naeem Mawji

by limiting the amount of demand placed on the supply. As we cannot have infinite amount of energy per capita, EDAs can help reserve enough power to supply health centres, street lights, and water pumping and others.

Mr Heinz Pape then explored the pros and cons of small hydro. For hydro, there are some significant drawbacks: the long lead time from planning to production, which can stretch to six years or so; the projected decline in water resources, leading to weaker energy provision in the future; high investment costs; and grid weaknesses that mean that the national grid might not be able to accept injections of large-scale hydro. However, there is significant potential for small hydro in Tanzania, with 141 suitable sites of 10MW or below, servicing a potential population of around 1 million.

Mr Pape also outlined the potential of biomass fuelled gasifiers, which use rice husks to provide around 40 – 80 kW of power over around 6 to 8 hours. Dry gasifiers are preferable to the relatively high-emissions of the wet gasifier models, and the units only have a relatively short lifespan of around 10 years. However, the advantages are many – they can be installed very quickly, create lots of jobs during the installation period, and create useful byproducts such as fertiliser and charcoal.

Mr Heinz Pape

Finally, Mr Naeem Mawji explored the business model of his enterprise, Carbon X, which seeks to overcome the challenges of electrification in Tanzania by pioneering a "one-box" solution, where all the equipment needed to electrify a village could be packed into one easily-transportable shipping container, allowing projects to get operational in less than a week. This creates a platform so that independent power producers can deploy mini-grids anywhere, with all the necessary infrastructure in place, and leave them to focus on demand-side challenges such as managing load, grid monitoring, and revenue collection.

The addition of smart meters in homes can detect variations in consumption and supply, thus helping to build better models, and reduce theft by remotely switching off clusters that show signs of illegal hook up activity. Mr Mawji also explained how Carbon X enables consumers to use their mobile phones to buy energy credit, with payment from the mobile's account.

In a lively question and answer session following the presentations, the panel explored different business models for financing rural electrification, including community-based schemes where the assets are owned by the community (even if they have been partially subsidised) or by the municipality, and are operated by a local association. This is more cost-effective, but does have some drawbacks when it comes to auditing and bill collection.

Bill collection is an ongoing problem for off-grid renewable energy projects, as consumers often don't have the capacity to pay fines, and the legislation required to back up grid operators is often lacking. Mr Mawji emphasised the need for alternative strategies to minimise the need for extracting fines in the first place.

Safety challenges were also explored, with the thatched roofs of many off-grid villages presenting a major problem. Thatched roofs leak in rainy conditions, which can then cause major electric shock risks for inhabitants. Prefabricated solutions can find ways around these problems, however, such as ready-made waterproof boxes containing all the circuit breakers and fuses, so that no internal wiring is required in villager's homes.

Mr Djimo Souare MP

Session 2: What works? Case Studies

After lunch, the delegates reconvened for the second panel session, designed to explore case studies for innovative policy design and implementation from mini-grids and solar home systems in Africa and Asia. On the panel were **Mohamedrafik A. Parpia**, Founder & CEO of Zara Solar Limited; **Zacharia Mselle** of Sincronicity Power Ltd; **Ronald Schuurhuizen** of Solar Now; and **George Wadsworth** of Kisizi Mini Hydropower.

Mr Mselle explained the "ABC" concept of renewable energy, standing for "Anchor, Business, Community", where private firms such as telecoms providers are co-opted by renewable developers to provide an existing infrastructural anchor point – in this case, a mobile phone tower – to provide a base for providing electricity to the community. This opens the door to potentially replicating the extraordinary growth of mobile telecommunications provision all over the less-industrialised world. Good research is also essential, however, and any developer must first identify their potential market, the ability of consumers to pay – and, even more important, their willingness to pay.

Mr Schuurhuizen then gave a succinct overview of Solar Now, a successful private firm installing solar systems in Uganda. Drawing

Mr Mohamedrafik Parpia

inspiration from the example of Bangladesh's highly-successful solar home system scheme, Mr Schuurhuizen outlined two key lessons. Firstly, people want to have solar home systems – but only ones that work. Quality and longevity is therefore vital in convincing people to invest, as is the provision of low-cost credit to buyers. Secondly, Solar Now takes a totally commercial approach, orientated towards making a profit and reinvesting those profits into expanding the business – the only sustainable model. Thanks to this, Mr Schuurhuizen

argues, Solar Now has a 99% repayment rate on its loans for solar systems.

Finally, he made three recommendations to MPs hoping to boost the deployment of renewable energy businesses in their home countries: 1, reduce import duty on solar components; 2, give start ups access to low-cost capital; and 3, provide rigorous quality control assurances through a well-funded bureau of standards, to prevent cheap low-quality products from flooding the market.

Mr Wadsworth then gave the case study of the village of Kisiizi, which has a 30m waterfall used for hydro since 1944. A new 300KW system was installed in 1999 by a private limited company formed by hospital and local church community, costing around 850,000 USD, of which 70% was funded by the Uganda government, and 30% by the community. Completed in 2009, the system supports around 300 customers plus the significant energy needs of the hospital, with sales in excess of $43,000. Several important factors played a role in the success of the project, including the strong support of the local community, excellent management personnel, and strong government support. Mr Wadsworth concluded by arguing that, since minigrid electricity is relatively expensive, it should be reserved for those purposes which cannot be performed by other fuels, such as lighting and powering machines and equipment, but not squandered on water heating or cooking where other fuels can perform those jobs equally well.

Mr Ronald Schuurhuizen

Ms Ndeye Lucie Cisse MP

The panel discussions and delegate questions following the presentations centred around how governments can encourage investment in renewable energy in situations where affordable project finance is difficult to arrange. Questions were also asked regarding the sometimes inferior quality of low-budget solar projects, despite their high installation costs, which have lead to a loss of trust in solar technology among many developing world citizens.

Mr Papia acknowledged these concerns over solar quality, especially after an initial installations were poorly managed. His company took the initiative of going to rural areas and giving demonstrations to local people, for example taking a television and showing them how you can power it with a solar system. UNDP has also installed demonstration solar systems in schools and hospitals, which helped to convince people.

The panelists agreed that, although many believe that solar products from China are low quality, this isn't always true – instead, you tend to get what you pay for. Since many companies – especially in the less-industrialised world go for cheap products, the quality inevitably diminishes. However, by paying a little bit more, good quality can be assured.

Empowering women & families

The final session of Friday saw **Ms Mary Swai** of Tatedo give an illuminating presentation on the gender aspects of energy and climate. She explored how men and women have different demands on energy, not only in terms of amounts required but the uses to which that energy is put, and that women are often the main beneficiaries of off-grid electrification programs which help supplant traditional fuels such as wood or dung.

Ms Swai then detailed what she described as the energy and gender nexus. Men earn 1.7 times more than women in Tanzania, while 95% of the rural population rely on firewood for cooking and heating, and 70% of agricultural land is cultivated by hand, with women providing 80% of the labour force. This makes it crucial that energy projects to have women's participation designed into the entire project cycle, with women not be thought of solely as recipients of energy, but as designers, planners and implementers.

Sadly, this is not presently the case: despite being the main users of renewable energy systems, women are underrepresented at the decision-making level of energy interventions. Ms Swai argued that women should learn how to build, repair and run their own renewable energy systems, and demonstrated how women's effectiveness in maintaining such systems has been consistently better than men. In conclusion, Ms Swai made the point that, if the time saved by the use of renewable energy is not used to generate income for the family, then women won't invest in the technology; developers must work to ensure that the opportunity cost for women is positive.

Ms Mary Swai

Day 2: Opening session

Saturday's session was opened by Mr Stefan Schurig of the World Future Council, who gave a presentation on the challenges posed by 21st century electrification. Opening by pointing out that for thousands of years, mankind existed only on renewable energy – in other words, muscle and firewood. It's only in the last 300 years that we've moved to unsustainable forms – so the big question is now, can we make the transition back again?

Under current projections, the planet is well on course for a cataclysmic 4˚C of warming, and national governments are still spending almost 9% of their total government budgets on subsidising the burning of more fossil fuel reserves. Even Germany – famous for its wind power – still relies on coal for 40% of its energy.

Mr Schurig argued that renewables are destabilising to the tradition energy utility model and pose an inherent threat to large energy companies, as they allow consumers to become energy producers. This, in a sense, literally gives power to the people, as it removes political power from the energy companies and hands it to the people who are now responsible for making their own energy. Mr Schurig predicted that the majority of electricity in the future will come from private

Mr Stefan Schurig

individuals and local communities; thanks to this, he suggested, the guiding principle for the much-needed energy transition must be to allow people to produce their own power.

He concluded with a choice quote from Thomas Edison, who in 1931 had the following to say: "We are like tenant farmers chopping down the fence around our house for fuel when we should be using Nature's inexhaustible sources of energy – sun, wind and tide. I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."

Session 3: Creative policy design

The first panel session of the day featured **Mohamedrafik A. Parpia** of Zara Solar Limited; **Naeem Mawji** of CarbonX Energy; **Ronald Schuurhuizen** of SolarNow, **Xavier Vallve** of Trama TecnoAmbiental, and **Jasmin Fraatz** representing GIZ Kenya. Dispensing with formal presentations, the panel was organised as a more responsive open discussion between the panelists and the delegates, chaired by James Corre of the Climate Parliament.

The panel kicked off with a lively debate over whether solar and other renewable energy projects should be eligible to receive government subsidies. Mr Parpia argued that almost all infrastructure, even in less-industrialised countries, is subsidised, as its a public good and would be under-provided otherwise; therefore, he concluded, renewables too should have subsidies. However, Mr Schuurhuizen pointed out that that his company Solar Now is competitive even without subsidies, and that the solar industry could not always rely on a safety net of public money.

Mr Mawji made the point that private companies such as CarbonX and Solar Now are building energy infrastructure that would, in the past, have only been built by the government, and savoured the irony that services currently being undersupplied by the public sector are being provided by the private sector under commercially viable business models.

Ms Fraatz, however, still argued in favour of subsidising renewables, and gave an interesting case study of her work with GIZ in developing public-private partnerships (PPPs) with telecommunications companies, using mobile towers as beacons for rural electrification in Uganda. At present, most African mobile towers are run on diesel, which is extremely expensive and impractical as it has to be imported via Kenya and delivered by road, with around 30% of each delivery lost to theft. There is, therefore, a clear cost advantage for the telecoms companies to convert their towers to solar energy – and as the masts are often located close to rural settlements, the energy generated can be split between the tower and the community. This model alone could reach an estimate 50,000 people in Uganda.

Mr Corre then steered the discussion towards one of the big questions that had emerged over the previous day's discussions – what happens to off-grid renewable systems when the grid arrives?

Ms Fraatz suggested that mobile and trans-

Ms Jasmin Fraatz

portable units, such as those based within shipping containers, avoid this issue as they can be picked up and moved elsewhere without too much trouble. Mr Mawji agreed, but pointed out that an even better system would be to develop minigrids according to technical standards that ensure they are compatible with the national grid, so if it does arrive, the mini-grid can be transformed into a small power producer feeding electricity into the grid – thus mitigating investor anxiety over grid expansion.

Mr Vallve made the additional point that grid arrival is often very unlikely in most places, and if it does arrive, that will be because of a government subsidy, not because it is a business decision. Grid electricity is often expensive and unreliable, so consumers who are happy with their mini-grid service may prefer to remain with the existing system, rather than connect to the grid. Finally, Mr Vallve argued that there is a danger of over-regulation, as we don't know what this rapidly evolving technology will do in the future.

Questions and comments from the assembled MPs and other experts then followed. Collins Cheruiyot of CAFOD Kenya argued in favour of a "pro-poor" energy model, which considers the impact on the poorest and let their needs guide decisions on energy. Ms Nabila Benomar MP suggested that Morocco may be a useful model regarding electrification and the use of renewables, but argued that MPs should start thinking about laws to finance poor people's energy as free, in order to avoid the situation in Morocco where, despite 100% grid connection, some are still too poor to buy electricity. Ms Hasna Marsit, MP for Tunisia, made the point that many investors still prefer to invest in fossil fuels, despite the clear advantages of renewables, and asked the panel how investors could be persuaded to make the switch.

Mr Mawji responded by calling for a combination of legal protection and commercial freedom to encourage investors. This would involve opening the power market up from state utilities so independent power producers can develop new business models, while simultaneously providing legislative guarantees and safeguards against grid expansion, fossil subsidies etc. He also argued in favour of a separate agency that focuses purely on rural electrification, rather than having state grid regulators assume responsibility for bringing power to off-grid communities.

Session 4: Mainstreaming renewables

After a brief coffee break, the delegates reassembled for the next session, which centred around a discussion of how national policy can trigger investment in mini-grids to encourage rural electrification. The panel comprised of **Jansenio Delgado** of the Ecowas Center for Renewable Energy and Energy Efficiency (ECREEE); **Ansgar Keine** from the World Future Council; **Eco Matser** of Hivos International; and **Heinz M. Pape** of Innovation Energie Développment (IED).

Mr Delgado kicked off the panel with a short presentation on how ECREEE was addressing energy challenges in West Africa through developing the huge potential for renewables in the region. Assisting member states with the creation of national renewable energy strategies and action plans is a key part of ECREEE's work, which also extends to supporting mini-grid schemes through concessional financing, and capacity building activities for officials and project implementers.

Mr Kiene of the World Future Council then delivered an introduction to African renewable energy feed-in tariffs (REFiTs), arguing that traditional energy sources are insufficient to meet the explosion in demand for electricity as they are unreliable, unaffordable, and environmentally unacceptable. REFiTs are an important tool for enabling renewables to compete on open market places, and with 65 countries around the world now implementing some form of REFiT, they have already demonstrated their considerable potential for driving growth. The WFC has published a study on thirteen African countries who have – or are considering – implementing a REFiT, which can help to inform decision making for MPs from other nations when they come to design their own feed-in tariff scheme.

Mr Ansgar Keine

Mr Jansenio Delgado

Mr Kiene outlined several key factors that contribute to the success of a REFiT scheme. These included high level political support; a good enabling environment with a simple administrative process, resolved land issues, access to finance, awareness of the technology, and existing capacity; and finally, a reasonable return on investment to attract investors. Financing a REFiT is often the biggest obstacle, Mr Kiene argued, but money is available. He called upon Tanzania legislators to earmark a percentage of its newly-discovered off-shore gas profits for renewables and rural electrification.

Mr Pape then followed with a presentation concerning how best to involve the private sector in operating mini-grids. He called for light-handed regulation; flexibility regarding end-user tariffs,

which he argued should be only as much as necessary but as little as possible; and a one-stop-shop for administrative and regulatory requirements, so that developers don't have to apply to many different agencies to receive different permits and licences. He pointed out the important difference between "least-cost solutions" and low-cost solutions, especially as the costs of solar production are still quite high compared to existing tariffs..

Mr Pape concluded that financing is always the most important barrier to private sector involvement, and countries that wish to expand market investment in renewables could, for example, provide subsidies to cover expensive feasibility studies, or enable easy access to loans with reasonable conditions and interest rates.

Next to present was Mr Eco Matser, who discussed Hivo's renewable initiatives on the Indonesian island of Sumba, where only 30% of the population have access to electricity, despite the wealth of renewable energy resources. The aim of the Hivos project is to demonstrate to the world that a 100% renewable energy supply is possible, even on a small scale, and that it can be cheaper to power communities from sun and wind than via fossil fuels.

Mr Matser outlined the lessons learned from the Sumba project for successful future development, which include having a clear overall goal, engaging the community at all stages of project implementation so they feel a real sense of project ownership, ensuring transparency of goals and methods to gain trust, and having high-level political support for a positive enabling environment.

Mr Eco Matser

Session 5: Reeling in the big fish

After lunch, the fourth panel of the Forum provided an engaging overview of policies to attract large-scale investment in rural electrification from international finance markets, development banks, and climate financing initiatives. The panel comprised of **James Knuckles**, from the Cass Business School; **Dr Alastair K Livesey** of Africa Power Ltd; **Kevin Kinusu Kinyangi** of Hivos Kenya; and **David L. Ross** of Statera Capital.

Dr Livesey gave the first presentation, which provided an overview of his new venture, Africa Power Ltd, which aims to provide electricity for business equipment, so that local commercial ventures can boost development by providing jobs and income-generating activities in rural communities. The project runs on a pro-poor, pay-as-you-go business model, and helps to support countless different household and commercial activities that could be significantly improved through access to modern energy, such as drip-feed irrigation, millet mining, grain collection, and others.

Dr Alastair Livesey

Dr Livesey then moved on to a macro-level examination of rural electrification finance. He argued that the sums required to really get renewable energy moving in less-industrialised economies are huge, far beyond what is currently being considered. Dr Livesey insisted that enough pilot schemes have been done:

Mr Kevin Kinyangi

we know that the systems work, and we know that there is huge demand for these kind of projects. What is required now is business models ambitious and resilient enough to leverage private finance at scale.

The next presentation was given by Kevin Kinusu Kinyangi of Hivos Kenya. Mr Kinyangi spoke of new financing opportunities emerging in the wake of the UNFCCC COP19 in Poland, such as $280 million of new funding under the UN's REDD (Reducing Emissions from Deforestation in Developing Countries) scheme, or the soon-to-be-established Green Climate Fund.

Mr Kinyangi argued that the finance is out there, if policymakers know how to find it; however, he suggested that the proper mechanisms need to be established first so that the money can flow to where it most needed. If policy frameworks are not aligned to the access points of international finance, then no cash will flow – like trying to connect a power plug to a mis-fitting wall socket. He concluded by relating an old Kenyan folk story in which a man spends all day cutting down one small tree with a blunt axe; when asked why he didn't sharpen his axe, the man replied he was too busy cutting down the tree.

James Knuckles

Next to present was Mr James Knuckles, a former World Bank consultant now at the Cass Business School. He began by launching a new World Bank publication, created specifically for policy makers and regulators, on the financing policies required to implement renewables at all scales. Mr Kunckles then argued that investment in mini-grids simply will not happen until the projects become commercially viable, and the gap between renewable tariffs and retail prices is closed.

He suggest a raft of policies that could help mini-grid projects become more attractive to investors. These included governments allowing mini-grid providers to charge tariffs above national rates; allow developers to cross-subsidise their tariffs (ie: charge business users higher rates than households); lower the regulatory burden on developers; legally require tariffs that incorporate equipment depreciation costs; allow developers to recover administration costs via on-bill financing for initial connection and internal wiring; and allow a five-year regulatory grace period for new mini-grid companies, so they have the freedom to design their own business models free of state interference.

Mr David Ross, a investor with considerable experience of the sector, gave the next presentation, which opened by noting the political power of electrification as a near-certain vote-winner. He then suggested that different scale organisations operate on very different time frames. If MPs want their districts electrified, they have different options: if they rely on development agencies, funding could take years to arrive. If capital is sought from private banks, it will take many months – perhaps years – for the finance to be secured; however, capital-rich individual entrepreneurs can get projects up and running in a matter of weeks. He suggested that a good way of sourcing seed capital for electrification projects would be to link up wealthy members of the community with would-be developers who already have good models in place; investors would stand to make a healthy profit, while simultaneously benefitting their community as a whole.

David Ross

Session 6: The power of parliaments

Shashi Bhusan Behera MP

The final session of Saturday began with a trio of presentations from MPs belonging to the Climate Parliament network, all reporting back on their recent parliamentary initiatives in the fields of energy, development and climate change.

The first to speak was Mr Shashi Bhusan Behera, an MP from India who began with an inspirational quote from Ghandi regarding the importance of caring for the environment and focusing on the future. He went on to detail how India's economic growth has increased demand for electricity considerably, to around 223GW by 2013. Electricity generation, however, has not kept pace with this demand, and India currently has around 75 million households without access to electricity. And, although India has low greenhouse emissions when measured per capita, the nation is fourth in the world in terms of total emissions. To address these intertwined problems, the group of MPs comprising the Climate Parliament in India are seeking to help the government to step up the renewables growth rate by focusing on gaps in current legislation and investment programmes. To this end, Mr Behera was proud to announce the launch of a new detailed research report, conducted on behalf of the Climate Parliament, into legislative and financial solutions to challenges in India's renewable energy markets. Mr Behera hoped the report would form the basis of future action to tackle the climate challenge in India.

Next, Ms Bernadette Mshashu, MP from Tanzania, gave a short presentation in which she called upon her fellow MPs to ensure that their parliaments do more to support renewables. Since MPs pass budgets and represent their constituents, Ms Mshashu argued there is much then can do to sensitise their communities to the climate threat and see renewables as a viable solution. She argued that MPs need to play a leading role in developing new policies and pressing for new budget priorities, even in the face of executive pressure. She gave the example of how, in the recent budgetary session of the Tanzanian parliament, MPs had joined together and refused to pass the President's new budget until spending on rural electrification programmes was increased – despite the fact that the President can fire MPs at will for not passing legislation. Courage and cooperation can achieve much, Ms Mshashu argued; she hoped her colleagues in different parliaments around the world agreed with her.

Finally, Mr Dhammir Mannai, MP for Tunisia, gave a detailed presentation explaining his countries new "Strategy for the Energy Transition 2014-2030", a bold raft of policy reforms including an ambitious target of 30% renewable energy by 2030. With Tunisian oil production declining rapidly but demand for energy expanding rapidly, energy imports and subsidies to fossil fuel energy have rapidly cre-

Ms Bernadette Mshashu MP

Dhamir Mannai MP

ated an economic catastrophe for the Tunisian government. However, Tunisian Climate Parliament MPs have developed new laws to move the country towards a more sustainable future. Mr Mannai outlined the strategy, which includes slashing subsidies to fossil fuels and redirecting the money to renewable energy projects, energy efficiency measures, a fund to help finance new investment in renewables, and a new clause in the Tunisian constitution introducing a duty on the government to protect the climate.

The final session of the day focussed on the power of parliaments, and how legislation could help to build model policies and legislation to accelerate the energy transition. Mr Rudolf Rechsteiner, a former Member of Parliament and author of renewable energy legislation now working with the Swiss Development Cooperation Agency, gave an informative presentation in which he outlined the exciting prospects for renewable energy over the coming years, with the US solar market alone expanding by around $1 billion every year.

Mr Rechsteiner argued that the time has come for policymakers and investors to overcome their suspicion and skepticism over the expense of renewable energy, as, over the medium term (20 years), renewables are much cheaper than power from traditional utilities. This is due to the concept of depreciation, where the cost of assets is balanced over the lifetime over which those assets are to be used. Renewables require high up-front costs, but once you've paid off the interest on these initial loans, renewable utilities can produce energy for a fraction of the cost of their traditional counterparts; as Mr Rechsteiner pointed out, the sun doesn't send you any bills for using it, nor does the wind.

Well designed programs using a balance of different technologies can overcome problems of intermittency, with sun and wind power balancing each other out over the course of a year. Indeed, in the deserts of Africa, the sun is so intense that it provides the energy equivalent of one barrel of oil for every square metre of solar panel. However, to harness this energy, legislators need to work to improve tariff controls, and to improve technical standards for renewable energy equipment and grid integration, so that the national grid can be opened to new producers of renewables, paid a fair price based on avoided costs or a feed-in tariff model.

In conclusion, Mr Rechsteiner outlined what he sees as ten essential rules for designing national policy on renewables. These included: a single unified framework of national technical standards; local ownership of local utilities; a solid legal framework for feeding in to the national grid; a support system of microcredit directed to mini-grid developers; ensure that billing standards allow developers to recover the costs of development, operation and maintenance; the introduction of the user pays principle to ensure systems fit demand and income level; allowing independent power producers to send their power to the grid; the creation of training institutes for renewables; the reduction of import duties on renewable technology; and the redirection of fossil fuel subsidies towards renewables.

Rudolf Rechsteiner

About the PARE project

Chronic power shortage is a major problem in the South. At the same time, countries in Africa and Asia have rich potential in renewable energies like solar, wind, hydroelectric or biomass energy. If harnessed, these resources could provide the unlimited energy that is needed to lift the poor out of poverty and help reduce gender inequalities, without accelerating climate change.

The lack of national legal frameworks and policies as well as a lack of financial resources are major obstacles that have to be overcome if we want to promote and enable renewable energy for a significant portion of the world's population. Parliaments are key national institutions for the development, promotion and funding of renewable energy projects.

Members of Parliament must have the right tools to ensure access to clean energy for all the worlds' citizens. UNDP and the Climate Parliament propose to work together to build the capacity of parliamentarians to strengthen their advocacy and monitoring of the development of renewable energy sources, and to promote policy and regulatory reform to encourage investment in renewables.

UNDP is uniquely placed to build the capacity of developing country parliaments on energy issues, and to strengthen links between MPs and the UN system. UNDP currently supports one in three parliaments around the world. As the principal UN agency dealing with renewable energy issues (with clean energy as one of its main focus areas), UNDP is a key entry point to funding renewable energy and climate change projects through mechanisms such as the Global Environment Facility.

The Climate Parliament is the only global parliamentary network which has renewable energy as its primary focus, and it has already achieved impressive results in stimulating legislative and policy initiatives in Africa, India and the small island states.

In this collaboration, entitled Parliamentary Action on Renewable Energy, UNDP and the Climate Parliament are building regional networks of MPs and national cross-party parliamentary groups to promote renewable energy, new grids and other steps to ensure access to sustainable energy. At the same time, we will facilitate technical advice to the parliamentarians from across the UN system and from other organisations.

To learn more, visit the Climate Parliament website, at:

www.climateparl.net,

or the AGORA parliamentary portal, at:

agora-parl.org

Climate Parliament

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