

Climate Parliament

# The **Green Grid Network** Parliamentary Roundtable



Marrakesh, Morocco

14 - 15 November 2016





# Climate Parliament

Legislators working worldwide to combat climate change

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For copies of the presentations and policy papers made during the event,  
please visit: [climateparl.net/marrakech-2016](http://climateparl.net/marrakech-2016)

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# Introduction

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In November 2016, the Climate Parliament held our latest parliamentary roundtable event, timed to coincide with the COP22 climate talks in Marrakesh Morocco.

Some fifty MPs from across Africa, Asia and the Middle East were joined by representatives of the World Bank, the International Energy Agency, the International Renewable Energy Agency, the European Investment Bank, the WWF, and others.

Many different topics were covered over the course of the two days, and I cannot hope in such a short note to do justice to them all. Yet the Hearing reaffirmed a fact that I have heard from numerous energy experts: renewable energy is already out-competing fossil fuels on the open market. With political will, parliamentarians can help pioneer the policy push required to get renewable energy to point where it can compete with fossil fuel prices – without subsidies.

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 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.

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 – [www.climateparl.net](http://www.climateparl.net) - or contact [info@climateparl.net](mailto:info@climateparl.net).

Yours,

A handwritten signature in black ink, which appears to read "Graham Watson". The signature is written in a cursive, flowing style.

**Sir Graham Watson MEP**

Hon. President, the Climate Parliament

# List of participants

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## Members of Parliament

Ms. Maria Goretti Ajilo	Uganda	Mr. Oscar Ledesma	Ecuador
Ms. Katia Abreu	Brazil	Mrs. Martine Lignières-Cassou	France
Ms. Violet Akurut Adome	Uganda	Mr. Everton Lucero	Brazil
Ms. Jacqueline Amongin	Uganda	Ms. Lídice da Mata	Brazil
Ms. Veronica Babirye	Uganda	Mr. Francisco Matos	Dom. Rep.
Ms. Annalena Baerbock	Germany	Ms. Noris Medina	Dom. Rep.
Ms. Anifa Bangirana Kawooya	Uganda	Mr. Samir Murad	Jordan
Ms. Wafa Bani Mostafa	Jordan	Ms. Florence Namayanja	Uganda
Mr. Rachid Benhamou	Morocco	Mr. Morris Ogenga Latigo	Uganda
Ms. Nabila Benomar	Morocco	Ms. Cecilia Ogwal	Uganda
Mr. Fernando Bezerra Coelho	Brazil	Ms. Janet Ong'era	Kenya
Mr. Lawrence Biyika Songa	Uganda	Ms. Leila Ouled Ali	Tunisia
Mrs. Lucie Cissé	Senegal	Mr. Nahim Razak	Bangladesh
Mr. Francisco Domínguez	Dominican Republic	Mr. Ernesto Reyna	Dom. Rep.
Mr. Abelino Esquivel	Costa Rica	Mr. A.S. Senasinghe	Sri Lanka
Ms. Salima Faraji	Morocco	Mr. Jitu Soni	Tanzania
Ms. María Fernández	Dom. Rep.	Mr. Víctor Suárez	Dom. Rep.
Mr. Barry Gardiner	UK	Mr. Alemayehu Tegenu	Ethiopia
Ms. Vanessa Grazziotin	Brazil	Mr. Lamine Thiam	Senegal
Mr. Edgar Gutiérrez	Costa Rica	Mr. Pape Biram Touré	Senegal
Mr. A.N. Jha	India	Mr. Kaj Turunen	Finland
Ms. Zineb Kayouh	Morocco	Mr. Patricio Vallespín	Chile
Mr. Billow Kerrow	Kenya	Mr. Jorge Viana	Brazil
Mr. George Khaniri	Kenya	Mr. Juan Carlos Villalonga	Argentina
Dr. D.K. Khare	India	Mr. Armando Villanueva	Peru
Ms. Margaret Lamwaka	Uganda	Ms. Martha Wangari	Kenya
		Mr. Apollo Yeri Ofwono	Uganda

## Analysts, Experts, Officials, & Observers

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Mr. Moad Abbadi	Jordanian Senate	Mr. Daniel Maselli	Swiss Agency for Development & Cooperation
Mr. Richie Ahuja	Environmental Defense Fund	Mr. Pranav Mehta	National Solar Energy Federation of India
Dr. Shamshad Akhtar	Executive Secretary, UNESCAP	Dr. Sergio Missana	Climate Parliament
Ms Safiatou Alzouma	International Renewable Energy Agency (IRENA)	Mr. K. Nagaraj Naidu	Indian Min. of Ext. Affairs
Mr. Peter Armstrong	Climate Parliament	Mr. Simon Ngure	Govt. of Kenya
Dr. Ahmed Badr	Regional Center for Renewable Energy & Energy Efficiency	Ms. Alexandra Norodom	Climate Parliament
Ms. Naye Bathily	World Bank	Ms. Getrude Nthiiri	Kenya
Mr. Jean-Louis Borloo	Energies pour l'Afrique	Ms. Yuri Okubo	Renewable Energy Institute, Japan
Mr. Nicholas Carpenecus	GIZ Uganda	Dr. Lorenz Petersen	GIZ
Ms. Maya Clark	Climate Parliament	Mr. Jean-Pascal Pham-Ba	Terrawatt Initiative
Mr. James Corr�	Climate Parliament	Mr. Cedric Philibert	International Energy Agency
Ms. Marina DeBlonay	IRENA	Mr. K.S. Popli	Indian Renewable Energy Development
Mr. Nicholas Dunlop	Climate Parliament	Mr. Herv� Poulouen	Mediterranean Solar Plan
Prof. Damien Ernst	Universit� de Li�ge	Mr. Manuel Pulgar	WWF-International
Ms. Dan Geng	Climate Parliament	Dr. Subir Sen	Power Grid Corporation of India
Dr. Huang Han	GEIDCO China	Mr. Mwanate Shaban	Kenyan Parliament
Ms. Christine Kaaya	GIZ Uganda	Mr. Gurdeep Singh	National Thermal Power Corp.
Mr. Sekar Karnam	State Bank of India	Mr. Christian Stoffaes	Medgrid
Mr. John Ssemulema	GIZ Uganda	Dr. Upendra Tripathy	Former Secretary, Ministry of New & Renewable Energy, India
Mr. Christopher Knowles	European Investment Bank	Mr. John Tumuhimbise	Ugandan Ministry of Energy and Minerals
Dr. Sanjay Kumar	Climate Parliament	Ms. Anuradha Vittachi	Climate Parliament
Mr. Ashvini Kumar	Solar Energy Corporation of India	Dr. Arthouros Zervos	REN-21
Mr. Li Junfeng	NCSC China		
Mr. P.C. Maithani	International Solar Alliance		
Dr. Dhamir Mannai	Climate Parliament		
Mr. Ben Martin	Climate Parliament		



# The Green Grid Network overview

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Scientists tell us that to keep the planet's temperature rise below 2°C, the remaining "budget" of carbon dioxide that we can emit may be as low as 550 gigatonnes. Even after taking into account the aggregate emissions reductions pledged by the world's governments in Paris, as shown in the report published by the UNFCCC in May 2016, we will use up that budget within around 15 years. To achieve the Paris target of 1.5°C, total emissions of CO<sub>2</sub>, which lasts in the atmosphere for centuries, must be even less. Since oil, coal and gas account for more than two thirds of greenhouse gas emissions, this means we have to make the transition from fossil fuels to renewable energy very fast indeed.

Two recent initiatives involving the world's two largest nations offer a unique opportunity to speed up the global energy transition. In September 2015 at the UN President Xi Jinping of China proposed an initiative on Global Energy Interconnection. China is proposing that each region of the world should create a regional supergrid to share their best renewable energy resources. This would be followed by an intercontinental backbone grid to enable energy trading between regions. Then at the Paris climate summit in December 2015, Indian Prime Minister Narendra Modi and French President François Hollande launched the International Solar Alliance with the support of 121 nations. Their aim: to mobilise \$1 trillion in order to deploy 1 terawatt of solar power (roughly equivalent to the US power supply) by 2030. India has recently pledged assistance for solar projects in Africa to the tune of US\$ 1.5 billion.

Al Gore, Jim Hansen, Bill Gates and many others, including the Climate Parliament, have long argued that, with the right grids, we could

easily meet global power demand with cheap, reliable renewable energy. These two initiatives offer the chance to start building the new clean energy system at the speed and scale needed. The Climate Parliament proposes to create a Green Grid Network made up of legislators in 25 key countries, and an expert advisory group. We will help to generate the essential political will and budgetary support to ensure that the two initiatives advance as rapidly as possible. On budgetary support, we have a track record. Over three years our legislators mobilised more than \$1 billion in additional public support for renewable energy around the world.

As part of this work, we are working to convene a Green Grid Alliance made up of the executive branches of up to 25 countries. This will consist of a South-South initiative of 20 developing countries, with 5 Northern Partners, acting as a leadership group to help plan, finance and build the new smart grids. Those grids must range from continental-scale connections to village microgrids. So far, 16 developing countries have informally indicated their interest in participating in the Green Grid Alliance. They are: **Argentina, Bangladesh, Chile, China, Costa Rica, Dominican Republic, Ethiopia, Jordan, Mongolia, Morocco, Peru, Samoa, Senegal, Tanzania, Tunisia and Uganda.** We have begun discussions with **Brazil, India, Indonesia, South Africa and Uruguay,** and we will also talk with **Kenya, Mauritius, Mexico** and the **Seychelles.**

Ambitious? Yes. Possible? Absolutely. Our event in Marrakesh was an important parliamentary roundtable to introduce the concept of the Green Grid Network, and discuss with legislators and experts how best its goals can be advanced.



# Programme

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## Monday 14th November

09:00 - 10:00 **Opening remarks and keynote speeches**

Sir Graham Watson, Hon. President, Climate Parliament

H.E. Edgar Gutiérrez, Minister of Environment and Energy, Costa Rica

10:00 - 11:15 **The Green Grid Network and trading renewable energy**

Nicholas Dunlop, Secretary-General, Climate Parliament

Prof. Damien Ernst, University of Liege, Belgium

Discussion, Tea and coffee

11:45 - 13:15 **Green Grids and Global Energy Interconnection**

Li Junfeng, Director-General, National Centre for Climate Strategy and International Cooperation (China)

Huang Han, GEIDCO Beijing

Dr. Subir Sen, Chief Operating Officer, Power Grid Corporation of India

Marina DeBlonay, International Renewable Energy Agency, Abu Dhabi

Discussion, Lunch

14:45 - 16:00 **Building the International Solar Alliance**

Ahwini Kumar, Managing Director, Solar Energy Corporation of India

Jean-Pascal Pham-Ba, Secretary-General, Terawatt Initiative

Barry Gardiner, Shadow Secretary of State for International Trade and Shadow Minister for International Climate Change, United Kingdom

Discussion, Tea and coffee

16:15 - 17:15 **Energy access and renewable energy community grids**

Sanjay Kumar, Executive Director, Climate Parliament

Dr. Shamshad Akhtar, Executive Secretary, UNESCAP

17:15 - 18:15 **Summing-up and final remarks:**

Dr. Upendra Tripathy, Ministry of New and Renewable Energy, India

## Tuesday 15th November

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Tuesday will consist of presentations by - and discussions with - ministers or senior representatives from some of the countries which are leading the world on renewable energy, briefly describing their plans and policies for promoting renewable energy, modernising grids and increasing cross-border electricity interconnections. There will also be presentations from some international agencies. Timing of sessions may be altered depending on schedules of speakers.

### 09:30 – 11:00 **Asia and International Organisations**

Mr. Paddy Padmanathan, CEO, ACWA Power

Mr. A.N. Jha, Ministry of Environment, Forest & Climate Change, India

Hon. Arjuna Sujeewa Senasinghe, Minister of International Trade, Sri Lanka

Mr. Cedric Philibert, Senior Policy Analyst, International Energy Agency

Ms. Naye Bathily, Head of Parliamentary Engagement, World Bank

Tea and coffee

### 11:30 – 13:15 **Africa, the Arab region and Europe**

H.E. Alemayehu Tegenu, Minister, Ethiopia

Belaynesh Birru, Director for Environment and Climate Change, Ethiopia

Hon. January Makamba, Minister for Environment, Tanzania

Mr. Simon Ngure, Government of Kenya

Mr. Christopher Knowles, Associate Director, European Investment Bank

13:15 - 14:45 Lunch

### 14:45 - 16:15 **The Americas and International Organisations**

Everton Lucero, Vice-Minister Climate Change and Environment, Brazil

H.E. Pablo Badenier, Minister of Environment, Chile

H.E. Francisco Domínguez, Minister of Environment, Dominican Republic

Dr. Lorenz Petersen, Head, Climate Change Department, GIZ, Germany

Dr. Arthouros Zervos, Chairman of REN-21

Tea and coffee

### 16:30 - 17:30 **Discussion: next steps for Green Grid Network**



## Day 1: Opening session

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In the absence of Graham Watson, proceedings were opened by Barry Gardiner, the UK shadow Secretary of State for International Trade and Shadow Minister for International Climate Change. He spoke passionately on how the sense of hope from the Paris climate deal has been replaced with concerns in the wake of Donald Trump's election. There is increasing realisation in the international community that NDCs alone are not sufficient and that more ambition is needed. Legislators must scrutinise and hold their governments to account, insisting to their Ministers and officials that the job is not finished and we have yet to do enough.

The keystone speech to open the event was then given by H.E. Edgar Gutiérrez, Minister of Environment and Energy for Costa Rica. Mr Gutiérrez laid out the history of Costa Rican energy and environmental policy,



arguing that environmental and human rights and sustainability have been part of the country's political heritage since 1949, with a constitutional commitment to renewable energy that dates to that year. The country is now aiming for 100% renewables, and is now at 99% - an impressive achievement.

Describing the Costa Rican energy sector, Mr Gutiérrez argued that most fossil fuels are used for transport. Costa Rica's long and rich history of hydroelectric power has made it hard to convince engineers and the electricity industry that solar is a viable option, and this inertia was important to overcome. There will always be limits to hydropower - after all, there are only so many rivers, and El Nino and other climate impacts can radically affect the water supply & thus electrical production. Wind & solar, however, have no such drawbacks, and are effectively infinite.

Moving on to more global themes, Mr Gutiérrez criticised the philosophy of free-market neoliberals who just follow the whim of the market, thus ignoring long-term goals. Without proper planning and strategic direction, the best outcomes cannot be achieved, and left to its own deregulated devices, the free market will always led to subpar eventualities.

Next to the speakers' podium was Nicholas Dunlop, Secretary-General of the Climate Parliament. His speech centered on the non-partisan work of the organisation, stressing the value of a global networking of parliaments as MPs put in place national laws to bring about the shift in energy markets from fossils to renewables.

Mr Dunlop argued that global leadership on renewables and climate has already passed from the global north to the global south – countries like India, China, Chile, Costa Rica, and Morocco. There is now more investment in the developing world than in OECD countries for renewables, just to take one example. That's why the Climate Parliament is building the Green Grid Network - a group of less-industrialised economies and northern partners who can provide leadership on the energy infrastructure needed to get the world on a clean energy footing.

And the threat of climate change is as real as ever - indeed, more so. Events such as the Indonesian wildfires of 2016 – which emitted as much CO<sub>2</sub> in 3 weeks as Germany does in a whole year - and the continued disappearance



of Arctic sea ice point to ever greater dangers. Feedback loops, triggered by warming and accelerating further warming, will drive global warming beyond human control. The new energy system required to avert these calamities needs to be built, and it needs to be built now. After all, it shouldn't be that hard, Mr Dunlop argued, since human beings once built some pyramids.

Professor Damien Ernst of the University of Liege then stepped up to make his presentation. He gave a detail-rich and technically sophisticated account of how the world can generate enough energy to meet the needs of billions of people, arguing that while humans might be bad at finding agreement, they do manage to build impressive things and survive tough challenges. Therefore, building a global powergrid should be seen as both necessary and possible.

But, the Professor asked, how do we generate all this energy cleanly and greenly? And why do we need a green grid network? Yet it turned out that these questions were largely rhetorical, as Prof Ernst already knew the answers. Namely, a global grid reduces the amount of overall capacity needed by factor of 2-3, because you can trade power with other regions. It also reduces the need for storage capacity. The EU grid, for example, is already in existence, so there is progress being made – but not fast enough to avoid climate change.

At the moment, market prices are too low to justify major investments in solar or wind capacity. Governments need to start thinking about subsidy reform, both those provided to fossil fuels but also those for green energy.

Prof Ernst argued that compelling energy firms through legislation that mandates a certain - ever increasing - percentage of their sales should be in the form of green energy would be a more effective way to accelerate the green energy transition.

Although the global grid is technically feasible, it remains a project that is misunderstood and, in some cases, feared or dismissed. These fears are, in a sense, understandable, reckoned the Prof. Humanity, despite its admittedly impressive achievements, still lacks much experience of building anything as big, complex, expensive, and dependent on international cooperation as a globe-spanning electricity grid.

Yet there are flagship projects on the drawing board which are showing the way, and we need to support and encourage these pathfinders so as to prompt others to follow. South American wind, for example, could power the whole continent - with the southern tip of Argentina being around four times windier than Europe. Another example might be an electricity connection between the Middle East and China, to smooth out daily PV fluctuations. Another might be an undersea cable between Morocco & Belgium. These projects, Prof Ernst concluded, are not just possible - but they would be profitable too.

The speaker's baton then passed to Mr Li Junfeng, Director-General of China's National Centre for Climate Strategy and International Cooperation. Mr Li began his presentation by comparing various kinds of networks, including those in transport, telecoms, and logistics. These networks get around political challenges because we need them, and it should be the same with energy too.

Mr Li argued that one of the key factors behind the successful signing of the Paris climate accords was the harmony between the research of scientists, the consent of the business community, pressure from civil society organisations, and negotiation from politicians. He also highlighted the fact that a lot of good work is being done at the city and regional level instead of at the national, state, and interstate level. With ever-growing numbers of private companies coming on board as well, pressure is building to transform the world energy system from within. The technology is available, and cost is not a problem. Resources are not a problem either, Mr Li argued - the only holdback is conceptual, and ideological. We must change



the ideological and political straightjacket that constricts greater cooperation on energy, Mr Li concluded: we need to work together, to share our power together.

Huang Han from GEIDCO Beijing then strode confidently to the plinth to deliver the next presentation. He explained to the delegates that GEIDCO has been working on the concept of the Green Grid since 2014, starting from the assumption that gas and oil will run out in 50 years and coal in 100. Environmental pollution is also getting pretty out of hand in China, and climate warming threatens human existence by the end of century.

Global energy consumption keeps on increasing, and will continue to do so. As such, Mr Han argued, we simply cannot keep global temperature rises below 2 °C if fossil fuels stay in the energy mix. We need to phase them out, and replace them with renewables - but if we look on a map where the best sources of renewable energy lie, we can see immediately that they are not spread evenly. The obvious conclusion, Mr Han opined, is that we need a global platform capable of delivering power from where it is found, to where it is needed. Different clean energy technologies have different technical features, in terms of intermittency, unpredictableness, and so forth. So interconnection helps overcome these problems as well.

Finally, Mr Han concluded with a sobering thought: a mere 0.05% of all the renewable energy that the world receives is sufficient to meet the needs of all human society - with every citizen having access to fair level of energy. Smart grids can bring that energy





to where it is needed most - and we have a responsibility to build them.

The next speaker was Dr. Subir Sen, Chief Operating Officer of the Power Grid Corporation of India. His was a presentation of two halves, including an integration plan for renewables, and an exploration of green energy corridors. In India, he explained, renewables are growing very rapidly, and the government has committed to even more expansion in the coming years.

At the Paris Climate Talks, India committed to a 35% reduction in carbon emission intensity, as well as a pledge to get 30% of its electricity from non-fossil fuel sources, and to use carbon sinks to absorb 3 gigatonnes of carbon. In order to do this, however, it is critical to match development of demand with development of generation - and then meet the two with transmission. This, of course, is the role of the Power Grid Corporation of India, as Mr Sen explained: the careful balancing of load, generation, demand and distribution, in order to keep the grid stable, safe, and secure.

Renewables make this process slightly more complicated, as the power they're supplying is intermittent and cannot be as easily ramped up or down as, say, a gas fired power station. This leads to the famous "duck curve" - the steep ramping up of demand for dispatchable power in the early evening, as solar power starts to go offline with the setting of the sun just as demand for power increases rapidly as people return from work.

How can we meet this huge uptick in demand, Mr Sen asked? He answered that grid security is an important factor, as is strong and well enforced technical standards, intelligent market design, frequency control, and greater interconnection - through green energy corridors - to transfer energy around.

The presentations continued, this time with Ms Marina DeBlonay, of the International Renewable Energy Agency. Ms DeBlonay addressed several important topics in the field of renewables, concentrating on zoning and resource assessment and the ACEC implementation process. She spoke of IRENA's work in organising awareness raising, capacity building, and training for key stakeholders and change makers around the world, and gave a brief overview of the organisation's important work in research and policy analysis.

After a lengthy question and answer session, the delegates retired for a well-deserved luncheon. Having supped, they returned to the event ready for the next presentation, which was given by Jean-Pascal Pham-Ba, the Secretary-General of the Terawatt Initiative.

He argued persuasively that, as subsidies are drying up, we have to increasingly rely on market forces alone to drive resources and investment into renewables. Thus: clean energy must be cheaper than anything else, or it simply will not attract sufficient investment. But, Mr Pham-Ba asked, how do we get there?

The private sector has its financial models to source the cost of solar, and these take account of the fact that the fuel for such technology is free. So the only cost to an investor is the cost of equipment and the cost of capital. Over recent years, the cost of equipment has dropped massively, and will continue to fall. But what's really crucial is access to financing - especially in developing countries. In order to unlock greater





investment, regulators and policy makers need to ensure that investors around the world have equitable access to equity. This is what allows market forces to deliver the shift and modernise the whole sector.

At this stage, the question becomes - how do we get to \$30 per MWh – the tipping point? A lot of costs are arising out of unoptimised regulation and inefficiencies in private sector activity, Mr Pham-Ba pointed out. The risks of currency fluctuation, institutional instability, or policy changes – all these can put off private developers. But with organisations such as the International Solar Alliance leading the way, the worm is starting to turn, and is beginning to address the last barriers still in the way of making solar and renewable power very cheap for everyone, reduce emissions, and provide power for all.

Next to the rostrum was Mr Ahwini Kumar, the Managing Director of the Solar Energy Corporation of India. He explained that the International Solar Alliance, or ISA, is an international alliance on solar - featuring 121 countries located in the tropics, with a mix of developing and developed but united by their excellence solar energy resources almost none of which is currently tapped. Mr Kumar argued that the Alliance would help its members to pool their resources, knowledge base and share problems together to overcome shared challenges. He was certain that this will be an alliance that's useful for everyone.

He went on to describe many of the richly varied schemes that exist to support solar deployment in India. These include solar parks, central PSUs, grid connected rooftops, bundling with coal, canal tops, and viability gap funding. Learning lessons from these schemes is an important step



to designing new, more effective programmes, and Mr Kumar shared some of the detailed analysis with the delegates.

The final speaker on the first day of the conference was Mr Barry Gardiner MP, the UK's shadow secretary of state for international trade and climate change. Mr Gardiner gave an excellent and keenly-felt speech, outlining how he was neither an electrician nor a scientist nor policy wonk, but a politician. Referring to the startling fall in the costs of solar energy over the course of 2016, he asked how politicians could best utilise these technical and financial breakthroughs to ensure that climate change was tackled through clean and renewable energy.

Mr Gardiner insisted that policy makers need to take vital decisions and regulate with reality in mind. He encouraged the delegates to incentivise business to invest in the area of renewables, and argued that new regulatory frameworks are required. Criticising the tendency of governments to chop and change the laws and policies governing energy, he insisted that business are only interested in clarity, stability, predictability, and reliability. Therefore, the best way to encourage greater investment in renewables is to simply avoid tinkering too much with laws and regulations, and allow the market to gain confidence in a long-term commitment.

An example of the negative consequences of governmental fiddling, Mr Gardiner mooted, was the United Kingdom - a country that has slumped in the rankings of renewable energy business from 4th to 13th inside just 5 years. A salutary example, therefore, of how regulation has to be left alone in order to be effective.

As technology continues its inexorable march, we see new and more effective solutions being advanced all the time. Electric vehicles give battery storage, allowing solar and the transport sector to be integrated to the benefit of all. Mr



Gardiner made the point - well grasped by the delegates - that both technology and policy has to work with how people actually live.

In conclusion, Mr Gardiner rousingly argued that we are not saving the planet through climate action. In fact, we are saving ourselves. We don't need to persuade businesses of the theology of climate change - that just won't do anything. Instead, policy makers need to sell to investors as a business proposition supported by government.

Next up was Dr Sanjay Kumar, the Executive Director of the Climate Parliament. Dr Kumar spoke passionately about energy access and electrification of rural areas to bring modern energy services to the 1.2 billion people around the world who still lack access to the power, light, and heat that electricity can provide. The vast majority of these people live in sub-Saharan Africa and the emerging economies of Asia, with some African countries having as few as 15% of the population with access to energy; in many countries, the electricity system even for those who are connected to the grid is unreliable, unaffordable, or insufficient to meet people's energy needs.

Dr Kumar gave the delegates a classic overview of how this energy access gap could be closed. Pointing to research from the IEA that found that an additional 952 TWh of generation would be required by 2030 to ensure universal access, Dr Kumar argued that almost half of this additional capacity would have to come in the form of mini-grids, rather than traditional grid expansion. The investment required for universal access could reach some \$700 billion in 2009 prices, and again some 43% of that figure would have to be reserved to minigrids.

In Africa, for example, around 20% of the energy shortfall could best be met through investment in off-grid systems such as domestic-scale solar,

wind, biogas, or combined systems, while a further 41% could be achieved through mini-grid rollout at the 50kW to 2MW level. Grid expansion alone will not be - and will never be - sufficient to close the gap. Markets are beginning to realise that traditional grid expansion is not only technically unfeasible in many cases, but also economically inefficient - with solar PV minigrids and solar home systems coming in at less than half the LCOE of grid extension projects, according to NORPLAN 2012.

Dr Kumar then moved on to explain the exciting opportunities for rural electrification through renewables afforded by the rapid improvement in battery and converter technology over the coming decades. Despite these opportunities however, several risks remain in the field of scaling up mini-grids. These include political, financial, regulatory, and offtaking risks in terms of finding enough consumers and guaranteeing good prices for investors. All these things can slow investment and prevent greater ambition at the governmental and financial level. Some policies can alleviate these risks, which Dr Kumar explored for the benefit of the enraptured delegation - including aggregating minigrid demand across regions, prescribing minimum fees for users, creating payment guarantees, and allowing hedging and low interest debt in local currency for investors.

After Dr Kumar's presentation there was another presentation, this one delivered by none other than Dr. Shamshad Akhtar, the Executive Secretary of UNESCAP. She gave a confident and inspiring talk on the significance of sustainable financing as an integral element of the post-2015 development agenda, as evident from the Rio+20 decision to establish an intergovernmental committee of experts on sustainable development financing and to mandate the UN system to bring to the General Assembly its assessment of needs, as well as to explore alternative and innovative sources of financing and avenues for public private partnership.

To set the scene for their regional deliberations, Dr Akhtar outlined for the delegates how the ESCAP secretariat has circulated a background document with the intention to inform the sustainable finance committee of experts about the current status of Asian finance; to offer estimates of the financing requirements of the region (albeit conservative, tentative and likely to rise); and to examine opportunities to strengthen financing systems and leverage new partnerships and resources for sustainable development.



In conclusion, Dr Akhtar argued, going forward it was important that the region should work collectively to ensure that it nurtures strong and stable financial systems. To achieve this, policymakers and regulators need to work with the private sector to develop more diversified and balanced financial sectors—which are key to reinforcing financial stability and sustainability, as well as to extending finance to meet the people's needs and the region's development.

The last but by no means the least presentation of the first day was given by Mr Upendra Tripathy, the former Secretary of the Ministry of New and Renewable Energy. He discussed India's efforts to promote the new International Solar Alliance, through the promotion of policy guidelines, including in ISA member countries, to ensure grid expansion, integration, upgradation, and modernization in order to support massive increase in renewable generation worldwide. He argued that countries should extend all fiscal and financial benefits, given nationally and internationally to the renewable energy sector, to the green grid sector.

However, Mr Tripathy pointed out, persuading domestic, bilateral and multilateral banks world over to adequately finance grid related projects in the same terms and conditions as applicable to RE projects will not be easy. To aid this, he recommended that investments in grid related projects and electric energy generation maintain equality at a ratio of 1:1, and urged legislators to support him in pushing for greater action from financiers and investors. Green grids and energy corridors must be constructed to ensure that renewable energy is able to travel to where it is needed most.

But while large-scale infrastructure is essential, Mr Tripathy reminded the delegates that it's important not to forget the smaller off-grid solutions. Each country in the ISA should promote a policy for micro and mini grids in off-grid areas so that the promoters, entrepreneurs, and employees of such grids do not suffer when grids are extended to such rural or inaccessible localities, to ensure maximum uptake of renewables.





## Day 2: Presentations

On the second day, the presentations continued, with the first of the day being given by Mr Paddy Padmanathan, the CEO of ACWA Power. He argued that his attitude towards power generation is agnostic on technology, meaning – ACWA will do anything to generate power, using a wide range of technologies, and a very diverse portfolio. The company looks to set up local partnerships so they can grow the skills and industries of local economies.

Launching into a potted corporate history, Mr Padmanathan explained how ACWA expanded beyond its origins in Saudi Arabian oil and gas into the world of renewables. The model revolves around investing a lot of capital upfront and then collecting revenue over the long term - like most clean energy investors, they borrow a lot, pay back the loans first, and then the investors get paid back at the end of the project. So, he continued, the tariff that the firm wins at the tender must be sustainable – the customer must willingly pay for 25 years for these investments to work out. With technology costs coming down all the time, ACWA always tries to provide the cheapest possible price to customers.



Moving on to describe the 510MW Moroccan Noor solar complex at Ouazazate, which when complete will provide 5% of all of Morocco's power, Mr Padmanathan described the positive impact the project has had on Morocco's credit rating. Ratings agencies have factored in environmental and sustainability concerns, as well as the considerable savings on fossil imports, and the resulting reduction in balance of payments sensitivity to energy price fluctuations. According to Moody's, the Noor plant represents a 0.3% uplift in GDP in



avoided oil import costs alone - thus helping to improve Morocco's credit situation, and helping make it an attractive place for other investors.

Mr Cedric Philibert from the International Energy Agency was next to the podium, and took the delegates on a tour of his organisation's work on promoting real world solutions to accelerate the clean energy transition.

The energy industry, Mr Philibert argued, is beset by questions these days. What will the role of distributed power be? Should we invest more in minigrids, or supergrids? Is truly distributed power without utilities possible, or even desirable? We need to start reconciling these different visions, and recognise the need for smart technology, with grids that shift information as well as energy.

2015 was a record breaking year, with total renewables capacity exceeding coal for the first time. Solar auction prices were also dropping at impressive rates, a trend that has continued into 2016 - leading to a sense that things are really speeding up in the industry, and that a tipping point might have been reached. Even the UK has produced more energy from sunshine than from coal in the last six months - a truly impressive achievement given both the UK's history and climate.

Some lessons can be drawn from these radical changes. Firstly, the best results occur where price competition, long-term contracts, and good resource availability are combined, with stability of policy to boost investor confidence. Lots of countries are approaching 15-20% market share for renewables, and so far it's mainly been surprisingly easy in terms of technical and technological challenges, apart from some teething problems in Germany and South Australia.



Renewables can be vernacular - built on and around people's homes and distributed around the country, giving more flexibility and an even spread of energy to grid operators. However, good interconnections and a proper approach to distribution are important in designing such a decentralised system. With wind farm capacity factors increasing steadily, up to around 40% on average these days, interconnection can provide benefits in terms of smoothing out supply, demand, and variability of generation.

The next speaker was Naye Bathily, head of parliamentary engagement at the World Bank. She explained that climate change is a top priority for the World Bank because it is one of the biggest threats to poverty eradication. She explained that more than 100 million people could fall into extreme poverty by 2030 if countries don't mitigate and adapt to climate change. Recognising this, over the course of the last five years, the World Bank has stepped up its support for climate-safe investment and financing, and has published some of the more most eye-catching and thought-provoking policy and economics papers on the subject.

Ms Bathily suggested to the delegates that the Paris Agreement had created a great sense of momentum, bringing countries on board despite their skepticism of international climate action. But now the torch is being passed to legislators, with the Agreement emphasising the importance of all levels of government working together. Those who make national laws thus have a huge role to play. Ms Bathily asked: who better than parliamentarians to champion climate action? National legislation is the only way that countries will meet their NDCs - and parliamentary oversight on those laws is urgently required.

The next presenter was H.E. Alemayehu Tegenu,



a former Minister from Ethiopia. His presentation centered on the necessity of building a climate resilient economy, ensuring that all development must be sustainable and driven by renewable energy. With demand for energy high and rising, the government of Ethiopia has designed new policies and programmes to fast-track the completion of new energy infrastructure, adding 6000MW to the country's generating capacity.

Christopher Knowles from the European Investment Bank was the next in line to give a presentation, and he duly delivered. One of his most interesting points was that the developing world actually is a far more stable regulatory environment for investment in clean energy than Europe, which features some of the worst examples of policy instability in the world. This instability in rich countries' attitudes to renewables can, Mr Knowles argued, account for quite a fair chunk of the reason why developing markets for renewables are now bigger than their Northern counterparts.

Planning risk is increasing in the developed world especially given planning "nimbyism". This, but not only this, poses a real challenge to financing a full decarbonisation by 2050. New technologies that will be essential in the fight for a zero-carbon world have significant uncertainty for investors: batteries, carbon capture and storage, new clean technologies like tidal, floating wind farms, etc – so it's very important to work out how we can reduce these costs and risk perceptions. Mr Knowles laid out how the European Investment Bank is trying its best to do this.

Some examples of its work in the field provided illumination for the delegates: with renewable solutions cheaper in the long-run, they do need a little more upfront financing, and so this is where

the EIB steps in. Projected in Morocco, which is connecting 10,000 houses a year to clean energy, and countries with lots of intermittent wind / solar generation such as Denmark and Germany need to connect to countries with lots of excess hydro capacity like Norway. The EIB is helping to finance the building of a large undersea cable to help both countries, and hopes that similar projects will be financed in the future.

Not to be outdone in the presenting of presentations, Dr Lorenz Petersen of the GiZ was next to the speakers' plinth, from where he delivered an engaging and apposite talk on the GiZ's experience of integrating renewable energy in partner countries.

As Director of Climate Change, Rural Development and Infrastructure at the GiZ, Dr Petersen was able to speak with some authority to the delegates on how renewable deployment faces unique challenges in emerging economies - especially as it pertains to boosting energy access in those regions still blighted by energy poverty. He characterised many non-OECD countries' power markets with several common features, including strong demand growth, weak grid and transmission systems, weak institutions, but excellent renewable energy resources. Following this, Dr Petersen gave an overview of GiZ activities in the field, covering the technical and regulatory perspectives, and including an overview of some recent results from renewable energy auctions around the world.

Grid integration, Dr Petersen argued, is a key objective for bringing about the energy transition, partly because huge cost reductions for renewable energies have made them cheaper than conventional fuels, but also because many emerging economies have big ambitions on the deployment side. Indo-German collaboration on the green energy corridor concept over the last three years provides an excellent case study







of how technical challenges can be overcome with proper planning and technical foresight, with 5800km of new power lines currently being deployed to assist India in rolling out green technologies.

In conclusion, Dr Petersen argued that there is a need for scientific power generation forecasting techniques and state of the art tools at control centres; while a regional balancing framework is required with sufficient reserve controls have to be technically implemented. Additionally, the introduction of aggregators/balancing groups can increase the overall efficiency of the system, while a market for ancillary services should be established.

The next presentation of the day was performed by Arthouros Zervos, chair of REN21. Mr Zervos explained that REN21 is a global multi

stakeholder network dedicated to the rapid uptake of renewable energy worldwide, covering national governments, NGOs, industry associations, science and academia, and international organisations. Mr Zervos also pointed out that an interesting way of measuring which countries were doing most on renewables was not simply to look at raw capacity additions, but at investment in RE per unit of GDP. Measured like this, the top five investors in renewables are Mauritania, Honduras, Uruguay, Morocco, and Jamaica.

More facts and figures flowed from the powerpoint pen of Mr Zervos. With renewables making up 60% of new capacity additions to energy networks world wide in 2015, and a 9% growth in total installed capacity, it's clear that renewables are reaching a tipping point. Solar PV alone has seen a ten-fold increase in annual investment inside just ten years, with other technologies seeing similar gains. 173 countries now have targets for renewable energy installation.

Further challenges and opportunities remain, Mr Zervos insisted. These include smart grid management, allowing for the integration of high shares of variable renewables, and an increasing role of enabling technologies such as storage, ICT, heat-pumps. With the electrification of the heating & cooling sector being a high-priority in coming years, in addition to e-mobility in the transport sector, improvements in storage technologies, and the increasing role of cities and municipalities, Mr Zervos argued that there will be an increased emphasis on activities to improve energy efficiency in all sectors.

## Conclusions and commitments

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Following the conclusion of the plenary presentations, the assembled parliamentarians from different regions and countries were given the opportunity to provide their thoughts and responses to the roundtable, as well as committing to policy action upon their return to their own parliaments.

**Uganda:** as the first country in East Africa to have hydropower, Uganda is a highly endowed country climactically. Yet, as the MPs pointed out, climate change is already beginning to be a reality: drought, less water for hydropower, strange weather, food shortages, and rapid deforestation have all made themselves felt in recent years. New dams are being built to boost generation capacity, but will they be effective in a period of increasing drought? The MPs recognised the need for diversification into solar, wind, and mini hydro technologies, and lauded the role of the department of climate change in the Ministry of Environment, as well as the Uganda Parliamentary Forum on Climate Change, which was formed in 2008. Challenges remain however, including low levels of electrification and increasingly high demand. A comprehensive programme for the green economy has not been



developed yet, and the MPs are worried that the discovery of oil in Uganda might derail progress towards a cleaner energy future. They concluded by reaffirming the need to build on opportunities, tap into strength of this parliamentary forum, and formulate real policies with a focus on agriculture.

**Morocco:** The Moroccan MPs drew the attention of the delegates to the huge solar project at Ouazazate, of which the first phase went operational in February 2016. The second and third phases are now being built to exploit Morocco's rich endowment of solar energies, with funding made available for emerging economies to assist them in





the fight against climate change. Yet the commitments of richer nations to honour their promises of greater climate finance have not been kept - including the famous promise of \$100 billion dollars arising from the 2009 Copenhagen talks. The MPs called for greater transparency from northern partners, with the objective to provide equal investment for adaptation and mitigation.

**Senegal:** The MPs paid tribute to Senegal's strong tradition of renewables, mainly hydropower, while admitting that there had been a marked slow down in progress since 2011. Costs remain fairly high, while electrification rates remain low. In 2012, the MPs explained, a new policy was adopted by the president, aiming for a better mix for renewable energy sources and increased access to energy for the rural poor. The MPs argued that renewables must drive rural electrification, and pointed to several successful projects and ambitious targets in this area, that have led to lots of new power projects being built. Community projects account for the lion's share of these, while co-operative interconnection projects with Guineau-Bissau are also on the drawing board. New regulatory frameworks stemming from 2011 have allowed the liberalisation of the energy sector, with private investors now playing an important role in generation.

**Costa Rica:** The legislators from Costa Rica also extolled their nation's proud history of renewable energy, arguably being one of the most ambitious and aggressive early adopters of clean energy in the world. Although much of this historic growth in clean energy was built around hydropower, the MPs pointed out that the country has made major steps in non-hydropower renewables in recent years. The MPs shared a few highlights with the group, including the inspiring fact that for the first 5 months of 2016 Costa Rica was powered entirely by 100% renewable energy. The government is now moving to tackle emissions from the transport sector, which accounts for 70% of oil imports and which produces 40% of the carbon emissions. The MPs insisted that this must be a real priority for us, and called upon their colleagues to join them in strengthening key public institutions and boosting public transport.

**Bangladesh:** The Bangladeshi chapter

shared the inspiring tale of the SREDA policy campaign with the delegates, urging them to be patient and consider the long game - after all, they admitted, it took them 4 years to get the Agency funded. There was also candid discussion of the government's failure to hit its own target of 5% of total energy should be renewable by 2015, and urged fellow legislators to draw lessons from their failures just as much as their successes. These successes include a successful home roof solar programme. There are some alarming signs, however; infrastructure investments have taken a priority, with lots of Chinese investment - USD 13.6 billion in energy projects alone, but far less attention is being paid to renewables. The Bangladeshi MPs argued that there aren't enough MPs pushing for renewables within the parliament, and called for a more focussed and intensive advocacy for change. In conclusion, they argued that lawmakers need to be better informed and better able to push for policy pilot projects to encourage innovation.

**Tanzania:** With ambitious goals of getting up to 100% renewables, Tanzania has certainly set a high bar for renewable action. The MPs laid out the details of several key policy planks, including a levy for fuel that is directed towards rural electrification, with the important fact that the law ensures such projects are not 100% donor dependent for rural energy access efforts. On the topic of the Green Grid Alliance, the MPs promised to speak to their ministers, to secure commitments and written assurances that Tanzania wants to be in the forefront of the alliance. Awareness and support for interconnectors is building, helping to link neighbours into a coherent create power pool that can ensure stability of supply. Hydropower has been a major area in the past, the MPs argued, but currently finds itself affected by drought and has to be replaced by fossil fuels; we need to build more clean energy back up for hydro shortfalls. Finally, the MPs shared a new policy that aims to encourage consumers to change diesel pumps to solar pumps for water, which are now starting to spread out across Tanzania.

**Ethiopia** The Ethiopian legislators group thanked the rest of the delegates for an enlightening two days of discussion and debate, and laid out the conclusions they

had drawn from the event. They stressed primarily the need for strong and effective community monitoring of rural electrification projects, additional external financing to overcome investment challenges, the promotion of local manufacturing to ensure jobs, prosperity and technology transfer to less-developed communities, and the moral importance of increasing access to electricity for rural communities.

**Chile:** The Chilean group of legislators thanked the Climate Parliament for their involvement and engagement with renewable energy issues, and gave the delegates a quick run through of the work that the MPs had achieved over the previous two years. This included the passage of robust legislation to encourage the roll out of renewable energy, as result of the ongoing collaboration with Climate Parliament. Additionally, the Chilean MPs offered to make all of the recently passed legislation available for the other delegates to share, draw inspiration from and help to design their own policy projects. The new legislation is targeting a drop in the price of generating electricity of at least 60% from 2020 onwards; with 50% of new energy in Chile mandated in the law to come from solar and wind. This, the MPs avowed, would catalyse further success. The MPs called upon their colleagues in Latin America to join with them in strengthening and developing the Climate Parliament network in the region, and to assist in the creation of a regional parliamentary strategic alliance to push for greater progress on clean energy. Finally, they urged the assembled delegations to work on persuading their Ministers of Economy, Development, Treasury and others of the sound business and financial case for investing in renewable energy.

**Peru:** The Peruvian delegates began by noting how very inspiring and motivating they had found the event, and by stressing the need to change the way that we work in approaching climate and renewable energy problems. Events such as this one, they claimed, were invaluable ways of tapping into combined knowledge of a global group of legislators, and helping everyone to understand better the complex challenges of energy, development, and climate. They admitted that Peru has still some distance to travel before it can claim to be a leader in installed renewable energy

capacity, and pledged to work to increase the amount of clean energy installed in the future. Too often, they said, decisions on energy investment had been made with only short-term considerations, in a situation of economic stagnation and with renewables seemingly too expensive to consider. This approach, they suggested, needs to be reconsidered, thanks to the threat of climate change. The MP insisted that after joining in the discussions of the previous two days, he was convinced of the centrality of climate change as an essential issue, and pledged to work to convince his colleagues of this as well.

**Benin:** The legislators from Benin also thanked the Climate Parliament for helping to organise various bilateral and regional workshops on renewable energy policy, practice, and financing, which have helped - they claim - develop more parliamentary awareness of climate change as an issue, and brought civil society representatives more involved into the legislative process. This, they insisted, was a golden opportunity to expedite progress, and explained to the group how they were planning a draft bill initiative on public-private partnerships for renewables. With the parliament in Benin currently examining existing energy laws, some of which are quite outdated, it is a moment at which Benin's energy sector can be liberalised and de-congested in order to promote growth.

**France:** Finally, the MP from France set out her thoughts. Despite the uncertainties of the US election showing that considerable challenges still lay ahead, the MP explained her sense of optimism: the market is shifting on renewables, strong global mobilisation on climate action is starting to gather, and political will is growing. There is also now more of a focus on the implementation of laws, not only on their drafting. Surprisingly, the MP opined that wind energy hasn't received a lot of enthusiasm in France, so pledged to support solar instead. In conclusion, the MP pointed to the recent ISA agreement with India which is an important achievement, aiming for 1TW by 2030.