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Marlon Brando's clean energy legacy

Giles Parkinson

An island paradise in Polynesia that once served as Marlon Brando's hideaway is emerging as a potential test case for the clean energy grid of the future – combining solar PV, with wave-powered energy and desalination and biofuel sourced from coconut oil.

Brando himself used the stunning atoll of Tetiaroa, north of Tahiti, as a secluded hideaway with little in the way of luxuries or energy requirements. But his estate has developed a six-star eco-resort and a local community that will use a 100 per cent renewable energy grid to power it.

This includes a salt water air conditioning system, drawing cool water (around 5°C) from 1km below the surface of the tropical ocean, a flow battery as backup, biofuels from coconut oil, and it is exploring wave power and desalination with technology from Australia's Carnegie Wave Energy.

It all sounds a little utopian and improbable, but Dan Kammen, the chief technical specialist for renewable energy and energy efficiency for the World Bank, says island and remote communities, particularly in developing countries, are proving to be excellent testing grounds on how to achieve 100 per cent clean energy outcomes. The high price of fossil fuels in these countries allows the technology to be available sooner, and many have no other options.

"Getting to 10 and 20 per cent renewables has proved very doable, but how do you get to 80, 90, 100 per cent where you've really got to deal with integration issues? And what we're seeing in many island communities, and also many isolated non islands that look like islands from a power perspective, is that good management of the system, integrating efficiency and renewables, finding ways to back up your clean generation; those lessons translate to countries rich and poor around the world."

Here's what else Kammen had to say in an interview with *Climate Spectator* while in Australia for the Ecogen 2011 conference and for some work with the Climate Commission:

Giles Parkinson: Dan, you're the chief technical specialist at the Renewable Energy and Energy Efficiency office of the World Bank and you're responsible for a budget of about \$5.8 billion. Is that right?

Dan Kammen: That's the flow through. So, the World Bank's energy budget is about \$8 billion, and about \$5-\$5.5 billion, depending how you count some policy projects and others, is in the renewables non-carbon space and that's my primary responsibility: to be engaged in assessments, helping out individual country project teams and also working on what is really the fastest growing area:... policy loans to assist countries in evaluating everything from feed-in tariffs, to auction schemes, to the economic and environmental benefits of interconnection with their neighbouring countries. So really, it's to be a resource within the Bank and outside on clean energy programs.

GP: So what are you doing with that money then?

DK: The areas that have ramped up the most dramatically are, again, loans and policy and, again, that's everything from countries taking money from the Bank to do assessments of their

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energy policies ...

GP: Using that money to do assessments?

DK: Correct. But also to evaluate what would be the economic impacts. One of the challenging areas for countries that have examined feed-in tariffs is setting the rates right, and there's a real worry that, if you set the rates too high, you will have to pay too much; too low, you don't get action. That's a capacity that takes time to build up. And so we've worked on that.

Investments in transmission distribution are one of the fastest growing areas in the Bank and we've been investing quite heavily in transmission lines to do things like ...connect Ethiopia with a lot of hydro and Kenya with a lot of wind and geothermal, so that they can build a regional market. Similar investments in transmission in Turkey, to link very large and very rich wind resources into the metropolitan areas, as well, so they can export power both to Europe and to Syria. So, finding transmission projects that really facilitate green markets is another area.

GP: Is it just developing countries? Some of those issues, for instance trying to get the PV policies right and also the transmission areas, it sounds like Australia needs a bit of help in that as well?

DK: Well, I think we all need help in it, but at the World Bank my mandate is industrialising nations, so I talk quite a bit with the donor community, of which Australia is a member. But most of my actual project work is with the developing nations.

GP: So, why are the developing nations interested in renewable energy? Because isn't it more expensive than fossil fuel? Wouldn't they be better off just having a coal-fired power station and gas, or whatever, and waiting for renewables further down the track?

DK: Well, no actually. In a number of situations renewables are at or below cost of the fossil fuel competitors today. In many, many island systems, where the price of diesel is very high, renewables are already at least cost, but not always easily accessible, and so it can take some financing to get them going even if they can show a cost benefit right away. There are a number of situations where low-cost wind resources, large-scale integrated solar all work, but they need to overcome the problems of utilities that have not been thinking about them in the past. And so that's one of the areas where, even for cost-competitive ones, you need that lean forward, you need that push to crowd them into the market. That's part of what we do. And then there are, of course, some places where they are in fact still more expensive and just like in developed countries around the world, trying to find the optimal use of scarce resources to incentivise... to open markets is another piece of what we do.

GP: And so how are they dealing with factors like having a high penetration of renewables into their grid? Because a lot of them have small grids, but they're getting a lot of renewables coming in – most of which, I guess, are intermittent?

DK: Well, that's really a place where the system side of both my former background as an academic – looking at how energy systems work and the practical job of working with client governments – is really key, because frequently the intermittency of solar and wind can be backed up with biofuels, with existing gas already on the network, and also by managing the efficiency side of the equation much more aggressively. So demand-side management – finding programs to incentivise industry to be more efficient – this can have a larger balancing effect than almost anything else, in many cases. And so we work on those programs that integrate efficiency and renewables from the start.

GP: You mentioned today the island formerly owned by Marlon Brando, where they were actually looking at a mini grid type of scheme, which has a mixture of wave and biomass of coconut oil and solar and what have you. What do we learn from projects like that?

DK: Well, that's a really interesting example, because in the process of developing a sustainable community for the island, including hotels for eco tourism, they've really confronted a lot of the issues that countries are only just getting to because their goal from the outset is 100 per cent renewable. They are looking at what we thought previously to be the expensive part of the cost curve. Getting to 10 and 20 per cent renewables has proved very doable, but how do you get to 80, 90, 100 per cent, where you've really got to deal with integration issues?

And what we're seeing in many island communities, and also many isolated non-islands, that look like islands from a power perspective, is that good management of the system – integrating efficiency and renewables, finding ways to back up your clean generation – those lessons translate to countries rich and poor around the world. And so, part of my ongoing engagement with island projects has been how far ahead of the curve they are, because they are already confronting targets many countries won't be seeing for decades.

GP: That's fascinating. And because you're travelling right around the world, can you give us some sort of sense about the way clean energy is being viewed across the world in industrialising nations, and what are we seeing? Are we seeing a shift because of energy security or climate change or is it a mixture of both?

DK: It's really a mixture. In fact, in this very trip I am literally doing a round the world ticket. From here I'm heading to look at a project in Malaysia that has found a cost-competitive way to build their energy resources with local resources, using geothermal, using waste biomass, using solar, using mini hydro. And then I'll be travelling to South Africa for a meeting of African energy ministers, which is a meeting designed to pull together those announcements that countries will be making in the Durban Climate Conference in December 0 the big COP 17 meeting.

And what we're seeing there is that, as a World Bank representative, I'm being approached all the time with really innovative opportunities where there's a piece missing. There's not quite enough policy expertise. There's a need to find ways to get more innovation in the private sector. There's a need to try to work with and educate the regulators in often some very newly formed offices of clean, sustainable energy. And they don't all need the same thing, but they consistently need a piece of the pie. And so the World Bank has been working to build those capacities, so that it can really be that resource for all nations to find what local mix works, but drawing from a kind of a global body of knowledge.

GP: Is it possible to say whether the big drive now is happening in developed countries or developing countries?

DK: It's a pretty even mix. It's a great question, because most of the energy capacity that will be installed in the next few decades is going to be in developing nations. It's more than 80 per cent, so it's really a huge push and China, India, Brazil, Indonesia, Argentina are really big players in that mix. At the same time the R&D... capacity in most of those countries is still evolving, and so the need to find new technologies really requires more of a balance back and forth between developed and industrialising nations. And that actually works, I would say, in our favour as an opportunity for collaboration and cooperation, as opposed to, you know, do you have to pick and choose? This is really where everyone needs each other. And since the clock is very much ticking on, getting this clean energy portfolio large on a global scale, I'm actually quite thankful that the need to collaborate is recognised. We're having, of course, lots of problems at the political level in getting countries and regions to step forward, but in terms of the recognised benefit to do this, that's a good start.

GP: What about some of the impediments then? In your presentation you talk about networks and the way things are structured and the way the rewards are given to people who distribute, or who sell, or even to those who generate energy. Can you discuss those impediments and how do we get out around those things?

DK: Right. Well, the impediments are severe and, actually, they're pretty evenly distributed between all countries, developing and industrialised, right now. Where utilities that are used to a way of doing business, that are not used to thinking about a value for sustainability – whether it's through a price on carbon, through a cap and trade, or simply through a loading order that requires companies to examine clean energy options first – all of those features are big impediments right now, because very few utilities anywhere have the expertise. So right off, that's one of the features. The other one is that the total global estimate for the amount of money going into the clean energy space is about a \$150-\$190 billion. The global subsidy for fossil fuels today is in the order of \$400 billion a year. And so, even if one could just highlight, identify, and try to reduce some of the existing subsidies for the fossil industry, let alone anything about bringing them up for the clean part, renewables are at a huge disadvantage, just in terms of those built in subsidies.

So, a number of groups at the World Bank, at the International Energy Agency, a number of developing governments have been working with us to identify those subsidies and to recognise

the ways in which those subsidies actually work against a critical part of the World Bank's agenda, which is poverty alleviation and access to power. Subsidies tend to work much better for those already-well-off consumers of energy and they work against access for the poor. And so, we're finding a real synergy between bringing down those barriers and building a system that will lead to less energy poverty and hence less poverty overall.

GP: Ok. You worked on the Californian emissions trading scheme which is, I guess, along with Australia, one of the few outside the EU. What can you tell us about what's happening in California and why it's not been reciprocated or not been followed around the rest of the United States?

DK: Well, it's a mixed story. I mean there's already an emissions trading market in place in the New England and mid Atlantic states. California is actually only going to start in January 2012. But the benefit of the California plan is that it explicitly touches all sectors of the economy. It's not just about an emissions trading scheme for power plants. It also involves vehicles. And it also involves the carbon associated with the goods we buy. And that holistic look at the market is one of the key features in driving innovation. If the carbon market is very limited, say it only applies to a certain type of power plant, what you typically get is a search for lower-carbon fuels, and that's okay, but we're trying to drive innovation. And the California market is one that has taken that on.

So, I'm very optimistic actually that, as the California market launches, I think it's going to uncover innovation; it is going to be seen as a driver of a Silicon Valley of clean energy. And I am seeing similar programs elsewhere that are unrelated to California. And China is launching a four-province cap-and-trade experiment. I think they are going to find similar features. We are seeing efforts, already, to launch subsidy programs for innovators. So giving to people who do R&D and cleantech benefits a number of countries, and that's not unique to the California plan, but it's one of the hallmarks.

And so, I think we are... if we can keep momentum going, which has been very hard politically recently, I think that we will be able to demonstrate that in fact low carbon means more growth. But this is the sort of thing they require to sustain policies; and what we've seen in the last few years is that, politically, that's been very hard in countries around the world.

GP: Ok. And just to finish on a touch of controversy, I suppose, the World Bank was criticised the large coal-fired power plant that was built in South Africa. Was that criticism valid? And will the World Bank continue to fund those sorts of projects?

DK: So, tricky question. The Medupi investment, a \$4 billion coal-fired power plant project in South Africa, was pushed for, and justified, because South Africa had not built baseload coal capacity in 20 years and has a very large unserved population. There are health effects. There are other issues that are associated with coal that are a real challenge. The Bank saw it as a needed investment in a country with a great deal of coal where it could come in as low cost. And to sweeten that package, in terms of the overall focus of the utility Eskom, a program to invest to develop an in-house capacity on solar thermal and wind was part of that package.

So, people look at that investment in different ways. We will see over the coming years: was this a point that we look back on and say, Eskom, a very large utility, really did shift its direction and they needed that baseload power, but they were able to evolve in new ways; or was this a case of being interested in renewables, but really all about the coal? We don't know the answer yet, but it exists as a project right now that, if it ushers in more coal when other options are there, we're not going to be able to look at it as very successful. But if, in fact, it marked a turning point in getting other large utilities with really expert technical capacity to think about new technologies, then it will look positive in the flow of history. I don't know yet.

GP: But I guess those are the issues and questions that lots of different countries will be asking themselves, won't it?

DK: I think that's right, and that's why, from my perspective – I was not at the World Bank when the South Africa loan went through – from my perspective the story for efficiency renewables is compelling not just on environmental grounds, but it's compelling on job creation and energy security grounds. My office's mission is to demonstrate those effects and to be a resource for countries, companies and communities that want to do that. And I myself look for strategies that allow us to get to that low-carbon world we want to get to. Individual projects along the way need to lead to that. And I think that's the million-dollar question. We don't know which path we're on yet.

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