

RENEWABLE ENERGY DEBATE CONTINUES

Costs down, demand up; but coal still an attractive option to some

A global debate on renewables bubbles to the surface this quarter. The IEA forecasts considerable expansion but is unsure where some of the funding will come from. Meanwhile, the World Bank has offered up energy financing for Africa with a caveat: it all needs to come from renewables. Positive benefits of lower cost of capital of renewables (the most obvious being lower emissions) may be outweighed by falling carbon prices in EU, resulting in greater demand for coal.

The “cost down curve” of renewable energy projects may be a primary driver of the reduction of fossil fuel demand and production. According to the Carbon Tracker Initiative report: [Carbon Supply Cost Curves: Evaluating Financial Risk to Coal Capital Expenditures](#), renewables are getting cheaper every day. “The pace of growth in installed renewables capacity has outperformed most predictions since 2000. Average photovoltaic module prices have fallen by nearly 75% in the past three years.” Bloomberg New Energy Finance projects costs continuing to fall out to 2030. According to their research, wind and solar are already price-competitive with fossil fuels in some markets, such as the US and Australia. Renewable energy may get as much as

two-thirds of the \$7.7 trillion investment forecasted for building new power plants by 2030 as declining costs make it more competitive with fossil fuels, Bloomberg reports. ([Sustainable Insights: Edition 49](#))

COST OF CAPITAL

This prediction is reflected across several recent projects. For example, the cost of capital of a solar-power plant has [fallen by 22 percent since 2010](#). Recently, however, economists have been taking into account “levelized costs” in order to calculate the true costs, including the capital and operating costs over the lifecycle of the project. For example, since wind power is not generated on a calm day, nor solar power at night, conventional power always needs to be available. This is not typically included in the cost of renewables. ([Sustainable Insights: Edition 52](#))

Demand for renewables is up, at least in Europe. The UK has announced that renewable-power projects will compete for ‘contracts-for-difference’ which the government hopes will spur low-carbon electricity generation. This comes at a time when a recent poll of UK voters across all parties finds almost half of respondents say investing in green energy is a ‘top priority’. Support for renewables was more than three times greater than nuclear energy, the next most popular option. ([Sustainable Insights: Edition 52](#)). There has been a similar sentiment in Germany. According to researcher [Agora](#), clean-energy sources met 27.7 percent of Germany’s demand in 2014, for the first time exceeding the 26.3 percent share held by lignite coal. ([Sustainable Insights: Edition 62](#))

Several recent analyses forecast considerable expansion in the renewables market. The International Energy Agency (IEA) released two new reports in September: [Technology Roadmap:](#)



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[Solar Photovoltaic Energy](#) and [Technology Roadmap: Solar Thermal Electricity](#). Both highlight “expected technology improvement targets” and the policies needed to reach “priority actions and milestones”. The main takeaway is that the cost of renewables will fall so dramatically in the next 10-15 years that it will not be economically viable to rely on fossil fuels. “The take-off is around 2025 to 2030,” the agency said. “By then the cost of solar will be \$100 per megawatt hour (MWh) and will compete with fuels facing carbon prices of \$50 a tonne.” ([Sustainable Insights: Edition 62](#))

RENEWABLE PROJECT FUNDING

But it’s not always easy to secure the funding necessary for renewable energy projects. The IEA predicted a USD 20 billion drop in yearly new clean energy funding by the decade’s end, bringing it down to USD 230 billion. In its first investment outlook, the agency’s 2014 medium-term forecast for renewable electricity generation predicts “annual 5.4% growth rates to total 7,310 terrawatt-hours (TWh) by 2020 – a 0.6% drop on last year’s forecast. The new 2018 estimation is for only total 5,505 TWh, compared to last year’s 6,850 TWh.” ([Sustainable Insights: Edition 57](#))

However, the World Bank is stepping up its commitment to finance renewables. It pledged USD 5 billion to Africa for electricity generation, but with strings attached: the money cannot be used to finance coal projects. Instead, it must be used for wind, geothermal, gas and hydro power. Phil Hay, the World Bank spokesman for Africa said in a statement, “This includes

“*The money does not include any financing for coal... Instead it will help to provide affordable, reliable, and sustainable energy to Africans, On the power generation side, we will finance a mix of technologies including wind, geothermal, gas, and hydropower.*”

-Phil Hay, World Bank Spokesman for Africa

investments in rural energy access, as well as in generation, transmission and distribution for on-grid access. On the power generation side, we will finance a mix of technologies including wind, geothermal, gas, and hydropower.”

But there appear some unintentional consequences from renewable growth. The growth of the sector can be linked to carbon pricing as well as falling EU carbon prices, incidentally making coal and gas more attractive. Pakistan has long depended on gas supplies to power its economy. Prime Minister Nawaz Sharif announced that the country will move towards coal to achieve several goals: end dependence on gas (whose supplies are decreasing), curb subsidies, and comply with conditions set by the International Monetary Fund (IMF). “The IMF is this continuous force that is pushing Pakistan toward energy reform,” said Muzzammil Aslam, managing director at Emerging Economics Research. “It gave the push and urgency needed for the government to solve the crisis.” ([Sustainable Insights: Edition 54](#))

RESISTANCE TO ANTIBIOTICS POSES GLOBAL THREAT; ALSO MANY CHOOSING NOT TO GET CHILDREN IMMUNIZED

Concerns around antibiotics are increasing as disease-causing microbes evolve to become resistant to drugs. Antimicrobial resistance threatens the effective treatment of infections caused by bacteria and viruses. Globally, there have been hundreds of thousands of new cases of multi-drug resistant diseases. Some have likened this issue to climate change. The scale of the challenge is immense and both require cooperation between nations. Ramanan Laxminarayan, director of the Center for Disease Dynamics, Economics & Policy noted that “Antibiotics are a natural resource, just like fossil fuels. As we run out, finding new ones will be hard and expensive. Penicillin costs pennies. Newer antibiotics may cost hundreds or even thousands of dollars.”

It is an issue of science and public health, but also of economics and national security. Professor Sally Davies, Britain’s chief medical officer, urged governments to raise this issue at the next G8 summit. ([Sustainable Insights: Edition 50](#))

Following the largest Ebola virus outbreak in West Africa, there has been a heightened interest in experimental drugs used to treat the disease. ZMapp, which is “a mixture of three varieties of humanized monoclonal antibodies—which bind, in vivo, to proteins on the surface of the Ebola virus” is derived from a genetically modified tobacco plant. An early study of ZMapp in monkeys was reported in the journal Nature. The findings appear encouraging. All 18 monkeys treated with the drug recovered. ([Sustainable Insights: Edition 58](#))

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There appears to be an inherent conflict of immunization: first, too many antibiotics, now too few vaccinations. Now it appears the spread of infectious diseases is also increasing due in part because fewer children are being vaccinated. An opinion piece in the Wall Street Journal examined the increase of vaccine-prevented diseases in part because of low vaccination rates. In the piece, author Dr. Paul Offit criticizes parents who chose not to have their kids vaccinated. And the number of them is increasing. “A 2006 study in the Journal of the American Medical Association showed that between 1991 and 2004, the percentage of children whose parents had chosen to opt out of vaccines increased by 6% a year, resulting in a more than twofold increase.” ([Sustainable Insights: Edition 61](#))

OVERSUPPLY SLASHES COMMODITY PRICES, BUT NATURAL RESOURCE TRENDS MAY THREATEN AGRICULTURE IN THE LONG TERM

Global resource trends are increasingly putting pressure on agriculture. Some agricultural products are under scrutiny as health and environmental risks come to the forefront. Big data is helping with solutions.

Here's a term you may not be familiar with: "Peak Soil". Increasingly, soil degradation is threatening to increase food prices and intensify the demand for deforestation. A 'business as usual' scenario indicates that by 2050 current soils will yield 30 percent less agricultural production. Although in the short term food prices have fallen, the UN Food and Agriculture Organization (FAO) has estimated that 25 percent of agricultural land is highly degraded, while a further 8 percent is moderately degraded. Increased food consumption has contributed to more intensive production, overgrazing and deforestation, all of which can "strip soil of vital nutrients and beneficial micro-organisms, reduce its ability to hold water and make it more vulnerable to erosion". There is still a lot of research underway to fully understand the risks. "We know far more about the amount of oil there is globally and how long those stocks will last than we know about how much soil there is," said John Crawford, Director of the Sustainable Systems Program in Rothamsted Research in England. ([Sustainable Insights: Edition 51](#))

However, it is not all grim. 'Big data' may offer solutions. The Obama Administration is urging the agriculture sector to focus on food resilience as part of [Climate Data Initiative](#). America is faced with food scarcity and systemic food waste challenges. Encouraged by the Obama Administration's Climate Data Initiative, dozens of private sector companies are developing powerful applications and information resources "enabled by the convergence of sensors, sophisticated imagery and powerful analytics" or big data.



The Obama Administration issued a challenge to America's agriculture sector and its private-sector innovators. The Administration is renewing the President's call to "leverage open government data and other resources to build tools that will make the U.S. and global food systems more resilient against the impacts of climate change." ([Sustainable Insights: Edition 58](#)). In addition, scientists are using mathematical models to speed up the process of identifying genetic traits that could help crops become more resilient to climate change. ([Sustainable Insights: Edition 56](#))

RESPONSE

How are Americans responding to the increased attention on agriculture, especially controversial issues such as meat and sugar? In some areas, meat is coming under intense scrutiny as a livestock production is shown to be a primary contributor to global climate change. The Environmental Protection Agency estimates that U.S. agriculture, including livestock production, accounts for only about 8% of total greenhouse-gas emissions in the country. However, some note that future improvements in feed and animal genetics could reduce animal-agriculture's impact.

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SUSTAINABLE TRENDS



EDITION 5 | QUARTER 3 2014

There is evidence that Americans may be turning against another staple of the American diet: sugar. Given new information on the economic, environmental, societal, and health impacts, including obesity, sugar's reputation has taken a recent beating. Are we becoming anti sugar? ([Sustainable Insights: Edition 56](#))
And a discussion about consumer perception of food is not

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complete without the vexed topic of genetically modified organisms (GMOs). There have been a few recent wins for GMO supporters. A new law on the Hawaiian island of Kauai that would have required large agricultural companies to disclose pesticide use and GMO crop plantings has been overturned. The ruling reveals that state regulations override local regulations on GMO and therefore these local requirements are invalid. It would have mandated the establishment of buffer zones around schools, homes and hospitals to protect people from exposure to pesticides used on the crops. ([Sustainable Insights: Edition 57](#))

Meanwhile mainstream American media outlets, such as the New York Times and the Boston Globe, have recently published articles arguing that GMO products are not more risky to consumers. ([Sustainable Insights: Edition 57](#))

OCEANS GIVE US CLUES TO CLIMATE CHANGE; WE'RE ALSO SEEING AN INCREASE IN EFFORT TO PROTECT THEM

CLIMATE CHANGE CLUES

The link between oceans and climate change is getting more and more coverage. A recent study found that ocean life may be more resilient to climate change than previously thought. One type of microscopic algae can still thrive in warmer ocean temperatures and higher acid levels.

Over 3,000 robotic floats measure ocean temperature and conditions. Robot prototypes are scanning the ocean to record temperatures and other conditions at different depths in order to give scientists more insight into the changing climate. Although the rate of warming of the earth's surface has slowed over recent years, scientists are urging people not to mistake this with a decline in the rate of global warming. In fact, most of the heat trapped by greenhouse gases in the atmosphere is being absorbed by the ocean. The hope is that these devices can begin to document this occurrence in detail. ([Sustainable Insights: Edition 55](#))

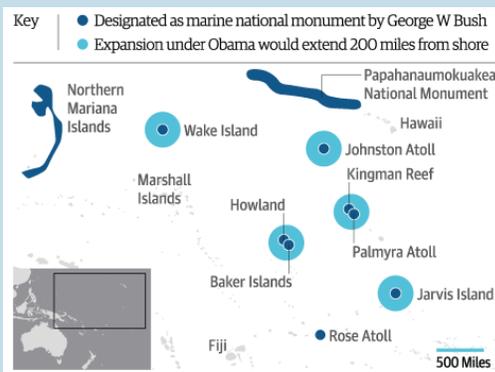
CONSERVATION AND FINANCING EFFORTS

Meanwhile, the Sustainable Seafood Coalition has published two new codes of conduct outlining their policies guiding environmental labeling and sourcing. ([Sustainable Insights: Edition 60](#)). In addition, The EU Commissioner for Maritime Affairs & Fisheries supports new 'blue bonds' to attract capital to finance sustainable fisheries. ([Sustainable Insights: Edition 50](#))

“The Pacific Ocean, in particular, oscillates in ways that can strongly influence the temperature of the atmosphere.”

-New York Times, August 11, 2014

President Barack Obama is designating the Pacific Remote Islands Marine National Monument—a vast area of the Pacific Ocean—as the largest marine preserve in the world. It will cover 490,000 square miles (that's roughly three times the size of California) and make the waters off-limits to drilling and most fishing. ([Sustainable Insights: Edition 61](#))



Source: The Guardian

DEMAND FOR GREEN FINANCIAL PRODUCTS UP ISLAMIC FINANCIAL SECTOR INTERESTED IN GREEN BONDS, RENEWABLE ENERGY

There have been promising developments in the sustainable sphere. The demand for green bonds is on the rise and interestingly, the Islamic finance sector is particularly interested in green investment vehicles. International development banks have also responded by ramping up climate finance.

If 2014 has taught us anything, it is that the investor appetite for sustainable investment products is soaring. The first half of 2014 saw nearly twice as many green bonds issued than in all of 2013. The green bond market has grown rapidly in 2014, with many bonds being two or three times oversubscribed. Green bonds, which to date are all investment grade, are defined as financial instruments which link the proceeds from the bond issue to environmental projects or investments. For example, an issuer may use the money raised to finance a renewable energy project or an efficient manufacturing plant. This year there has been an increase in green bond issues by companies. Unilever, for example, issued a green bond in March which will help

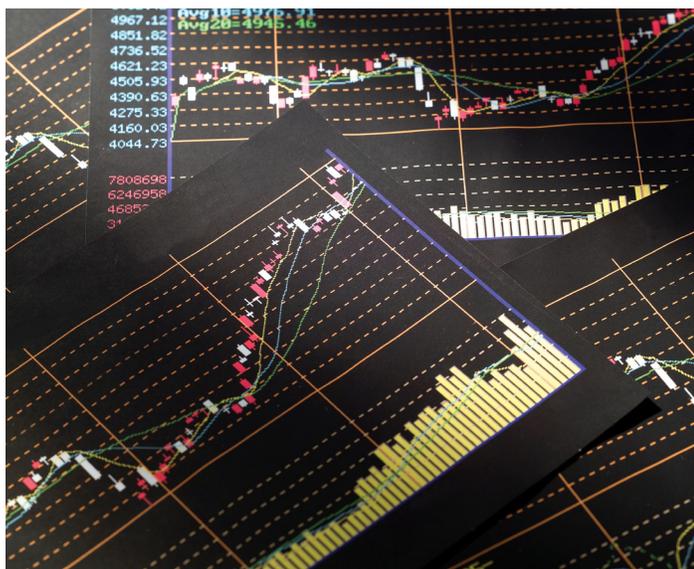
finance its Sustainable Living Plan based on a set of Green Bond Principles. This is in contrast to 2013, when most green bonds were issued by international agencies, such as the World Bank. Although the cumulative value of the green bond market (USD 50bn) is a fraction of the size of the total bond market (USD 80tr), the market is growing rapidly, with over USD 20bn worth of green bonds issued in the first half of 2014 alone. The EU Commissioner for Maritime Affairs & Fisheries supports new 'blue bonds' to attract capital to finance sustainable fisheries. ([Sustainable Insights: Edition 50](#))

The District of Columbia Water and Sewer Authority issued a USD 300m green bond with a 100-year maturity period. Goldman Sachs and Barclays prepared the deal. The proceeds will contribute to a drainage system called the DC Clean Rivers Project. ([Sustainable Insights: Edition 50](#))

Around the same time, MSCI and Barclays announced that they will offer a new Green Bond Index to fund projects with environmental benefits. The MSCI ESG Research team will offer objective evaluation of Green Bond securities to determine if they meet Green Bond classification. Meanwhile, MSCI also announced in July that it will buy GMI Ratings for \$15m, further consolidating the ESG data industry. ([Sustainable Insights: Edition 49](#))

ISLAMIC FINANCE SECTOR

Interestingly, green bonds, renewable energy, and sustainable agriculture are emerging as key interests of the Islamic finance sector. Several Islamic financial bodies have issued guidelines for investing in socially responsible Islamic bonds (sukuk) to raise money for projects ranging from sustainable agriculture to renewable energy. The World Bank, for instance, hopes to raise USD 500 million in Islamic bonds to help fund immunization



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SUSTAINABLE TRENDS



EDITION 5 | QUARTER 3 2014

programs. Although Islamic finance follows investment guidelines based on religious principles, such as forbidding involvement in tobacco and alcohol, the mandate is now extending more broadly to socially responsible investing. In April the Dubai Supreme Council of Energy and the World Bank agreed to develop funding for the emirate's green investment program, including "green" Islamic bonds. ([Sustainable Insights: Edition 58](#))

The third quarter also saw several major development banks launch green bond programs. The French development bank, Agence Française de Développement issued a €1 billion, 10-year bond verified by ESG ratings provider, Vigeo. Underwriters include Bank of America Merrill Lynch and Credit Agricole CIB. Furthermore, World Bank's International Finance Corporation (IFC) has launched a new program that allows individual investors to buy triple-A rated IFC "green" bonds. These bonds—called IFC Impact Notes—will finance renewable energy and energy efficiency investments in developing countries. ([Sustainable Insights: Edition 60](#))

UK'S FIRST CLIMATE BOND

Meanwhile, a UK solar farm also issued Europe's first certified climate bonds. The "Big60Million" Solar Bonds were developed to finance Willersey Solar Farm in the Cotswolds. The bonds allow UK residents to invest in the solar farm and receive fixed 7 percent annual returns for five years. The bonds are certified under the Climate Bond Standards and Certification Scheme. The bonds proved popular. "Over £3.4m of the £60 bonds have been purchased and reserved since they went on sale at the end of July with an average of £9,000 per investor." ([Sustainable Insights: Edition 60](#))

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