

Where energy is waiting to be tapped

The intermittent nature of solar and wind power has triggered exploration of unusual sources of electricity

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Viewed against the backdrop of the energy history of the country, the main-streaming of wind and solar has been rather sudden. Just three years ago, few would have thought of them as meaningful sources of energy. Today, they account for 7% of the country's electricity production – small still, but firmly set to grow, by at least ten percentage points in the next five years.

Coal, on the other hand, while still being the dominant player, is on the back foot. Apart from being a source of pollution and global warming, it is also a water guzzler – in ten years, India's coal-fired power plants will need 12,000 million litres each day, thrice as much as Mumbai consumes daily now. With these issues, there is little reason to believe in the fuel's resurgence as a dominant force.

There is a lot more juice left in wind and solar than has been squeezed out today. Newer materials such as perovskites that can replace silicon are showing up, giving solar panels more bang for the buck; the cost of offshore wind is falling dramatically so as to open up literally new areas – the seas.

But solar is a daytime source, wind is seasonal, and both are on-off energy generators. Even with the advances in storage technology, these two sources cannot replace coal completely. It is unlikely that they have enough power to replace coal. If they can't, what can?

The search for clean energy has not stopped with wind and solar. A phalanx of sources is waiting to be tapped into. Some – like Helium 3 from the moon – are on the very edge of science. But there are others that are not so far away. Swing the searchlight around, you see three that are more promising than the rest.

Hydrogen
The gas' time is truly beginning now, even if only for the reason that goes hand-in-hand with renewables. Electricity from wind and solar can be used to produce hydrogen, which can be stored. Also, hydrogen can be a good grid stabiliser – it can



From the deep blue sea: An 'always-on' source of power, tidal turbines, as above, are turned by ocean currents and power is exported onshore. U.K.-based Atlantis Resources claims to have 1,000 MW of such projects underway. **• GE RENEWABLE ENERGY**

be used to fill gaps in the flow of power from wind and solar. "In a few years, hydrogen will compete with batteries," says Dr. R.K. Malhotra, President, Hydrogen Association of India told *The Hindu*. Japan is ahead in hydrogen use, but more for automotive applications, with around 90 hydrogen filling stations to serve fuel cell powered cars made by Toyota.

"It is a lot easier to use in stationary engines for power generation than in combustion engines," said Dr. Malhotra.

But fuel cells are a lot more efficient, easier and cleaner way than burning it in combustion engines. Fuel cells are devices that split the hydrogen atoms into protons and electrons and get the electrons to flow through a circuit – flow of electrons is electricity. Smaller fuel cells can be used in vehicles and in applications such as powering telecom towers – a Bengaluru-based company

called Intelligent Energy is selling such products. Larger fuel cells, or stacks of them, can be used for electricity for the grid.

Hydrogen is not far off. French company, Alstom, has just come up with a fuel cell-powered passenger train, Coradia iLint. The rise of hydrogen is impeded only by the cost of the gas, but experts such as Dr. Malhotra expect the cost to decline when demand, and production, increase.

Ocean energy
There are three subsets of this 24x7 energy source – waves (including up-down bob of the water surface), tides and underwater currents. A few commercial scale projects have come up, but there are dozens of pilots.

There are many tricks to steal energy from the oceans. For instance, the Swansea Bay project, U.K., is to build a U-shaped wall – or, breakwater – on the coast

where there is a tide, with the mouth open to the sea and place an array of turbines along the mouth. Water comes in when the tide flows and goes out when it ebbs – it turns the turbines both times.

Hydrogen can help fill gaps in the flow of wind and solar power
DR. R.K. MALHOTRA
President, Hydrogen Association of India

Another U.K. company, AIM-listed Atlantis Resources, places 'underwater windmills' on the sea bed – the turbines are turned by the flow of currents. The company claims to have 1,000 MW of projects underway, including its marquee 400 MW MeyGen project in Scotland and another 150 MW one in Indonesia. Atlantis Resources is no stranger to India – Gujarat State Power Corporation has an agreement with it to build

a 250 MW tidal energy project. Tidal energy is not distant – companies like Alstom and GE have announced manufacture of the turbines.

The bobbing movement of the waters is another source of energy. Of the many companies that have tried to tap it, Wave Star Energy, (whose principal shareholders are the Clausen brothers, the owners of the Danish company Danfoss) seems closest to commercialisation. The technology is basically to let buoys to move up and down, compressing air or pumping water which could then turn the turbines.

Cold fusion
Once dismissed as snake oil solution, energy from fusion of sub-atomic particles at near room temperatures has received a pep ever since an Italian engineer called Andrea Rossi came up in 2011 with a device that he claimed produces more energy than it consumes. His 'E-Cat' has since been at the heart of a

huge technical and commercial controversy and the subject of a courtroom battle with an American company called Industrial Heat. The book 'An Impossible Invention' by Mats Lewan, is on the E-Cat.

Observers are divided into people who admire Mr. Rossi and those who think he is a fraud. But his E-Cat, which is a small box with a pinch of nickel, hydrogen and lithium, has rejuvenated the cold fusion talk.

While Mr. Rossi has kept the workings of his machine secret, a group of scientists were able to replicate it in a now-famous experiment carried out in 2014 in Lugano, Switzerland, and found it working, though they said they did not know how. Later, a respected Russian scientist, Alexander Parkhimov, repeated the experiment and reported success.

Alongside, a few companies in the U.S. have long been labouring over different forms of cold fusion.

Leading among them are Brillouin Energy and Brilliant Light Power. Their method is to tinker with atoms to release energy. Brillouin's is to fuse two hydrogen atoms into a helium atom, while Brilliant works on nudging the electron in the hydrogen atom closer to the proton – both process release energy.

Cold fusion, as low energy nuclear reaction is commonly called, is not yet established science, but there is too much happening for it to be unreal. Recently, the Anthropocene Institute brought out a list of 100 entities, half of them commercial R&D that have raised \$250 million.

In India, Dr. Mahadeva Srinivasan, a former BARC scientist, has made it his life mission to get Indian nuclear establishment interested in 'low energy nuclear reactions', to no avail. However, Dr. Srinivasan said he believed that LENR is a source of very cheap, clean energy and India should seize it.

Commercial hydrogen, ocean energy and LENR could be a decade away, but they are all happening technologies that have the potential to replace coal. Extremely cheap, clean power is no longer unthinkable.

GUEST COLUMN

Time for a digital Indian Rupee

Financial inclusion is an attainable goal

AJEYA SINGH

With a vision to place India on the digital India landscape, the country is beginning to understand transformative agenda like demonetisation by the government. Digital transactions have soared with Net banking, credit cards, digital wallets, payment gateways, Aadhaar pay, PPI, UPI, payments bank and BHIM since demonetisation.

These are radical initiatives that used technology to ensure wider acceptance. But such formats come with their own limitations and security concerns. In India, where more than 95% transactions are cash-driven, the rural and semi-urban populations have not had complete inclusion in this financial methodology. Hence, it is imperative to introduce digital fiat currency as part of the remonetisation of the economy for monetary sovereignty and policy effectiveness.

The digital fiat currency, which we have proposed to the government, works in the same way as do notes and coins. By virtue of its digital nature, it has the potential to be the most financially inclusive instrument.

Any person in India can hold it, transfer it and use it to settle debts, be it a farmer living in Gahmar village in U.P. or a salaried individual in Mumbai, with or without a bank account.

Anonymous users

The validity of paper notes and coins is independent of the holder. The two persons transacting do not need to know each other's names nor an ID because the trust is built into the payment instrument. The transaction is final as soon as cash changes hands. There is no need for subsequent settlement between banks.

It is our proposal that the government issue a digital fiat currency, titled digital India Rupee, which would bear the same characteristics as does the cash Rupee. It would be legal tender and accepted throughout India. It would be backed by the

Government. The amount of digital India Rupee in circulation would be controlled as are notes and coins today in circulation. It would be used by and exchanged between any digital payment schemes and would have full interoperability. It would have two additional advantages over paper notes and coins. It would transcend time and space, i.e. it could be transacted remotely between two parties. And, it would be counterfeit-proof! First, the advanced technology would prevent any fraud. Also, any counterfeit with a single rupee could be detected immediately without hurting circulation.

The digital currency would bring more innovation, competition, better consumer protection, more consumer choices, more open access and better regulatory transparency. It would create a 'firewall' between banking and digital payment systems, protecting bank accounts and information on digital systems.

The digital India Rupee would bear the same features that cash now does

Since digital India Rupee would be a centrally-issued sovereign currency, it would possess immense trust, security and control. It would also bring transparency on black money, tax evasion and other illicit activities under the legal framework. Also, with the negligible logistics costs and benefits of riding on existing infrastructure, the cost of digital India Rupee would be marginal.

India's cash-to-GDP ratio is 12.04%. The transition from physical notes and coins to a digital currency could drastically bring this down at par with the rest of the world. Other countries have explored this for their national digital vision. Even Sweden, that sees low cash usage, is debating issuance of a digital currency and is eyeing a decision on its 'ekrona' in the next two years.

(The writer is the former head of Credit Suisse India and Lehman Brothers India)

EXPLAINER

FATCA: Deadline, procedure and details



SANJAY VIJAYAKUMAR
CHENNAI

Your bank account and other financial transactions like mutual funds need to be compliant with The Foreign Account Tax Compliance Act (FATCA). Non-compliance would lead to blocking of accounts.

What is FATCA?

■ The Foreign Account Tax Compliance Act (FATCA) is a United States federal law that requires United States persons, including U.S. citizens who live outside the United States, to report their financial accounts held outside of the U.S., and requires foreign financial institutions to report to the Internal Revenue Service (IRS) about their U.S. clients.

Why is FATCA compliance necessary in India?

■ India had signed an agreement with the U.S. on July 9, 2015 which enables automatic exchange of financial information between India and the U.S. The agreement provides that Indian Financial Institutions will provide the necessary information to the Indian tax authority i.e. Central Board of Direct Taxes (CBDT), which information will then be transmitted to the U.S. automatically in the

case of FATCA. The agreement came into effect on August 31, 2015.

Which financial transactions need FATCA compliance?

■ The compliance is needed for bank accounts, mutual fund, national pension scheme and other such transactions. The compliance is needed to be done for all individual and entity accounts opened from July 1, 2014 to August 31, 2015.

What do you need to submit to be FATCA compliant and how can it be done?

■ Individuals and entities need to provide details of their country of birth, country of citizenship, country of residence for tax purposes, among others, to the respective financial institutions. The self certification can be done online for bank accounts and mutual funds. The Pension Fund Regulatory and Development Authority has said it would come out with revised guidelines on FATCA shortly.

What will happen if I am not FATCA compliant?

■ In a press statement issued on April 11, 2017, the Finance Ministry said the process should be completed by April 30, 2017; otherwise the transactions would be blocked in the accounts for the said period. However, experts point out that on ground, the accounts have not been blocked; even if they have been, one can still provide self certification and unblock the accounts.

INTERVIEW| VISHWAVIR AHUJA

‘We didn’t want to compete with big banks’

The strategy is to focus on financial inclusion, development banking and technology, says the MD & CEO of RBL Bank

MANOJIT SAHA
MUMBAI
RBL Bank, which came out with an IPO in 2016, has seen healthy investor interest making the lender one of the 10 most-valuable banks in terms of market capitalisation. **Vishwavir Ahuja**, managing director & CEO of the bank shared the bank's Vision 2020 in an interview. Excerpts:

The bank has been recording high business growth, much above the industry. Two years ago, the Reserve Bank of India had raised some concerns over the high growth. Is the regulator comfortable now with the business strategy of the bank?

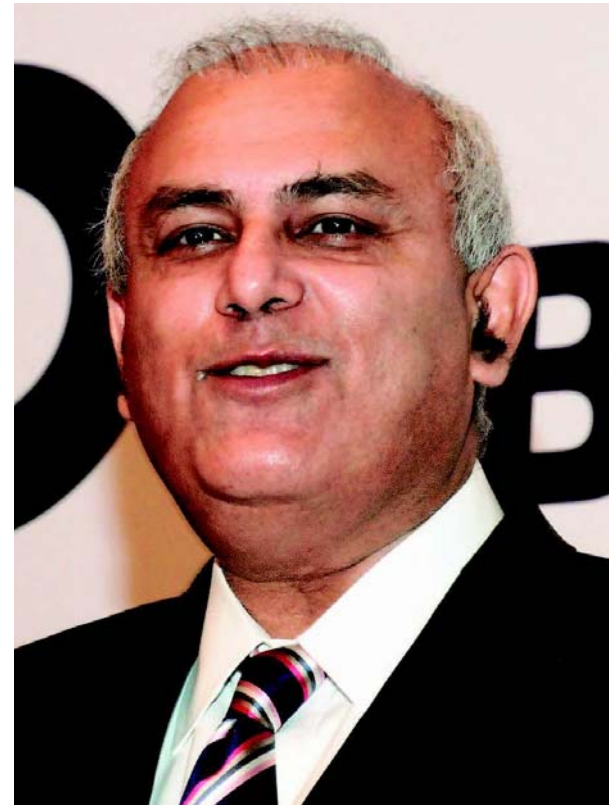
■ Yes, but not any more. The IPO has changed a lot of that things. The overall comfort level of the regulator with us became much better following the IPO. We are extremely well capitalised now.

The IPO happened last year. Investors seems happy as the stock performance indicates...

■ Right now, version 3 of the bank is in place, where we say we have to take each business to a threshold of scale, operating profitability, and efficiency. So we have put in place the vision 2020.

Part of the reason the markets are giving us high marks is that we stated our vision statement in numbers and in concrete terms and we outlined our strategy and we are executing well. So, investors have clarity.

And, in this tough credit environment, where amid slow economic growth there



The NPA number went up last quarter due to one account. If you take that one name out, our NPA numbers have actually improved on a sequential basis.

are huge problems of balance sheet impairment, we are not impacted adversely. It's not that we are immune, it's not that we are not impacted at all, but we have run the shop in a manner where the impact was minimal.

What are the main objectives of version 1 and 2?

■ IPO was a major milestone and turning point for the bank. Much of the time

prior to that was about transitioning from a very old-age, under-invested, small bank.

The task in the first phase (the first three years from 2010) was to modernise the bank, bring in technology, skills, controls, systems etc. The second phase was about building the strategic positioning. The second phase was to get it ready, putting the building blocks in place, in terms of long-term sustainability.

The thinking was that we should not go for IPO till the second phase [was over]. IPO was the first step of the third phase. The strategy was to build a universal bank and not a niche bank.

How do you differentiate your strategy from other tech-savvy private sector banks?

■ There are two things we have done differently. One is financial inclusion and development banking, which many banks were not doing. This is basically micro lending and micro banking which includes micro insurance and self-help group lending which we started in 2011.

This is something micro finance institutions were doing but not the banks – the historical legacy banks – they were not committed to this space. I would say we have a small finance bank sitting inside our bank.

The other area where we differentiated was in technology. This, again, we started in the hinterland of India with doorstep banking to deliver micro services. We have created 70,000 customer service points where lending does not happen but services happen, mainly remittances. So, this is a payments bank model.

These two we did before the differentiated bank licence regime started. So our strategy was to not compete head-on with the bigger banks.

Do you see the corporate-retail lending mix changing in the next few years?

■ In the fourth quarter the mix was 55% corporate and

45% retail while for the year as a whole it was 60:40. By 2020, we want to make it 50:50. Retail is growing faster now.

But, RBL Bank still has a long way to go in improving visibility and acceptability...

■ Surely, we are conscious [of it]. But we are seeing much better visibility compared to the past. This is one of the very positive impacts of our IPO. Post IPO, the branding and visibility of the bank have got a major boost.

We had 14 lakhs retail applications for the retail IPO. Of that 30-40% have become customers of the bank.

There is direct relationship between the number of branches and current and savings account (Casa) deposits. Our Casa ratio is 22% while branches are only 250. When I have a 1,000 branches our Casa ratio will be definitely above 30%.

So, you plan to open more branches...

■ We are very clear that we will open as many branches as we can self fund. I will not invest and say, 'I will bear the loss for two years'. I am not saying this is unimportant, it is still important in the big game. We will take it to 1,000 branches, gradually.

By 2020?

■ No, not even then. May be 500-600 by 2020. 1,000 is the ultimate threshold.

The bank's gross NPA went up in the fourth quarter? Do you see asset quality worsening further?

■ This is an area of extreme focus and attention for us. The NPA number went up last quarter due to one account, [because of] which other banks are also impacted. If you take that one name out, our NPA numbers have actually improved on a sequential basis. Our gross NPA ratio is now at 1.2%, and I am not worried about the number. Asset quality is improving for the large-corporate and mid-corporate segments. I expect gross NPAs to remain in the range of 1.2-1.3%. There is stress in some pockets of the microfinance portfolio. There too our numbers are better than the industry average.

You had some plans to raise capital? How much do you want to raise and by when?

■ Yes, we need capital for our growth needs. I still have 13.7% capital adequacy ratio but I am raising more capital. We haven't frozen the numbers but it would be ₹1,000 crore plus. It could be by way of QIP or any other instruments. This could happen in the first half of the financial year.

There were some reports you are planning to acquire Bharat Financial (formerly SKS Micro Finance)...

■ No...nothing is on the table at all.

Are you looking to acquire any other MFI?

■ Right now, nothing is on the table. I am growing the business at 45-55% per annum, why do I need to acquire?