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## News & Views

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### Deep geothermics – interdisciplinary challenge promoting innovations

The deep geothermal exploitation of energy in the form of heat and electricity is bound to grow considerably in significance both ecologically and economically in future owing to the scarcity of fossil energy sources. This is also because the use as well as the generation of geothermal energy possesses major advantages when compared with all other kinds of sustainable forms of energy. Obtaining energy from the earth's crust is possible 24 h/day, 365 days/year regardless of climatic conditions or weather patterns. Consequently deep geothermics represents an important source for providing baseload electricity and heat; at present this form of energy is only rarely exploited as a renewable source on account of the high drilling costs and contributes to the overall energy mix to a negligible extent.

The great advantage of generating energy from deep in the earth's crust is that it is essentially available everywhere regardless of external environmental conditions and possesses a substantially greater life expectancy than solar or wind energy production. Furthermore, geothermal energy can be produced and obtained practically without CO<sub>2</sub>. It is produced by a purely physical process. In other words, no combustion or other chemical transformation takes place. Geothermal energy, which is numbered among the renewable forms, is incidentally the only one of these environmentally acceptable energies, with a baseload capacity.

By and large, when exploiting the earth's heat using deep geothermics, a distinction is drawn between hydrothermal and petrothermal systems as well as between open and closed systems. It represents a vision that practically all facilities devised to operate a geothermal power plant could be set up underground, resulting in minimal emissions for the environment. Geothermal energy production plants would thus require the smallest amount of surface space of all renewable energies.

In addition, when establishing a geothermal power plant synergies with other energy sources can be exploited so that the overall degree of efficiency is increased. One possibility would be to make use of the difference in height within the underground structures (e.g. covering peaks by means of a storage power plant) and to generate electricity via a turbine. Another conceivable method would be to take advantage of the difference of temperature, which results from differences in the density of the ventilation in the intake and outlet shafts. This air movement could possibly be exploited energetically by rotors.

In order to open up such sources of energy, drilling technologies are needed by means of which it is possible to arrive at the required depth. Nowadays drilling down to a depth of 7,000 m is state of the art in technical terms; however, depths of 5,000 m can be regarded as economically feasible.

Caverns with major cross-sections and relatively short length are needed for constructing and operating underground deep geothermal plants. They would be connected to the earth's surface via headings or shafts. The choice of favourable cross-sectional forms, the application of excavation methods that go easy with the rock as well as selecting means of support as temporary and final

securing measures are represented among the most vital tasks. In this connection, it should be mentioned that the deepest underground drill hole bored by the Prakla RB50, the largest deep drilling rig, reached 2,000 m. Larger and in turn more powerful drilling rigs require more space of course, so that they can be operated when set up underground, which naturally results in new challenges in logistical, safety technical, rock mechanical and geotechnical terms.

I am convinced that the generation that is active today should deal intensively with such a scenario regarding geological and geothermal location issues in order to exploit deep geothermal energy. Drilling technologies including the provision of the necessary infrastructures for sinking deep holes from an underground site must be developed, rock, operating and process parameters evolved as well as safety aspects appraised, which occur in the special case of existing or even newly set up underground facilities.

Finally the potential of deep geothermics and its risks have to be appraised both in technical and economic terms. Scientific as well as economic evaluation of the topic of deep geothermics calls for the interdisciplinary development of concepts and methods of all the disciplines involved. The research results obtained in this connection can be applied on a worldwide scale. On the one hand, deep geothermics is highly innovative and on the other, also risky, but would provide a series of findings, which will be of use in other fields, even if not crowned by success.

**-Robert Galler**

Source: Tunnel 7/2013, [www.tunnel-online.info](http://www.tunnel-online.info)

## **Train spotting**

On June 25, 2013 Kashmir, India will take another step closer to the mainland when the Qazigund-Banihal stretch of the 345 km Baramulla-Jammu Railway line is inaugurated. The 18 km section, which cost Rs. 17,000 million, passes through an 11 km tunnel, the longest in the country and the second-longest in Asia. This line will provide all-weather connectivity to the Valley, which is cut off when snowfall, landslides and heavy rainfall shut down the Srinagar-Jammu highway, its only link to the mainland. A look at other historic rail lines:

### ***Jammu-Baramulla Railway***

- Steel-arch bridge over the Chenab on the Qazigund-Katra section is at 359m, making it the highest bridge in the world.
- Qazigund-Katra section is 125 km long, expected to be completed by 2017.
- A 25 km stretch from Katra to Udampur will open by the end of this year after missing several deadlines.

### ***Yiwan Railway***

- China's most difficult and expensive railway
- A 377 km stretch which links Yichang in Central Hubei province to Chongqing in Wanzhou, cutting the trip from 22 hours to five.
- Cost \$3.41 billion or \$9.01 million per kilometer.
- 50,000 workers involved, took 7 years to build.
- Line runs over 253 bridges, through 159 tunnels.

### ***Qinghai-Tibet Heavy Rail Line***

- Inaugurated in 2006, it cost \$3.5 billion
- At 5,072 metres highest track in the world. It is the train to rooftop of the world.

- 1,956 km long, it connects Xining of China's Qinghai province to Lhasa in Tibet.
- More than 20,000 workers and 6,000 pieces of equipment used.
- 4,500 m is the average elevation of the line.
- Tanggula station at 5,068 m is the highest railway station.
- 550 m of its tracks are on frozen earth.
- Has the world's most elevated tunnel, the Fenghuoshan Tunnel, at 4905 m height.

### ***Peruvian Central Railway***

- World's highest railway till the line to Tibet came up.
- 4,782 m is the height to which passengers travel from sea level on the Andes, through 6 climate zones, in 12 hours.
- Popularly known as 'The Rail-road in the Clouds', it's more than 100 years old.
- 10,000 men worked on it, plans were drawn up in 1851, and construction began in 1870. Took nearly 40 years to finish the line.
- 69 tunnels in all dot the line.
- The highest point of the line, Galera, is inside a tunnel. It has over 58 bridges and 21 zigzag switchbacks.
- 10,280 ft (app 3100m) is the height at which the Infiernillo Bridge hangs between two vast rock tunnels over a canyon.

### ***The Devil's Nose***

- Dubbed the most difficult Railway in the world, Ecuador's first rail between the coastal city of Guayaquil and the capital Quito took 25 years of planning before work began in 1899.
- 130 km east of Guayaquil, the line ran into a near-vertical wall of rock known as El Nariz del Diablo (The Devil's Nose). Engineers carved out a series of zigzags on the rock which allowed the train to climb 800m at a gradient of 1-in-18, going forward and backward up the tracks.
- 12 km stretch from Alausi to Pistishi at the end of the Devil's Nose descent remains open after El Nino devastated the tracks in 1997.

### ***ALP Transit***

- Also called New Railway Link Alp transit is under-construction across the Swiss Alps, expected to open in 2016.
- \$13 billion to be spent.
- The network is almost entirely underground, comprising base tunnels several hundred metres below current tunnels that were built in the late 1800s.
- 57 km is the length of the Gotthard Base Tunnel, the World's Longest Railway Tunnel.

*Source: Indian Express, 23.6.2013*

## **Huge plug may keep water out of tunnels!**

With a few dull thuds, the 1-ton bag of high-strength fabric tumbled from the wall of the mock subway tunnel and onto the floor. Then it began to grow. As air flowed into it through a hose, the bundle inflated until it was crammed tight inside the 16-foot-diameter tunnel, looking like the filling in a giant concrete-and-steel cannoli.

The three-minute procedure, conducted on a chilly morning this month in an airport hangar not far from West Virginia University, was the latest test of a device that may someday help guard real tunnels during disasters - whether a terrorist strike or a storm like Sandy, whose wind-driven surge of water overwhelmed New York City's subway system, shutting it down for days.

“The goal is to provide flooding protection for transportation tunnels,” said John Fortune, who is managing the project for the federal Department of Homeland Security.

The idea: Rather than retrofitting tunnels with metal floodgates or other expensive structures, the project aims to use a relatively cheap inflatable plug to hold back floodwaters.

In theory, it would be like blowing up a balloon inside a tube. But in practice, developing a plug that is strong, durable, quick to install and foolproof to deploy is a difficult task, one made even more challenging because of the pliable, relatively lightweight materials required.

“Water is heavy, there’s a lot of pressure,” said Greg Holter, an engineer with Pacific Northwest National Laboratory who helps manage the project. “The plug has to be able to withstand the pressure of the water behind it.”

The idea has been in development for more than five years - this test was the 21st - and Fortune says there are at least a few more years of work ahead. If the plugs are shown to be effective, they will be made available to transit systems across the country; at least initially, they are expected to cost about \$400,000 each.

Work on the plug began in 2007, after Ever J. Barbero, a WVU professor whose specialty is the use of advanced materials in engineering, was contacted by a Homeland Security official looking for outside-the-box ideas on ways to keep a subway system from flooding if an underwater tunnel were breached - by a terrorist bomb, for example.

“I said, ‘We’ll put an air bag in a tunnel,’” he recalled. The department was intrigued and decided to finance the project. About \$8 million has been spent.

The plug sits, folded up, inside a long container snug against a tunnel wall, out of the way of passing trains.

There are many challenges, as a subway tunnel is hardly a pristine environment to work in, given that it’s full of grease and grime - and, often, rats.

“That’s something we’ve talked about,” Fortune said. “We’ve actually put (fabric) samples in tunnels, to see if rats ate it. They didn’t.”

One of the reasons the device has been tested so often is to ensure that it will unfold properly every time.

“This is something like the air bag in your car,” Barbero said. “If you need it, it’s got to be there, and it better work.”

*Source: The New York Times, 21.11.2012*

## **Largest urban ropeway of Eurasia**

This alternative is sure to appeal even to passionate motorists. Instead of waiting in traffic jams, the residents of Ankara can soon just hop onto a gondola lift. The new detachable ten-passenger gondola lift from Leitner ropeways will connect the neighbourhood of Sentepe with the city centre via a total of four stations from next year. It shows how innovative and architecturally ambitious ropeways can revolutionise urban transport.

The biggest ropeway project on the Eurasian continent clearly demonstrates the possibilities and advantages of the use of ropeways in large cities. Starting in spring 2014, the Leitner ropeway will connect the Sentepe neighbourhood with Yenimahalle metro station and with the main arterial traffic line of the city. The type GD10 ropeway with a total of four stations uses cabins that can be coupled with each other will offer a transport capacity of 2,400 persons per hour in both directions over a length of 3,204 metres.

This way of linking the neighbourhood to public transport is prone to substantially relieve road traffic and in addition to protect the environment through considerably reduced emissions. Modern design and an extraordinary architecture make the stations an optical highlight. Special LED systems produce light effects during the night. For the towers, a special urban design has been developed. They can be accessed completely from the inside. In developing the towers, Leitner ropeways worked closely together with its associate company Leitwind.

### ***106 cabins at a height of 60 metres***

The cabins, equipped with seat heating, will hover about 60 metres above the ground and offer a spectacular view of the city. As the system will operate all day from five to eleven pm, they will be equipped with night-time lighting. Besides the 106 regular cabins, the gondola ropeway will have two VIP cabins with leather seats, an MP3 sound system and a cooler. Equipped with the most modern drive technology the new gondola lift will be operational 365 days a year.

This spectacular project underscores the leading role of Leitner ropeways as a manufacturer of ropeways in urban setting. The Leitner group has implemented numerous ropeways in large cities across the globe, including Barcelona, Frankfurt, Hong Kong, New York and Rio de Janeiro. In Turkey, systems from Leitner ropeways are already in use in several cities such as Istanbul, Bergama, Erzincan and Ordu.

*Source: Innotrans, No.2, Oct. 2013*

## **Deep breathing for genetic improvement**

The Indian breathing exercises (deep pranayam) is capable of rejuvenating people, curing their eyes first of all, reducing overweight soon and finally reducing aging of persons by about 30 years. The lack of deep breathing exercises is the cause of several body and brain diseases due to the lack of oxygenation of our blood and weakened immune system. Even cancer is due to the lack of deep breathing exercises regularly. Our brains are hungry of oxygen. So the deep breathing reduces tensions in our brains. Pranayam cures the heart diseases also eventually. Deep breathing cures the lungs also soon. The deep breathing for one hour approximately is essential if possible in the evening also. Some medical doctors are prescribing Indian breathing exercises to revive the immune system of patients and become independent of medicine pills. Indian breathing exercises can also rejuvenate exhausted brains after some time. White hairs become black (dark) soon even in the old age. Regular deep breathing is a boon in the old age. There are thousands of case histories of healing of minor diseases.

In 21<sup>st</sup> century the most people like to spend their life time sitting in the chairs. Deep breathing exercise is good for them. It is well known that our red blood cells are hungry of oxygen. The deep breathing releases endorphin. It is a feel-good Hormone (opium). The deep breathing makes deep breathers beautiful due to removal of tensions and toxins. So there is happiness in deep breathing. Thus deep breathing is addictive. The deep breathing rejuvenates our heads, hearts and digestive

system in about 6 months. The cycles of deep breathing-exhausting by the right nostril and again by left nostril (commonly known as *Anulom-Vilom*) should be less than 8 per minute. There should be no noise while inhaling by left nostril or exhausting by right nostril and so on. There are a few pauses between breathing cycles. The memory is revived after about 1-2 years. The deep breathing may be harmful in the polluted mega cities due to inhaling of the polluted air. The inhaling of oxygen is about 10 times more after regular deep breathing. The ten-time intake of oxygen strengthens our immune system by about 10 times. So the fighting capacity of oxygenated blood cells with germs' and bacteria's increases by about 10 times. So we are able to resist hundreds of diseases by regular deep breathing.

The regular deep breathing eliminates all kinds of cancers due to ten-fold stronger immune system. Regular deep breathing increases the flow of oxygen to the heart whose health is thus improved. But please do not stop taking medicines and your regular check-up due to happiness. The regular deep breathing increases our concentration of mind also. The regular deep breathing for over 2 years results in the inner evolution of evolving inner happiness due to regeneration of brain, body and senses. The detoxification of both body and brain is essential in the polluted environment now-a-days by deep breathing regularly. For this purpose, please drink 2 liters of clean water every day, mostly in the morning before going to the toilet. The regular deep breathing causes degenerated cells to regenerate. The regular deep breathing cures imbalances in our bodies. The regular deep breathing makes the genetic improvement, curing the genetic diseases like high blood pressures etc. The regular deep breathing cures Parkinson's disease (H.H. Ramdev). It is a miracle. Thus the regular mass deep breathing may improve our body and brain genes permanently in the whole world by the Grace of God.

- V.K. Katiyar, IIT Roorkee

### **Very active students do better academically**

Intensive exercise improves English, Maths and Science scores in teenagers, shows a study of about 5000 children, which found improvements for every extra 17 minutes boys exercised, and 12 minutes for girls. Children who carried out regular exercise, not only did better academically at 11 but also at 13 and in their exams at 16, the study suggested. The study by the universities of Strathclyde and Dundee in Scotland found that physical activity particularly benefited girls' performance at science (Dance is better for girls).

The study published in the British Journal of Sports Medicine, said it was possible children who carried out 60 minutes of exercise every day could improve their academic performance by a full grade - for example, from a C to a B, or a B to an A.

Source: *Hindustan Times*, 27.10.2013

### **Farmers rely on match-sticks, not pesticides to save produce**

The Saran mid-day meal tragedy, in which 23 students lost their lives after eating food contaminated by pesticides, has led to innovative ways to preserve food grain in Bihar.

Enterprising, or as the Hindi colloquialism says - *jugaad*, farmers in this part of north Bihar have started using match-sticks to safeguard their produce from pests and rodent attacks. Matchsticks are considered a 'safe' alternative to insecticides and pesticides.

"The main ingredients of match-stick head are potassium chlorate and red phosphorus. These serve as disinfectants and have pesticide's properties too, but are relatively safe," said Rajat Singh a chemical engineer.



Sale of match-boxes in rural areas has gone up by 25 times since the Saran tragedy. Niraj Kumar, a shopkeeper at Masrakh village, said he had sold more than 15 carton of matches in the past one week.

“Farmers put match-sticks in sacks of foodgrain to keep them safe from pests. This new measure is proving to be most effective,” he said.

Dr. Rajiv Ranjan, a Patna based doctor, said that the chemicals in match-sticks are used to preserve grain in several countries.

Nawal Thakur, a farmer at Sarai, said he has been using match-sticks to keep away rodents and insects since the last one month.

“It is not dangerous for humans and does not smell foul. Also, a small box of matches is enough for one sack of foodgrain,” said Thakur.

“It is cheaper and safer than insecticides. While a box of match-sticks costs ₹10, one has to pay between ₹50 and ₹100 for insecticides,” said Naresh Rai, a Saran farmer, “And match-sticks could simply be removed when the grain is to be consumed.” (It is being used in other parts of India like, U.P.).

Source: Hindustan Times, 29.7.2013

### States’ installed solar capacity

State	Solar Power
Gujarat	824 MW
Rajasthan	442 MW
Maharashtra	345 MW
Andhra Pradesh	23.15 MW
Uttar Pradesh	12 MW
Total India	941 MW

- 20,000 MW solar energy to be generated by 2022
- With around 300 sunny days, India can generate 0.2 million MW of solar power

Source: Hindustan Times, 26.8.2013

### Road map for generating 9000 MW by 13<sup>th</sup> plan in J&K

Achievements since 2009	Upcoming Projects
<ul style="list-style-type: none"> <li>• 850 MW Ratle HEP (IPP Mode) allotted on tariff basis - First in the country.</li> <li>• 450 MW BHEP-II (Cost = ₹ 3113 crore) allotted to be commissioned by 8.2015 – Quickest Hydel Project to be completed in the country.</li> <li>• 5 MW Geothermal plant in Pugh Leh Allotted - First in country</li> <li>• 3 small HEPs (DAH 9 MW, HANU 9 MW, Pahalgam 1.5 MW) Allotted.</li> <li>• 6 IPP Projects of 152 MW Capacity Allotted.</li> </ul>	<p>A. State sector (7 no: 3566.5 MW)</p> <ul style="list-style-type: none"> <li>• Sawalkote 1856 MW</li> <li>• Kirthal-I 390 MW</li> <li>• Kirthal-II 930 MW</li> <li>• UJH Multipurpose Project 212 MW</li> <li>• New Ganderbal 93 MW</li> <li>• Lower Kalnai 48 MW</li> <li>• Parnai 37.5 mw</li> </ul> <p>B. JV (CVPPPL) (3 no. 2220 MW)</p> <ul style="list-style-type: none"> <li>• Pakal Dul 1000 MW</li> <li>• Kiru 660 MW</li> </ul>

<ul style="list-style-type: none"> <li>• Coal block of 130 Million Tons for 1000 MW Thermal Power Project Allocated.</li> <li>• 150 MW of additional power allotted from National Grid.</li> <li>• 4 IPP projects of 42.5 MW capacity commissioned</li> <li>• 2 small HEPs of 2.76MW commissioned</li> <li>• BHEP-I Generated 13365 MU of energy since 2008-09 accruing a revenue of ₹ 4975 crore.</li> </ul>	<ul style="list-style-type: none"> <li>• Kawar 560 MW</li> </ul> <p>C. Central Sector (3 nos. 1770 MW)</p> <ul style="list-style-type: none"> <li>• Kishen Ganga 330 MW (under execution)</li> <li>• URI-II 240 MW (being commissioned shortly)</li> <li>• Burser storage scheme 1200 W (prioritized on fast track)</li> </ul> <p>D. Ipp Mode (25 No. 166 MW as on 31.08.2013)</p>
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(₹1 crore = ₹10 million)

Source: Indian Express, 8.9.2013

### Food waste : India versus rest of the world

India (Wastage avg)		World (Wastage avg)	
11.9 %	Fruit	45 %	Fruit
9.6 %	Veggie	45 %	Veggie
5.2 %	Cereal	30 %	Cereal
6 %	Oilseed	20 %	Oilseed
2.3 %	Meat	20 %	Meat
2.9 %	Fish	30 %	Fish
3.7 %	Poultry	32 %	Poultry

Source: Hindustan Times, 9.6.2013

### Top 5 takeovers by Indian companies

Acquirer	Target	Year	Deal size
Tata Steel	Corus	Oct-2006	\$ 12.9 bn
Bharti Airtel	Zain Africa	Feb-2010	\$ 10.7 bn
Hindalco Industry	Novelis	Feb-2007	\$ 5.7 bn
ONGC	Kashagan Oil Fields	Nov-2012	\$ 5.0 bn
ONGC	Imperial Energy	Aug-2008	\$ 2.6 bn

Source: Hindustan Times, 13.6.2013

### World's best gas-fields in Tripura: ONGC

The northeastern state of Tripura has perhaps the world's highest success rate when it came to yielding natural gas, a top official of state owned Oil, and Natural Gas Corporation said on Wednesday.

“We are striking gas in one out of every two wells drilled in Tripura, while the average ratio worldwide is one out of every three wells,” ONGC Group General Manager Ved Prakash Mahawar said. Since 1972, ONGC has drilled 176 wells in Tripura, bordering Bangladesh. Of these, 82' are yielding as in 11 fields.

The gas exploration major has committed to supplying gas to two giant power projects – 726 MW Palatana power plant and 104 MW Monarchak power project in Trupura, besides providing piped gas to 12,220 house holds for cooking. It will also feed CNG to 5,100 vehicles and auto-rickshaws, as well as industrial units.



The official said the technical problem in supplying gas to Palatana power plant in southern Tripura was sorted out earlier this week.

*Source: Hindustan Times, 15.8.2013*

### **Air pollution causes cancer, confirms WHO**

The World Health Organization (WHO)'s International Agency for Research on Cancer (IARC) has declared air pollution as carcinogenic – a major cause for cancer among humans.

The IARC added air pollution to Group 1 carcinogenic – the same category under which tobacco, UV radiation and plutonium come.

Air pollution was known to be among the causes for heart and lung diseases, but now evidence has emerged for the first time about it being carcinogenic.

“There is sufficient evidence that exposure to outdoor air pollution causes lung cancer with a positive association with an increased risk of bladder cancer. Particulate matter, a major component of outdoor air pollution, was evaluated separately and was also classified as carcinogenic to humans (Group 1),” said an IARC statement.

IARC Monographs Section head Kurt Straif said the air we breathe has become polluted with a mixture of cancer causing substances. “We now know that outdoor air pollution is not only a major risk to health in general, but also a leading environmental cause of cancer deaths.”

Studies indicate exposure levels have increased significantly in some parts of the world, particularly in rapidly industrializing countries with large populations in recent years. The most recent data indicates 0.223 million deaths of lung cancer worldwide resulted from air pollution in 2010.

The IARC Monographs Programme, dubbed the “encyclopedia of carcinogens”, provides an authoritative source of scientific evidence on cancer-causing substances and exposures.

In the past, the programme evaluated many individual chemicals and specific mixtures that occur in air pollution. These included diesel engine exhaust, solvents, metals, and dust. But this is the first time that experts have classified outdoor air pollution as a cause of cancer.

“Our task was to evaluate the air everyone breathes rather than focus on specific air pollutants,” said Straif’s deputy, Dana Loomis.

“The results from the reviewed studies point in the same direction: the risk of developing lung cancer is significantly increased in people exposed to air pollution.”

IARC reached its conclusion after an independent review of over 1000 scientific papers from studies on five continents. The studies analyzed carcinogenicity of various pollutants present in outdoor air pollution, especially particulate matter and transportation related pollution.

*Source: The Times of India, 18.10.2013*

### **NTPC’s vision is to be world’s best power producer!**

Excerpts of question & answer session with Dr. Arup Roy Choudhury, CMD, National Thermal Power Corporation (NTPC) and Chairman, Damodar Valley Corporation (DVC).

*Indian power sector has seen many ups and downs recently. What according to you would be the future scenario considering the constraints?*

Power sector is the key enabler of India's economic growth. The sector consists of generation, transmission and distribution utilities and is a crucial component of India's infrastructure. In terms of consumption pattern India ranks amongst the lowest in the world. The per capita consumption of power in India has increased from 631 units in financial year 2005-06 to 917 units in financial year 2012-13 as per CEA (Central Electricity Authority). This is many times less than the electricity consumption in the developed countries giving enormous scope of capacity addition in India. This enormous power deficit in country, if tackled in planned manner, translates into huge potential for the growth of power sector which will automatically give a big boost to the national economy.

*How does NTPC plan to maintain its leadership position in the power sector in the country?*

NTPC has consistently been rated as number one company in the world in terms of capacity utilization. It has been ranked No.1 Independent Power Producer in World by Platts in the Top 250 Global Energy Companies' list for the year 2013. It is, therefore, one of the best and most efficient power generators in the world. Our efforts are always directed towards our vision to be the world's largest and best power producer powering India's growth.

At present with about 18% of the installed capacity in the country NTPC units generated about 27% of the total power generated in the country in FY 13.

*Are there any NTPC plans for harnessing energy through the renewable resources?*

NTPC has also formulated its business plan of capacity addition of about 1,000MW through renewable resources by 2017. In this endeavour, NTPC has already commissioned 10MW solar PV projects and another 85MW solar PV and 8MW small hydro power projects are under implementation.

*Source: Times of India, 21.1.2014*

## **Prayer is the cry of a soul**

We often hear people say that behind every successful man is a woman. I will modify this by saying, behind every success, there is the Divine, saying, "I am behind you". The Divine dawns in you when you pray for Grace; when you cry for it.

Prayer is a vital tool to improve your life. What you can do, do it. What you cannot do, pray for it! When you feel the obstacle is too much to handle, deep prayer can work miracles. Whatever you do, know that a higher power has the final say and you can tap that power through your prayers.

You don't need any special qualifications or abilities to pray. Whether a fool or a wise person, rich or poor, anybody can pray. Prayer doesn't mean just sitting and chanting some words. It's about being in that serene, calm, meditative state. That is why, in vedic tradition, dhyana, meditation, is done before prayer as well as after-wards. When the mind is focused, prayer becomes far more powerful.

Prayer is the cry of a soul. To whom you pray is not so important. Whereas religion puts words to the prayer, and adds symbols and rituals to it, prayer itself transcends them. It happens at the subtle level of feelings; feelings transcend words and religion. The act of praying itself has the power to bring transformation.

When you pray, there should be total involvement. If the mind is preoccupied elsewhere then that is no prayer at all. When there is pain there is more involvement. That's why people turn to prayer when they are in pain. Prayer happens when you feel grateful or when you feel utterly helpless. In either case your prayers will be answered. When you feel helpless, prayer happens by itself. That's why in Hindi we say 'Nirbal toh Balram'. If you are weak, God is with you. Prayer is that moment when you get in touch with your limitations, your boundaries.

Usually when you love something, you want to possess it and you pray for it. True prayer, however, is just the opposite of wanting to possess. It's about honouring and offering everything to the Divine. Honouring brings devotion and leads to surrender. Devotion heals.

True prayer can't happen without devotion and faith. Having faith is to realize that God's protection is there for you. Devotion is inner flowering; it starts from where you are. Unless you are lit in devotion to the Divine, your life will remain restless. In devotion, longing will arise in you and true prayer happens by itself.

Be sincere in your prayers. Do not try to outsmart the Divine. What type of time do you give the Divine? Usually you give time that is left over; when you have nothing else to do, no guests to attend to, no parties to go to, then you go to the Divine. This is not quality time. Give prime time to the Divine. You will definitely be rewarded. If your prayers are not answered, it is because you have never given quality time.

There are four types of people who go to God – first, those who seek the truth (knowledge and freedom); second, the wise ones (gyanis); third, the ones who seek material comforts (wealth) and fourth, ones who are in misery. The wise one does not pray for some thing. His life itself is a prayer.

If at all you have to pray for something, pray for happiness of all the people in the world. *Loka Samastha Sukinou Bhavantu* – May everybody be happy.

- Sri Sri Ravi Shankar

Source: *The Speaking Tree, Times of India, Jan 2014*

## 7 Great quotations

- (i) If you born poor, it's not your mistake, but if you die poor it's your mistake.
- (ii) Born with personality is an accident, but dying in a personality is an achievement.
- (iii) Your birth may be normal, but your death should be history.
- (iv) Follow none, but learn from every one.
- (v) Practice like a Devil and play like an Angel.
- (vi) Do or Die is an old concept, Do it before Die is a new concept.
- (vii) Like all, Trust few.

- Anonymus

## Humour

- Upon hearing that his obituary had been published. American author Mark Twain sent a cable from London in 1897. It read: "The reports of my death are greatly exaggerated."
- The zoo is a place for animals to study the behavior of human beings.