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Indian Association of Energy Management Professionals

THE URJA WATCH

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It is about "Conscience Keeping on Energy Matters"

HOME ENERGY MANAGEMENT

SPECIAL ISSUE

SPECIAL ISSUE - HOME ENERGY MANAGEMENT

What's inside...

Website: www.iaemp.org **Editor Contact:** tellsubi@gmail.com

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From the Editor's Desk

CUTTING HOME ENERGY COSTS

What energy experts have learnt over the years about energy efficiency improvement is not readily available to the people who manage our homes. Realizing this knowledge gap, IAEMP has recently launched a training programme to share expertise on energy management with home energy consumers. The Urja Watch welcomes this great initiative and congratulates IAEMP.

In the space of a couple of years, living styles in India have drastically changed with pronounced impact on domestic energy consumption. Demand has surged for consumer durable goods such as automobiles, two-wheelers, computers, electronic gadgets, home appliances, and numerous other items. As the country's economy gets further strengthened, more people will get attracted to better lifestyles stimulating a greater hunger for consumer products and services. This change is bound to push up energy needs sharply; a need that must be supported by adequate supply and efficient use of available energy.

There is nothing sinful about expanding our portfolio of personal assets, but wasting our scarce resources is. Energy is a precious resource and expensive too.

Energy efficiency in residential buildings is one of the lowest. However, spiralling prices are now prompting many consumers to cut back spending. So, homes are ripe places to be looking for energy savings. Many homeowners still don't realize how much they pay towards energy that seeps out of their houses every day. Cost-effective energy-reduction strategies could yield anywhere between 10 and 30 percent savings, perhaps even more with upgrades and new energy-saving technologies.

By nature, we are not wasteful people but let us face it. Don't we often tend to ignore small things such as televisions and radios blaring to no one, lights and appliances left on for absent people, and making unnecessary road trips by car? Some of our power uses are necessary and some of them are not. Saving energy happens in the ways you live.

To begin with, we can cut energy costs at home through many simple steps such as:

- Switching off the lights, air-conditioners, fans, television and computers when not needed. Remember that appliances in stand-by mode still consume electricity.
- Installing energy-saving lamps, buying energy-efficient domestic appliances and using them judiciously.
- Cutting back on water usages by minimizing wastages.
- Taking a walk or riding a bicycle instead of using a car; wherever possible, climbing the stairs instead of using the lift – it's good for health too!

Many technologies are now available to save energy. Dramatic improvements have been made in lighting, air conditioners, refrigerators, and domestic appliances.

A lot of these technologies are easy to follow if one understands how energy is used at home. For example, you can heat a cup of coffee in many ways – over a gas stove or an electric heater or in a microwave oven. In each case, what you get is a cup of hot coffee but the energy consumption and cost varies for each method. So, one has many options to consider on how energy could be saved.

Wasting water wastes electricity. Why? Because the biggest use of electricity in most cities is supplying water and cleaning it up after it's been used! Electric power is also used to pump water to the overhead tanks on buildings.

Most of the water we use in our homes is consumed in the bathrooms. A low flush toilet, for example, can save a lot of water besides electricity for pumping. A leaky toilet can waste more than 30,000 litres of water a year!

Dripping taps are bad, too. A water bottle that leaks even little water to fill about two soda bottles every hour will waste over 7000 litres of water a year.

Another simple way to save water is to use 'smart' showerheads that use less water. Electric storage water geysers consume substantial energy. It makes economic sense to explore and install solar water heaters for your home hot water needs.

In the kitchen, there are many ways one can save energy. If you need to warm up or defrost small amounts of food, use a microwave instead of the stove to save energy. Microwave ovens use around 50 percent less energy than conventional ovens do. For large meals, however, the stove is usually more efficient. In the summer, using a microwave causes less heat in the kitchen, which saves money on air conditioning.

Replace old appliances, heating equipment and hot water heaters with Energy Star or better versions. Today's appliances can be several times more efficient than those of ten years ago. Remember old refrigerators are real energy hogs! It may be worth investing in a new energy efficient refrigerator.

Think about what you and your family members want to buy for your home. There is a bewildering range of consumer appliances available today each with varying cost and energy consumption. Choose those products that are relevant to your situation and at the same time save energy costs for you.

Four hundred years ago, Sir Francis Bacon said "Knowledge is Power". Today, as a corollary, we can say that energy management knowledge is indeed "electric" power as every unit of power saved by you is equivalent to producing more than one unit of power for the country.

Enjoy reading this special issue and do tell me what you feel about it.

Energetically,

S.Subramanian
Editor
Email: tellsubi@gmail.com

Letters from Readers

We reproduce below some of the e-mail letters received in response to the August 2008 issue of 'The Urja Watch". They capture the essence of how readers feel. Please convey your impressions to the Editor at tellsubi@gmail.com.

On the Independence Day Special Edition of "The Urja Watch"

Hearty Congratulations for publishing a well created and an excellent issue of "The Urja watch" on Independence Day. Let us now take an oath individually to reduce our own energy consumption and if possible try to regularly do our own energy audit and take steps in future to increase our own energy efficiency by implementing different energy conservation steps in our life. Let us even spend some time in noting these events of our life on paper, where our goals are achieved. If we can do this, probably we would be proud to say that we are really "conscience keepers on energy matters". Let us start working for a better and energy efficient India of tomorrow. Keep it up!

F T Kanpurwala, Ahmedabad

It was nice to see that IAEMP news magazine is now being made available through www.pothi.com. I have seen its hard copy and it has come out very well. It is really a very good idea for self publication.

I congratulate the entire editorial team of IAEMP and pothi.com for doing an excellent work.

Harish

Its really very good addition and having rich knowledge & information concerning to Power field. We have to focus more on "The Urja Watch". It is one of the best ways to popularise IAEMP. All members are requested to take interest. We should contact concerned persons in our surrounding areas and request them for subscription to "The Urja Watch". By increasing the number of subscriptions, we can not only increase the popularity of IAEMP group but also earn commercial support.

We have to spread the market of Urja Watch across the country step by step. We can contact companies to advertise, and we can also advertise the power sector recruitments.

Looking towards the Bright Future of Urja Watch & IAEMP.

Nitin Sharma

Members Speak...

Economic and Energy Woes

On 22nd July 2008, during the debate on trust vote in the parliament, Mr. Rahul Gandhi gave an example of Kalawati's miserable economic plight.

Kalawati's story is a metaphor for the country's energy situation. Kalawati's diverse activities like rearing a buffalo and digging a pond have not yet provided her the much-needed 'economic security'. Just as Kalawati continues to wrestle with her economic woes, our country struggles with energy woes. Despite exploring various options including nuclear, our energy woes continue unabated. Kalawati's limited resources of earning her livelihood can be compared to India's limited options of energy production causing poor energy security. Kalawati's efforts appear to be more of a desperate nature than a well thought-out strategy of diversification for getting reasonable returns. Welfare of poor people cannot be achieved by pointless, non-merit & unproductive subsidies. Similar is the situation of India's power scenario.

Every nation has built-in inequalities that can be removed basically by leveraging innovative knowledge and by bringing about change in technology. Modern technology for improving "energy efficiency" and saving substantial amount of energy is a much needed option.

One third of the energy in the country is lost in distribution & commercial network while half of the energy that is produced reaches end users. To provide one unit of electricity, more than 1.5 units need to be generated to take care of transmission, distribution & commercial losses. It is like Rajiv Gandhi's famous saying that only Rs.15 reaches the needy when Rs.100 is sent. What more proof is needed for the prevalent nation-wide corruption in public services and administration?

Also often-repeated expression like: "Let not ask what country is doing for you, ask what you are doing for the country" will not be just & righteous in this case. No one is willing voluntarily to save "energy" unless it is made mandatory like that in "Energy Conservation Act, 2001". But unfortunately the act is resting on its deathbed for more than seven years, while Gujarat enacted & implemented it's own state laws from 2000 and saved significant amount of energy by carrying out energy audits. Tamil Nadu government has made water harvesting compulsory in high rise buildings to tide over the water scarcity situation. Claims of the suffering population for government intervention are usually held up to ridicule. But it is the prime responsibility of those occupying driver's seat to reach the vehicle to the destination. It should not need calls for frequent interventions of passengers sitting in the vehicle.

G.G.Dalal

Editor's Note: We respect the member's views. We agree that there is an urgent need for superior leadership to address critical energy issues. At the same time, we must realize that many laws in the country are flouted with impunity. JFK's famous expression is still relevant.

"Nobody has a more sacred obligation to obey the law than those who make it."
- SOPHOCLES

Freedom to Choose Your Electricity Supplier

By Vikas Apte

Good News! The Supreme Court of India has allowed Tata Power Company to supply electricity to retail consumers having a power requirement of 1,000 kVA or less in Mumbai.

While delivering the judgement, the bench headed by Justice Altamas Kabir, rejected Reliance Energy's contention that Tata Power had license to supply power to only bulk customers. This landmark judgement will go down in history books of energy as the turnaround for freedom given to people in the choice of electricity supplier. This will also bring to an end the tyrannical regime of Reliance Energy Limited (REL), now Reliance Infrastructure Ltd. and erstwhile Bombay Suburban Electric Supply Co. (BSES) in the city of Mumbai.

While provisions were already laid down in Electricity Act 2003, it took a full five years for the consumers to gain independence to choose their electricity supplier. And thanks to all conscience keepers to the nation on energy matters who helped to win this freedom. In particular, I would like to mention about “Bijlee”, a very dynamic group within yahoo groups that had spearheaded a campaign and relentlessly fought against the oppressive regime of Reliance Energy and the Maharashtra Electricity Regulatory Commission (MERC) to facilitate the Supreme Court order for the benefit of all consumers.

Judgement Implications

What implications can this judgement have on retail consumers?

Can the consumers still buy power from Tata Power Company (TPC) even though the basic infrastructure in terms of substations, transmission lines, power and distribution transformers right up to the energy meter installed at the ground level in each building society is of REL or Bombay Electric Supply and Transport (BEST)?.

Won’t REL/BEST charge the consumers for using their infrastructure, even though power is generated and supplied by Tata Power?

Does this mean that the retail consumer will have to keep track of two bills every month, one for fixed charges/demand charges to be paid to existing distribution company and the other for variable charges to the new company from whom they will buy power?.

Or will it be a simple matter of paying one bill to any company like mobile telephone companies, who also share the infrastructure of other telecom companies?

Many such questions arise with few clear answers. Experts have provided different opinions. What follows is a summary of the reports from some of the experts.

Business Standard Review

The Supreme Court judgment allowing Tata Power to retail power to consumers in Mumbai could pose a few regulatory challenges, experts feel.

Efforts by Tata Power to wean away customers from Reliance Infrastructure or expand its distribution network are likely to put the regulator in a spot, they say.

"It's going to be interesting. For the first time, the market has been thrown open. The regulator will have a difficult job," said S L Rao, a former chairman of Central Electricity Regulatory Commission, who also serves as an independent director on the board of Reliance Infrastructure, but spoke to us as an expert tracking the power sector.

The SC order was over a dispute in which Anil Ambani's Reliance Infrastructure (formerly Reliance Energy) had contended that Tata Power had the license to supply power only to bulk customers and the regulator and electricity appellate tribunal had ruled in favour of it. The problem is that Tata Power is a supplier to Reliance Infrastructure, and will now be able to poach on its customers.

"The regulator has to see if the supplier is using its clout to cut tariff for selective customers. The regulator has some real work to do as it is raising issues, which are thorny," said an expert.

"Tomorrow, Reliance Infrastructure could say that `if you take away my cream, how you are expecting me to service the low-end customers?' " Said another expert.

Interestingly, utilities in Maharashtra are not allowed to charge a "surcharge" for meeting the cost of cross-subsidising power as the state faces a huge deficit.

The Electricity Act, 2003 allowed open access, except where the network is owned by a municipality. Tatas can apply for open access and ride Reliance's network to reach out to customers.

"The regulator has to see the tariff keeping in mind that Tata Power is also a wholesale supplier," said an expert.

Customers wanting to buy from Tatas in Reliance's license area will have to pay a wheeling charge (for using the latter's network). Like a fuel surcharge, this is a pass-through, and will be have to be borne by the customer.

What's not clear is the extent to which this charge will make Tata's power more expensive. The Tatas plan to expand its network in Mumbai, but it's not clear if the regulator will allow it to duplicate the network, as the cost will be eventually borne by the customer in tariff?

"It's unlikely the regulator will allow that," said another expert tracking the power sector." If the utilities invest Rs.100 with a debt-equity ratio of 70:30 they make a 16-per cent return on the equity component.

This is recovered from customers as a component of tariff. The regulator may not allow it to duplicate the network,'' explained an analyst with a brokerage firm.

Mumbai Grahak Panchayat president Ashok Pendse said it was good that there would be competition for supplying power. “The court’s sentiment is to allow consumers a choice and so it is welcome,” he said. But Pendse pointed out that TPC would have to offer power to retail consumers all over Mumbai without any prejudice. “They cannot pick and choose retail consumers in certain parts of Mumbai. It will be bound by Universal Service Obligations (USO) that mandate supply to every consumer asking for a connection,” he said. “TPC could roll out its supply in phases. It can always identify one area, Saki Naka or Andheri for example, and offer electricity to anyone opting for its service,” he added.

Maharashtra Electricity Regulatory Commission (MERC) officials said TPC would have to present a detailed roll-out plan to the regulator before starting supply.

Power sector experts said TPC could also use the REL network to supply power to retail consumers in the suburbs by paying “wheeling charges” under the Open-Access Policy. But it will not be able to use the BEST network in the island city as Open-Access Policy is not applicable in areas served by government undertakings.

So TPC will have to spend a huge sum to lay infrastructure in the island city.

REL director Lalit Jalan welcomed competition and said REL would not mind lending its network to TPC in lieu of wheeling charges. “But TPC’s tariff will be higher than ours after taking into account distribution losses and wheeling charges. So, at some point, it will have to lay its own infrastructure which, in turn, will entail massive expenditure,” he said.

Besides, TPC did not have too much power to spare for direct supply to retail consumers after giving power to bulk consumers.

BEST additional general manager (electricity) S A Puranik said BEST was not worried by TPC’s entry into retail supply because it already had an agreement with the latter to buy 800 MW for next 10 years.

FAQs Related With This Judgement

1. What does the court order mean to you?

It means that you will, for the first time, get a chance to choose your power supplier irrespective of your address in Mumbai. The situation will be quite similar to a telecom circle with multiple players offering the same service at competitive rates.

The Supreme Court order puts an end to the monopoly in electricity supply, which BEST and REL have been enjoying in the island city and the suburbs, respectively.

2. Can you shift immediately out of the BEST or REL loop (if you are, for any reason, not satisfied with its service) and avail of supply from TPC?

No, you cannot make the shift immediately. TPC will have to come out with a detailed tariff plan that has to be approved by the Maharashtra Electricity Regulatory Commission (MERC). There are other problems as well. TPC does not have the distribution network to take power directly to homes, offices and factories although it can use the REL and BEST networks by paying 'wheeling charges'. But TPC will still need receiving stations, sub-stations, its own transformers and last-mile metered connections to housing societies and office complexes.

3. What will be the next course of action for your current power suppliers, REL and BEST?

Well, for one, they can improve services to the point that not a single consumer will look for an alternative supplier. REL and BEST are already existing utilities and have the supply infrastructure in place. It is much easier to add to existing network than to start from scratch. But they will also have to control expenses and try to procure cheap power to retain consumers.

4. What are public opinions and activists' views?

Here are some feedbacks from a variety of sources:

"Consumers feel empowered with the switch-over option" .....Viju B

Neelima Sethi runs a small-scale embroidery shop near Dahisar. Her staff work in shifts and they need 24x7 power inside their brightly-lit workshop. "I pay a bill of Rs.15, 000 every day and, during the lean period, it eats into my profits," she says. But the Supreme Court verdict on Tata Power Company, she feels rightly or wrongly, may bring about a change in the tariff structure. And that, she says, will definitely come as a huge relief for her — and others like her — in the near future. "I see a ray of hope because, if there is one more power utility that promises to provide decent service, I have an option of switching over. This competition will be good for consumers," Sethi said.

"The Times of India" spoke to a cross-section of consumers, consumer-right activists and power experts on the issue and all of them agreed that that the Supreme Court verdict could only have a positive impact on the power sector and pricing in the long run. Experts, however, also advised caution in the midst of the euphoria as the switch-over option might not be available immediately.

"This is good news for the 2000-odd small-scale industrial units within BMC limits. We feel that tariff will definitely come down in the long run as there will be no monopoly in distribution of power now," Bombay Small-Scale Industries Association president Rakshpal Abrol said. "Tatas already have power licenses and they have a track record of efficiency. The existing power utilities will now be forced to better their services and this again is good for consumers," Abrol said.

NGOs like the Parayas Energy Group, which are in the forefront of the fight for power reforms and conservation, also agree that the tariff may come down. "But a lot depends on the Maharashtra Electricity Regulatory Commission and the tariff structure it proposes," Prayas consultant Shantanu Dikshit said.

This is the first time that the country will see private power operators vying for a share of the same pie. "This is going to be extremely beneficial for consumers," he added.

Consumer activists have welcomed the development but are still wary. "We have to see that they do not hike the exit and entry charges when consumers switch over from one utility to another. There should be more flexibility so that consumers can shift from one provider to another without any restriction," consumer activist Rajesh Darak said.

The above views and responses go to prove that just as we achieved political independence on 15th Aug 1947, and became a true republic only on 26th Jan 1950 when the entire constitution was put in place with painstaking efforts by Dr Babasaheb Ambedkar. Similarly, an entirely new constitution has to be made for electricity independence, having various Articles such as open access, power wheeling, and others.

The most significant part of this judgement is that it has unfurled the flag of electricity independence.

About the author: *Vikas Apte is a certified energy auditor. He serves as the Treasurer for IAEMP.*

INSPIRING QUOTES WHICH KEEP US GOING……

"One who can become mad with an idea, he alone sees light'.

"They alone live who live for others, the rest are more dead than alive".

"Unselfishness is more paying; only people have not the patience to practice".

"Stand up be bold, be strong. Take the whole responsibility on your shoulders

"He who struggles is better than he who never attempts".

Home Energy Management Training

By Sunil Sood

The subject of energy conservation is very dry and thus not taken seriously by many of us. There is a misconception that the conservation means sacrifice or taking trouble. Still many people come to take training on "Home Energy Management" with lots of interest but with several doubts in mind. Hence, the training contents must be interesting and capable of maintaining the initial enthusiasm. Presently, the training is confined only to electrical energy. For the LPG and Petrol saving ideas, I request the participants to visit the website www.pcra.org of Petroleum Conservation and Research Association (PCRA) and also read the literature provided by PCRA.

I start the training program by telling them about 'The Arrogance of a Switch" and the story of a village boy who had never seen an electric switch. You will find these in the IAEMP Vision Document. This helps in creating a good opening. Then the power point presentation is made which covers the points covered in the following paragraphs. Actual consumption of some of the gadgets is also demonstrated with the help of an electronic meter.

The Concept of Home Energy Manager

To begin with, a suggestion is made to the participants of the training programme to appoint a family member as Home Energy Manager (HEM) for keeping a constant check on home energy consumption.

What is the role of HEM? The program explains as to how the HEM should start by collecting past data, and maintain a file on energy consumption - by keeping a record of electricity bills, LPG bills and petrol/diesel purchases. Then, HEM can estimate the average consumption of each type of energy consumed in the previous year, identify energy saving opportunities, and prepare and enforce a plan to bring the consumption down.

One more suggestion - To provide an incentive, the HEM might be rewarded with a payment one-third the net savings realised at the end of the year. The remaining two-thirds can be spent on family members as an incentive for their co-operation, and to purchase energy-efficient gadgets for the home.

Learning to Understand Electricity Bills

The participants are then told about the how billing is done for electricity consumption. Many of them do not even know what the meaning of a unit is. It is explained by doing a sample calculation. The concepts of Fixed Charges and the Energy Charges are then explained. The electric power tariff structure is also explained to them to drive home the point that higher consumption of electric power attracts a higher rate per unit.

An example of Bangalore Electricity Supply Company (BESCOM)'s tariff as applicable for domestic consumers is given in the following table:

Tariff Schedule - LT-2(a)(ii)		
Rate Schedule :	Applicable to areas coming under:	
	Areas under Urban local Bodies other than those under LT2(a)(i) category	
Fixed Charges :	For the first KW	Rs.20
	For every additional KW	Rs.30
Energy Charges :	For the first 30 units	185 paise/unit
	For the next 70 units	290 paise/unit
	For the next 100 units	360 paise/unit
	For the next 100 units	410 paise/unit
	For the next 100 units	435 paise/unit
	For consumption exceeding 400 units	460 paise/unit

The Accounting of Electricity Consumption

Where there is no accounting there can be no saving. If you don't know how much goes into which head of expense, how can you identify areas where you can save? Most of us know how to account for household expenses. We know how much is spent on milk, vegetables, grocery etc. We can even give the rates of each item. But when it comes to analyzing electricity bills, most of us do not give it any thought. The importance of the accounting of electricity consumption is explained to the participants. A sample accounting of my own home is shown to them (see Annexure-I)

Best Practices

The training then focuses on the best practices. This covers the following points:

i) Identification of ghost consumers
ii) Scope for installation of energy efficient appliances
iii) Use of renewable energy based devices
iv) Use of human powered devices
v) Correct sizing and smart use of appliances
vi) Optimum use of water and other resources
vii) Development of innovative ideas.

Standby (Phantom loads or Ghost) Consumers

Not many are aware that the Standby consumers (Phantom loads or ghost consumers) may sometimes account for as much as 10% of the total electricity consumption. This fact is explained to them by practical demonstration of the wide spread practice of switching off TV with remote. The TV keeps consuming 6 watts. Left in this manner this single ghost consumer may account for at least 70 to 100 Whr of electricity per day. A proper understanding of these consumers and practices is important. Similar other practices like leaving the mosquito mats on, not disconnecting the mobile charger, leaving the kitchen appliances plugged-in, losses due to wrong settings of thermostats in Geysers and Refrigerators etc are explained.

The popular misconception about the so-called 'zero watt' bulb is also removed by showing that the bulb consumes 10-15 watts and not 'zero' watt.

With the picture of a typical rural house that uses an oil lamp, I tell the participants that 46 percent of the households in India do not have access to electricity and that almost 30 percent of the world's population without electricity lives in India.

It is explained as to how the rural and many urban households manage to provide some lighting at home with the help of make shift kerosene lamps.

In order to create a sense of responsibility amongst the participants, they are then informed that two such homes can be lit with 8 watts Compact Fluorescent Lamps (CFL) for 4 –5 hours if just one ghost consumer (standby power) used for switching off the TV with remote is saved and donated to them. When asked whether, they are willing to donate electricity in this manner all of them enthusiastically agree, if a mechanism for such donation was in place. If all the ghost consumers are eliminated and that energy is donated, then how many households can be lit in this manner is left to the imagination of the participants!

Energy Efficient Appliances

The programme provides participants with information on a range of energy efficient products like fans, electronic regulators, CFLs, T8 tube lights with electronic chokes, and LED Lamps. The cost economics of replacing the existing ones with energy efficient products is explained in terms of return on investment.

Renewable Energy Devices

Solar water heater is the unsung hero of renewable energy. About 6 percent of the energy in India is used for low grade heating applications like water heating for bathing, cleaning laundry etc.

A Solar Water Heater can easily and most economically provide this energy at least for 300 days in a year. This calculation is shown to the participants.

The solar home light applications are not encouraged. However, Solar Lanterns in place of emergency lamps are recommended.

Wherever possible, use of Solar Cookers is recommended.

Other Ideas and Innovations

The programme provides opportunities to learn ideas like correct sizing and smart use of appliances, optimum use of water and other resources, effective use of human powered devices in place of electric devices and others.

Development of innovative ideas like not ironing the lower part of the shirt since it goes inside the pant or not ironing the top of the pant if you keep the shirt out are told to them and they are encouraged to think of such innovative ideas to maintain the interest.

In order to end the training in a humorous note, I ask them if they can relate the 'Munnabhai' character with electricity. Sometimes, I get the obvious answer about the existence of a 'Circuit'. Then I go on explaining other similarities and difference between the two as explained in the IAEMP Vision Document.

Conclusion

I am of the strong opinion that if proper and systematic training is provided by trained persons the consumption in domestic sector can be brought down by at least 40-50 %. Similar programmes for offices, schools etc need to be started. Instead of organizing ritualistic painting and essay competitions, campaigns etc, a cadre of professionals needs to be created. They may have any background. With little training even servants and security staff can work as Home/Office/School energy manager.

Every day we hear or read newer words and phrases being coined on Global Warming like – ' Carbon Neutral' , Carbon Foot Print', 'Low Carbon Economy', 'Climate Refugees', 'Climate Criminals' ,'Green Currency' and so on prompting us to do our bit to fight the climate change. I feel bringing down our own energy consumption and maintaining it at that level is the best way to fight the Climate Change from the comfort of one's home! And office! All that is needed is commitment and proper training.

About the author

Sunil Sood is an engineering professional with considerable experience in energy management. He is the President of the Indian Association of Energy Management Professionals (IAEMP) based in Bangalore. As part of his activities, he serves as a faculty for IAEMP's Home Energy Management Training Programme.He is employed with MECON LTD,Bangalore He can be reached at sunilsolar@yahoo.co.in

Home Energy Management Training

Annexure-I

Sample accounting of electricity consumption at the author's home

Name of the Occupant: Sunil Sood

Home address of the occupant: F/F, 304,20th Cross, VIth Block, Jayanagar, Bangalore-560082

No. of Occupants: 2 Adults.

Electricity Consumption

Sl. No.	Location	Item Description	Rated Watts	Actual Watts	Estimated KWh per Month	Remarks
A	**Kitchen**					
1.		Mixer	500	300		Used rarely
2.		CFL	15	12.5	2	
B	**Drawing Room**					
1.		Havell CFL	11	9	1.5	
2.		Reliance Landline phone		1-2	1	
3.		Mobiles Chargers		1-3	1	
C.	**Dining Room**					
1.		Fridge 80 Litres	-	150	15-21	0.7 to 0.85 units per day, switched off in winter nights.
2.		TV, Samsung 51"		58-65	7-8	Higher with loud sound, 6 w on remote

Table continued on the next page….

Annexure 1- Sample accounting of electricity consumption

Sr. No	Location	Item Description	Rated Watts	Actual Watts	Estimated KWh per month	Remarks
3.	**Dining Room**	Edison CFL	23	21	3	
4.		Transistor	-	9	1	
5.		Havell Ceiling Fan	50		5-6	18,30,38,54 in 4 speeds with 'Cona' make step regulator
D	**Bed Room-1**					Used as Pooja Room
1.		Philips Iron	1000	860	1-2	
2.		Edison CFL	15	13	2	
3.		LED Lamp	0.8w	0.5		
E	**Bed Room-2**					
1.		Edison CFL	23	18-21	1	
2.		Havell Ceiling Fan	50		6-7	18,30,38,54 in 4 speeds with 'Cona' make step regulator
3.		Mosquito Mat		6		
F	**Change Room**					
1.		Havell CFL	11	9	0.5	
G.	**Bath Room**					
1.		Havell CFL	11	9	0.5	
2.		Immersion Heater	1000	1010	5	10 minutes use

Table continued on the next page….

Annexure 1- Sample accounting of electricity consumption

Sr. No	Location	Item Description	Rated Watts	Actual Watts	Estimated KWh per month	Remarks
H	**Toilet**	LED Lamp	0.8	0.5		
I	**Balcony**	LED Lamp	0.8	0.5		
J	**Veranda**	LED Lamp	0.8	0.5		
K.	**Other Consumer item**	Lap Top			3	60 Whr is consumed for charging the battery which is then available for use for 3 Hrs per day.

Based on the above table, the average electricity consumption is 66 units per month. The target for the next year is to bring it down below 50 units per month.

Notes:

1. Fan mostly used in 1st or 2nd speeds
2. Extra insulation is provided for refrigerator. It has reduced the energy consumption by .1 to .15 units per day
3. Refrigerator is kept off during winter nights
4. Consumption by all LED Lamps is negligible
5. Planning to buy solar water heater /gas-heated geyser
6. Also planning to introduce water recycling and solid waste composting.

Arrogance of a "Switch' –

I am the undisputed King of the electric world; I am present everywhere – in your dining room ,your kitchen, bed room; in your office, schools market. Everywhere! I am omni-present and the most powerful incarnation of the God on Earth! My one signal can stop A/cs, motors fans:; even trains! I control use of more than Rs.6 lakhs crores worth of energy.

Despite my importance, some people tend to neglect me. Every time they do so, I surely and severely punish them by way of increased bills, low voltages, power cuts, and erratic supply. Sometime their neglect causes accidents too. I do not forgive. I am not for forgiveness. I am after all the Emperor of the "United Kingdom of Electrical", my name is the King Switch

(For further reading refer IAEMP Vision Document)

PANCH SHUNYA – FIVE ZEROES

Thermal Comfort System

Based On Traditional Indian Wisdom

By Surendra H. Shah

Abstract: To provide thermal comfort, an energy hungry technology called "air conditioning" is foisted upon us. It is widely acclaimed as the only effective solution for meeting comfort standards related to air temperature and humidity. Never mind that these standards were set for a temperate climate- they are mindlessly applied to our country, which is in the tropical zone, with disastrous results for both our economy and ecology.

By contrast, our heritage buildings such as the Taj Mahal at Agra, the Gol Gumbaj at Bijapur and countless others remain thermally comfortable throughout the year. The method used in such buildings is described as Panch Shunya or Five Zeroes referring to Zero Energy, Zero Carbon, Zero Global Warming, Zero Ozone Depletion, and Zero Water Depletion.

This article describes the Panch Shunya method which is obsolete now, but very much applicable even today.

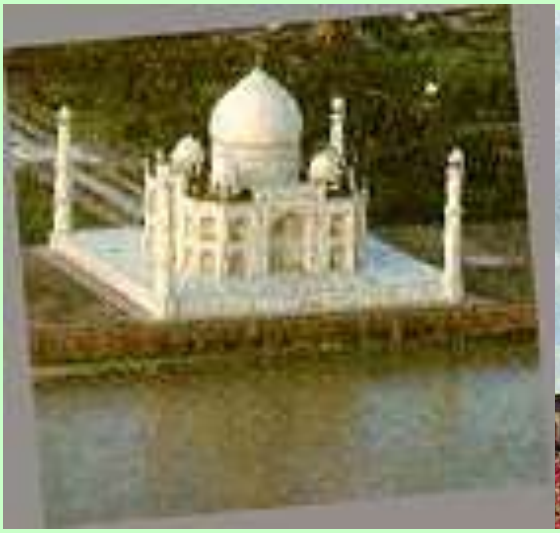
The Energy Issue

Air conditioning systems use refrigeration to pump heat out of conditioned space to achieve thermal comfort. Pumping requires energy. To cool a small room, even an efficient air conditioner would use one kilowatt of electricity. To supply this unit, the power plant would have to use four kW equivalent units of primary energy such as oil or coal etc., due to inefficiencies and losses. Six more primary units account for energy used in drilling, pumping and transporting oil to the power station. Thus ten units of primary energy are used for running an air conditioner using one kW. Each kW equivalent unit of primary energy would emit approximately one half kg of carbon-di-oxide into the atmosphere.

Last year the HVAC industry in India alone added 6000 Megawatts of demand for power. One does not need much imagination to realise what the global warming caused by such demands can do, and is doing, to our environment. Much has been written about it already; there is no need to repeat it here. Instead, we shall look for a solution.

Do we have a solution to this energy issue? Yes – Look at our heritage buildings! They remain comfortable without any mechanical cooling system, earth tunnels or wind towers. What do our heritage buildings teach us?

Our ancestors learned from nature and used that knowledge to keep buildings like the Taj Mahal and Gol Gumbaz thermally comfortable.



An aerial view of the Taj Mahal, Agra

The Gol Gumbaj, Bijapur

They made these buildings massive enough to absorb solar heat and put it on a huge base in contact with a water body that would cool it by conduction and evaporation. The idea was to keep the structure below 34°C, the human skin temperature.

Did they have a secret that we could use?

Our ancient master builders used a three pronged technique to achieve thermal comfort using no energy:

1. Create barriers to thermal transfer
2. Build massive structures and use that mass as a thermal capacitor.
3. Drain out the stored heat.

The barriers were trees, verandas, hollow walls, stone screens etc. Mass was created by thick walls and high ceilings. Drain for the stored heat was provided by water bodies in contact with the plinth and by special plasters that promoted effective radiation to the sky.

The exterior coating contained the mineral barites that contain barium sulphate which has an emissivity of 0.95 and absorptivity of 0.05.

The sun occupies less than half a degree of the sky and heats for less than five hours daily.

The radiant temperature of the rest of the hemisphere is minus 40 degrees during the day, lower at night.

The building absorbs only 5 percent of the sunlight and radiates away 95 percent Conduction and convection both help.

Thus the building remains cool without insulation or artificial cooling.

None of these require any energy at all. Still all our heritage buildings remain within a comfortable temperature range throughout the year. They have zero global warming impact and zero carbon emissions.

Isn't this what the whole world is looking desperately for? Yes and No!

Yes to the technique and **no** to the technology.

The old techniques are obsolete now because:

1. Barriers - While trees, verandas etc are still used in rural and semi urban locations, they are not feasible in high density cities.
2. Massive structures as thermal capacitors – It is too expensive to build thick walls that also reduce the saleable carpet area from the built-up area.
3. Flowing water or open water bodies as heat sinks- Cost of land and decreasing supply of water prevents its general use.

So, we need to develop a new technology based on old techniques:

Applying new technology: The net effect of the above techniques was the reduction of **Mean Radiant Temperature (MRT)**. By keeping the structure cool, our ancestors were able to keep the **MRT** of the interior space below the skin temperature of the occupants. That magic number is 35°C. The MRT of most heritage building is usually below 30°C even today.

The diagrams that follow explain how the solar heat causes high MRT in a modern building, how direct structure cooling reduces it and the effect of a cool structure on the pattern of heat loss from a human body.

By applying a new technology, the same old techniques can work as under:

1. Barriers
    a. R-15 or better above-deck roof insulation
    b. Vermiculite insulation under floor.
    c. Thermal barrier interior paint.
    d. Radiant barrier vertical blinds for windows.
2. Thermal Storage:
    a. A solar/wind driven pump draws water from a large underground tank and circulates it through pipes in direct contact with the structure. The water absorbs heat from the structure and is flushed back into the same tank. The water replaces the masonry as the heat storage medium. The stored heat is rejected to the atmosphere via passive means.

The following comparison of the heritage technique and modern technology would help to understand the concept.

Heritage Technique	**Modern Technology**
Uses Real Mass	Employs Virtual Mass –like a welded grid of steel tubes filled with water and connected
Makes use of Real River	Virtual River – like a cooling tower circulating cool water through the grid

Water in the steel grids may be led to a cooling unit without pumping, using thermal forces only and cooled by a heat exchanger located within the cooling unit.

Based on his experience, the author provides the following supplementary information in support of the technology:

- One of the applications for this technology required small amount of energy and some water (about 200watts and 300liters/day) to extract three tons of cooling load from 1000 sq. ft. of roof, saving 4.5 kW of demand. This works out to a COP of 22.5 watts/watt. If solar electricity is used then it becomes a four zero system.

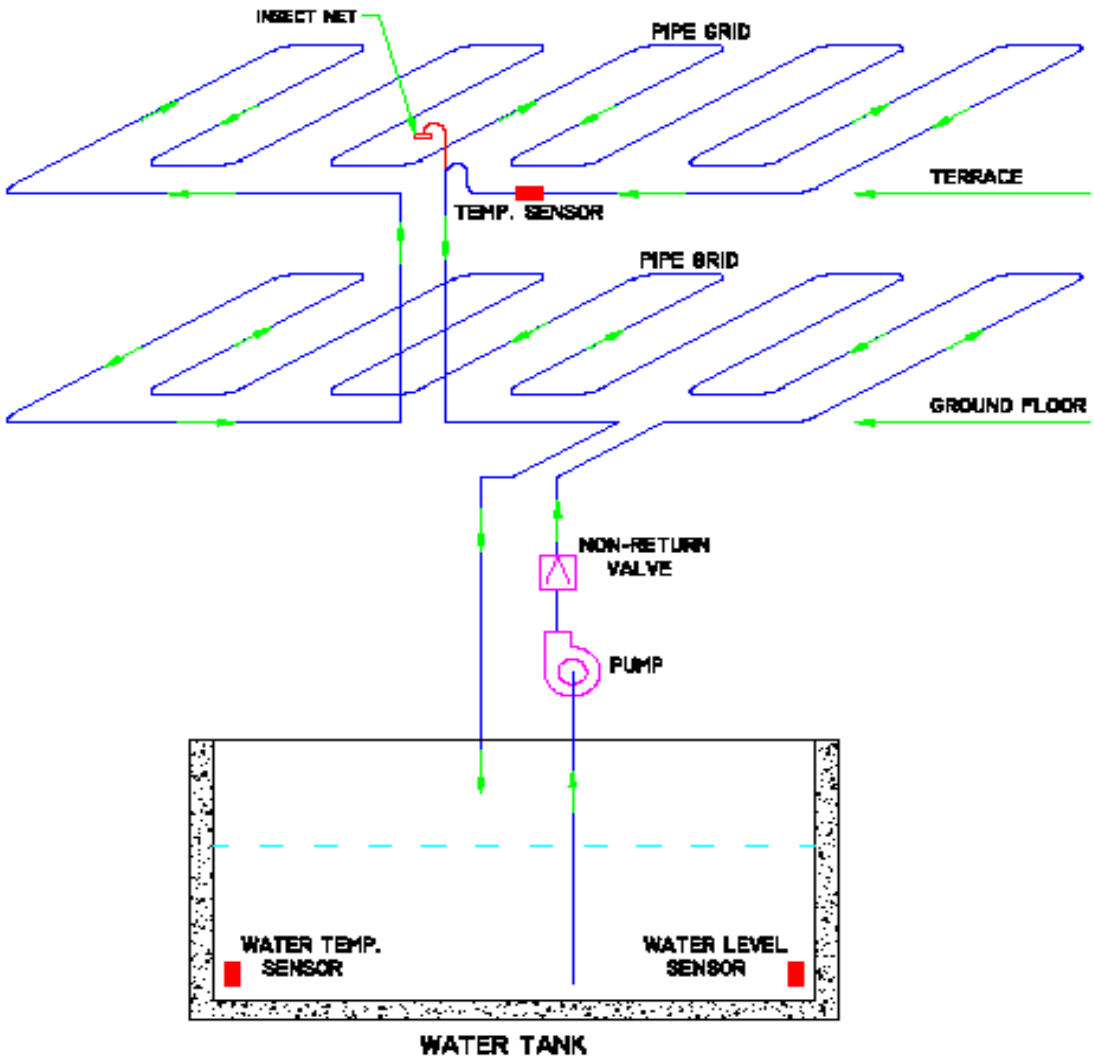
- Every new urban apartment cluster is required by law to have a rain water harvesting tank. For Panch Shunya, this tank could be suitably enlarged and used as a thermal storage device.

- Cost directly attributed to the system would only include the cost of a small pump, the solar panel pipe grid and simple controls. The total installed cost would not exceed that of air conditioning. However, it is not a replacement for air conditioning. Although many will find indoor conditions adequate, there will be some who would fit a/c anyway on top. In the first case, the operating cost will be zero, not counting interest. In the second, the energy bill will be reduced by at least one half in a residence.

Our HVAC industry added 6000 Megawatts of demand in one year. So you can imagine the effect of wide adoption of this ancestral wisdom could do our energy scene and global warming. No fuel is used in this ancient system, there are no emissions of carbon, water, or ozone depleting substances and it has zero global warming potential.

The Panch Shunya System is the modern version of what our heritage buildings used to remain cool even today without using any energy or causing emissions. The following pages that are part of this article illustrate the system through a schematic diagram, an analysis of roof and wall surface temperatures, and test readings taken at a building in Ahmedabad.

The Panch Shunya System is not patented and has no secret processes. Thus it can, and must be promoted worldwide as India's perfect answer to global warming caused by air conditioning.

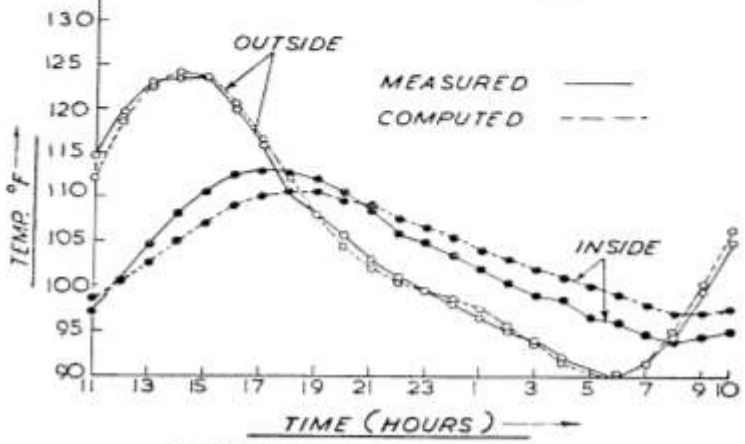


SCHEMATIC DIAGRAM

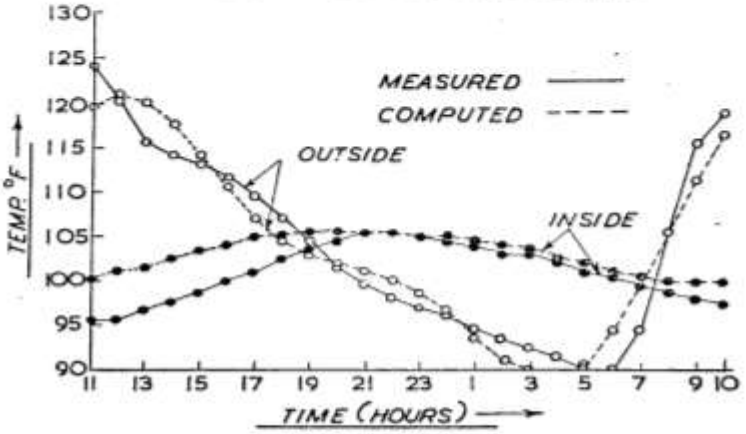
COMBY ® IS THE TRADE MARK OF M/S. PAN ASIA CORPORATION.

PRODUCT. STRUCTURE COOLING SYSTEM				CLIENT. INDIGO ARCHITECTS		
TITLE. PIPING LAYOUT				Panasia Engineers Pvt. Ltd.	SCALE. N.T.S	CHKD. S.G.
REV. NO. 1	DWG. NO. PEPL/M/013/1	SHEET NO. 1 OF 1	DATE. 03-08-09		DRN. JULIUS	APPD.

FROM: GUPTA & RAYCHAUDHURI: ANALYSIS OF UNCONDITIONED BUILDINGS



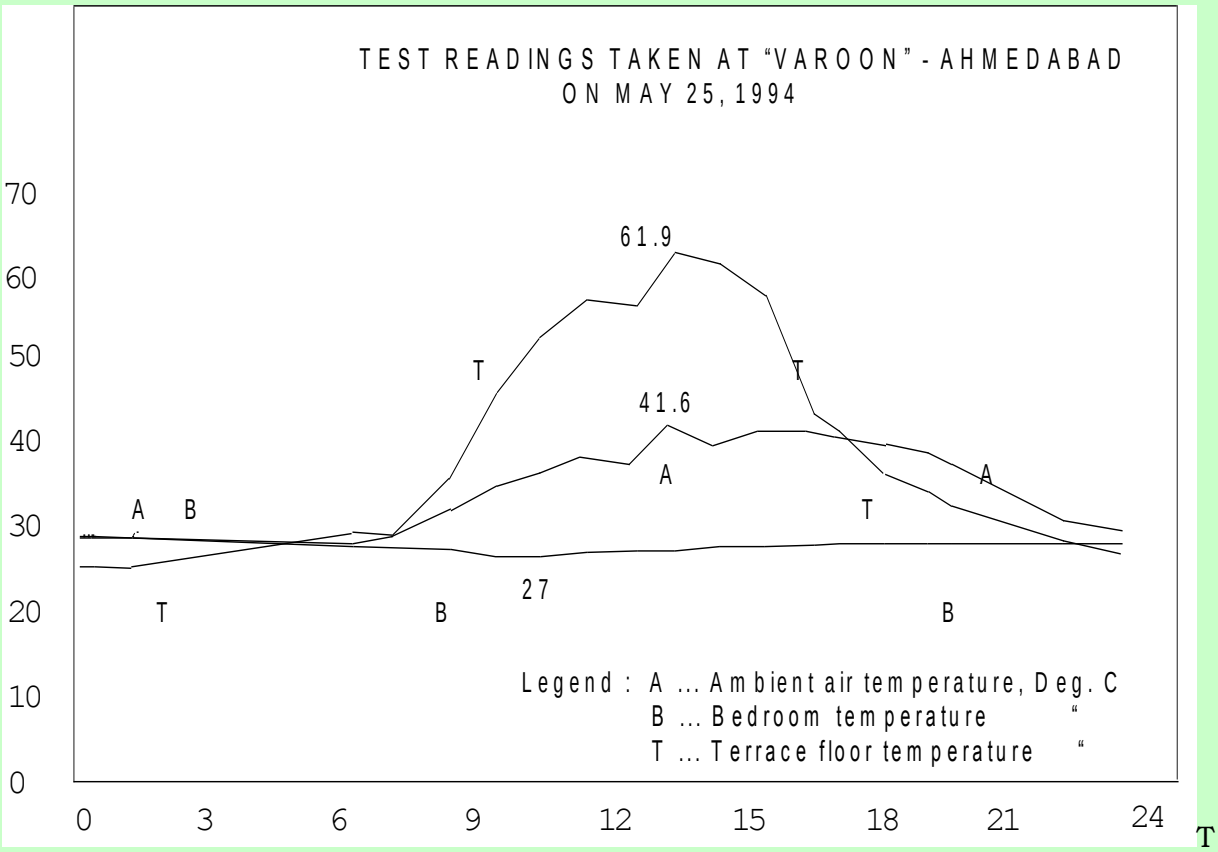
DIURNAL VARIATION OF ROOF SURFACE TEMPERATURES



DIURNAL VARIATION OF EAST WALL SURFACE TEMPERATURES

FIG. 1

These diagrams are a part of the article “Panch Shunya” by Surendra H. Shah



Effect of direct structure cooling on inside temperature.

The bedroom under the roof remains below 30°C all the time

This diagram is a part of the article "Panch Shunya" by Surendra H. Shah

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About the author:

Surendra H. Shah has over 12 years of experience in many applications related to this article. For more information, please contact him at mail.surendrashah@gmail.com

IAEMP ACTIVITIES IN NEWS

THE HINDU , 16th August'08

http://www.thehindu.com/2008/08/16/stories/2008081654050800.htm

DECCAN HERALD,26th August'08

http://www.deccanherald.com/content/Aug262008/state2008082586575.asp

http://www.deccanherald.com/Content/Aug262008/state2008082586579.asp

PRAJAVANI,2nd Sept'08

(This is Kannada Language paper, link not known)

(Excerpts from the half page coverage in DH on 26th August'08)
http://www.deccanherald.com/Content/Aug262008/state2008082586579.asp -A report by Ms.Rashmi R.Hebbur

Learn to save some energy

Bangaloreans can now access some hands-on training on various aspects of home or office energy management. The Indian Association of Energy Management Professionals (IAEMP) has launched a Home/Office Energy Conservation Information-cum-Training Centre in City. The centre is at No 304, 20th Cross, 6th Block, Jayanagar, Bangalore, and is open between 5.30 to 7 pm. Call 9241778871 for details IAEMP also has published a Vision Document for 2022, with ideas and strategies for private and public implementation of energy conservation methods. The Association is open to voluntary participation. For details, call Sunil Sood on 9241778871, e-mail sunilsolar@ yahoo.co.in or visit www.iaemp.org

UPCOMING EVENTS

Carbon Markets India September 29-30, 2008
Mumbai, India
www.greenpowerconferences.com/carbonmarkets/carbonmarkets_india_2008.html

World Energy Engineering Congress (WEEC) October 1-3, 2008
Washington, D.C. USA
www.aeecenter.org/weec

India Energy Conference - Oil, Gas & Alternatives October 3-4, 2008
New Delhi, India
www.teriin.org/iec

Cleantech Forum XIX October 7-8, 2008
Mumbai, India
www.cleantech.com

Green Energy Summit 2008 October 16-19, 2008
Bangalore, India
www.greenenergysummit.com

POWER-GEN Asia October 21–23, 2008
Kuala Lumpur Convention Centre
Kuala Lumpur, Malaysia
www.powergenasia.com

Sustainable Manufacturing Summit Europe November 17-18, 2008
Brussels, Belgium
www.greenpowerconferences.com

Green build International Conference & Expo November 19-21, 2008
Boston, USA
http://www.greenbuildexpo.org

Ist Envirotech'08, and "Energy Tech'08" 14th – 17th December, 2008
Pragati Maidan, New Delhi
www.indiatradefair.org
www.envirotech-india.com

The Cheer Columns

In this and the next few pages that follow, The Urja Watch presents a few columns that are unrelated to energy issues. These are intended to bring cheers and provide inspiration to our esteemed readers. You too can contribute anecdotes, and articles. We love your feedbacks too! E-mail to 'tellsubi@gmail.com'- *Editor*

The Wisdom of Socrates

In ancient Greece, Socrates was a great philosopher and widely acclaimed for his wisdom. One day, a friend ran up to him excitedly and said, "Socrates, do you know what I just heard about one of your students called Plato?"

"Wait a moment," Socrates replied. "Before you tell me anything, I' would like you to answer a few test questions. It's called the Triple Filter Test".

"Triple filter?" asked the friend.

"That's right," Socrates continued. "Before you talk to me about my student, I am going to ask you three questions"

The first Filter is Truth. Have you made absolutely sure that what you are about to tell me is true?"

"No," the man said, "actually I just heard about it and..."

"All right," said Socrates. "So you are not sure if it's true or not.

Now let's try the second filter, the Filter of Goodness. Is what you are about to tell me about my student something good?

"No, on the contrary..." said the man.

"So," Socrates continued, "you want to tell me something bad about him, even though you're not certain it's true?"

The man shrugged, a little embarrassed.

Socrates continued. "You may still pass the Triple Filter test though, because there is a third filter - the Filter of usefulness. Is what you want to tell me about my student going to be useful to me?"

"No, not really..."

"Well," concluded Socrates, "if what you want to tell me is neither True nor Good, nor even Useful, why tell it to me at all?" The man was defeated and ashamed.

A Tribute to Sir M. Visveswaraya

Editor's Note: Bharat Ratna Sir. M. Visvesvaraya's Birthday on September 15 is celebrated as 'Engineer's Day'. Through this short write-up, "The Urja Watch" pays tribute to Sir. M. Visvesvaraya on this day.

"Remember, your work may be only to sweep a railway crossing, but it is your duty to keep it so clean that no other crossing in the world is as clean as yours" said Sir. M. Visvesvaraya, one of the most celebrated engineers of India.

The obsession for perfection and excellence is clearly reflected in the above quotation. Any endeavour that Sir. Visvesvaraya took up for implementation, he executed with a great degree of perfection.

An engineer by profession and a genius, Sir MV, as he was affectionately and respectfully addressed, was the architect of the Krishnarajasagara dam, which has amazed and enchanted thousands of people from all countries. It is one of the biggest dams in India which irrigates a hundred and twenty thousand acres of land. Graduating from the College of Engineering, Pune, he was instrumental in designing the Khadakwasla earthen dam near Pune. The Bhadravati Iron and Steel Works, the Mysore Sandal Oil Factory and the Mysore Soap factory, Mysore University, the State Bank of Mysore (it was first named The Bank of Mysore) - all these were the gifts of one man, Sir MV - and he gave these to his country, when it was still not free. Bharata Ratna (The gem of India), the highest honour for a citizen of India was conferred on him in 1955. He achieved celebrity status when he designed a flood protection system to save Hyderabad city from floods. He was also instrumental in developing a system to save the Visakhapatnam port from sea erosion.

After taking a voluntary retirement in 1908, he was appointed Dewan of Mysore, one of the largest and most important princely states in India. With the support of HH The Maharaja of Mysore, Krishnaraja Wodeyar IV, he made an arguably unprecedented contribution as Dewan to the all-round development of the state. Not only the KRS dam & reservoir, but also the hydel projects at Shivanasamudra, the steel mills at Bhadravati, the University of Mysore and many other industries and public works owe their inception or active nurture to him. He was instrumental in setting up the Government Engineering College in 1917 in the city of Bangalore, one of the first Engineering institutes in the country. This institution was later named the UVCE (University Visvesvaraya College of Engineering) after its founder; it remains one of the most reputed institutes of higher learning in Karnataka.

The institutions named in his honour are deservedly a legion, and include the technical university, Visvesvaraya Technological University, Belgaum, to which all the state engineering colleges of the Karnataka state are now affiliated. As part of his birth centenary celebrations, the Visvesvaraya Industrial and Technological Museum was set up in Bangalore.

The Century Club in Cubbon Park where IAEMP has held many programs was founded by Sir MV. It is called 'Century Club' because it started with 100 members.

Sir MV, a great philanthropist, a fearless patriot and a soul of great conviction died at the ripe age of 101. His famous quote was "Industrialise or Perish". He was one of the makers of Modern India. Every one of his creations was mighty and magnificent.

From his boyhood Visvesvaraya was eager to learn new things. When he was past one hundred, a relative was going to Madras; he asked Sir MV, "What shall I bring you from Madras?" Said MV, "Bring me a good Modern English Dictionary."

We derive inspiration from Visvesraya's life. Let all of us join in saluting the noble and great soul of Sir MV, whose birth day falls on September 15.

Learning To Be Lucky

A question we often ask is - Why do some people get all the luck while others never get the breaks they really deserve?

A psychologist says he has discovered the answer. Let's take a look at the summary of findings by Professor Richard Wiseman, University of Hertfordshire.

Ten years ago, I set out to examine luck.

I wanted to know why some people are always in the right place at the right time, while others consistently experience ill fortune.

I placed advertisements in national newspapers asking for people who felt consistently lucky or unlucky to contact me.

Hundreds of extraordinary men and women volunteered for my research and, over the years, I have interviewed them, monitored their lives and had them take part in experiments.

The results reveal that although these people have almost no insight into the causes of their luck, their thoughts and behaviour are responsible for much of their good and bad fortune.

Take the case of seemingly chance opportunities. Lucky people consistently encounter such opportunities, whereas unlucky people do not.

I carried out a simple experiment to discover whether this was due to differences in their ability to spot such opportunities.

I gave both lucky and unlucky people a newspaper, and asked them to look through it and tell me how many photographs were inside.

I had secretly placed a large message halfway through the newspaper saying: "Tell the experimenter you have seen this and win £250."

This message took up half of the page and was written in type that was more than two inches high.

Anxiety

It was staring everyone straight in the face, but the unlucky people tended to miss it and the lucky people tended to spot it.

Unlucky people are generally tenser than lucky people, and this anxiety disrupts their ability to notice the unexpected.

As a result, they miss opportunities because they are too focused on looking for something else.

They go to parties intent on finding their perfect partner and so miss opportunities to make good friends. They look through newspapers determined to find certain types of job advertisements and miss other types of jobs.

Self-fulfilling prophecies

Lucky people are more relaxed and open, and therefore see what is there rather than just what they are looking for.

My research eventually revealed that lucky people generate good fortune via four principles.

They are skilled at creating and noticing chance opportunities, make lucky decisions by listening to their intuition, create self-fulfilling prophesies via positive expectations, and adopt a resilient attitude that transforms bad luck into good.

Towards the end of the work, I wondered whether these principles could be used to create good luck.

I asked a group of volunteers to spend a month carrying out exercises designed to help them think and behave like a lucky person.

Dramatic results

These exercises helped them spot chance opportunities, listen to their intuition, expect to be lucky, and be more resilient to bad luck.

One month later, the volunteers returned and described what had happened. The results were dramatic: 80% of people were now happier, more satisfied with their lives and, perhaps most important of all, luckier.

The lucky people had become even luckier and the unlucky had become lucky.

Finally, I had found the elusive "luck factor". Here are Professor Wiseman's four top tips for becoming lucky:

- **Listen to your gut instincts - they are normally right.**
- **Be open to new experiences and breaking your normal routine.**
- **Spend a few moments each day remembering things that went well.**
- **Visualise yourself being lucky before an important meeting or telephone call. Luck is very often a self-fulfilling prophecy.**

We Need Your Articles…

Do you have an area of expertise in energy management? Have you solved a difficult problem or have an interesting case study?

Share your knowledge with others and promote yourself too, by contributing an article to **The Urja Watch.**

You may also tell us about upcoming energy-related events in your area. Be sure to mention the title of the event, organizers, dates, venue, city, and contact information to get more details of the event.

Please note the following points while making your submissions:

- Articles must be original, in electronic version, 500 words or less.
- Please include contact information (full name, title/organization, phone numbers, and email ID) with your submission.
- Articles should be in MS word, easily readable font, preferably Arial size 12.
- Please e-mail your article to Editor, "The Urja Watch" at tellsubi@gmail.com
- There are no deadlines for submissions. You may submit articles anytime.
- We reserve the right to edit, rewrite or reject any article.

We Need Your Feedback Too!

Please feel free to write your views and suggestions to the editor at: tellsubi@gmail.com

Letters must include the writer's name, address, phone and email ID.

We appreciate your feedback and thank you for your support.