

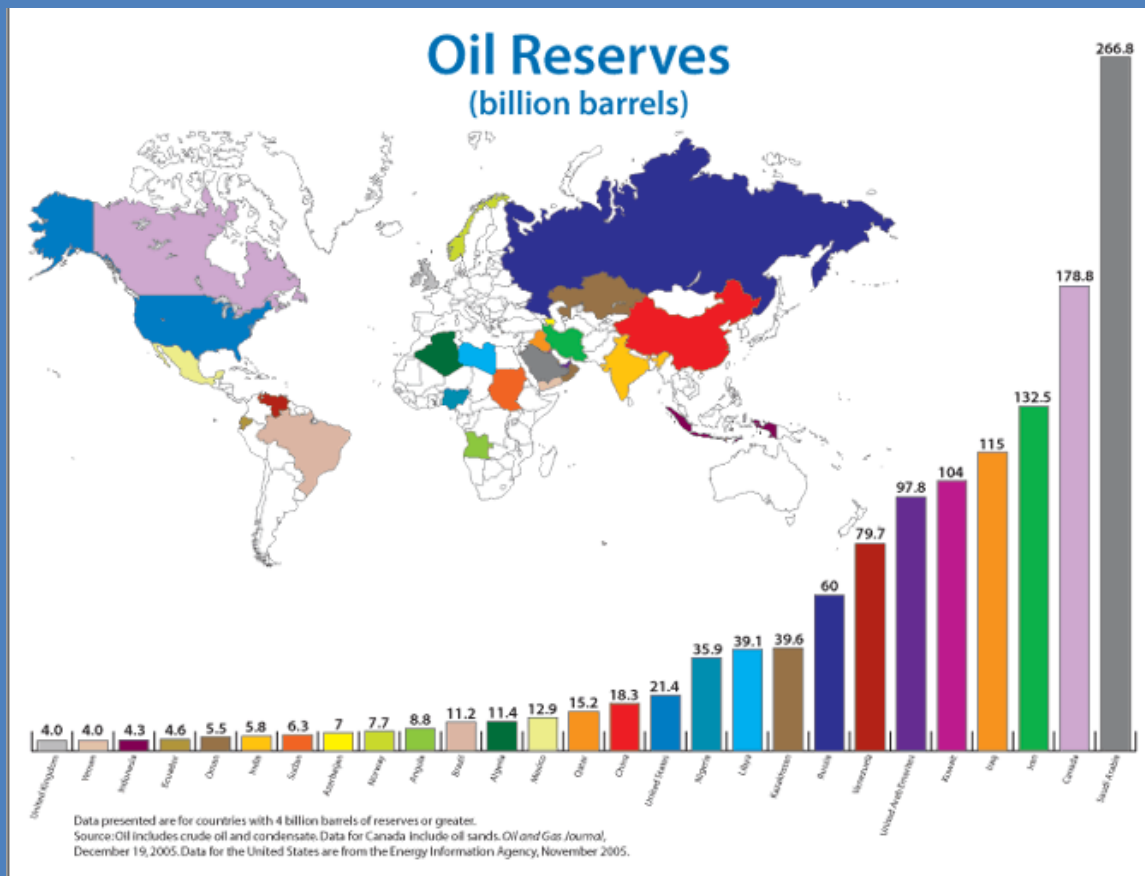
A monthly newsletter of  
*Indian Association of Energy Management Professionals*

# THE URJA WATCH

April 2009, Vol. II/Issue 10

*It is about "Conscience Keeping on Energy Matters"*

## Focus on Oil and Gas Sector



**FOCUS ON  
OIL AND GAS SECTOR**

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## **From the Editor's Desk...**

### **The Challenge Ahead for India's Oil and Gas Sector**



Dear Readers,

Today (April 22) is the World Earth Day. It is a day Earth's designed to inspire awareness and appreciation for the environment. Rising early this morning, I traveled comfortably from Chennai to Bengaluru by train covering a distance of 362 Kms in just five hours. In Bengaluru city, it took me about an hour to travel by road a distance of less than 20 Kms.

The city roads were choked with slow moving and chaotic traffic. No doubt, the air was heavily polluted.

The situation is no different in many other cities. Besides a huge amount of fuel being wasted by idling vehicles, the air that we breathe gets highly polluted by the exhaust gases. The road transport sector is the largest consumer of commercial fuel energy within the transportation system in India and accounts for over one-third of the total liquid commercial fuel consumption by all sectors.

India's transportation sector has grown rapidly, particularly passenger vehicles. Through the 1990s, passenger cars grew at an average rate of 11.4% per year (Insight 2001). Two-wheelers grew at a staggering 13.6% from 1999-2000 to 2004-05 (CRIS-INFAC 2005), and over 11% from 1992-2000 (India Infoline). Estimates indicate that by the year 2016, India's on road vehicle population is expected to be over 370 million from the present level of around 60 million vehicles. A similar increase can be expected in the fuel consumption and consequent air pollution. It is therefore important to focus attention on the transportation sector and find ways to reduce fuel consumption.

Apart from the air pollution caused by excessive fuel consumption, there is a significant impact on the country's economy. A recent case study (published in this issue) observes that in the city of Delhi alone, idling vehicles at traffic signals cause an estimated loss of Rs. 994 crores per annum - equivalent to a massive Rs. 272.5 lakhs per day. If this is the amount of loss in just one city, the amount of fuel being wasted and the air pollution created by vehicles on a national scale must be far greater. How do we address such a critical situation?

While the study makes clear recommendations on remedial measures, there is an urgent need to improve public transportation services and vehicle efficiencies.

Besides the transportation sector, conservation of oil and gas is of major concern to many industries today. A large number of oil and energy conservation equipment is available in the market for a wide variety of applications suiting different industrial purposes. Synthetic oil constructed from pure chemicals could be a good substitute for lubricant oil such as conventional oil refined from petroleum. Many of the oil-saving products are demonstrated to be cost-effective.

Several measures to save oil and gas are already in place but they are just not adequate given the explosive growth in the vehicle population and the aging infrastructure. After the oil shock in the '70's, the Government of India set up the Petroleum Conservation Research Association (PCRA) as a nodal agency under the Ministry of Petroleum & Natural Gas for encouraging conservation & optimum use of oil and gas sources of energy. Over the last three decades, the PCRA has been working to create mass awareness through various publications, workshops and other activities. In this issue, we are pleased to publish some articles on PCRA's activities. We acknowledge with thanks the information provided through PCRA sources.

The estimated reserves of crude oil in the country exceed 700 Million Metric Tonnes while that of natural gas is in excess of 1000 Billion Cubic Metres. The figures may look impressive but remember, the reserves are not going to last eternally. The demand for hydrocarbon source of energy will continue to grow in India with more vehicles on the road and rapid economic growth of the country. The challenge ahead for India's oil and gas sectors clearly lies in effectively addressing issues related to - price increases in oil and gas, growth in crude imports, and significant environmental damages. Oil and gas conservation should, therefore, be accorded a top priority in the country.

In raising awareness and promoting fuel-saving projects, non-profit organizations like PCRA and IAEMP have a crucial role to play. This is also the most appropriate time to empower and motivate individuals to make meaningful personal changes toward a sustainable future. As usual, we encourage readers to share their thoughts and provide us feedbacks.

Energetically,

S. Subramanian  
Editor

## Letters to the Editor

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Dear Sir.

I am engaged in the promotion of renewable energy, energy conservation and energy efficiency in the state of Chattisgarh.

Recently, I have gone through the latest issue of your magazine “The Urja Watch.” It is really excellent, very comprehensive, highly informative and most interesting magazine.

I would like to receive it regularly. Please include my name in your mailing list.

Thanks.

Sanjeev Jain  
Certified Energy Auditor  
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## **Losses of Petroleum Products - A Study at Traffic Intersections in Delhi**

**Abstract:** In a formal study spread over three months on 12 busy traffic intersections in the capital city, it was found that Delhi loses a whopping Rs.994 Crores per annum or a massive Rs 272.5 Lakhs per day due to idling of vehicles at traffic lights. It was also revealed that the Capital wastes 3,311 lakh litres of fuel every year as vehicles idle at many traffic intersections. The study was conducted by the Central Road Research Institute (CRRI) and the Petroleum Conservation research Association (PCRA).

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### 1. Introduction

Transport performs a key role in achieving fast economic growth. Road Transport is the dominant consumer of the petroleum products. The usage is high due to the alarming increase in travel demand and growth of vehicles. The vehicle owners have to overcome congestion and delay on roads. There is considerable loss of fuel due to idling of vehicles at the traffic intersections which results in increase of operating cost and wastage of precious fuel.

### 2. Objective of the study

To estimate the total fuel loss per day due to idling of vehicles at traffic intersections in Delhi and to recommend remedial measures for conserving fuel at intersections.

### 3. Methodology Adopted

3.1 Ten types of vehicles along with their idling fuel consumption adopted for this study is as given below:

S. No.	Type of Vehicle	Idle Fuel Consumption (Litres/Hr)	
		Petrol	Diesel
1.	Ambassador Car	0.78*	-
2.	Premier Padmini Car	0.49	-
3.	Maruti (800)	0.45	-

4.	Three Wheeler (Bajaj)	0.42	-
5.	Two Wheeler (Super)	0.34	-
6.	Diesel Jeep	-	0.74*
7.	LCV & Mini Bus	-	0.69
8.	Bus (Tata UGA-120, 692-DI)	-	0.86
9.	Ashok Leyland Truck (Commet)	-	0.88
10.	Tata Truck (1210 SE)	-	0.92*

*\*Adopted from Road User Cost Study in India-CRRI, 1982. Others are based on study by Indian Institute of Petroleum, Dehradun - 1996.*

3.2 Total signalized traffic intersections in Delhi i.e. 466 Nos. were listed. These intersections were classified into three categories based on the traffic volume as follows:

Type of Intersections	No. of Intersections	of Vehicles crossing per day (in Lacs)
No. of high volume Intersections	183	More than 1.00
No. of medium volume Intersections	250	0.6 to 1.00
No. of low volume Intersections	33	Less than 0.6

#### 4. Field Experiments

To arrive at the volume and compositions of traffic approaching the signalized intersection from each arm and measure the delays to these vehicles at the intersection, field studies were organized from 6.00 am to 10.00 pm. These field studies were repeated for three working days of the week.

4.1 Selection of Survey Points: Nine signalized intersections were identified on arterial roads of Delhi. The intersections were identified on the basis of available records of traffic volume, projected traffic and carriageway widths of the intersections roads.

The names of the traffic intersections are given below:

S. No.	Intersection	Type of Intersection
1.	Ashram Intersection	High volume Intersection
2.	Delhi Gate Intersection	High volume Intersection
3.	Punjabi Bagh Intersection	High volume Intersection
4.	Zakir Hussain Intersection	Medium volume Intersection
5.	Lajwanti Intersection	Medium volume Intersection
6.	Madhuban Chowk Intersection	Medium volume Intersection
7.	Siri Fort Intersection	Low volume Intersection
8.	Escorts Heart Centre Intersection	Low volume Intersection
9.	Preet Vihar Intersection	Low volume Intersection

4.2 Traffic Volume Counts: Classified traffic volume counts by direction for each arm and each phase were recorded by a set of trained enumerators on specially designed proforma from 6.00 am to 1.00 pm at all the nine intersections. This survey was repeated for three working days per intersection for eliminating the daily variation. Free left turning vehicles were not included in the study as they were not subjected to delays. Data was collected for each traffic movement sequentially as per signal phases at each of the selected intersection.

4.3 Measurement of Delay: This study was conducted along with the traffic volume survey, with the help of a test car operating at normal safe speed of the stream. Efforts were made to record the idling time (stopped time of the test vehicle) with the help of electronic stop watch for each direction of traffic movement during different periods of the day from 6.00 am to 10.00 am in various periods as indicated in the next table.



Type	Time Period
Morning Off-Peak	6.00 am to 8.00 am
Morning Peak	8.00 am to 12.00 noon
Morning Off-Peak	12.00 noon to 4.00 pm
Evening Peak	4.00 pm to 8.00 pm
Evening Off-Peak	8.00 pm to 10.00 pm

4.4 Video Recording: Video recording of traffic movements was done at each of the selected intersections for a total period of 3 hours, comprising of one hour for each time periods representing morning peak, off peak between two peaks and evening peak. The video camera was positioned at vantage points at five of the nine intersections. Due to the absence or non-availability of vantage points, video camera was placed at appropriately suited corner of the intersection for the remaining four intersections to record the traffic movements.

## 5. Data Analysis

5.1 Average Daily Traffic: Classified traffic volume counts made during green periods of the signal cycle time have been verified with the help of video recording made at all the nine intersections. The counts for all the traffic directions, (except for free left turns –not subjected to traffic delays) were summed up to arrive at the classified traffic volume.

On the basis of the previous studies made by CRRI and others, the relationship between 16 hrs. counts and 24 hrs. Counts were established and the same were employed to determine the night traffic between 10.00 pm to 6.00 am. Average hourly classified traffic for each intersection is determined by taking the average of corresponding hourly traffic over three days for which counts were made. Based on the average hourly volumes, Average Daily Traffic (ADT) is estimated for each intersection.

5.2 Estimation of Delays to vehicles: Delays of vehicles during different hours of the day were calculated by multiplying the classified traffic flow with the corresponding delay measured by the experimental vehicle for three days and average out for the estimation of average hourly classified vehicle delays for the average of three days.

5.3 Average Idling fuel consumption: With the help of idling fuel consumption figures for each vehicle the hourly average fuel losses (separately for petrol and diesel) have been estimated for each category of intersection.

#### 5.4 Estimated fuel and monetary losses per day in Delhi

Type of Intersection	Petrol (in Ltrs/Day)		Diesel (in Ltrs/Day)	
High vol.	958	175347	319	58370
Medium vol.	536	134018	168	41923
Low vol.	366	12067	61	1019
Total		321432		101312

### 6. Remedies to reduce delays

Due to time sharing nature of the traffic control devices at the intersections there are bound to be delays. The following remedial measures have been suggested to reduce/minimize vehicular delays and consequently avoiding expected loss of precious petroleum products due to idling to the vehicles to some extent.

#### 6.1 Traffic Engineering/Management Measures

- Installation of vehicle actuated traffic signals.
- Provision of flyovers and grade separated interchanges at the high volume and priority intersections.
- Optimization of signal cycle timings.
- Co-ordination of synchronization of traffic signals on important routes (using Area Traffic Control systems).
- Provision of adequate road geometrics.
- Differential cycle timings for different periods (peak and non-peak).
- Adequate provisions for free left turns.
- Minimization of the use of private vehicles and more and more use of mass transport.

#### 6.2 Traffic Enforcement Measures

At intersections, lack of discipline either by the vehicle or by the pedestrians can cause and increase the delays resulting in loss of fuel. Therefore, stricter enforcement in terms of lane discipline, STOP line violations or the jumping of red lights etc. need to be controlled.

### 6.3 Traffic Education Measures

Public participation is very important towards the minimization of the loss of fuel. More and more efforts need to be made in this direction in educating the road users for observance of traffic rules eg. parking of vehicles and lane discipline etc.

### 7. Action taken by PCRA based on the study

Based on the studies, the Vice Chairman, PCRA/Addl. Secretary, MOP&NG had advised to the State Authorities, the need for adopting the recommendations of the study on priority in their respective states. To facilitate expeditious action, Chief Secretaries and Secretary transport of the State Governments had been requested to review the above suggestion and take up with CPWD/Municipal Corporation and Traffic Police for initiating suitable action to implement the recommendations.

As a result of follow ups at Delhi, the Lt. Governor has ordered the setting up of a special task force called Traffic Management Task Force (TMTF), to plan better traffic management and coordinate the work of various agencies involved. The high powered panel, will formulate the policy on vehicular movement in Delhi and oversee its implementation. The TMTF is headed by Lt. Governor and has Police Commissioner, Members from Govt. & NGOs. School of Planning and Architecture, Automobile Association, CRRI, Transport Secretary, MCD Commissioner, DTC, DESU etc.

Chairman, EC, PCRA had advised the Oil companies to come forward for forward for sponsoring projects for improving the Traffic Management scenario thereby serving the cause of oil conservation and reducing environment pollution.

**“Bread baked without love is a bitter bread that feeds but half a man’s hunger”- Khalil Gibran as quoted in “Wings of Fire”- An Autobiography of A P J Abdul Kalam with Arun Tiwari**

**Those who can not work with their hearts achieve but a hollow, half hearted success that breeds bitterness all around. If you are a writer who would secretly prefer to be a lawyer or a doctor, your written words will feed but half the hunger of your readers; if you are a teacher who would rather be a businessman, your instructions will meet but half the need for knowledge of your students; if you are a scientist who hates science your performance will satisfy but half the needs of your mission.**

## **PAN India Campaign to Conserve Petroleum Products**

*The Ministry of Petroleum and Natural Gas has allocated a substantial budget of Rs.40 Crores to PCRA to carry out a special PAN -India campaign on petroleum conservation. The details of the campaign are reproduced from PCRA web site –[www.pcr.org](http://www.pcr.org) .- Editor*

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### **The Need for Pan India Campaign on Conservation of Fossil Fuel & its effect on Climate Change**

India spends maximum of its foreign earnings on importing crude oil for meeting its growing energy demand. On the other hand, Global warming is the looming concern today. CO<sub>2</sub> is the largest contributor to the phenomenon of global warming and petroleum products are the largest source of CO<sub>2</sub> emissions into the environment. CO<sub>2</sub> cannot be stopped being emitted from burning of petroleum products, but it certainly can be reduced to a great extent by way of efficient utilization of these products and that is where the role of PCRA critically comes into fore.

### **Major Concerns**

Following are major concerns why India drastically needs a national movement on petroleum conservation in order to promote fuel efficiency in each sector of the economy:

- World 8 years away from being a living hell – IPCC report - May 2007.
- 450 MMT out of 1100 MMT of CO<sub>2</sub> emissions in India from fossil fuels (POL).
- India 5th largest emitter of CO<sub>2</sub> in the world after USA (5800MT), China (4732 MT), Russia (1529 MT) & Japan (1215 MT).
- Growth of consumption of petroleum products in the Xth Plan was 2.6% annually, when the economy is growing at 8% per annum.
- Projected growth rate of petroleum products for India is 2.4% per annum till 2030.
- Efforts mostly on supply side management (SSM) i.e. NELP, acquisition of assets abroad, JVs with leading oil majors for setting up refineries etc.

- Cost of demand side management is a fraction as compared to SSM
- DSM reduces CO2 emissions
- Most developed and emerging nations heavily into DSM
- Good DSM will ensure that India emerges as an environmentally responsible super power.
- China targeting for 20% reduction between 2006 and 2010!
- Energy Policy for Europe (EPE)2007: 20% reduction in energy consumption by 2020.
- **Japan - 9.2 times more energy efficient per \$1000 of GDP compared to India.**
- Energy consumption levels today in Industrial sector in Japan is same as 1973 levels!
- India consumes petroleum products worth Rs 4 lakh Crores per annum.
- A 2 - 2.5 % conservation would result into a saving of Rs. 8000 - 10000 crores per year!

With concerted conservation efforts, India can achieve 8% GDP growth rate which could be almost POL neutral.

With the above backdrop in mind, PCRA intends to give a new thrust and direction to conservation activities in the country to bring conservation on the forefront of the National Agenda.

The Ministry of Petroleum & Natural Gas, Govt. of India has allocated a budget of Rs.40 Crores to PCRA to carry out this special campaign.

### **Target Group**

PCRA's prime objective is to promote efficient utilization of petroleum products in India.

On an average, the consumption pattern of petroleum products in India is as follows:

- Transport (Petrol, Diesel, CNG, Aviation Fuel) : **51%**
- Industry (Petrol, Diesel, Fuel Oil, Naphtha, Natural Gas): **14%**
- Commercial & Others : **13%**
- Domestic (LPG & Kerosene): **18%**
- Agriculture (Diesel): **4%**

### **Outlines of the Campaign**

- PCRA should engage one of the country's highly experienced and reputed advertising agencies to design and execute the job.
- The campaign will be focused at motivating the users through emotional retina.
- Conceptually, PCRA campaign is to be centered on the children and youth who in turn would motivate their parents towards petroleum conservation.
- Children and youth are the common factor who can bind users of petroleum products across sectors, be it personal vehicle, truck, bus, industry, commercial establishment, household or farmer, hence the campaign would be targeted towards them as the main focus.
- The first campaign could read like "Save Petroleum to save India" from environmental point of view, imbibing a strong feeling in the minds of each child to motivate respective parents towards petroleum conservation.
- A generic campaign on petroleum conservation would be launched simultaneously targeting the parents on the themes like "Save Petroleum to save your child's future."
- Once the generic campaigns are launched and are visible, sector specific campaigns will be launched i.e. targeting the industrial units, transport users, housewives using LPG, farmers using pump sets etc.
- The services of a Brand Ambassador for PCRA campaign would be used extensively.
- A National Theme Song on conservation is to be developed by one of the best music directors of the country.



## Transport Sector

State wise Transport Density in India  
(As per data of Ministry of Road Transport)

Sl.	State	No. of Vehicles (in lakhs)	%age of total	Rank
1	Maharashtra	89.69	12.33	1
2	Tamilnadu	85.75	11.79	2
3	Gujarat	70.87	9.75	3
4	Uttar Pradesh	64.60	8.88	4
5	Andhra Pradesh	57.19	7.80	5
6	Delhi	25.48	5.83	6
7	Karnataka	39.77	5.47	7
8	Rajasthan	38.34	5.27	8
9	Madhya Pradesh	38.04	5.23	9
10	Punjab	35.29	4.85	10
11	Kerala	27.92	3.84	11
12	Haryana	25.48	3.50	12
13	West Bengal	25.48	3.50	13
14	Orissa	15.25	2.10	14
15	Jharkhand	12.17	1.67	15
16	Chattisgarh	12.16	1.67	16
17	Bihar	7.51	1.03	17
18	Assam	7.27	1.00	18
19	Chandigarh	5.86	0.81	19
20	Uttaranchal	5.16	0.71	20
21	Jammu & Kashmir	4.39	0.60	21
22	Goa	4.36	0.60	22
23	Pondichery	3.13	0.43	23
24	Himachal Pradesh	2.89	0.40	24
25	Nagaland	1.72	0.24	25
26	Manipur	1.06	0.15	26
27	Tripura	0.76	0.10	27
28	Meghalaya	0.73	0.10	28
29	Daman & Diu	0.48	0.06	29
30	Mizoram	0.42	0.06	30
31	Dadra & Nagar Haveli	0.35	0.05	31
32	Andaman & Nicobar	0.28	0.04	32
33	Arunachal Pradesh	0.21	0.03	33
34	Sikkim	0.17	0.02	34
35	Lakshadweep	0.05	0.01	35
<b>Total</b>		727.00		

### **Tips on Fuel conservation in transport sector**

- Switch off your engine beyond 15 seconds at traffic red lights to reduce your petrol bill
- Drive your car at 45 KMPH and save petrol up to 15% against driving at 65 KMPH
- If you drive your car at 80 KMPH, you burn 30% more petrol Correct tyre pressure can save up to 10% petrol
- Maximize use of 5th gear to get better mileage
- Drive in correct gear always for fuel efficiency – incorrect gear driving can lead you 20% increase in fuel consumption
- Keep your engine healthy by regular tuning – it saves you 6% fuel
- Clean your air filter regularly – dust causes rapid wear of engine components and increases fuel consumption
- Avoid frequent apply of Brakes. “stop-and-go” driving wastes fuel. Save fuel by anticipating stops and adjusting your speed accordingly
- Riding the clutch damages clutch linings and causes loss of energy. Keep your foot off the clutch and save fuel
- Don't wait for your car engine to warm up. Drive in low gear till the engine warms up and save fuel
- Share your car for car pool. It considerably reduces your monthly fuel bill
- Even though a slightly longer route, you get more mileage per liter if you take a less congested route
- Judicious use of car Air Conditioner can result in considerable fuel saving. You burn 20% more fuel when AC is in use
- Unnecessary loads increase fuel consumption. A reduction in weight increases fuel efficiency.
- Check the car manual and oil manufacturer's recommendations before using any particular grade of oil. Use recommended grade of engine oil.



## Industrial Sector

### States with high industrial density

State	Types of Industries
<b>Maharashtra</b>	Oil Refinery, Petrochemical, Automobiles, Food Processing, Leather, Floriculture, Textiles, Auto Parts, Pharmaceuticals.
<b>Gujarat</b>	Oil Refinery, Petrochemicals, Textiles, Food Processing, Dairy, Leather, Gems & Jewelry, Electronics, Pharmaceuticals.
<b>Tamilnadu</b>	Oil Refinery, Mineral based industries, Leather, Engineering Industry, Pharmaceuticals, Cotton Textiles, Wood Products, Agro based Industry, Chemical, Automobiles, Poultry, Auto Parts
<b>Karnataka</b>	Automobile, Electronics & Telecommunications, Agro based, Apparel, IT, Bio technology, Handicraft
<b>MP</b>	Cement, Automobiles, Processing, Fertilizer, Paper & Pulp, Electronic Goods, Rubber
<b>Andhra Pradesh</b>	Oil Refinery, Automobile, Mines & Minerals, Textiles, Horticulture, Poultry, IT, Auto Parts
<b>Haryana</b>	Automobile & Auto Parts, Bicycle, Tractor, Machinery, Handloom & Handicrafts, Consumer Durables
<b>Chandigarh</b>	Paper, Chemicals, Metal & Alloys, Machinery, Food Products, Metal, Electrical Goods
<b>Jharkhand</b>	Coal Mining, Heavy Engineering, Textiles, Steel, IT
<b>Rajasthan</b>	Mineral, Agro based industries, Cement, Textiles
<b>Kerala</b>	Oil Refinery, Textiles, Minerals, Biotechnology, Petrochemicals, Rubber, Light Engineering
<b>Orissa</b>	Cement, Minerals, Paper, Iron & Steel, Sugar, Fertilizer
<b>Punjab</b>	Textiles, Pharmaceuticals, Dairy, Poultry, Machine Manufacturing, Electronics, Animal Husbandry, White goods
<b>UP</b>	Auto Ancillaries, Electronics, Engineering
<b>WB</b>	Tea, Jute, Paper, Leather, Engineering
<b>Uttaranchal</b>	Handicrafts, Handlooms, Waxed based
<b>Bihar</b>	Oil Refinery, Engineering Industries, Sugar Mills
<b>Pondichery</b>	Auto Components, Metal, Textiles, Leather, Agro based

### **Tips on fuel conservation in industrial sector**

- Undertake regular energy audit to reduce your energy bill
- Leakage of one drop of oil per second amounts to a loss over 200 liters of oil every year – Carry out energy audit in your industry
- Incomplete combustion leads to wastage of fuel – Carry out energy audit to identify wastage
- Recover and utilize waste heat from furnace flue gases for preheating of combustion of air – Carry out energy audit in your industry
- Reduce heat losses through furnace openings – Carry out energy audit in your industry
- Recover heat from steam condensate – Carry out energy audit in your industry
- Improve boiler efficiency by checking radiation loss, incomplete combustion, blow down loss, excess air and save up to 20% fuel – Carry out energy audit in your industry
- Maintain steam pipe insulation to save considerable amount of fuel – Carry out energy audit in your industry

### **Commercial Sector**

**Cities for Commercial Campaign**

<i>City</i>	<i>City</i>	<i>City</i>	<i>City</i>
<i>Delhi</i>	Mumbai	Chennai	Lucknow
<i>Kolkata</i>	Bangalore	Hyderabad	Kanpur
<i>Pune</i>	Ahmedabad	Cochin	Agra
<i>Goa</i>	Gurgaon	Bhubneswar	Udaipur
<i>Bhopal</i>	Jaipur	Trivandram	Nagpur

### **Tips on fuel conservation in Commercial Sector**

- Carry out energy audit in big buildings to reduce electricity consumption. You can reduce your energy bill up to 35% by auditing energy consumption in your building
- PCRA has already carried out prestigious energy audits in Govt. Buildings, viz. North Block, South Block, Shastri Bhavan, Krishi Bhavan, New Delhi.

## Domestic Sector

Consumers of Domestic Sector are the users of LPG and Kerosene. LPG users are educated and semi-educated, while kerosene users are BPL. Consumers of Domestic Sector therefore are uniformly spread across the country. PCRA is extensively taking up the promotion of Nutan Deep Kerosene Lamp developed by Indian Oil Corporation that is 50% more efficient.

### Tips on fuel conservation in Domestic Sector

- A few minutes of planning ensures a big fuel saving.
- Pressure cooking saves fuel.
- Use optimum quantity of water in cooking to save fuel.
- Reduce the flame when boiling starts.
- Soak before cooking.
- Shallow, wide vessels save fuel.
- Put the lid to prevent heat losses and save fuel.
- Use of the small burner saves LPG.
- A clean burner helps save LPG.
- Allow frozen food to reach room temperature before cooking and save LPG.
- Plan your meal timings and save LPG or electricity on reheating food.
- Use Nutan Deep Kerosene Lamp that saves 50% kerosene in comparison to the conventional bottle and flick kerosene lamp.

## Agriculture Sector


### States for agriculture campaign:

State	State	State
<i>Punjab</i>	Andhra Pradesh	Haryana
<i>Chhattisgarh</i>	Maharashtra	Rajasthan
<i>Tamilnadu</i>	Karnataka	Kerala
<i>Assam</i>	Orissa	Bihar
<i>Gujarat</i>	Uttar Pradesh	Himachal Pradesh

## Tips for fuel conservation in Agriculture Sector

- For Irrigation Pump set, low friction ISI marked foot valve can save up to 10% diesel consumption
- Bigger diameter rigid PVC Pipeline saves considerable amount of diesel in pump irrigation system
- Pipeline arrangement in Pump Irrigation system should not involve bends to save diesel and sharp bends should be avoided
- Know your Tractor and stop diesel leakage
- Turn your engine off when you stop your Tractor
- Drive your Tractor in correct gear ..... always
- Does your Tractor smoke? It means it wastes diesel
- Dirt – your engine's worst enemy... clean engine regularly
- Match hauling capacity with load
- Plan your field run


*Your **commercial building** houses the **key to future!***



**M**ake it energy efficient. Reduce Energy bills. And create a sustainable environment.

Large commercial buildings and offices consume lot of energy. Carry out Energy Audit in your building to identify the sources of wasteful energy use and save up to 20% on your energy bills.

**Unlock value through Energy Audit**

 **PCRA**  
Petroleum Conservation Research Association  
(Ministry of Petroleum & Natural Gas)  
Sanrakshan Bhawan, 10 Bhikaji Cama Place, New Delhi - 110066 Phone: 26198856 E-mail: pcra@pcra.org

Together We can do it

Logos of member organizations: IndianOil, Bharat Petroleum, GAIL, Indian Petrochemicals, BPCL, तजविबो O I D B, ONGC, NRL, Hindalco, Oil India Limited, and others.





**THE WAY YOU  
USE PETROL  
REFLECTS WHAT  
YOU ARE !**



**ATTITUDES CAN BE MEASURED IN LITRES !**



Mr. Farsighted



Mr. Careless

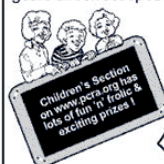


Mr. Self-centered



Mr. Ignorant

To be Mr. Farsighted, **Stretch** every litre the **'I Care !'** way.  
\* Switch off ignition at traffic intersections \* Drive at uniform speed of 45-55 kmph for fuel economy \* Get your vehicle serviced regularly \* Shift gears at correct speeds \* Pool your vehicle.



**Petroleum Conservation Research Association**  
Sanskritkhan Bhawan, 10 Brikasaj Cama Place,  
New Delhi - 110 066 Tel: 6198809, 6198856  
Fax: 6109668 E-mail: pcrad@del2.vsnl.net.in  
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WHERE CONSERVATION FAILS, POLLUTION STARTS • OIL CONSERVATION FOR A CLEAN ENVIRONMENT

# Driver Training Program of PCRA

## Objective

Fuel/lubricants consumption in a vehicle depends on various factors like vehicular design, road conditions, traffic pattern, driving habits, and maintenance practices. Out of these, the quickest and cheapest way to effect saving of fuels is by following good driving habits. Proper driving not only saves fuel but also reduces breakdowns and increases road safety. This also reduces the pollution levels due to vehicle emissions.

The objective is to train drivers/driver instructors and mechanics of the organized and unorganized sectors of the road transport on good driving habits and maintenance practices. Also, to develop a cadre of drivers and driver instructors who can further train other drivers on their own and thus promote and propagate fuel conservation in the road transport sector. On an average a saving of about 10-20 percent of diesel consumption is possible.

Training Mechanism: Each training program is for three days.

### Day-1

- A suitable route covering a distance of 5-10 KM is chosen.
- A special calibrated tank developed by PCRA for storage of diesel is fitted in the bus so as to measure the exact fuel consumption.
- Each driver drives the bus on the selected route as per his usual driving habits. PCRA trained Driver Instructor accompanies the driver and takes down the good and poor driving habits on a standard format.

The time taken and KMPL recorded for each driver is handed over to the driver after completion of driving test.

### Day-2

A class room session is conducted and the drivers are explained on the good driving/maintenance practices. In the afternoon, analysis is done on individual driver's driving habits and practical problems in achieving the conservation to the desired extent. A video film 'Driving for Diesel Economy' is also shown.

### Day-3

Once again all the drivers are asked to drive the same bus on the same bus on the same route as on day-1 under the supervision and guidance of PCRA Driver Instructor who monitors each driver's performance and corrects those on-the-spot wherever required.

## **Model Garages Scheme of PCRA**

The objective of the scheme is to provide financial assistance in the form of soft loan for procuring maintenance equipment in selected garages of STUs/fleet operators/retail outlets etc. to demonstrate the benefits achievable through better maintenance practices and thereby other garages and fleet owners to save fuel on a large scale by adopting this concept in their garages also. The instruments and equipment for which the loans are granted are as under:

S. No.	Instruments / Equipment
1.	Diesel Injector Testing Machine
2.	Air Compressor
3.	Fuel Pump Testing Machine
4.	Pneumatic Grease Gun
5.	Nozzle Grinding Machine
6.	Automatic Bus Washing Machine
7.	SAJ Froud Test Plant for TATA/Ashok Leyland Vehicles
8.	Recambering Machine
9.	Wheel alignment equipment
10.	Brake Tester
11.	Diesel Engine Diagnostic instrument/equipment
12.	Wheel Balancer
13.	Eddy current dynamometer with Microprocessor for engine testing
14.	Auto Service Lift Station
15.	Engine Exhaust analyzer / smokemeter

16.	Hydraulic Elect. Dynamometer
17.	Lubrisencer / Engine Oil testing kit
18.	Exhaust Gas Analyser for Petrol Driven Vehicle
19.	Honing machine/cylinder boring machine /crankshaft grinding machine
20.	Spark Plug Tester
21.	Automatic Tyre Inflator with Gauge
22.	Valve Seat Cutting Machine
23.	Horizontal Line Boring Machine
24.	Connecting Rod Aligner

Under this scheme, there is no provision for giving loan towards the purchase of spares and consumables.

### **Loan Scheme**

A beneficiary can take assistance in the form of part loan from the PCRA for the purchase of above equipment up to 50% of the cost, of Rs.10 Lacs whichever is lower, with the beneficiary contributing the balance 50%. An interest of 8% on reduced principal basis per year shall be charged. The repayment of loan shall be made in six equal annual installments (principal & interest) and the payment will start after one year from the disbursement of loan.

**Let craft, ambition, spite,  
Be quenched in Reason's night,  
Till weakness turn to might,  
Till what is dark be light,  
Till what is wrong be right!**  
- Lewis Carroll

**If you want to leave your foot prints  
On the sands of time  
Do not drag your feet**



## Ideas for from IAEMP Vision Document

( Every new opinion at its beginning is precisely at the minority of one- )

- i) Promote shared Taxi/Auto services
- ii) Identify employees who can work from home at least on alternate days. IT companies, marketing sector and many other organizations should be easily able to do so.
- iii) Increase speed of clearance at road junctions. This can be done by synchronizing the signals and also by shifting the stop line 30-40 meters before the junction. The details of this idea are given in 'Exhibit-I'
- iv) Promote use of two wheelers for single commuters. Giving some concessions on traffic rules for two wheeler users can do this. Like allowing 'U-turn' for two wheelers and permitting entry at some of the 'no-entry' roads
- v) Encourage mutual transfer near place of residence.
- vi) Change Car allowance rules .Many people buy car just to claim the allowance. Instead the same money can be paid in some other form.
- vii) Promote distant education. Schools can be closed for different days and lectures may be given on TV/internet. Our former President Dr Kalam had advocated that children may be involved in 'Energy Mapping'.However, for this idea to succeed a policy decision has to be taken so that it is treated as substitute for Home work and suitable marks may be earmarked for such exercises.
- viii) Promote extensive use of internet/mobile for ticket bookings/order placement.
- ix) Discourage unnecessary meetings/ conferences/ seminars in Hotels etc. Instead promote video conferencing. Even Interviews can be conducted through video-conferencing.
- x) Spread information about alternate routes and put more road signs.
- xi) Promote good agencies for door-deliveries of goods and services.
- xii) Allow only even no. Vehicles in the congested/central areas on even hours and odd no vehicles on hours days. In many countries similar rules exist to de-congest central district areas.

**Between the conception  
And the creation  
Between the emotion  
And the response  
Falls the Shadow**

**- From T.S.Eliot's 'Hollow Men' as quoted in "Wings of Fire"- An Autobiography of A P J Abdul Kalam with Arun Tiwari**

## EXHIBIT-I

### For better traffic control

Sir - I have a suggestion to improve the existing traffic control system at road junctions. The suggestion is based on the principles of "Traffic and Motion Studies", normally adopted by professional engineering engineers to minimise the time taken for completion of a particular journey.

The suggested traffic control system has the potential of resulting in substantial savings towards fuel consumption and maintenance besides saving in speeding and other vehicular traffic, across road junctions.

The present system of traffic control at road junctions has, among others, these disadvantages: First, the stop lines being too close to the junctions, the average speed at which vehicles clear the junction does not exceed 15 km/hr. Thus the vehicles occupy the junction for longer time.

Secondly, since the waiting time is more at junctions due to slow clearance of traffic, a lot of time and fuel is wasted during idling for wait (which is more). This also increases air and noise pollution in that particular area.

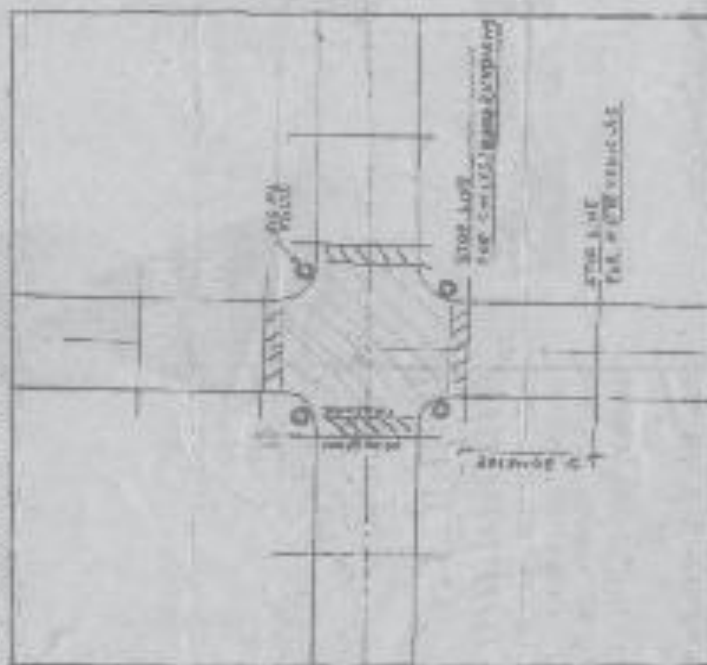
Thirdly, the slow rate of traffic clearance across junctions increases congestion and causes frequent stop-go junction accidents due to sudden breakdown of vehicles.

The above disadvantages can be overcome if the traffic control system at junctions is changed to as shown in the figure.

As shown in the figure, the stop line for motor vehicles should be

the line equally occupied by other vehicles, a given number of vehicles will pass through the junction in one-third to half of the time taken with the present system. Thus, the vehicles on the other side of the junction, will have to wait for one-third to half of the time only.

It is also suggested that the stop line not exceed, hand-reachway, can be seen to the pedestrian standing to give them enough head room for motor vehicles.



Suggested method of traffic control

Indian Express - 09-04-1990

The suggested method has a important advantage. First, even in the case of a jammed traffic, the waiting time for motor vehicles can be reduced to one-third to half of the time taken with the present system.

Secondly, saving of time. An estimated 50-60 thousand man-hours per day can be saved due to less waiting time.

Thirdly, improved traffic control. Due to better observation across junctions, the traffic congestion on the roads-vehicles will be less. As a result, the number of traffic jams and accidents due to congestion will reduce considerably.

Fourthly, reduction in air and noise pollution. Obviously, due to less congestion of traffic, there will be reduction in air and noise pollution.

I intend to take up the matter with the Ministry. I would be happy if experts in the field make me in the feasibility of the method suggested.

B. K. Sood

MELBON

25, M. D. Road, Bangalore-5.

## Suggestions to improve Urban Transport System

S.Khandekar, VP,IAEMP

Indian drivers are generally an undisciplined lot, except – contrary to popular belief- long distance truck drivers. Hence, if any system is to work here, it has to be designed taking into account this fact.

In most of the cities, there is always a mix of very slow moving vehicles like cycle rickshaw & modern fast cars/ motorcycles. Most of us are not too bothered about creating noise or air pollution.

More often than not, the point of commencement of a traffic jam is the point of intersection of two roads. By pass roads intended to circumvent busy traffic routes in the city and allow vehicles to move fast become slow and hazardous within a few months due to mushrooming growth of legal/illegal constructions around it.

A major cause of fatal accidents involving two wheelers is the high speed and acceleration that they can achieve.

Movements of vehicle with headlights on a high beam at night cause accidents & disturbance to the smooth flow of traffic.

Traffic congestion due to overloaded/ inadequate parking space.

Based on the above observations my suggestions are as follows:

**Synchronization of traffic signals** – the traffic signals in various directions have to be synchronized in such a way that a majority of vehicles move in any direction without interruptions. This may not be possible in all directions. To cater to this, I suggest creation of blocking points at different points in different directions.

In fact we can go a step further. I understand that in Japan, at some places, a computerized traffic control system is installed, where the traffic on various roads is assessed through a central computer, and the synchronization and timings of each signal is adjusted according to the need. In case of an unusual delay in clearing of traffic at any point, this system can also alert the traffic police.

At any traffic junction, vehicles have to slow down or stop if they do not have green signal. If the roads at this point have an upward slope, it is

not unusual to find the engines of the geared vehicles stopping due to extra thrust required at this point thereby stopping the passage of the vehicles behind them and creating a traffic jam. Some times the vehicles also move backwards, leading to minor accidents. To avoid this, my suggestion is that there should be no upward slopes on a road leading towards a traffic junction. The distance up to which there is no slope could be 20, 30 or more meters, depending upon the traffic density at that junction.

Another advantage of this will be conservation of precious fuel. It may be noted that a vehicle starting its movement on an upward slope consumes more fuel than a vehicle starting on a plain surface.

**Movement around traffic islands** – movements of traffic around traffic islands can lead to jams due to interference of vehicles trying to move on to different roads. Since the traffic directions in India are such that the vehicles move in clockwise directions, the signals must move in anti-clockwise directions. This I have illustrated in the enclosed fig. No. 2. It can be seen that with clockwise movement of signals, congestion will always take place, whereas with anti-clockwise rotation of signals, the traffic gets evenly distributed. If a few of the roads leading from the island or towards it are having comparatively heavy traffic, the signals could be staggered. But they should always be in the anti-clockwise direction.

In most of the cities today, multi-lane bypass roads are being constructed far away from the cities so that vehicles and especially goods carrying trucks can move out fast and without adding to the congestion in the city. At some places in India, expressways are also being created for this very purpose. The purpose however gets defeated due to the unrestrained growth of residences & shops etc. around these roads, and within no time these roads become a part of the urban transport system.

**Minimizing fatal accidents involving two wheelers** – Today's two wheelers are designed not only to move very fast but also to accelerate to high speed within a short time. Really speaking only two types of people are actually required to move at a high speed. The police and The thieves!

My suggestion is to curb this problem at the origin. Instead of trying to control millions of drivers of two wheelers, it is best to curb the production of fast moving vehicles, which is controlled by a hand full of manufacturers. The manufacturers of these vehicles could be asked to make necessary modifications in their designs so that the maximum speed does not exceed 50kmph. For police, military etc, faster vehicles can be produced with a specific permission. I also wish to stress here that considering that the world's stock of petroleum is not going to last

more than 50 years, it is time to pay more attention towards fuel efficiency of vehicles, rather than speed and acceleration. It should be noted that high acceleration always leads to higher consumption of fuel.

To check the problems of bypass roads and expressways becoming a part of the urban traffic system, I suggest that up to a distance of at least 300 meters from the road, forest zones should be created. No residence or commercial place be allowed to be constructed in this zone, except at a few junction points. No footpaths should be provided for these roads.

For vehicles moving with high beam at night I have no suggestion except controlling by the law enforcement agencies.

Traffic congestion due to overloaded/ inadequate parking- one of the major reasons for this in Nagpur I have found is the increasing number of coaching classes. In any commercial place, a room of the size of 50 x 20 sq. ft is sufficient to make seating arrangements for about 50 persons. If there are more than one batch in a day, the number of two wheelers could be even 80, far exceeding the space provided for parking. It is necessary to frame certain regulations for this.



### **Hypocrisy of OIL Marketing Companies**

On the one hand Oil Marketing Companies celebrate Oil & Gas conservation fortnights every year to encourage conservation of petroleum products, on the other hand the same oil companies indulge in aggressive marketing of petrol & other products by offering cash rewards & other incentives !



## **CDM Project- Optimizing Public Passenger Transport**

( From UNFCCC Web site)

1) The proposed methodology, targeted at the bus transport sector, supports projects that reduce the total vehicle kilometres travelled within a defined transit network, relative to: the total number of passengers carried by that transit system, the number of vehicles used in the system, and the network route length. In other words, the methodology measures how efficiently a transport operator is able to move a given number of passengers in a given year across a given network, minimizing the total system-wide distance travelled.

System management efficiency projects covered by this methodology would include (but shall not be limited to):

- ☐ ☐ Fleet size optimization (e.g., scrapping unnecessary vehicles);
- ☐ ☐ Vehicle-run optimization (e.g., reducing the number of daily round trips per vehicle); and
- ☐ ☐ Route optimization (e.g., removing redundancies from the fleet network).

These efficiency projects are optimization projects – that is, they remove specific redundancies from a system that do not provide sufficient benefit to justify their cost. Transport agencies that lack the optimization software, monitoring technology, or enforcement capability needed to optimize their networks will generate more emissions than similar agencies that have optimization capabilities. Technologies that help transport agencies optimize their fleets may include (but shall not be limited to) installation of a computerized bus dispatch system (e.g., RFID, GPS) to optimize vehicle-runs and prevent errant driver behaviour (e.g., deviating from stipulated route); or use of transport planning software to optimize routes and eliminate sub-optimal redundancies.

2) Because projects under the proposed methodology would result in fewer than 60,000 tons of CO<sub>2</sub>e emissions per year, the World Bank Carbon Finance Unit seeks to employ a small scale methodology for emissions reduction calculations and monitoring.

3) To date, four small scale methodologies have been approved for transport sector projects:

- AMS-IIIC: Low GHG Emissions Vehicles;
- AMS-IIIS: Low GHG Emissions Vehicles in Commercial Fleets;

- AMS-IIIT: Plant Oil Diesel Use; and
  - AMS-IIIU: Cable Cars.
- 4) Of these available small scale methodologies, none would be suitable for estimating emissions reductions from projects that minimize the vehicle-kilometers required to move a given number of passengers over a given distance in public transport fleets.
- 5) Because a small scale methodology is needed and no existing methodology meets the needs of projects that optimize vehicle-kilometers travelled, the World Bank Carbon Finance Unit is proposing a new small scale methodology.

## Upcoming Events

WINDPOWER 2009 Conference & Expo, Chicago, USA Organized by American Wind Energy Association <a href="http://www.windpowerexpo.org">www.windpowerexpo.org</a>	May 4 -7, 2009
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Clean Technology 2009. Houston, Texas, USA Energy, Water and Environmental Technologies <a href="http://www.csievents.org/Cleantech2009/">http://www.csievents.org/Cleantech2009/</a>	May 3-7, 2009
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World Renewable Energy Congress Bangkok, WREC 2009 Asia, Thailand. <a href="http://www.thai-exhibition.com/wrec2009asia/">www.thai-exhibition.com/wrec2009asia/</a>	May19-22, 2009
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PV America Conference & Exhibition, Philadelphia, USA Pennsylvania Convention Center, <a href="http://www.seia.org">www.seia.org</a>	June 8-10, 2009
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Do you have an area of expertise in energy management? Have you solved a difficult problem or have an interesting case study? Do you want to share a joke with others? Or just have a word of appreciation for this issue. Share your knowledge with others and promote yourself too, by writing 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. If you are using material from external sources, please acknowledge them.
- ❖ Please include contact information (full name, title/organization, phone numbers, and email ID) with your submission.
- ❖ Articles should be in MS word, single spaced, with easily readable font, preferably Arial size 12. Photos should be of high resolution.
- ❖ Please e-mail your submissions to The Editor, “The Urja Watch” at [tellsubi@gmail.com](mailto: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.

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We appreciate your feedback and thank you for your support.

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