

# CATALYST

NEWSLETTER JUNE 2017 – MAY 2018



DEPARTMENT OF PETROCHEMICAL TECHNOLOGY  
UNIVERSITY COLLEGE OF ENGINEERING  
ANNA UNIVERSITY (BIT CAMPUS)  
TRICHY

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**Dr. M. Arulmozhi**  
HOD, Dept. of Petrochemical  
Technology

I am very happy to know that the students of B.Tech Petrochemical Technology are bringing out the IV issue of the News Letter. I wholeheartedly appreciate the students and staff for their tireless effort to get NBA accreditation status for the department. I congratulate the students who have won laurels in national level technical paper presentations, conferences and in interdepartmental sports meets.

I also congratulate the staff and students for their efforts in forming the IICChE students chapter in our campus. Similar conference to National Level Conference on Emerging Trends in Chemical and Petrochemical Technology (NETCPT') will be organized by the department every year. I congratulate the students who have scored ranks in GATE 2018 and students who were placed in interview by SPIC, SANMAR, TAGROSE etc., Department's research activities include bio synthesis of nano particles for various applications like biomedical, electronic and effluent treatment, Treatment of industrial waste, Biodiesel synthesis using microbes.

### EDITING DESK

#### STAFF INCHARGE

Dr. M. Rengasamy  
Asst. Professor

#### Students

K. Chellamai  
V. Krishna Theja  
S. Md Shajathkhan

Green Distillation Technologies Corporation is an Australian company which has developed world-first technology to recycle end-of-life car and truck and oversize tyres into carbon, oil and steel. GDT has developed innovative technology that converts tyres back into carbon, oil and steel, without producing emissions.



Green Distillation Technologies has achieved a world technological breakthrough by effectively and profitably recycling end of life car and truck tyres (ELTs) into saleable commodities of oil, carbon and steel. As well as the environmental problem caused by dumps of old tyres or illegally discarding them in bushland and waterways, after rain they become a breeding ground for mosquitoes and a source of such dangerous diseases as Dengue and Ross River Fever.

However, using a technique known as destructive distillation, Green Distillation Technologies is able to convert this wasted resource and an environmental hazard into high demand valuable raw materials. The process is emission free and the recycled oil is used as the heat source for the production process.

“We realise that we aren’t going to save the world, but we will make a difference by establishing a solution to a global problem by adding value to a waste stream that has nowhere to go. We believe that in the future our process will become the standard means of disposing of old tyres in an environmentally friendly way, which is consistent with the growing trend towards achieving a circular economy,” Mr. Bayley, the Chief operating officer said.

## **The GDT Tyre Recycling Process – How It Works**

Destructive Distillation is the name GDT gives to their tyre recycling process which is developed from basic chemistry, the genius of Technical Director Denis Randall and his 35 years of study and experimentation into organic waste streams. As a result GDT has developed the knowledge of getting the chemical reaction to occur. The process begins by loading whole end of life tyres into a process chamber, which is evacuated of air and sealed. In the initial steps no further processing of the tyres, such as chopping or crumbing is required. Heat is applied, which acts as a catalyst for the chemical reaction, which sees the tyre destructed into different compounds, one of which is collected and condensed into ‘manufactured’ oil.

At the end of the process and the chemical reaction is over, the carbon and steel can be extracted cooled and separated.

## **Do low oil prices have an impact on GDT?**

The current historically low oil prices do have an effect on GDT's financial return, the same as any commodity trader, but the oil from the tyre recycling process is defined as coming from a renewable resource and enjoys a premium. The financial calculations have been made around the crude oil price as this is a very conservative way to budget even though the GDT oil will be benchmarked against the 'fuel oil' standard. There is some impact from the price of crude oil, but it will be much less than the fluctuations in the daily price of crude and the impact will become clearer as oil deliveries are made on a regular basis.

In 2015 against a field of quality innovative competitors, including major multi-national corporations, Green Distillation Technologies was awarded a bronze medal in the Edison Awards, the world's top prize for innovation.

## **What products do GDT produce today?**

"At this point in time the company produces different products. The tyres are processed whole, being subjected to a comparatively low heat, in advance of extraction as a vapour. In cold hard figures, one cycle of up to 500 kg of tyres can take approximately 55 minutes. Each plant processes 19,000 tonnes of tyres per year and delivers in the region of 7.3 million litres of oil. Essentially GDT derives its income from the weight of the materials we produce from the tyre.. In that sense our whole business is a weight based business, we charge for the tyres by weight, we sell the oil, carbon and steel by weight". Bayley expanded more on GDT's products, "Our oil is very stable as a product. However, we have to suffer the ambiguity of being defined as the same product as pyrolysis oil. We have proven that GDT oil can be blended with diesel or further refined. Our oil is a revenue generator, whereas pyrolysis oil is a waste that is difficult to sell."



**Dr. Trevor Bayley,**  
**COO, GDT**







**Dr. N. Jaya**  
**Assistant Professor,**  
**Department of**  
**Petrochemical Technology**

Online courses paves the opportunity for learning and upgrading our skills. It is an excellent option to learn, update and train ourselves in their respective fields. Some of the successful online courses are National Programme on Technology Enhanced Learning (NPTEL), SWAYAM, Massive Open Online Courses (MOOC), Khan Academy, MIT Open Course Ware etc. NPTEL is a joint initiative of the IITs and IISc. This programme offers online courses and certification in various topics. NPTEL is free for all and certification exams are conducted by a nominal fee. It provides courses in engineering, sciences and other disciplines to students in India and abroad.

SWAYAM is a programme initiated by Ministry of Human Resource Development (MHRD) and All India Council for Technical Education (AICTE) government of India with the help of microsoft, designed to achieve the three cardinal principles of education policy namely access, equity and quality. The objective of this programme is to have the best teaching and learning resources. The courses are from school level till post-graduation. All the courses are prepared by eminent teachers of our country and are available at free of cost to the residents In India. The courses includes, video lecture, specially prepared reading material that can be downloaded, self-assessments through tests and quizzes and online discussion forum for clearing the doubts.

The quality of the contents were ensured by national coordinators from AICTE, NPTEL, University Grants Commission (UGC), Consortium for Educational Communication (CEC), National Council of Educational Research and Training (NCERT), National Institute of Open Schooling (NIOS), Indira Gandhi National Open University (IGNOU) , *Indian Institute of Management Bangalore* (IIMB). This is also offered at free of cost with meagre fee charged for certification. MOOC is a model for delivering learning content online to any person who wants to take a course, with no limit on attendance.

They are structured for higher education courses in which students watch lectures, read assigned material, participate in online discussions and forums, quizzes and tests on the course material. Each course focuses on single technology and describes what it is, where it is going and why it matters to teaching and learning. Some of the issues are presented by a short interview with an expert who provides a deeper exploration of additional aspects of the theme. Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom.

They tackle mathematics, science, computer programming, history, art history, economics, and more. Their missions guide learners from kindergarten to calculus using state-of-the-art, adaptive technology that identifies strengths and learning gaps.

They have also partnered with institutions like National Aeronautics and Space Administration (NASA), The Museum of Modern Art, The California Academy of Sciences, and Massachusetts Institute of Technology (MIT) to offer specialized content. MIT provides free online courses in variety of subjects. MIT Open Course Ware (OCW) is a web-based publication of virtually all MIT course content. Through OCW, educators improve courses and curricula, making their schools more effective; students find additional resources to help them succeed; and independent learners enrich their lives and use the content to tackle some of our world's most difficult challenges, including sustainable development, climate change, and cancer eradication. Students can make use these exceptional courses to face the challenges in industrial and academic areas.

## **To strengthen our dept knowledge**

[www.rigzone.com](http://www.rigzone.com)

[www.petrowiki.com](http://www.petrowiki.com)

[www.spe.org](http://www.spe.org)

[www.onepetro.org](http://www.onepetro.org)

[www.oilandgasiq.com](http://www.oilandgasiq.com)

[www.api.org](http://www.api.org)

[www.ogj.com](http://www.ogj.com)

[www.upstreamonline.com](http://www.upstreamonline.com)

[www.oilandgasjobsearch.com](http://www.oilandgasjobsearch.com)

[www.worldoil.com](http://www.worldoil.com)

[www.oilandgaspeople.com](http://www.oilandgaspeople.com)

[www.oilgasdaily.com](http://www.oilgasdaily.com)

[www.oilandgas360.com](http://www.oilandgas360.com)

[www.energyjobline.com](http://www.energyjobline.com)

## PETRONAS' FIRST FEMALE DRILLING SUPERVISOR

**Penny Chan** is proof that female employees in Malaysia's PETRONAS can take on challenging roles in a male-dominated offshore oil and gas sector when the opportunity arises.

Penny Chan has emerged as a trailblazer for Petroliaam Nasional Berhad (PETRONAS) by becoming the Malaysian national oil company's (NOC) first female drilling supervisor. She is currently the deputy drilling supervisor for the NC-3 Project offshore Sarawak.

The 26-year old Chan is proof of the firm's effort to strengthen its workforce through diversity, and inclusion is paying off.



### **ONLY WOMAN:**

Chan, who joined PETRONAS in March 2011, is presently the deputy drilling supervisor at the NC-3 project offshore Sarawak, Malaysia. Operating far from shore, she was sometimes "the only woman on an oil rig with more than 150 men. But she has taken all that it her stride ... [and] the experience has made her a better communicator and leader,"

( taken from PETRONAS upstream magazine flow wrote in its April/May edition)

### **CHAN HIGHLIGHTED HER WORKING ROLE:**

"To be effective on a male-dominated rig, I always put the [issue of] gender aside, and only focus on professional strength."

"There is always new technology coming in so we are constantly thinking of how we can drill a well safer, cheaper and faster. "

"I am looking forward to leading in the complex and challenging well drilling situations, and at the same time developing and mentoring the new batch of young engineers.

"I know that I made the right choice because I really like it. PETRONAS operates globally, so we have the opportunity to work abroad.

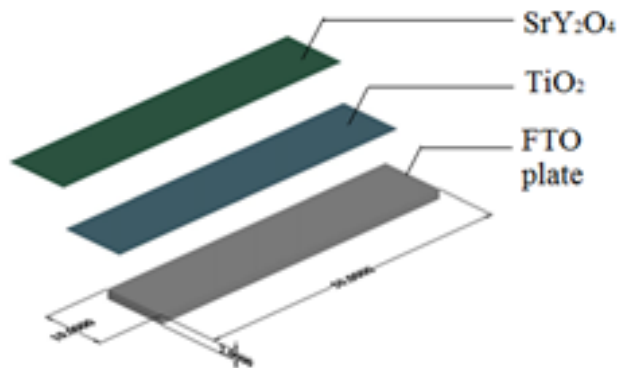
### **ABUNDANT OPPORTUNITIES:**

PETRONAS is becoming a choice for more female employees to start their career with, especially in the offshore oil and gas environment. "This will definitely inspire more women to take up the challenge and road less taken in the past."

"With the equal and abundant of opportunities and structured training program provided by PETRONAS, I do believe we'll have a more diverse and interactive workforce. There should be no barriers to women who are interested to work in a challenging oil and gas industry as we should always be driven by what interests us and what we want to be successful at".



## ENHANCEMENT OF PROPERTIES IN SOLAR CELL USING PEROVSKITE SUBSTANCE



Coating on the conductive side of the FTO plate.



**R.VIJAYAKUMAR**  
Part-time scholar  
Anna university  
BIT Campus Trichy

Solar energy is the green energy on which the future mankind depends on. Photovoltaic cells are the major components of solar energy which converts the light energy into electrical energy and it can be trapped using several applications. The analysis of characteristics of heterojunction solar panel are measured and it is replaced (i.e.) the silicon solar cell are coated using alternative material called the perovskite substances. The alternative material for solar cell used is perovskites ( $\text{SrY}_2\text{O}_3$ ). The alternative material is better than silicon solar cell is proved. The  $\text{SrY}_2\text{O}_3$  is an inorganic material and the method used for the analysis is  $\text{TiO}_2$  die synthesis method.

The sample materials are coated using the spray pyrolysis technique.  $\text{TiO}_2$  and  $\text{SrY}_2\text{O}_3$  are coated in the FTO plate is to promote the internal trapping of light by scattering (redirecting) the light reflected from the metallic electrode in the active layer and also to improve the transport of charge carriers through the active layer. The power properties of sample are to be tested by conductivity test. The energy band gap for substance is measured by UV visible spectrometer test. The short circuit current ( $I_{sc}$ ) and open circuit voltage ( $V_{oc}$ ) for perovskite substance  $\text{SrY}_2\text{O}_3$  are measured for the calculation of Power and Efficiency. The power and efficiency of the perovskites solar cell are measured and then compared with the silicon solar cell.

## FROM OUR ALUMNI

My college life started in 2004... Like everyone out of school, the decision to choose a path was one of the hardest one to make. Parents who were not graduates, wanted to make decisions based on other's opinions. I had no idea what lies ahead. When the entire friends circle chose something else, I chose to look the other way. Opted for the path least traveled. My choice was Petrochemical Technology. I could never say that the path has been easy. It has had its own Challenges. But the strong bond of friendship and its overwhelming support made all the difference. There would never have been an engineer in me without the support of my friends.

Life changed during my third year, when I got placed in an IT company. It boosted my morale and kept my spirit high throughout the next year. I left college with high hopes of joining this new company, my new to be workplace. I waited, the wait lasted a long time, long enough to make me forget about the company. Out of the blue came the opportunity from Transocean, the interview process in itself was enough to convince me that this was the job I wanted.



Was it destiny that brought me to this point? Was it my yearning for something far superior to what was available in that instant? My search for the answer is still on going. I read a beautiful line "You begin, You go as far as you can see, and, when you reach there, you will see further." When it seemed like there was no tomorrow, and I thought I reached the end, there was always something beyond that. There was always that inner voice "You have come this far, and you will go further" Trust that voice, it will take you through the most difficult times, it will help you reach the heights that you have yearned for.

To be ordinary or to be extraordinary is completely your choice. It's the choices that you make that determines your life. Make the right choice. It's the little choices you make that have a profound impact on your life. Make that choice. Life in college is not about success or failure, it's all about memories. Never in a million years will you and me get the four college years back. Making sure the memories are good is completely upto you. Good or bad those memories will stick in your head and you will have to live with them for the rest of your life. The choice, once again is yours. I wouldn't call this a success story yet. It's a success story still in the making. There is a lot more to see and do. There is a lot more to learn.

- **John Enock**  
**Assistant Driller**  
**Transocean**



## Industrial Visit to F.A.C.T

**STAFF INCHARGE :**  
**Dr. M.Rengasamy &**  
**Mrs. E.Gomathi**

**NO. OF STUDENTS : 52**

**III YEAR STUDENTS**



The Fertilizers and Chemicals Travancore Limited or FACT is a fertilizer and chemical manufacturing company headquartered in Kochi, Kerala, India. The company was incorporated in 1943, by Maharajah Sree Chithira Thirunal Balarama Varma. It is the first fertilizer manufacturing company in independent India and also the largest Central public Sector Undertaking (CPSU) in the State of Kerala.

## IN-PLANT TRAINING

COMPANY NAME	STUDENTS NAME	DURATION
CETEX ,manali, chennai	Mohana priya, Nisanth,Navin kumar,Ajith kumar	5 <sup>th</sup> semester- 5days
	R.Abirami, B.Dhanamani, D.Sandhiya, A.Sangeetha, R.Saranya	5 <sup>th</sup> sem- 5 days
	Maha Vishnu,Rooban,Ranjith kumar,Manoj kmar	4 <sup>th</sup> sem- 5 days
	Chellammai, swane, Varsha	5 <sup>th</sup> sem- 5days
ONGC, Kaaraikaal	Maha Vishnu, Arumugan, Ragunath, Gomathi, Kowsalya	5 <sup>th</sup> sem- 4 days
Sri Krishna Plastic Industries, Theni	Abinaya,Babu Krishna, Kani valan, Bharath, Dhivakar, Manoj Kumar, Chellammai, Ramya	4 <sup>th</sup> Sem- 4 days
CPCL , Nagappattinam	Amarnath, Tamil selvan, Tamil azhagan, N.Viswanath, Vishal, Naveen prasanth, Varnn,Ambrose thiyagaraja, Seenuvasan, Veeramani, Mohammed shajath khan, Swane	4 <sup>th</sup> Sem- 5 days
	Manojkumar, Vinoth, Vignesh, Umapathi, Deepakkumar	5 <sup>th</sup> Sem – 5 Days
	Rishibala., Sivaprakash, Balakrishnan, Sajish, Ramanathan, Ragunath, Nethaji subash Chandra Bose, Mohanraj, Abirami, Sandhya, Saranya, Srimathi	6 <sup>th</sup> Sem- 5 Days
DCW tuticorin	Mahavishnu, Arumugan, Naveenkumar	6 <sup>th</sup> Sem – 3 Days
RAINBOW pigments, Theni	Abinaya, Babu Krishna, Kani valan, Bharath, Dhivakar, Manoj kumar, Chellammai, Ramya	3 <sup>rd</sup> Sem- 5 days
Kothari petrochemicals Ltd.	Mohammed ameen, Noor Mohammed, Rooban	6 <sup>th</sup> Sem – 5 Days
FACT Kerala	Vignesh, Mohammed Shanavas	5 <sup>th</sup> Sem-5 Days





**First Year  
Inauguration Day  
03.09.2017**



**Organizers :  
Dr. K.Kumaraguru  
Ms. K.Anbarasi**

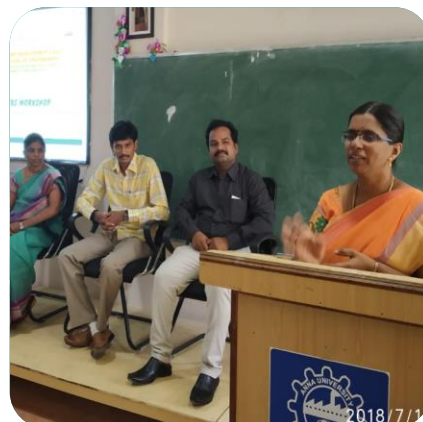


**NETCPT  
27 Sept  
2017**





**Coordinator  
Dr.K.Kumaraguru**



**E-Cell  
E-Leaders  
Workshop**



**Convocation 2017**



## NCC Events



PROGRAMS	PLACES	PRIZES
Heroes Day	BIT Campus, Trichy	Drill - WINNER
Champions Day	BIT Campus, Trichy	Drill – WINNER Overall - RUNNER
Champions Day	NIT Campus, Trichy	Drill - WINNER

## NSS CAMP



## MARCH-PAST



Sport	Place
Table Tennis	GOLD
Basket ball	GOLD
Badminton	SILVER
Chess	SILVER



**Farewell  
Celebration**

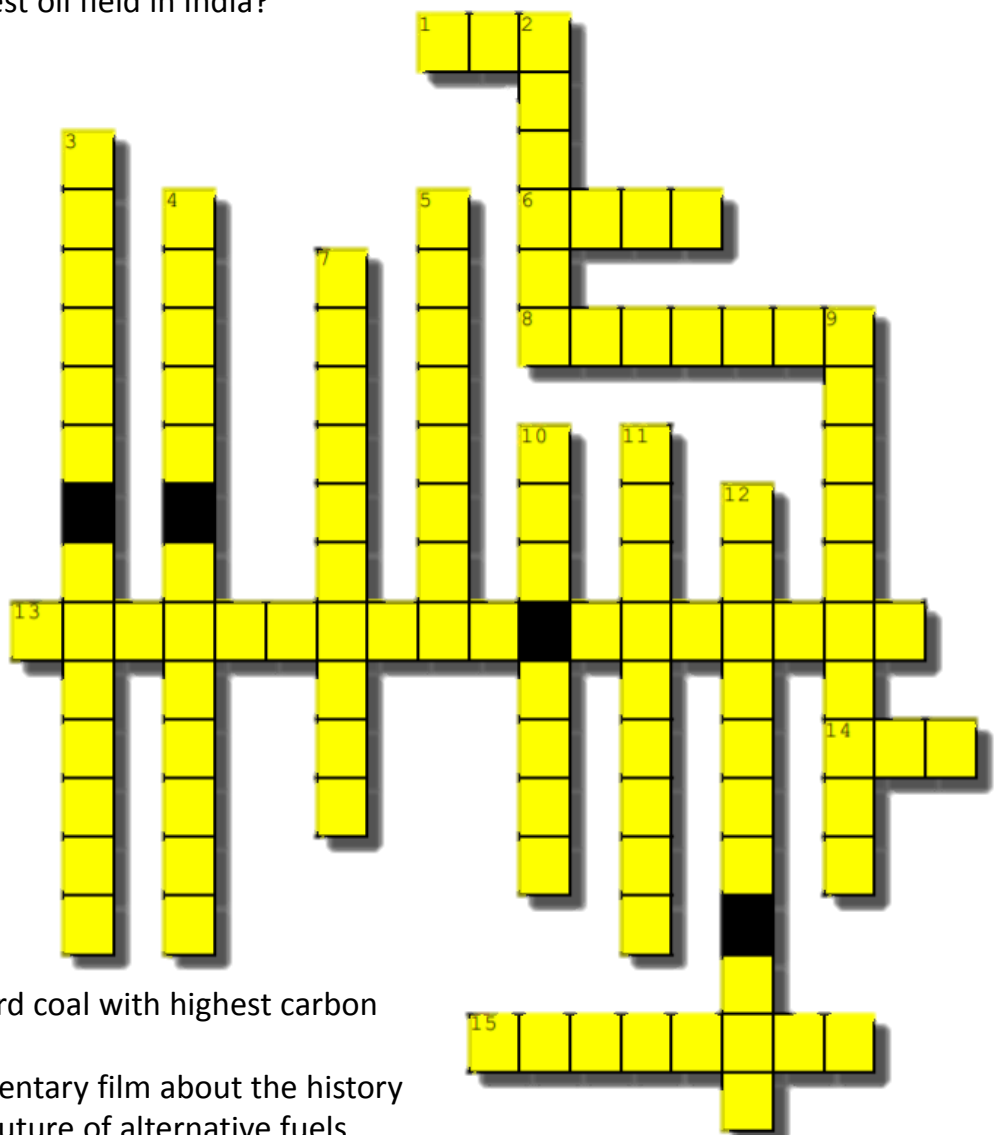


## Across

1. Which is the largest oil producing nation in the world?
6. This is an intergovernmental organization of 15 nations, having influence on Global oil prices?
8. The headquarters of OPEC is located in this country.
13. Who is the head of the Indian Ministry of Petroleum and natural gas?
14. Which is the largest oil producing company in India?
15. Which is the largest oil field in India?

## Down

2. Which Russian diamond mining company has the largest reserves for rough diamonds in the world?
3. This is the largest circulated Hindi newspaper in India?
4. Hydro Desulfurization (HDS) unit is also referred as?
5. 17<sup>th</sup> of this month is celebrated as 'Petroleum Day'
7. This Black coal also referred as Soft Coal.



## Down

9. This is called as Hard coal with highest carbon content
10. This is the documentary film about the history of oil prices and the future of alternative fuels directed by Scoh D. Roberts
11. Largest coal producing state in India
12. Which is the cleanest of all Fossil Fuels.

Answers on page no: 19

# LOGO QUIZ



- The largest oil company in India
- Indian public oil & gas company



- The largest in Europe
- British Dutch oil and gas company



- The company established as Pacific Coast Oil Co.
- American multinational energy corporation



- World 2<sup>nd</sup> largest proven crude oil reserves by revenue
- Saudi Arabian national oil and natural gas company



- The company's name resembles sky scrapers
- Malaysian oil and gas company



- One of India's largest private sector companies
- It also benefits from a strategic alliance with Chevron India



- The company produces 7% of the world's crude oil
- Kuwait's national oil company



- The 2<sup>nd</sup> largest in Europe
- Major marketing product 'Castrol'



- It was ranked 4<sup>th</sup> in 2017 fortune global 500 by revenue
- Chinese major national oil and gas corporation



- The 3<sup>rd</sup> largest in Europe
- French oil & gas company



- Member of OPEC
- Founded by Anglo-Persian Oil Company



- The largest Russian company
- The company possesses subsidiaries in many industries; sectors include finance, media, aviation.

LOGO QUIZ ANSWERS:

IOCL  
CHEVRON  
PETRONAS  
Kuwait Petroleum Corporation BP  
TOTAL  
National Iranian Oil Company  
GAZPROM



SCAN THIS & FEED YOUR BRAIN



## CROSS WORD ANSWERS:

### ACROSS:

- 1- USA
- 6- OPEC
- 8- Austria
- 13-Dharmendra Prathan
- 14-IOC
- 15-Raniganj

### DOWN:

- 2- Alrosa
- 3- Dainik Bhaskar
- 4- Hydro Treater
- 5- November
- 7- Bituminous
- 9- Anthracite
- 10-Gas Hole
- 11-Jharkhand
- 12-Natural Gas

**REDUCE, REUSE, RECYCLE**

