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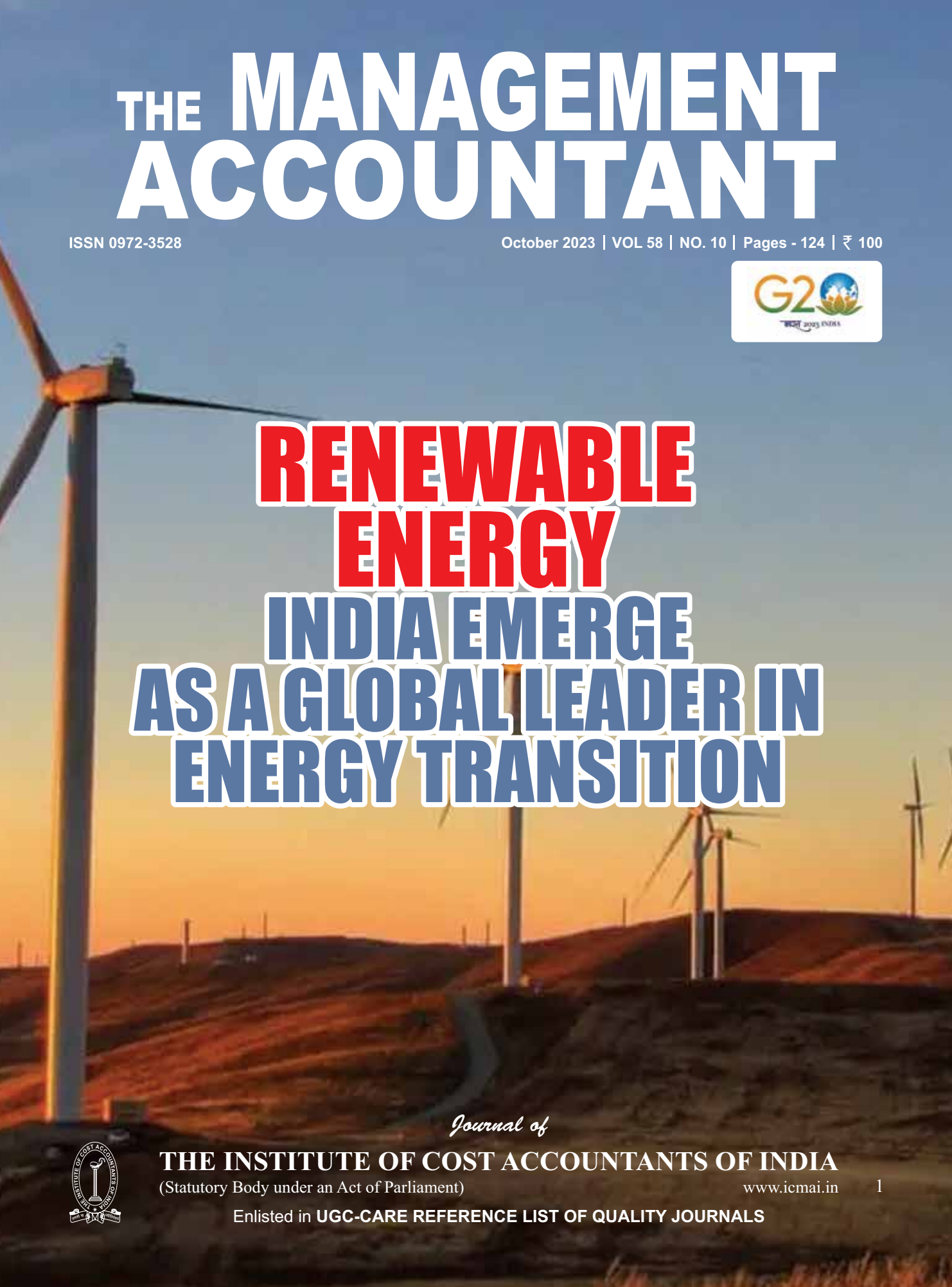

RENEWABLE ENERGY INDIA EMERGE AS A GLOBAL LEADER IN ENERGY TRANSITION

Journal of

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

(Statutory Body under an Act of Parliament)

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THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

Statutory body under an Act of Parliament

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- **THE INSTITUTE OF COST ACCOUNTANTS OF INDIA** (erstwhile The Institute of Cost and Works Accountants of India) was established in 1944 as a registered company under the Companies Act with the objects of promoting, regulating and developing the profession of Cost Accountancy.
- On 28 May 1959, the Institute was established by a special Act of Parliament, namely, the Cost and Works Accountants Act 1959 as a statutory professional body for the regulation of the profession of cost and management accountancy.
- It has since been continuously contributing to the growth of the industrial and economic climate of the country.
- The Institute of Cost Accountants of India is the only recognised statutory professional organisation and licensing body in India specialising exclusively in Cost and Management Accountancy.

VISION STATEMENT

"The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally."

MISSION STATEMENT

"The CMA Professionals would ethically drive enterprises globally by creating value to stakeholders in the socio-economic context through competencies drawn from the integration of strategy, management and accounting."

IDEALS THE INSTITUTE STANDS FOR

- *to develop the Cost and Management Accountancy profession*
- *to develop the body of members and properly equip them for functions*
- *to ensure sound professional ethics*
- *to keep abreast of new developments*

Behind every successful business decision, there is always a **CMA**

Headquarters
CMA Bhawan, 12 Sudder Street
Kolkata - 700016

Institute Motto

असतोमा सद्गमय
तमसोमा ज्योतिर् गमय
मृत्योर्मामृतं गमय
ॐ शान्ति शान्ति शान्तिः

From ignorance, lead me to truth
From darkness, lead me to light
From death, lead me to immortality
Peace, Peace, Peace

Delhi Office
CMA Bhawan, 3 Institutional Area
Lodhi Road, New Delhi - 110003

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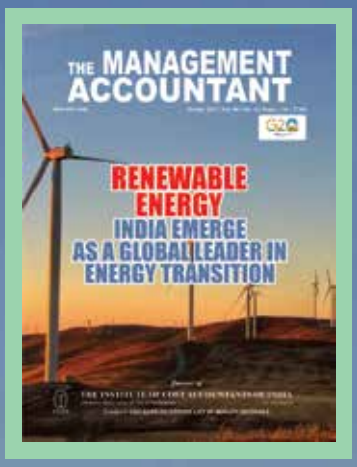

OCTOBER VOL 58 NO.10 ₹100

COVER STORY

INTERVIEW

CMA Pradip Kumar Das
Chairman &
Managing Director
Indian Renewable Energy
Development Agency Limited's (IREDA), New Delhi ⑥②

We have expanded our Readership from **1** to **94** Countries

Afghanistan, Algeria, Argentina, Australia, Azerbaijan, Bahrain, Bangladesh, Belgium, Benin, Botswana, Brazil, British Indian Ocean Territory, Bulgaria, Cambodia, Cameroon, Canada, Chile, China, Colombia, Croatia, Czech Republic, Djibouti, Egypt, France, Gambia, Germany, Ghana, Great Britain, Greece, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Lebanon, Liberia, Lithuania, Malawi, Malaysia, Mauritius, Mexico, Morocco, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nigeria, Oman, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Rwanda, Saudi Arabia, Serbia, Seychelles, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Suriname, Sweden, Switzerland, Syria, Taiwan, Tanzania, Thailand, Turkey, Uganda, Ukraine, United Arab Emirates, United Kingdom, United States of America, Vietnam, Zaire, Zimbabwe.

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https://reneweconomy.com.au/renewable-energy-now-accounts-for-a-third-of-global-power-capacity-69547/

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From the Editor's Desk

Renewable Energy: India emerge as a Global Leader in Energy Transition

India has been rapidly developing its renewable energy sector in recent years. The Government of India has done a commendable and exemplary task by developing initiatives in adopting renewable energy sources including wind, solar, and geothermal power to achieve efficiency. It is imperative that people adapt themselves in the changing conditions of the times.

Startups are playing a critical role in accelerating the adoption of renewable energy sources. Like, Bengaluru's Uravu Labs generates "water from air" using 100 percent renewable energy sources like solar, waste heat from industries and biomass. India's first solar-powered electric car, Eva, is the brainchild of Vayve Mobility, Pune. The single-door fully automatic car is designed keeping in mind the convenience required to drive in crowded cities. Eva is battery driven with an optional solar roof panel, which charges the battery when the car is parked in the open or when it's being driven. On2Cook India Pvt Ltd, built a cooking device that combines the benefits of cooking on a microwave and a stove and can save 70 percent time and 50 percent energy. 'Mamidala e-Bikes' startup makes affordable kits to turn normal cycles into electric cycles. Indi Energy makes low-cost, safe, high-performance sodium-ion batteries from agricultural waste — like paddy straw, sugarcane bagasse, coconut shells, or cattle manure and earth-abundant materials like sodium.

This issue presents articles on the cover story *"Renewable Energy: India emerge as a Global Leader in Energy Transition"* written by distinguished experts.

SMART GRID, AI, IOT AND BIG DATA: *Powering India's Renewable energy Revolution* accentuates the transformative potential of technology integration in India's RE sector, offering a greener, more efficient, and sustainable energy landscape.

Coal India Ltd: Role in India's Energy Transition discusses CIL's efforts to balance energy security with sustainability, addressing environmental concerns, diversifying investments, and promoting renewable energy

Renewable Natural Capital And Energy for Sustainable Development In India:A Study of Pharmaceutical Industry in India highlights the disclosures made by top 15 pharmaceutical companies listed in India, regarding the use of natural capital and efforts made by these companies for sustainability development.

Developing The Country's Renewable Energy Sector: Benefits from Foreign Direct Investment investigates the factors that influence FDI firms' decisions to engage in India's renewable energy projects.

Opportunities and Challenges For G-20 Countries Transition To Renewable Energy: Leadership Role of India discusses India's leadership role through initiatives, such as, International Solar Alliance (ISA), Global Biofuel Alliance (GBA), Mission Life and the clarion call for One Earth One Family One Future. It is a matter of hope for the world and pride for Indians to sustain development of human civilization.

A Comprehensive Analysis of Production, Utilization and future Prospects for Green Hydrogen for A Sustainable Future thoroughly analyses the concept of green hydrogen and its potential to revolutionize multiple industries, thereby nurturing a better future.

The research *Steering Towards a Greener and Safer Future: A Study of Electric Vehicles in Major States of India* paints a vivid picture of the escalating EV registrations across major Indian states, indicative of a larger shift towards sustainable transport solutions.

The G20 Energy Transitions Communiqué consistently recognizes energy efficiency as the primary driver for transitioning to clean energy, ensuring universal access to clean and affordable energy. The research paper *Empowering Global Energy Transition: Assessing India's G20 Presidency Initiatives and Energy Efficiency Strategies* delves into India's pivotal role during its G20 Presidency, highlighting the power of small actions in driving significant reforms.

We are privileged to incorporate Interview by CMA Pradip Kumar Das, CMD, IREDA Ltd, New Delhi. He expressed their desire for organising collaborative seminar/awareness workshops and also training sessions to upskill the future and assist in professional growth of the CMAs. Further, he concluded with an advice to our students - "Be deep rooted to the core values of the Institute by ensuring highest level of honesty, simplicity and constantly update your knowledge base as well as its application. Students must understand well how to manage their need and control their greed by highest level of ethical standards for ensuring sustainability in their existence and growth."

Apart from these, this issue contains articles on various other contemporary matters. We thank all the contributors for value addition to this issue and hope our readers would enjoy the articles.

We look forward to constructive feedback from our readers on the articles and for the overall development of the Journal. Please send your views and suggestions at editor@icmai.in.

Wishing all the readers a happy and prosperous festive season ahead!!!

THE MANAGEMENT ACCOUNTANT

PAPERS INVITED

Cover Stories on the topics given below are invited for ***'The Management Accountant'*** for the four forthcoming months

	Theme	Subtopics
November 2023	MSMEs: the key driving force to India's Economic Growth	⊙ MSMEs crucial role in realising the vision "Atmanirbhar Bharat" ⊙ Udyami Bharat: Introduction of CHAMPIONS 2.0 Portal ⊙ Increasing competitiveness & market presence for MSMEs in a global economy ⊙ Empowering MSMEs through GeM ⊙ Scaling Growth of MSMEs with Digital Transformation ⊙ TReDS: a prudent approach towards bridging the financing gap ⊙ Women Participation in MSME: Opportunities & Challenges ⊙ Vivad se Vishwas scheme: A relief to MSMEs ⊙ Future-ready MSMEs for India@100 ⊙ Scope for MSMEs in Defense Manufacturing ⊙ MSMEs partaking concerning improvement of Employability of the Youth
December 2023	Corporate Social Responsibility (CSR) Ecosystem in India: Trends, Challenges and Ways Forward	⊙ Emergence of CSR: History and Current Scenario ⊙ Board Strategy and Effective CSR for Global Economic Growth ⊙ Embedding CSR into the Corporate Governance Structure for Creating Shared Value ⊙ CSR: For improved Healthcare and Nutrition in Rural India ⊙ Sustainable Development Goals (SDGs) and its alignment with CSR towards building a sustainable society ⊙ ESG – A step ahead of the CSR ⊙ CSR as a Catalyst for Skill Development in India ⊙ Integrating CSR into Education to let youth reborn as ethical citizens ⊙ Regulations and Reporting: CSR Compliance and Beyond ⊙ Digital Transformation: a powerful tool to CSR
January 2024	Banking in India: Emerging Challenges and Preparedness of this sector	⊙ Expected Credit Loss Mechanism of Banks: Role of CMAs ⊙ Risk Based Internal Auditing a panacea for good governance ⊙ Stock Audit Appraisal: Checklist for highlighting the exceptional ⊙ CMAs role in Bank's Credit Appraisal and Monitoring Framework ⊙ CMAs as Concurrent Auditors ⊙ Mergers and Acquisitions the way forward for the Indian Banking System ⊙ Digital Banking: The need of the Hour ⊙ NBFCs are they an alternative to Banks ⊙ Artificial Intelligence: A Disruptive changeover in the Banking Landscape ⊙ Inclusive banking to inclusive growth
February 2024	Changing Landscape of Valuation Ecosystem in India	⊙ Valuation in Emerging Markets: Prospects & Challenges for the Valuation Profession ⊙ Risk Assessment and Mitigation: Role of Valuation Professionals ⊙ Forensic Audit & Valuation ⊙ Valuing Start-ups ventures ⊙ Future of Valuers in the Banking Industry – Opportunities and Limitations ⊙ Valuation of Digital Assets: Perspective and Future Prospects ⊙ Governance and Valuation: The Way Forward ⊙ Valuation and Management of Currency Risk ⊙ Valuation Practices in India v/s across the Globe

The above subtopics are only suggestive and hence the articles may not be limited to them only.

Articles on the above topics are invited from readers and authors along with scanned copies of their recent passport size photograph and scanned copy of declaration stating that the articles are their own original and have not been considered for anywhere else. Please send your articles by e-mail to editor@icmai.in latest by the 1st week of the previous month.

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PRESIDENT'S COMMUNIQUÉ

CMA Ashwin G. Dalwadi
President
The Institute of Cost Accountants of India

"A man is but a product of his thoughts. What he thinks he becomes."

-- Mahatma Gandhi

My Dear Professional Colleague,

At the outset, I would like to welcome CS (Dr.) Shyam Agarwal, Former President, ICSI, Shri Sushil Kumar, IAS (Retired), Shri Inderdeep Singh Dhariwal, Joint Secretary, MCA, Ms. Anita Shah Akella, Joint Secretary, MCA and Shri Jyoti Prakash Gadia as government nominees to the 21st Council of the Institute. I am sure that their presence and guidance will help the Institute to move ahead to achieve new heights and function effectively for the cause of the CMA profession.

On behalf of the Institute, I congratulate the students who have passed the Final and Intermediate examinations of the Institute and those who have passed the individual groups. I am happy to acknowledge your efforts and smart work which have yielded fruitful results by way of success in the June 2023 CMA exams. Students who could not clear the examinations this time, I want you to remember that any setback does not define your capabilities; it's a stepping stone towards success. You can certainly come out successful in your next examinations.

I request all students who have passed the Final examinations to register yourselves for the campus placement immediately in case you are contemplating to join the corporate and contribute to growth and development of these organizations. I sincerely appeal to all of you to apply for the membership of the Institute as soon as you become eligible to showcase the real strength of CMA Profession to the world.

Request to follow the official social media accounts of the Institute

I request all students, members and stakeholders to follow the official social media accounts of the Institute for all official announcements and updates. The links to various social media accounts of the Institute are available on the home page of Institute's website. All students and members are advised not to follow any fake social media accounts operating in the name of the Institute and not to rely on their false and unauthentic announcements in their own interest.

Advisory to Members to report UOM as mentioned against CTA Codes

Recently, in a meeting with the executives of Cost Audit Branch, Ministry of Corporate Affairs, it was brought to our notice that certain deviation in reporting unit of measurement (UOM) were observed as against the UOM with respect to CTA codes. All are requested to strictly refer and report UOM as mentioned against CTA Codes only. The notification issued in 2018 in this regard prescribed that the Unit of Measurement (UOM) for each Customs Tariff Act Heading, wherever applicable, shall be the same as provided for in the Customs Tariff Act, 1975 (51 of 1975) corresponding to that particular Customs Tariff Act Heading.

Meeting with dignitaries

- I along with my Council Colleagues CMA TCA Srinivasa Prasad, CMA Manoj Kumar Anand and CMA Vinayaranjan P. felicitated CMA Parminder Chopra, CMD of Power Finance Corporation Limited on 6th September, 2023
- I had a meeting with CA. Aniket Sunil Talati, President, ICAI on 10th September 2023 at Ahmedabad, Gujarat. We both discussed possible areas of collaboration and cooperation between both the Institutes for the mutual benefit of members and other stakeholders.
- I along with my Council Colleagues CMA Manoj Kumar Anand, CMA Neeraj D. Joshi and CMA Navneet Kumar Jain had a meeting with Shri Vijay Kumar, IAS, Special Secretary & Central Registrar of Cooperative Societies, Ministry of Cooperation, Govt. of India on 14th September, 2023.
- CMA Manoj Kumar Anand, Council Member, ICMAI along with CMA Rajendra Singh Bhati, Council Member, ICMAI had an opportunity to meet and greet Shri Arjun Ram Meghwal, Hon'ble Union Minister of Law and Justice & MoS for Culture and Parliamentary Affairs on 22nd September 2023.
- CMA Rajendra Singh Bhati, Council Member, ICMAI extended greetings to CMA Joshit Ranjan Sikidar, Director (Finance), Solar Energy Corporation of India Limited along with CMA Nikhil Agarwal, Chairman,

Gurugram Chapter, ICMAI.

- CMA Manoj Kumar Anand, Council Member, ICMAI along with CMA T.C.A Srinivasa Prasad, Council Member, ICMAI extended greetings to CMA Anil Kumar Tulsiani, Director (Finance) and Shri Praveen Nigam, ED (F&A), Steel Authority of India Limited (SAIL) and presented the Inaugural Volume of 'Industry Insights' on 26th September, 2023.
- CMA Baldev Kaur Sokhey, Director (Finance) and CMA Shri Hrishikesh Kumar, Executive Director (Finance), NBCC (India) Limited, visited the Institute and had a meeting with me and other Council Members, CMA TCA Srinivasa Prasad, CMA Manoj Kumar Anand and CMA Navneet Kumar Jain. They had discussions related to the overall development of the profession.

Swachhata Hi Sewa (SHS)

As you are aware, Swachhata Hi Sewa (SHS) campaign is an annual cleanliness and sanitation initiative celebrated from 15th September to 2nd October. The theme of SHS-2023 was 'Garbage Free India' with focus on visible cleanliness and welfare of Safai Mitras. I am happy to inform that the Institute wholeheartedly participated in the SHS-2023 by conducting various specified activities such as Cleanliness drives in office premises & adjacent areas. The Felicitation of housekeeping staff was done and Swachhata Pledge taken by all employees at Headquarters at Kolkata, Delhi Office, 4 Regional Offices at Kolkata, Delhi, Chennai & Mumbai, and 116 Chapters across the country.

ICSB International Training Program at Dhaka, Bangladesh

The Institute of Chartered Secretaries of Bangladesh (ICSB) organized a 2-days international training program titled 'Extended Scope of Work for CS Professionals' on 15 – 16 September 2023 jointly with the Institute of Companies Secretaries of India (ICSI). ICSB invited CMA (Dr.) V. Murali, Council Member, ICMAI, CMA Rajendra Singh Bhati, Council Member, ICMAI and CMA (Dr.) Kaushik Banerjee, Secretary, ICMAI to address the participants during the training program. During this visit to Dhaka, the delegation from the Institute visited the Institute of Cost and Management Accountants of Bangladesh (ICMAB) and had a meeting with Md. Abdul Rahman Khan, President ICMAB and other representatives of ICMAB, and had a fruitful discussion on some partnering endeavours between both the Institutes for widening the scope of CMA profession.

IFAC Board Meeting

CMA (Dr.) Ashish P. Thatte, Chairman, International Affairs Committee and CMA (Dr.) V. Murali, Chairman, Direct Taxation Committee ICMAI attended the IFAC Board meeting as 'observers' through virtual mode on 7th and 8th September 2023.

Joint Capacity Enhancement Program with Guru Nanak College

I along with CMA Bibhuti Bhusan Nayak, Vice President, ICMAI and CMA TCA Srinivasa Prasad, Chairman - Information Technology Committee and Members in Industry Committee, ICMAI participated in the Inaugural session of 5 days' Capacity Enhancement Program on "Information Technology in Commerce and Business" organized by School of Commerce, PG & Research Department of Commerce, Guru Nanak College in association with IT Committee of ICMAI. Mr. Manjit Singh Nayar, General Secretary & Correspondent, Dr. M.G. Ragunathan, Principal, Guru Nanak College, Dr. T.K. Avvai Kothai, Associate Professor & Head, PG & Research Program of Commerce, Dean-School of Commerce, CMA Rakesh Shankar Ravisankar, Assistant Professor, Commerce DDGD Vaishnav College, and Dr. R. Geetha & Dr. M. Ramila, organizing Secretaries also participated in the program. My Council Colleagues, CMA Neeraj D. Joshi, CMA (Dr.) Ashish P. Thatte, CMA Manoj Kumar Anand, CMA Rajendra Singh Bhati, CMA Vinayaranjan P., CMA Suresh R. Gunjalli and CMA Avijit Goswami delivered their key note addresses at different technical sessions.

Joint Strategic Development Program with S.A. College of Arts and Science

I along with CMA Bibhuti Bhusan Nayak, Vice President, ICMAI, CMA TCA Srinivasa Prasad, Chairman - Information Technology Committee and Members in Industry Committee, ICMAI and CMA (Dr.) K Ch A V S N Murthy, Chairman, Journal & Publications Committee, ICMAI participated in the Inaugural session of 5 Days Strategic Development Programme on "Digital Transformation in Business World – A Well Worn Path for Driving and Scaling Digital Initiatives" jointly organised by S.A. College of Arts and Science in association with IT Committee of ICMAI for Academicians, Educational Administrators, Industry Representatives, Professionals, and Students. My Council Colleagues, CMA Chittaranjan Chattopadhyay, CMA (Dr.) V Murali, CMA Navneet Kumar Jain and CMA Harshad Deshpande delivered their key note addresses at different technical sessions. Thiru P Venkatesh Raja, Correspondent, Dr. Malathi Selvakkumar, Principal, Dr. Sayi Satyavathi, Director, Dr. P.Suresh, Head-PG Department of Commerce and Commerce (General), Mr. Arjun NM, S.A. College of Arts & Science and CMA Rakesh Shankar Ravisankar, Assistant Professor, Commerce DDGD Vaishnav College also participated in the program.

DMA Conference on "ESG - the way forward"

The Institute associated with Delhi Management Association (DMA) for the Conference on "ESG - the way forward" organized on 22nd September 2023 at India Habitat Centre (IHC), New Delhi. CMA Navneet Kumar Jain, Council Member, ICMAI was one of the speakers amongst the other senior officials from various Ministries of the Government of India, corporate houses and Industry associations.

I now present a brief summary of the activities of various Departments/Committees/ Boards of the Institute, in addition to those detailed above:

BANKING, FINANCIAL SERVICES AND INSURANCE BOARD

I am pleased to inform you that CMAs are now eligible to apply for the post of Manager (Risk) in National Credit Guarantee Trustee Company Limited, Key Management Personnel (KMP) of Debt Capital Market (DCM) in Bank of Baroda, General Manager (Finance) in The Daman & Diu State Cooperative Bank Ltd., Assistant Manager in Grade A, Rural Development Banking Services, NABARD in General and Finance Disciplines.

The 7th Batch of the Certificate Course on Treasury and International Banking started on 9th September, 2023. Shri Vikas Babu Chittiprolu, DGM, Risk Management, Union Bank of India was the Chief Guest for the inaugural session. We request all to provide their Expression of Interest for the 8th batch of the Certificate Course on Treasury and International Banking as per the following link:

https://docs.google.com/forms/d/e/1FAIpQLSdx18Bm27SjBv83hUDP64j3jLmDuSIeVmGn2l2K3Epdg9P3Bw/viewform?vc=0&c=0&w=1&flr=0

The admission window for the other two Certificate Courses on Banking are presently open, viz:

- Certificate Course on Concurrent Audit of Banks (9th Batch)
- Certificate Course on Credit Management of Banks (9th Batch)

The members, students and others are requested to take the opportunity for capacity building and knowledge enhancement by enrolling in such courses for which the link of admission is as follows https://eicmai.in/advscc/Home.aspx .

BOARD OF ADVANCED STUDIES & RESEARCH

I am delighted to announce that the Board of Advanced Studies & Research has initiated the admission process for several cutting-edge Advanced Studies Courses, including:

- Diploma in Forensic Audit
- Certificate Course in Data Analytics for Finance Professionals
- Diploma in Information System Security Audit
- Advanced Certificate Course in Internal Audit
- Executive Diploma in Cost & Management Accounting for Engineers
- Diploma in Financial Modeling & Valuation

CAREER COUNSELLING & PLACEMENT COMMITTEE

I am pleased to share that the Career Counselling & Placement Committee of the Institute, being the Knowledge Partner, have participated in an Indian Express Initiative-Principal's Meet - Kolkata along with an EXPRESS RTC on education sector for 'Career prospects in such mainline and offline courses' amongst the aspiring students of the 2023-24 Academic Session. The event was held on 15th September, 2023 at Calcutta Club, Kolkata. The opportunity was to directly connect with more than 50 Principals of different colleges and more than 10 college authorities and other distinguished educationists.

A brainstorming session in the presence of the Principal Secretary, Department of Education, Govt. of West Bengal and other eminent dignitaries took place. On behalf of our Institute, CMA Chittaranjan Chattopadhyay, Council Member was the speaker for discussing about the career and prospects for joining our CMA Course.

It is for your information that all the Regional Councils and Chapters of the Institute are also conducting Career Counselling for creating awareness among the students.

COMMITTEE FOR ACCOUNTING TECHNICIANS (CAT)

I am pleased to share with you that CAT Directorate has started five batches for Defence personnel, details of which are given below:

I am glad to share that I was present during the inaugural function of first-ever batch of CAT course for retiring/retired JCOs/OR & their equivalent in association with Directorate General of Resettlement (DGR), Ministry of Defence, Government of India and gave presidential address to the candidates present. The inauguration of the batch took place on the 13th of September 2023 in Chennai, Tamil Nadu in august presence of Chief Guest Col Monesh Kumar Bathre, Director Recruiting, Chennai, CMA Rajendra Singh Bhati, Council Member & Chairman (CAT), CMA T C A Srinivasa Prasad, Council Member, CMA Dr. V. Murali, Council Member, CMA Divya Abhishek, Chairperson, SIRC, CMA Y. Srinivasa Rao, Secretary, SIRC and other dignitaries and staff of the HQ and SIRC in attendance.

Further, Inauguration of Second batch was done at Lucknow Chapter of ICMAI on 25th September, 2023 by Chief Guest Brigadier Sanjive Sokinda, SM, VSM, Addl. Director General of DRZ (Central), DGR, Ministry of Defence in presence of CMA Rajendra Singh Bhati, Council Member & Chairman (CAT), ICMAI and other dignitaries.

Furthermore, Inauguration of third batch was done at Jaipur Chapter of ICMAI on 25th September, 2023 by Chief Guest Col Rajesh Bhukar, Director, Army Welfare Placement Organisation, Rajasthan in presence of CMA Rajendra Singh Bhati, Council Member & Chairman (CAT), CMA S. N. Mittal, Chairman, NIRC, CMA Harendra Kumar Pareek, Chairman-Jaipur Chapter, CMA Purnima Goyal, Vice Chairperson, Jaipur Chapter, CMA (Dr.) Deepak Kumar Khandelwal, Secretary, Jaipur Chapter and other Managing Committee Members.

Two more batches commenced on 25th September, 2023 itself at Bhubaneswar & Indore at Bhubaneswar Chapter & Indore-Dewas Chapter respectively. The formal inauguration at these two locations will take place soon.

I am elated to share with you that the Ministry of Defence is pleased to have been associated with your Institute. I would

like to congratulate the CAT Directorate for their efforts in materialising the association with the Ministry of Defence.

COST ACCOUNTING STANDARDS BOARD (CASB)

CASB, the standard-setting body of the Institute, held its 100th meeting on 5th September 2023 in Delhi wherein I was also present. I congratulated the Chairman and Member of the current Board on the occasion. I conveyed my heartfelt gratitude to the former Chairmen and Members of the board for their worthwhile contribution in compiling the GACAPs, developing the Cost Accounting Standards and issuance of relevant guidance notes and technical publications for the benefit of the CMA Profession, Industry and other stakeholders. The Chairman, CASB assured that the Board is geared up to take up many new initiatives like development of Technical Guides in relevant areas.

I would like to inform you that the CASB in its 100th meeting approved the release of the Exposure Draft of the Cost Accounting Standard on Capacity Determination (CAS-2, Revised 2023) seeking public comments / suggestions in the prescribed format within 16th October 2023. The revised standard shall be finalised by the Board in the light of the suggestions / comments received within the prescribed last date.

I request you to submit your suggestions / comments to the Board at casb@icmai.in within the last date so that the same can be compiled and placed before the Board for consideration in its next meeting.

The Exposure Draft of CAS-2 (Revised 2023) is available at https://icmai.in/CASB/ED_CAS2_Revised_2023.php

DIRECTORATE OF STUDIES

I am pleased to share that the Directorate of Studies have started online live coaching classes for CMA students for all levels of Syllabus 2022 from 18th September 2023 onwards, these online classes are likely to continue till the start of CMA Examinations of December 2023 term. I call upon all students to take maximum benefit from these online classes for which the very best of resource persons have been engaged.

MEMBERS IN INDUSTRY COMMITTEE

I am delighted to share that we have started an exciting journey with the inaugural issue of 'Industry Insights' in September 2023 under the aegis of Members in Industry Committee. This publication promises to be a beacon of knowledge and enlightenment for the entire CMA fraternity. The Members in Industry Committee plays a pivotal role in bridging the gap between academia and industry. It serves as a conduit through which our members can engage with the real-world challenges and opportunities faced by organizations across various sectors.

I want to express my heartfelt gratitude to CMA TCA Srinivasa Prasad, Chairman, Members in Industry Committee and the entire team behind 'Industry Insights' for their dedication and hard work in bringing this publication to fruition. As we move forward, I encourage all of you to actively participate in this endeavor and share your experiences, expertise and insights. Let us make 'Industry Insights' a vibrant platform that catalyzes our collective growth and learning to witness the positive impact it will have on our professional community.

MSME & START-UP PROMOTION BOARD

I am happy to share that the MSME & Start-up Promotion Board had participated in the following events:

- CII Eastern Region's "CII MSME Conclave East" on 14th September, 2023 at ITC Sonar Kolkata with a theme "Towards a Competitive & Future Ready MSME for India@100".
- "MSME: Ease of Doing Business Initiative" - a round table discussion organized by The Statesman in association with SBI on 23rd September, 2023 at HHI, Kolkata.
- CII Eastern Region's 16th Edition of Banking Colloquium, one of their annual flagship conferences, on 28th September, 2023 at ITC Sonar, Kolkata wherein there was a dedicated session on "MSME Financing".

PROFESSIONAL DEVELOPMENT & CEP COMMITTEE

I would like to congratulate the Chairman, Professional Development & CEP Committee for commencing the 9th batch of online Mandatory Capacity Building Training (e-MCBT) for the new CoP holders on 21st September 2023. We are confident that this training will be a booster for the new practitioners and will give further impetus to their professional endeavours.

Please visit the PD Portal for Tenders/EOIs during the month of September 2023 where services of the Cost Accountants are required in Advanced Weapons and Equipment India Limited, Chandigarh International Airport Limited (CHIAL), State Health Society Maharashtra Coal India Limited, Power Development Department Jammu and Kashmir, Airports Authority of India, Madhya Pradesh Rajya Van Vikas Nigam Ltd. (MPRVVN), HLL Lifecare Limited, J&K Grameen Bank, Cement Corporation of India Limited, State Health Society (NHM), Chhattisgarh, Garden Reach Shipbuilders & Engineers Limited, etc.

Professional Development & CEP Committee in association with PHD Chamber of Commerce and Industry organized webinars on "Important latest GST legal jurisprudence" and "Search & Seizure under Income Tax Act".

During the month, around fifty webinars and programs were organized by the different Committees, Regional Councils and Chapters of the Institute on the topics of professional relevance and importance like Supply Chain Risk Management Resilience & Rebalancing, Prevention of Money Laundering Act, Strategic Development Program on Digital Transformation in Business World - A Well Worn Path for Driving and Scaling Digital Initiatives, Foreign Exchange Rates IND AS 21, Risk Management, GST Reporting in

Income Tax Audit - Clause 44 of Form 3CD, An insight into Cost Audit and Compliance Report, Income Tax Audit and Recent Changes and so on. I am sure our members are immensely benefited from the deliberations and take aways in these sessions.

REGIONAL COUNCIL & CHAPTERS COORDINATION COMMITTEE

I am happy to announce that in pursuance of Regulation 146 of the CWA Regulations, 1959, the Council at its 348th Council Meeting held on 27th and 28th August, 2023 has constituted a new Chapter, namely Bhiwani Chapter of The Institute of Cost Accountants of India covering the area of Bhiwani District in Haryana State under NIRC. A notification dated 21st September, 2023, to this effect, has been issued accordingly.

The Institute is contemplating to reintroduce offline Computer training and advance courses by RCs and Chapter as per the guidelines and under monitoring of Institute. Interested RCs and Chapters may get in touch with concerned executives.

The Institute encourages all members and students to seize this valuable opportunity to enrich their knowledge base at local level and I extend my best wishes for the success of this endeavour.

TAX RESEARCH DEPARTMENT

The Tax Research Department has received an overwhelming response from the Government and Private Sector organizations through enrollment of their employees to participate in the following seven taxation courses commenced during the month:

i. Certificate Course on GST (Batch – 14)
ii. Advanced Certificate Course on GST (Batch – 10)
iii. Advanced Course on GST Audit and Assessment Procedure (Batch – 7)
iv. Certificate Course on International Trade (Batch – 4)
v. Certificate Course on TDS (Batch – 10)
vi. Certificate Course on Filing of Returns (Batch – 10) and
vii. Advanced Course on Income Tax Assessment & Appeals (Batch – 7)

The department has also initiated its activity for submission of suggestions to the Government for the Pre Budget Memorandum for the year 2024-2025. I thank all members who have submitted their suggestions for Pre Budget Memorandum of 2024-25 on Direct and Indirect Taxes. The department is also working the area to suggest new changes for the ease of doing business, keeping in mind the government's point of view.

The Central Board of Direct Taxes has notified the forms for the Inventory Valuation report under clause (ii) of section 142(2A) of the Income-tax Act, 1961 on 27th September, 2023.This will open a new avenue for the practicing cost accountants. The Institute is planning to conduct workshops and seminars on PAN India basis for the capacity building of the members.

Fortnightly Tax bulletins have been released during the month. Top Stories section of the Taxation Portal has been continuously updated with circulars and notifications on both Direct and Indirect Taxation. The quiz is being conducted every Friday for the members.

INSOLVENCY PROFESSIONAL AGENCY (IPA) OF THE INSTITUTE

The Insolvency Professional Agency of Institute of Cost Accountants of India, in its endeavor to promote professional development and sharpen the skills of the professionals, has constantly been conducting various professional & orientation programs across the country and publishing various publications and books for the benefit of stakeholders at large. Towards that, IPA ICMAI has undertaken several online learning sessions, workshops, pre-registration educational courses during the month of September, 2023.

Further, IPA ICMAI published Au-Courant (Daily Newsletter), a weekly IBC Dossier, and a monthly e- Journal which are hosted on its website.

ICMAI REGISTERED VALUERS ORGANISATION (RVO)

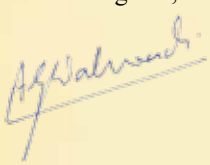
I am pleased to inform you that ICMAI RVO has successfully organized three "50 Hours training programs" for Securities or Financial Assets, Land and Building and organized 12 "Professional Development Programs" during the month of September 2023. In its efforts to bring out relevant publications for development of valuation profession, the ICMAI RVO also released its monthly Journal – The Valuation Professional. ICMAI RVO is planning to organize a program on the occasion of Valuation day on 18th October, 2023 in association with IBBI and some of the RVOs.

ICMAI SOCIAL AUDITORS ORGANISATION (SAO)

I am pleased to inform you that ICMAI SAO organized two Preparatory courses for preparing candidates for the Social Auditors exam conducted by NISM and also organized two Professional Development programs during September, 2023. ICMAI SAO also released its monthly Journal – The Social Auditor. ICMAI SAO also entered into Memorandum of Understanding with Catalyst 2030 and SR Asia.

I wish prosperity and happiness to members, students and their families on the occasion of Mahatma Gandhi Jayanti, Dussehra & Maharishi Valmiki Jayanti and pray for their success in all of their endeavours.

With warm regards,



CMA Ashwin G. Dalwadi
October 02, 2023

CAREER COUNSELLING EVENT

THE INDIAN EXPRESS GROUP ROUND TABLE CONFERENCE "PRINCIPAL MEET"

at Calcutta Club on September 15, 2023

Knowledge Partner - The Institute of Cost Accountants of India

All panelists and other dignitaries in one frame

Representatives of different Institutions present in the meet

CMA Chittaranjan Chattopadhyay, Council Member, ICMAI is addressing the audience in the meet

The Indian Express Group Round Table Conference, "Principal Meet", was held at Calcutta Club on September 15, 2023. Career Counselling & Placement Committee of our Institute had participated as the 'Knowledge Partner' in the event. The event focussed deeply on the challenges and opportunities faced by the West Bengal as an education hub for the region.

On behalf of our Institute, CMA Chittaranjan Chattopadhyay, Council Member was the resource person. He explained, how the ICMAI is bridging the glorious past with an exciting future for the students. He further expressed that the Institute, headquartered in Kolkata, attracts students from all over the country and also from overseas countries and the new syllabus of the Institute has included the infusion of new age courses like SAP, AI etc. which help to prepare CMAs who are truly industry ready at a low cost.

Shri Manish Jain, Principal Secretary, Department of Education, Govt. of West Bengal, Prof. Uma Dasgupta, an eminent Tagore Scholar, Dr.Ajoy Ray, Padmashree, Ex-Director of Bengal Engineering College & Ex-Professor of IIT Kharagpur, Dr. Chiranjib Bhattacharya, President of West Bengal Higher Secondary Education, Shri Siddharth Kankaria, Director PWC-India, CMA Chittaranjan Chattopadhyay, Council Member of ICMAI, Prof. Sukanta Chaudhuri, an eminent literally scholar, Sardar Simarpreet Singh, JIS Group, Dr. Naveen Das, Pro Vice Chancellor of Adamas University, Prof. (Dr.) Susmit Maity, Haldia Institue of Technology, Dr. Rama Prasad Bannerjee, Chairman & Director, EIILM-Kolkata were the dignitaries present amongst other eminent personalities in the event.

Capacity Enhancement Programme on Information Technology in Commerce and Business

11th September 2023 to 15th September 2023

The five days joint programme between Post Graduate and Research Department of Commerce, Guru Nanak College, Chennai and IT Committee, The Institute of Cost Accountants of India aimed at capacity building of the CMAs, students and faculty members in the IT domain and its transition in commerce and business with Enterprise Resource Planning [ERP], Artificial Intelligence [AI], Machine Learning [ML], Robotic Process Automation [RPA], Open Network for Digital Commerce [ONDC], Technology in Taxation in India, Cloud for Finance and Cyber Security, Management Information Systems [MIS] and Expert Information Systems in Business [EIS]. The programme was inaugurated by CMA Ashwin G. Dalwadi, President along with Dr. M.G. Ragunathan, Principal, Dr. T.K. Avvai Kothai, HOD & Dean School of Commerce, Guru Nanak College, CMA TCA Srinivasa Prasad, Council Member and Chairman IT Committee, ICMAI and CMA Rakesh Shankar Ravisankar, Cost Accountant and Faculty of Commerce. On 11th September 2023, Session I: Keynote Speaker and Resource Persons were CMA TCA Srinivasa Prasad, Council Member and Chairman IT Committee, ICMAI and CMA V Guruprasad, Vice President, Bengaluru. Highlights of the Session were shedding light on ERP as a comprehensive solution for business process integration.

Topic of Session II held on 12th September 2023 was Artificial Intelligence and Big Data in Business and keynote speakers were CMA (Dr.) Neeraj Dhananjay Joshi, Council Member, Member – IT Committee and CMA S Vasudevan Director Business Development, Institute of Analytics (USA). CMA (Dr.) Ashish Prakash Thatte, Council Member, Member IT Committee and CMA S Venkata Krishnan Senior Manager, Global Accounts Payable & Fixed Asset Management Omega Healthcare Management Services Private Limited were the speakers on Session III held on 12th September 2023. Highlight of the Session was "the speaker delved into Technology Initiatives in Taxation in India."

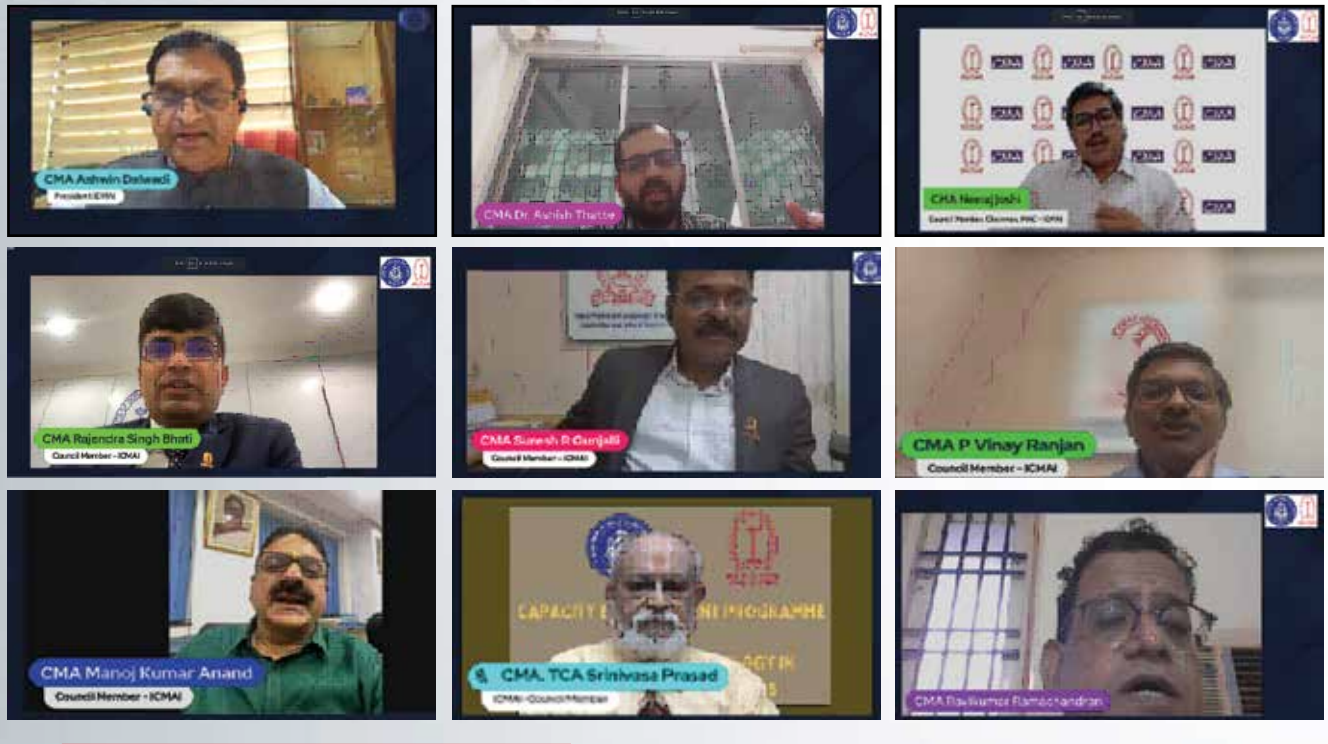
Session IV topic was ONDC Network and Other Government Initiatives, held on 13th September 2023. CMA Manoj Kumar Anand Council Member, Member IT Committee and Shri S Ram Gopal SAP Consultant were the keynote speakers. Highlights of the Session V were "the speaker delved into Technology Initiatives in Taxation in India". CMA Rajendra Singh Bhati

Council Member, Member IT Committee and CMA R Nellai Kumar Practicing Cost Accountant were the speakers.

On 14th September 2023 Session VI held on Cyber Security and Recent Trends. Main speakers were CMA P Vinayranjan Council Member, Member IT Committee and CMA R Ravi Kumar Enterprise GRC and Agile Practitioner Cyber Security Specialist and Professional Scrum Master. CMA Suresh Rachappa Gunjalli, Council Member, Member – IT Committee and CMA N Shastry, Tata Managing Director Chennai Operations, RSM India were the speakers on Session VII. The topic was MIS/EIS in Business.

15th September 2023, the last session VIII was on Cloud for Finance and its security. The keynote speakers were CMA Avijit Goswami, Council Member, Member – IT Committee and CMA Praveen Hebbali, Senior Vice President - Finance and Country Head, India ArisGlobal. CMA Bibhuti Bhushan Nayak, Vice President, ICMAI and CMA TCA Srinivasa Prasad, Council Member ICMAI assured of all possible means from the Institute. CMA TCA Srinivasa Prasad delivered the valedictory address highlighting the progressive outcome of the programme. The programme was coordinated by Dr. R Geetha, Dr. M Ramila, Assistant Professor Commerce and Sri. Akil Antony, Student Coordinator.

Screenshots



Report on the Five days Strategic Development Programme on Digital Transformation in Business World

25th September 2023 to 29th September 2023

Five days Strategic Development Programme on Digital Transformation in Business World – A Well Worn Path for Driving and Scaling Digital Initiatives organised jointly by the Information Technology Committee of the Institute of Cost Accountant of India and S.A. College of Arts and Science, Chennai from 25th September 2023 to 29th September 2023. On 25th September 2023 Welcome Address was delivered by Dr. Malathi Selvakkumar, Principal, S.A. College of Arts and Science, Chennai. CMA Ashwinkumar G Dalwadi, President ICMAI gave Inaugural Address and keynote speaker was CMA (Dr.) K Ch A V S N Murthy, Council Member, ICMAI. Expert Session was presented by CMA Chandrasekhar Kupperi, Founder, ANOVA Corporate Services.

On 26th September 2023, Keynote session on FinTech and Block Chain was presented by CMA Chittaranjan Chattopadhyay, Council Member, ICMAI. Technical Session on Technology in Business Compliances was conducted by CMA Palaniappan Nachiappan, CS and GM Finance, Bluedart Aviation Limited.

Another Technical Session on Digital Initiatives in Indirect Taxation was conducted on 27th September 2023 and speaker was CMA Mallikarjun N, Director Grand Thornton Bharat LLP.

On the topic Chat GPT for Business – Are We Ready? Expert session held on 28th September 2023 and speakers were CMA Navneet Kumar Jain, Council Member, ICMAI and CMA (Dr.) Somu Siva Rama Krishna, Chairman, Amaravati Chapter of SIRC of ICSI.

On 29th September 2023 a session was arranged on Cloud Business Solutions for MSME's – A Game Changer. Key speaker was CMA Harshad Shamkant Deshpande, Council Member, ICMAI and Expert Session was conducted by CMA Sriram Swaminathan, Consulting Practice Director – Oracle India. Felicitation and Valedictory session was conducted by Dr. Sayi Satyavathi, Director SA College of Arts and Science and CMA TCA Srinivasa Prasad, Council Member ICMAI. The event was coordinated by CMA Rakesh Shankar Ravisankar, Cost Accountant, Chennai along with the college authorities Dr. Malathi Selvakkumar Principal, Dr. Sayi Satyavathi Director, Dr. P Suresh Head, Commerce, Sri. Yeshwanthan M and Sri. Lakshmipathi, Student co-ordinators.

Screenshots

SWACHHATA HI SEWA PAKHWARA

(SHS Drive w.e.f 15th September - 02nd October 2023)

Cleanliness Drive undertaken at Institute's Headquarters, Kolkata

As a part of the cleanliness drive under SHS – 2023, ICMAI exercised the **Shramdaan** activities at Delhi Office premises & adjacent areas

Cleanliness Drive undertaken at Institutes Noida Office

Cleanliness activities by various Regional offices and Chapters of the Institute

CMA Manoj Kumar Anand, Council Member, ICMAI along with CMA Rajendra Singh Bhati, Council Member, ICMAI extending greetings to Shri Arjun Ram Meghwal, Hon'ble Union Minister of Law and Justice & MoS for Culture and Parliamentary Affairs on 22nd September, 2023.

Inauguration of First batch of CAT Course under Directorate General Resettlement, Ministry of Defence, Govt. of India at SIRC, ICMAI on 13th September, 2023 in the presence of CMA Ashwin G. Dalwadi, President, ICMAI, Col Monesh Kumar Bathre, Director - Recruiting Ministry of Defence, GOI, CMA Rajendra Singh Bhati, Council Member and Chairman, CAT, ICMAI, CMA (Dr.) V. Murali, Council Member ICMAI, CMA T.C.A. Srinivasa Prasad Council Member ICMAI, CMA Divya Abhishek, Chairperson, SIRC, ICMAI, Regional Council Members of SIRC, ICMAI and other dignitaries.

CMA (Dr.) V. Murali, Council Member, ICMAI, CMA Rajendra Singh Bhati, Council Member, ICMAI and CMA (Dr.) Kaushik Banerjee, Secretary, ICMAI along with the representatives of ICSB and ICSI during the International Training Programme jointly conducted by ICSB and ICSI on 15-16 September, 2023 in Dhaka, Bangladesh.

CMA Baldev Kaur Sokhey, Director (Finance) at NBCC, and CMA Shri Hrishikesh Kumar, Executive Director (Finance) at NBCC, visited The Institute of Cost Accountants of India (ICMAI) and had a meeting with President CMA Ashwin G. Dalwadi and other Council Members, CMA TCA Sriniwas, CMA M K Anand & CMA Navneet Kumar Jain. They had discussions related to the overall development of the profession.

Members in Industry, ICMAI releasing Inaugural Volume of 'Industry Insights' on 14th September,2023

CMA (Dr.) V. Murali, Council Member, CMA Rajendra Singh Bhati, Council Member and CMA (Dr.) Kaushik Banerjee, Secretary, ICMAI met with Md. Abdul Rahman Khan, President ICMAB and other representatives of ICMAB at Dhaka, Bangladesh and had a fruitful discussion on some partnering endeavours between both the Institutes widening the scope of CMA profession.

CMA Rajendra Singh Bhati, Council Member, ICMAI extending greetings to CMA Joshit Ranjan Sikidar, Director (Finance), Solar Energy Corporation of India Limited along with CMA Nikhil Agarwal, Chairman, Gurugram Chapter, ICMAI.

Inauguration of third batch of CAT Course under Directorate General Resettlement, Ministry of Defence, Govt. of India at Jaipur Chapter of Cost Accountants on 26th September, 2023.

CMA Chittaranjan Chattopadhyay, Chairman, BFSIB & IAASB and Council Member, ICMAI (extreme left) along with CMA Avijit Goswami, Chairman, Members' Facilities Committee & PSU Coordination Board, Council Member, ICMAI(extreme right) felicitating CMA Yatrik Vin, Group CFO and Head Corporate Affairs, NSE (centre) at Mumbai on 27th September, 2023.

CMA Navneet Kumar Jain, Chairman PR Committee and Council Member, ICMAI, met with Sh. Rakesh Kumar President, Sales Tax Bar Association, Delhi on 15 Sep, 2023

Inauguration of Second batch of CAT Course under Directorate General Resettlement, Ministry of Defence, Govt. of India at Lucknow Chapter of ICMAI on 25th September, 2023, by Brigadier Sanjive Sokinda, SM, VSM, Addl Director General of DRZ (Central) in the presence of CMA Rajendra Singh Bhati, Council Member & Chairman, CAT, ICMAI and other dignitaries.

CMA Chittaranjan Chattopadhyay, Chairman, BFSIB & IAASB and Council Member, ICMAI (2nd from left) along with CMA Avijit Goswami, Chairman, Members' Facilities Committee & PSU Coordination Board, Council Member, ICMAI (extreme left) and CMA (Dr.) Ashish P. Thatte,Chairman, International Affairs Committee and Career Counselling & Placement Committee (extreme right) With Sri Sundararaman Ramamurthy, MD & CEO of BSE (2nd from right).

SMART GRID, AI, IOT AND BIG DATA: POWERING INDIA'S RENEWABLE ENERGY REVOLUTION

Abstract

This article delves into the critical role of emerging technologies, including Smart Grids, Artificial Intelligence (AI), Internet of Things (IoT), and Big Data, in transforming India's renewable energy (RE) sector. It explores how these technologies are instrumental in achieving India's ambitious RE goals followed by policy measures, case studies and real-world examples that demonstrate the practical applications and impact of these technologies. It also talks about the challenges and limitations associated with their implementation and outlines effective measures to overcome them. The article accentuates the transformative potential of technology integration in India's RE sector, offering a greener, more efficient, and sustainable energy landscape.

CMA (Dr.) Dipra Bhattacharya
Management & IT Consultant
Kolkata
mail2dipra@gmail.com

INTRODUCTION

In the vibrant landscape of India's renewable energy (now onwards mentioned as "RE") sector, a renovation of insightful significance is unfolding. With a resolute commitment to sustainability and the motivated goal of developing RE capacity, the nation is taking on a paradigm shift in adopting technologies like Smart Grids, AI, IoT, and Big Data, which play a crucial role in shaping the future of energy generation, distribution, and consumption. These are essential components of a modernized energy ecosystem that enables the effective integration of RE, improves grid reliability, and enhances energy efficiency, contributing to a more sustainable and resilient energy future.

SMART GRIDS IN RE

RE sources like wind and solar, while eco-friendly, have intermittency issues. To ensure a continuous power supply, we rely on a smart grid—a sophisticated and adaptable electricity network which optimizes our use of RE, reducing dependence on fossil fuels and benefiting the environment.

- **RE Integration:** Smart grids enable the seamless mix of intermittent solar and wind sources into the existing energy infrastructure. They facilitate two-way communication, allowing grid operators to handle the fluctuations of renewable efficiently.
- **Efficiency Improvement:** Smart grids track and minimize transmission and distribution losses, optimizing proper utilization of energy.
- **Demand Supply Balance & Response:** Smart grids facilitate quick and real-time demand response programs, which can balance electricity supply and demand.

Let's dive into more details, how AI, Big Data and IoT are being promulgated and practiced in the Indian RE sector with industry case studies and how Government policies foster the clean energy transition and sustainability goals.

ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) is becoming increasingly important in India's RE sector. It's a key player in making RE sources work superior, making them more reliable, and helping them grow without costing too much.

1. **Smarter Solar Power Plants**

   AI algorithms analyze data from solar panels, weather conditions, and energy consumption patterns to predict and optimize energy production, boosting solar plant efficiency. *Tata Power* employs AI to optimize solar power plant performance to increase energy generation from solar plants.

2. **Wind Energy Forecasting**

   AI algorithms analyze past and real-time data, including wind speed and direction, for more accurate wind energy production predictions. This helps in better wind power integration and grid reliability. *Suzlon Energy* leverages AI for wind energy forecasting to minimize wind power fluctuations, enhance grid stability and reduce the need for backup power sources.

3. **Grid Management and Demand Forecasting**

   AI algorithms process huge data volumes to predict energy need patterns, optimize grid operations, and ensure a steady supply of RE. India's state-owned utility, *Power Grid Corporation of India Limited* (*POWERGRID*), integrates AI into grid management and demand forecasting to reduce energy wastage and bolster grid consistency.

4. **Energy Storage Optimization**

   AI optimizes the charging and discharging of energy storage systems, such as batteries, in response to real-time demand and supply conditions, ensuring efficient use of stored RE. *ReNew Power* explores AI for energy storage system optimization to enhance the reliability and consistent power provision.

5. **Smart Grid Development**

   Ministry of Power launches the AI enabled *National Smart Grid Mission*, focusing on creating smart grids across India. AI-driven smart grids will facilitate efficient management of sources, reduce power losses, enhance stability, and improve the integration of clean energy into the grid.

AI has been utilized in smart grid implementations in India to revamp the industry landscape:

The nation is taking on a paradigm shift in adopting technologies like Smart Grids, AI, IoT, and Big Data, which play a crucial role in shaping the future of energy generation

- **Grid Operation and Optimization:** *Power System Operation Corporation Limited* (*POSOCO*), which manages India's power grid, utilizes AI algorithms to predict electricity demand and optimize grid operations.
- **Energy Forecasting:** *The National* Institute *of Solar Energy (NISE*) employs AI-based models for accurate solar energy forecasting of weather data and historical energy production.
- **Load Management and Demand Response:** *Tata Power* in Mumbai implements AI-driven demand response programs. AI analyzes consumption data and communicates with smart appliances to manage energy use during peak hours, ensuring grid stability.
- **Fault Detection and Maintenance:** *Gujarat Energy Transmission Corporation Limited* (*GETCO*) uses AI for fault detection in power infrastructure. Algorithms predict equipment failures based on sensor data, allowing proactive maintenance and minimizing downtime.
- **Cybersecurity:** Utilities and grid operators deploy AI-based cyber security solutions to protect smart grid infrastructure from cyber threats. AI monitors network traffic, detects anomalies, and responds swiftly to safeguard the grid.
- **Consumer Engagement:** *BSES Rajdhani Power Limited* (*BRPL*) in Delhi employs AI Chatbots to provide real-time information, outage updates, and energy-saving tips, enhancing customer service.
- **Grid Resilience and Disaster Management:** *Kerala State Electricity Board* (*KSEB*) uses AI-based predictive analytics to assess grid resilience against natural disasters. AI simulates the impact of extreme weather events, aiding disaster management and response planning.
- **Energy Market Optimization:** The *Indian Energy Exchange* (*IEX*) utilizes AI algorithms for energy market optimization. AI analyzes market dynamics to determine efficient energy pricing and trading strategies.
- **RE Integration:** *Azure Power* employs AI to optimize energy storage systems. AI controls battery charging and discharging for efficient use of RE.
- **Electric Vehicle (EV) Charging:** EV charging infrastructure providers like *EVRE* use AI to optimize charging stations schedules considering grid conditions and cost-effectiveness, promoting sustainable transportation.

INTERNET OF THINGS

The Internet of Things (IoT) is a vital player in boosting grid intelligence, responsiveness and efficiency by enabling data collection

and analysis. This leads to smarter decision-making, enhanced grid reliability, and improved energy management. In India's ongoing smart grid expansion, IoT is a key component in achieving RE and sustainability goals.

Here are some key applications of IoT in smart grid implementations:

- **Remote Monitoring and Control:** *Tata Power Delhi Distribution Limited* (*Tata Power-DDL*) uses IoT-equipped smart meters. These meters provide real-time data on electricity use and grid health. It can control them remotely, reducing manual readings and responding faster to power outages.
- **Grid Equipment Health Monitoring:** *Power Grid Corporation of India Limited (POWERGRID*) employs IoT sensors to monitor transformer and critical grid equipment health. They track parameters like temperature and oil levels, triggering maintenance alerts for preventive action.
- **RE Integration:** IoT-connected weather sensors are used to monitor conditions like wind speed and solar radiation, optimizing RE operation and integrating it efficiently into the grid.
- **Demand Response Programs:** *Bangalore Electricity Supply Company* (*BESCOM*) implements IoT-based demand response programs. Smart meters communicate with the grid, allowing *BESCOM* to reduce power to non-essential appliances during peak demand, helping balance supply and demand.
- **Fault Detection and Self-Healing:** *Maharashtra State Electricity Distribution Company Limited (MSEDCL*) is developing IoT-based fault detection and self-healing system. IoT sensors on power lines detect faults, and IoT-controlled switches automatically reroute power to minimize downtime.
- **Energy Storage Optimization:** *Azure Power*, a solar energy provider, employs IoT for energy storage management. IoT sensors monitor battery conditions and performance, optimizing charging and discharging cycles for efficiency and grid stability.
- **Grid Security:** IoT-based cyber security solutions monitor network traffic for suspicious activity, provide real-time alerts, and offer threat intelligence.
- **Consumer Engagement:** *Adani Electricity Mumbai Limited (AEML*) uses IoT-enabled smart meters that provide real-time data to consumers via a mobile app. Consumers can monitor energy usage, set energy-saving goals, and receives alerts for unusual consumption, encouraging energy conservation.

BIG DATA

Big Data analytics plays a pivotal role in processing and making sense of the large volume of data generated by smart grids. It empowers utilities, regulators, and researchers to make data-driven decisions, improve grid reliability, enhance energy efficiency, and integrate RE sources more effectively into the Indian energy landscape.

Big Data is getting utilized in smart grid implementations in India, along with some case examples:

- **Grid Operations and Optimization:** *The Indian Smart* Grid *Forum (ISGF*) champions smart grid tech adoption in India. They harness Big Data analytics for grid operations, processing data from smart meters, sensors, and equipment. This aids in load forecasting, outage management, and grid efficiency enhancements.
- **RE Integration:** *The National Institute of Wind Energy (NIWE)* in India evaluates wind energy potential countrywide using Big Data analytics. Analyzing historical wind data helps NIWE pinpoint suitable wind farm locations and optimize their performance.
- **Consumer Behaviour Analysis:** Power utilities like *BSES Rajdhani Power Limited (BRPL*) tap into Big Data to study consumer behavior patterns. Data from smart meters allows utilities to offer personalized energy-saving recommendations to consumers.
- **Predictive Maintenance:** *Tata Power-DDL* relies on Big Data analytics to foresee maintenance needs for its grid infrastructure. Sensor data from transformers and power lines enables proactive maintenance scheduling, preventing equipment failures and outages.
- **Energy Theft Detection:** Energy theft is a concern in parts of India. *Tata Power* uses Big Data to spot abnormal usage patterns that may indicate theft. Analyzing consumption data helps detect and address energy theft more effectively.
- **Grid Resilience and Security:** *The Central Power Research Institute (CPRI)* in India assesses grid resilience against natural disasters and cyber threats using Big Data analytics. Historical data and

scenario simulations help CPRI enhance grid resilience.

- **Energy Market Analysis:** Market regulators like the *Indian Energy Exchange (IEX)* rely on Big Data analytics to analyze energy market data. This informs decisions regarding energy pricing, trading, and market operations.
- **Infrastructure Planning:** State Electricity Regulatory Commissions use Big Data analytics to plan grid infrastructure expansion. They examine factors like population growth and economic development to identify where new substations, transmission lines, and distribution networks are needed.

KEY LEGAL PROVISIONS RELATED TO TECHNOLOGY AND INNOVATION

India has implemented key legal provisions to promote technology and innovation in the RE sector:

- **National Solar Mission (JNNSM):** Launched in 2010, it is aimed to boost solar energy development, emphasizing technology innovation, research, and incentives for solar power generation.
- **National Wind-Solar Hybrid Policy:** Introduced in 2018, it encouraged hybrid wind and solar projects, focusing on technological advancements for optimized RE generation.
- **Renewable Purchase Obligation (RPO):** Mandated by the Electricity Act, 2003, it requires a percentage of electricity to come from renewables, driving investments in renewable tech.
- **Power Procurement Guidelines:** CERC and SERCs issued procurement guidelines with provisions for technology-specific tariffs and incentives.
- **Incentives and Subsidies:** Government schemes, including subsidies and tax benefits, promote innovation and tech adoption in renewables.
- **Net Metering and Grid Integration:** Regulations support grid integration, allowing consumers to sell excess RE to the grid.
- **RE Certificates (RECs):** A market mechanism enables meeting RPO targets by purchasing certificates representing RE generation.

CHALLENGES AND MEASURES TO OVERCOME

Despite challenges, the Indian Government and related organizations are actively addressing them to advance the adoption of emerging technologies in RE, speeding up India's move towards a sustainable and tech-savvy energy environment.

- **High Initial Costs:** The deployment of advanced technologies often requires significant upfront investments, which can be a barrier for smaller players. The Government (MNRE) announced subsidies, grants, and incentives for RE projects that incorporate these technologies.
- **Lack of Skilled Workforce:** Implementing and managing these technologies require a skilled workforce. *Skill Council for Green Jobs (SCGJ)* in India focuses on skill development for the RE sector.
- **Interoperability Issues:** Integrating various technologies like Smart Grids, IoT devices, and Big Data platforms can be complex, leading to inter-operability challenges. *Bureau of Indian Standards* (*BIS*) work on setting standards for various technologies.
- **Data Privacy and Security:** Data privacy and cyber security issues are addressed by enactment and enforcement of data protection laws. *The Ministry of Electronics and Information Technology (MeitY)* has introduced the Personal Data Protection Bill to address data privacy concerns.
- **Infrastructure and Connectivity:** Lack of robust infrastructure and connectivity can hinder the deployment of these technologies. The Government sanctioned investment in initiatives like *Bharat Net* to provide broadband connectivity to rural areas.

NOTEWORTHY GOVERNMENT INITIATIVES

1. **Solar Energy Implementation:** The Government's *KUSUM* program promotes solar pumps and grid-connected solar power plants. It includes provisions for subsidies and grid integration, overcoming cost challenges.
2. **Skill Development:** *MNRE's Surya mitra* program offers skill development courses in the solar sector, addressing the workforce challenge.
3. **Smart Meter Rollout:** The Government's *Ujwal DISCOM Assurance Yojana* (*UDAY*) scheme includes the installation of smart meters to improve grid management and reduce losses.
4. **Data Protection:** The Personal Data Protection Bill aims to regulate the use of personal

data, addressing data privacy concerns.

5. **Rural Connectivity:** The *Bharat Net* project is expanding internet connectivity to rural areas, supporting IoT and Big Data applications in remote regions.
6. **RE Parks:** The Government is establishing RE Parks to provide the necessary infrastructure for RE projects, facilitating technology implementation.

ILLUSTRATIVE CASE STUDIES

1. **Tata Power-DDL** uses data from smart meters, sensors and grid infrastructure to monitor and optimize grid operations. This includes real-time load monitoring, outage detection, and voltage control.

   Impact: A significant reduction in distribution losses (from over 52 to around 8 per cent %), improved reliability of power supply and better management of peak demand.
2. **Azure Power** utilizes AI algorithms to monitor weather forecasts, solar irradiance, and historical plant performance data to predict and adjust energy generation.

   Impact: improvement in solar plant efficiency, maximizing the use of RE resources.
3. **IEX** employs Big Data analytics to analyze energy market data, including real-time energy prices and trading volumes to provide market participants with insights into energy pricing trends and trading strategies.

   Impact: Transparency in facilitating cost-effective electricity procurement for utilities and industries.
4. **KSEB** utilizes Big Data analytics and AI to assess grid resilience against natural disasters like floods and cyclones. It simulates the impact of extreme weather events on the grid to develop disaster response strategies.

   Impact: Enhanced grid's resilience and reduced downtime during extreme weather conditions.
5. **TCS** collaborated with POSOCO to develop an AI-based Decision Support System (DSS). It integrates data from IoT sensors and weather forecasts, to predict grid imbalances and provide real-time recommendations.

   Impact: Improved grid stability and reduced penalties for grid imbalances.

CONCLUSIVE NOTE

Integrating cutting-edge technologies like Smart Grids, AI, IoT, and Big Data into India's RE Sector signifies a shift towards a sustainable energy ecosystem, offering benefits such as grid reliability, reduced wastage and cost management. India's ambitious RE goals are closely tied to these technologies, with the Government addressing challenges through policies and infrastructure. Indian businesses and utilities are also adopting these technologies for efficiency and informed decision-making. Collaboration among Government, private sector, research institutions, and professionals is vital for leveraging these technologies, creating a greener and economically efficient energy landscape. Despite challenges, India's commitment to innovation and sound policies positions her as an emerging leader. MA

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COAL INDIA LTD: ROLE IN INDIA'S ENERGY TRANSITION

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Abstract

The article highlights the enduring significance of coal in India's energy landscape despite growing emphasis on renewable sources. Coal India Ltd. (CIL), the world's largest coal producer, plays a pivotal role in meeting the nation's energy demands. The article discusses CIL's efforts to balance energy security with sustainability, addressing environmental concerns, diversifying investments, and promoting renewable energy. With ambitious goals, including becoming a net-zero energy company, CIL demonstrates its commitment to India's energy security and environmental stewardship while navigating the transition to cleaner energy sources.

INTRODUCTION

Despite frequent criticism of coal as a polluting energy source, it remains one of the most cost-effective and extensively utilized fossil fuels worldwide. It serves as a critical energy source, particularly in the power sector, where it fulfils 67 per cent of the global demand for coal. In India's context, energy consumption has more than doubled since the year 2000, primarily due to a growing population, a burgeoning economy, and pursuit of an enhanced quality of life. This substantial increase in power requirements is expected to persist in the future. While a diverse energy mix is preferable, coal has been the primary driver in meeting India's essential commercial energy needs.

Coal India Ltd. (CIL) plays a vital role in safeguarding the nation's energy security, driven by the mission to provide energy access to all. As the world's largest coal producer, CIL's significance grows as India enters a transformative era, the *Amritkaal.* Based on the information available in the CIL's annual report and other public documents, this article delves into the question as to how CIL carefully navigates the challenge of reconciling the nation's increasing energy demands with the shift towards greener and more sustainable energy sources.

COUNTRY-WISE PRODUCTION (Million Tonnes)

Region	2020	2021	2022
China	3789	3942	4237
India	758	805	893
Australia	474	470	446
Indonesia	566	569	622
USA	486	332	357
Russia	402	437	404
Other	1117	1333	1359
TOTAL	7592	7888	8318

Source- Coal 2022, IEA

ROLE OF COAL INDUSTRY IN INDIA

According to the recent annual report of CIL, a substantial 84 per cent of the nation's total coal production is directed towards the power sector. Furthermore, sectors such as iron and steel, cement, and fertilizers rely on coal to meet their energy needs. In the fiscal year 2022-23, the country's total electricity generation, including renewable sources, reached an impressive 1624.16 billion units (BU). This marked an 8.87 per cent growth, which is the highest in 13 years, compared to the 1491.86 BU generated in 2021-22. Despite robust growth of 19 per cent in renewable sources in FY 22-23, their overall contribution to electricity generation was modest, accounting for only 12.5 per cent at 203.36 BU. Coal-based generations, on the other hand, constituted a significant 70.6 per cent share, amounting to 1145.86 BU, with a 10 per cent increase from the previous year.

According to a recent study conducted by PWC, approximately 13 million individuals in India are engaged in various sectors connected to coal, such as mining, transportation, power generation and the production of sponge iron and steel.

THE CHALLENGE OF BALANCING COAL AND RENEWABLE ENERGY

Despite the strong emphasis on expanding renewable energy sources, coal is projected to maintain a substantial share in the energy mix. According to the Ministry of Coal (MoC) projections, coal demand is anticipated to increase significantly, ranging between 1.3 to 1.5 billion tonnes by 2030, with a peak expected around 2040. The transition from coal to renewables is expected to progress slowly in India, presenting a considerable challenge, especially given India's commitment to actively combat climate change by reducing greenhouse gas emissions.

Throughout the years, CIL has placed significant emphasis on achieving environmentally and socially sustainable growth. It has consistently implemented best practices across the entire coal production cycle, from mining to market, with the aim of minimizing carbon emissions. Additionally, CIL has embraced diversification strategies to foster long-term, inclusive, and sustainable growth.

SECURING ENERGY FOR GROWTH

Coordinated Efforts and Measures in India's Coal Industry

Ensuring energy security to drive the nation's growth is a prerequisite before embarking on the transition to renewable energy sources. Achieving this goal necessitates a coordinated effort involving the Ministries of Power, Coal, and New & Renewable Energy. Coal India Ltd. (CIL) anticipates a substantial increase in coal production, targeting 1 billion tonnes by the fiscal year 2025-26. In parallel, the Ministry of Coal (MoC) has implemented a series of measures, ranging from adding more coal reserves to the Proven Category to facilitating coal block auctions to private entities. To enhance coal supply to thermal power plants (TPPs) and alleviate critical coal stock shortages in power plants,

Coal India Ltd. (CIL) plays a vital role in safeguarding the nation's energy security, driven by the mission to provide energy access to all

an Inter-Ministerial Sub-Group has been established. Additionally, an Inter-Ministerial Committee (IMC) has been formed to oversee the augmentation of coal supply and the expansion of power generation capacity.

DIVERSIFICATION STRATEGIES

CIL has made strategic investments in several joint ventures (JVs), including Hindustan Urvarak & Rasayan Limited (HURL) for the establishment of natural gas-based fertilizer plants in Gorakhpur, Sindri, and Barauni. Additionally, Talcher Fertilizers Limited (TFL) was formed to set up a coal-based fertilizer plant in Talcher. CIL also has plans to implement three projects for Surface Coal Gasification (SCG) through JVs. Furthermore, CIL is considering an Integrated Greenfield Aluminium Project in Odisha through its subsidiary MCL.

In addition to these initiatives, CIL is actively pursuing forward integration efforts by planning the construction of two Thermal Power Plants (TPPs) to ensure energy security and operational sustainability in the country. The first TPP, with a capacity of 1x660 MW, is being developed as a joint venture (JV) with the Madhya Pradesh Government (through MPPGCL) and SECL, a subsidiary of CIL, near Amarkantak. This project is currently in an advanced stage of approval. Another subsidiary of CIL, MCL, has established its subsidiary, Mahanadi Basin Power Limited, to construct a 2x800 MW TPP near its Basundhara Mines. These projects have a combined capital investment of ₹21,547 Crores and are expected to be completed by 2028. It is noteworthy that the cost of power generation from these projects is anticipated to be less than ₹4 per unit.

EMBRACING SUSTAINABILITY

While prioritizing energy sustainability, CIL is dedicated to aligning its sustainable objectives with India's commitments at the 26th Conference of the Parties (COP26) under the United Nations Framework Convention on Climate Change (UNFCCC). To realize these sustainability objectives, CIL has implemented a series of measures and initiatives. Some of the steps are discussed below:

1. **Sustainable Mining and Technological Advancement**

   CIL has placed a strong focus on employing selective mining, beneficiation and blending methods to attain efficient resource extraction while minimizing environmental consequences. Furthermore, the adoption of advanced technologies is planned to ensure compliance with stringent environmental regulations. CIL is also committed to diversifying its research and development efforts, taking on new projects in various areas such as environmental sustainability, energy management, digitization, thin coal technologies, carbon emissions reduction, renewable energy, utilization of AI and IoT, converting waste into wealth, and exploring innovative techniques in resource exploration.

2. **Environmental Management**

   CIL has consistently demonstrated environmental conscientiousness right from planning and project report preparation phase and placed a strong emphasis on

environmental mitigation efforts. Notably, CIL has made remarkable strides in reclaiming mined-out areas and external overburden (OB) dumps, executing eco-restoration through a three-tier plantation concept and establishing 30 eco-parks, facilitating mine tourism. These achievements reflect CIL's commitment to environmental stewardship.

CIL has diligently adhered to rigorous Management System Standards, including those related to environmental and energy management, as stipulated by ISO. Moreover, CIL has taken significant measures to address concerns related to air pollution, mine water management and noise pollution in mining areas, underscoring its dedication to minimizing environmental impacts.

3. Achieving Net Zero

Collectively, CIL and its subsidiary companies consume approximately 4.6 billion units of electricity annually. In response to this substantial energy demand, CIL has outlined a strategic plan to transition to cleaner energy sources, aligning with India's Intended Nationally Determined Contributions (INDCs). The goal is to transform CIL into a net-zero energy company within three years by establishing 3 GW of solar power projects.

To accomplish this ambitious 3 GW target, CIL is actively pursuing the development of solar projects on available land parcels and rooftops at its subsidiary facilities wherever feasible. Additionally, CIL has strategized the expansion of solar projects in states with significant solar energy potential, such as Rajasthan and Gujarat. Furthermore, participation in solar tenders organized by entities like SECI (Solar Energy Corporation of India), DISCOMs (Distribution Companies), and Power Exchanges is part of CIL's comprehensive plan for solar energy growth.

4. Setting up subsidiaries for Renewable Energy push:

In April 2021, CIL established two entirely owned subsidiaries. The first, CIL Navikarniya Urja Limited (CNUL), was created to explore new business opportunities in the domain of new and renewable energy, focusing on non-conventional segments. The second subsidiary, CIL Solar PV Limited, is dedicated to advancing the solar value chain (Ingot-wafer-Cell Module).

5. First Mile Connectivity

The First Mile Connectivity (FMC) initiatives entail the installation of enclosed conveyor systems to transport coal from mining pitheads to loading points. At these loading points, a rapid loading system is employed to efficiently transfer coal into railway rakes. This innovative approach eliminates the issue of dust pollution caused by the traditional road transportation of coal.

The FMC projects have several objectives, including improving the quality of life for residents in coal mining regions. This is achieved by addressing various challenges, such as traffic congestion, road accidents, environmental impacts, reduced carbon emissions, and health hazards associated with coal transportation. In total, there are 61 FMC projects identified for implementation, organized into three phases, with a combined capacity of 763.5 million tonnes per annum (MTPA). These projects align with the objectives of the PM *Gatishakti* programme, which aims to enhance multimodal connectivity.

CONCLUSION

While historically regarded as the cornerstone of the nation's energy security, CIL has maintained an enduring commitment to environmental responsibility. CIL's dedication to renewable energy and eco-friendly transportation initiatives underscores its unwavering commitment to sustainability and its pivotal role in advancing India's climate objectives. MA

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NEW INFORMATION TECHNOLOGY INITIATIVES

Introduction of Forgot Password Facility in Members Online System

Earlier the members were writing emails to the Membership Department in case they forget their membership password, and this takes lot of time to get their password. With the introduction of this facility, if a member forgets his membership login password, he can get this on his registered email ids by putting their membership number and clicking on "Forgot Password" button.

Note: In case the members do not have their email address in the membership database, to avail this new facility, the members are requested to register their email address with the membership database by filling M8 (Address Change) application form online / by post.

Introduction of OTP Based login in Members Online System

Earlier the members were allowed to login in the members online system by using their membership password only. With the introduction of this facility the members can login to their Member's Online System by using the One-time password (OTP) sent to their registered mobile phones.

Note: In case the members do not have their mobile phones in the membership database, to avail this new facility, the members are requested to register their mobile phones with the membership database by filling M8 (Address Change) application form online. Kindly also ensure that the registered mobile number is not DND activated.

Revamp of Helpdesk Portal

The Helpdesk Portal has been revamped with some new features like Audit Trail and better User Interface.

Website Review

Complete review of the ICMAI website has been done from IT end.

Behind every successful business decision, there is always a **CMA**

RENEWABLE NATURAL CAPITAL AND ENERGY FOR SUSTAINABLE DEVELOPMENT IN INDIA: A STUDY OF PHARMACEUTICAL INDUSTRY IN INDIA

Abstract

Cautious use of natural capital and increased use of renewable energy creates sustainable grounds for a circular economy, an economic model that emphasizes on reusing and recycling materials to reduce the consumption of natural resources and prevent creation of wastes. Housing over 11,000 pharmaceutical manufacturing units, the Indian Pharmaceutical Industry (IPI) makes extensive use of natural resources. The present study highlights the disclosures made by top 15 pharmaceutical companies listed in India, regarding the use of natural capital and efforts made by these companies for sustainability development.

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INTRODUCTION

The concept of sustainability was born from the term 'sustainable development', which means efforts made towards fulfilling existing needs without hampering the propensity of future generations towards the same(Pezzey, *1989*). In the

bargain of profit maximization, organizations have paid less emphasis on non-core aspects of business including environmental sustainability and utilization of natural resources in a justifiable manner(*Ahmad et al., 2020*). John Elkington introduced the term "Triple Bottom Line" which emphasized equal importance to people, profits and planet(*Arowoshegbe and Emmanu, n.d.*). Even the emerging concept of ESG (Environmental, Social and Governance) emphasizes the effective utilization of natural resources. Organizations that are ESG compliant and consider environmental sustainability have an edge in terms of investor engagement, bidder preferences, regulatory approvals, future growth engines, compounded returns over the long-term horizon, cost advantage, positive quality of life of employees resulting in enhanced value creation and reduced dependence on naturally occurring resources, rendering it shockproof in times of supply disruption*(Atan et al., 2016; Darnall et al., 2022; Dixon et al., 2022; Kumar, 2022)*.

OBJECTIVES

1. To examine the initiatives undertaken by these pharmaceutical companies for effective utilization of natural capital.
2. To analyze the disclosures on natural capital made by selected pharmaceutical companies in India.
3. To determine the top performers in effective utilization of natural capital for sustainable development.

METHODOLOGY

The top 15 pharmaceutical companies listed in India, were analyzed on 17 parameters categorized under water, energy, emissions and waste management to determine their natural capital and environment sustainability practices. In the absence of any standard reporting format, binary coding has been used by assigning '1' if the data is directly published in the annual reports or easily quantifiable/ calculated and '0' in case of unavailability of quantifiable data. The coded data has been subjected to scoring and the scores are furnished graphically for ease of interpretation. A sample of top 15 listed companies based on market value has been selected for the study as it is mandatory for them to furnish this information.

TABLE 1

TOP 15 PHARMACEUTICAL COMPANIES LISTED IN INDIA BASED ON MOVING ANNUAL TURNOVER

Rank	Company	Value (Rs. Cr.)
1	Sun Pharma	₹15,714
2	Abbott	₹12,672
3	Cipla	₹11,121
4	Alkem	₹8,319
5	Lupin	₹7,066
6	Torrent	₹6,917
7	Zydus	₹5,917
8	Dr.Reddy's	₹5,888
9	Glaxosmithkline	₹5,179
10	Glenmark	₹4,165
11	Pfizer	₹3,291
12	Sanofi	3,158
13	IPCA	₹3,791
14	FDC	₹2,158
15	Eris Lifesciences	₹2,155

Source: Market Feedback Report, IQVIA (June, 2023)

DATA ANALYSIS AND INTERPRETATION

To achieve the aforesaid objectives, Tables 2, 3, 4, 5, 6 and 7present in detail the disclosures made and initiatives undertaken by top 15 selected pharmaceutical companies on natural capital, categorized into water, energy, emissions and waste management.

TABLE 2

WATER USAGE AND ITS PROCESSING IN SELECTED PHARMACEUTICAL COMPANIES

Company	Water Usage
Sun Pharma	2,863,563 KL
Abbott India	36,049 KL (against the target of 40,239 KL) in 2020-21 and 46,869 KL (against the target of 48,615 kL) in 2021-22
Cipla	19,98,811.63 KL Treatment of wastewater in ETP resulted in reuse to the extent of 32 per cent .
Alkem	Avg. monthly raw water intake (cubic meter): 61,230 Treated water usage: 83 per cent
Lupin	Total water withdrawal Global - 8,645,133 (KL) Total water consumption Global - 9,353,445 (KL) Total wastewater generation Global - 1,031,496 (KL) Recovered water used in operations in India – 695,008 (KL) Total water recycled as a percentage of total water withdrawal in Indian operations – 4 per cebt%

Torrent Pharma	Water withdrawal: 0.97 m^3 Withdrawal of surface water: 16 per cent decrease Water recycled: 48 per cent *Water Stewardship Data in Mn m3 /annum:* Surface water (0.711), Ground Water (0.255) Total water withdrawal 0.966 Water recycled and reused (0.462), treated water discharged outside the premises (0.099), water consumption (0.867)
Zydus Cadila	30 per cent reduction in the usage of ground water Recovery of waste water for reuse: 70 per cent
Dr. Reddy's (DRL)	*For FY21-22* Surface water withdrawn (KL) – 40,975 Groundwater withdrawn (KL) – 468,156 Third party water (KL) – 110,925 Others (kL) – 334,593 Total volume of water consumption (KL) – 950,874 Total water discharged (KL) – 3,775
GSK	Surface water (KL) – 53,562 Municipal water (kL) – 93,961 Total volume of water withdrawal (KL) – 147,523
Glenmark Pharma	8,34,571 kL of water consumed across sites Cumulative water saved (kL): 11,98,002 *For FY-22-23-* Water withdrawal by source (KL)- Surface (spring water, rainwater) – 8,685 Groundwater – 279,059 Third-party – 546,827 Total water withdrawn – 8,34,571 Waste water recycled (KL) – 3,17,152
Pfizer	Water used per Mn tablets in FY21 – 6.68 L Reduction in water consumption by 2 per cent as compared to FY20
Sanofi	Zero liquid discharge (ZLD) at Goa unit Wastewater treatment and co-processing Rainwater harvesting systems

TABLE 3
WATER AS NATURAL CAPITAL

Corporation	WATER					
	Withdrawal/ Intake	Consumption	Wastewater generation	Recycled/ reused	Water discharge	Water harvested
Sun	22,99,489 KL	22,09,014 KL	-	-	90,475 KL	-
Abbott	-	46,869 KL	-	-	-	1,055 KL
Cipla	16,46,351 KL	15,54,419 KL	-	88%, 42%	91,932 KL	1,20,648 KL
Alkem	7,34,760 KL	-	-	83%	-	-
Lupin	16,61,168 KL	23,69,480 KL	10,31,496 KL Global	6,95,008 KL	50% sites ZLD	-
Torrent	0.97 Mn M^3	0.87 Mn M^3	-	0.56 Mn M^3	0.09 Mn M^3	55+ Structures
Zydus	-	30% Decrease	-	70%	-	-
DRL	18,38,019 KL	17,04,281 KL	-	-	1,33,738 KL	-
GSK	1,47,523 KL	-	-	43,805 KL	ZLD	-
Glenmark	8,34,571 KL	8,34,571 KL	-	3,17,152 KL	40% sites ZLD	-
Pfizer	-	6.68 L/Mn tablets	-	-	-	-
Sanofi	-	-	-	-	ZLD	-
Alembic	-	146 KL/Tonne of product	-	-	-	1,79,160 KL
IPCA	-	-	-	-	-	-
FDC	-	-	-	14,850 KL	ZLD	-
Eris	-	-	-	~25,000 L/ day	ZLD	~75,000 L/ month

TABLE 4

ENERGY USAGE AND ITS BREAKDOWN IN SELECTED PHARMACEUTICAL COMPANIES

Company	Energy Usage
Sun Pharma	• Electricity (KWh): 490,477,900 • Gas (in '000 nm3): 11,935 • Furnace oil (MT): 3,057 • HSD (L): 967,200 • Briquette (MT): 1,33,166
Abbott India	**N.A.**
Cipla India	• Electricity from DISCOM (GJ): 9,94,669 • Furnace oil (GJ): 3,10,172 • High-speed diesel (GJ): 1,45,577 • Gas-US (GJ): 19,782 • Gas-Ind (GJ): 1,10,286 • Briquette (GJ): 1,48,331 • Solar (GJ): 1,22,805 • Wind (GJ): 12,425 • **Total energy consumption for FY2020-21 (in TJ): 1,864**
Alkem	• Average monthly electricity consumption (kWh): 10,366,433 • Average monthly generation of solar power (kWh): 514,294 • Utilization of solar power in avg. monthly power consumption: 4.96%
Lupin	**Energy consumption** (in GJ) ***(i) Non-renewable sources*** Grid electricity purchase: 1,365,680 Steam purchased: - 710,657 Furnace oil - 408,105 Natural gas - 372,783 Diesel - 64,435 LPG - 3,519 LSHS - 23,296 ***(ii) Renewable sources*** Steam generation (Agrowaste) - 110,538 Steam purchased (Agrowaste) - 91,694 Wind-grid - 46,874 Solar-captive - 5,713 • GHG emissions savings of 4,341,896 tCO2 e (Tonnes of Carbon Dioxide equivalent) • GHG savings in India 18,439 tCO2 e from steam generated from agro-waste, 15,296 tCO2 e steam purchased from agro-waste and 24,048 tCO2 e from tree plantations • Increased utilization of renewable energy by 5.30 MW at 2 sites • Reduction in total power consumption by 9.33 lakh kWh per annum • Increase in contribution of renewable power by 5.3 MW led by the decision to shift onto hybrid power. • Rooftop solar installed – Ankleshwar unit: 275 KW, Dabhasa: 268 KW and Sikkim: 500KW • Electronically commutated (EC) motors reduced power consumed to a tune of 5 lakh units per annum • Power saved through automatic condenser tube cleaning system – 5.6 KWH per annum

Torrent Pharma	• Energy consumed: 855.88 TJ • Renewable energy generation: 36% rise • Energy consumption(in GJ) **(i) *Non-renewable sources*** *Boilers* - Natural Gas (80,930), Furnace Oil (1,12,208), High Speed Diesel (10,389), Light Diesel (32,321), Low Sulphur Heavy Stock (LSHS) (1,15,619) DG Set - High Speed Diesel (36,038) Electricity - Grid Electricity (4,50,758) **(ii) *Renewable sources:*** Electricity- Solar Electricity (7,921) *Bio-fuels* *Boiler* - Briquette (Bio-fuel) (9,530) Cafeteria- Biogas (166) TOTAL: 8,55,880
Zydus Cadila	• 50% rise in Briquette consumption • Attempts to replace DG fuel and boiler with natural gas and briquettes
Dr. Reddy's	***Renewable source:*** • Total electricity consumption (GJ) – 3,81,069 • Total fuel consumption (GJ) – 153,349 ***Non-renewable source:*** • Total electricity consumption (GJ) – 878,812 • Total fuel consumption (GJ) – 3,081,774
GSK	TOTAL ENERGY CONSUMPTION FOR FY2021-22 • Total electricity consumption – 56,935.28 GJ • Energy consumption through other sources – 0.72 GJ • Total energy consumption – 56,936 GJ
Glenmark Pharma	• Total energy consumption (GJ): 11,15,900 • Total energy consumption from renewable sources (GJ): 53,651 • Biofuel and biodiesel consumption (KL): 1,053 • Energy is sourced from renewable sources (GJ): 25,019.5 (5%) • Electricity consumption from renewable sources (GJ): 28,631 **Fuel mix** • HSD (KL): 11% • Furnace oil: 11% • LDO (KL): 5% • Natural Gas: 62% • LPG (Kg): 2% • LSHS (KL): 4% • Biofuel (KL): 2% • Biodiesel (KL): 3%
Pfizer	Energy used per Mn tablets in FY21- 7.03 Reduction in energy consumption by 5 % as compared to FY20
Sanofi	Electricity purchased (kWh): 12.451 Mn Electricity generated (kWh): 0.501 Mn Diesel Oil (kWh): 3.824 Biomass (Tonnes): 2122

TABLE 5
ENERGY AS NATURAL CAPITAL

Corporation	ENERGY			
	Consumed	Saved	Reduction in energy used	Renewable energy capacity/ Utilization
Sun	3,277 TJ	-	-	1,286 TJ
Abbott	-	59,135 KWH	-	-
Cipla	1,850 TJ	14 TJ	0.0077	448 TJ
Alkem	448 TJ	-	-	5,14,294 KWH
Lupin	3,122 TJ	-	9.33 lac KWH/ annum	255 TJ
Torrent	856 TJ	1.07 TJ	-	1,688 KW
Zydus	-	-	-	4.14 TJ
DRL	4,495 TJ	-	-	534 TJ
GSK	57 TJ	-	0.066	100 KWp
Glenmark	1,116 TJ	-	-	53.65 TJ
Pfizer	1,545 KWH/Mn tablets	-	-	345MWH
Sanofi	-	-	-	2.1 MW
Alembic	216 GJ/ tonne of product	-	-	2.1 MW
IPCA	-	-	-	36.5 MW
FDC	-	-	-	2.5 MWp
Eris	-	~40,000 units/ month	-	-

TABLE 6
EMISSIONS DETAILS OF SELECTED PHARMACEUTICAL COMPANIES

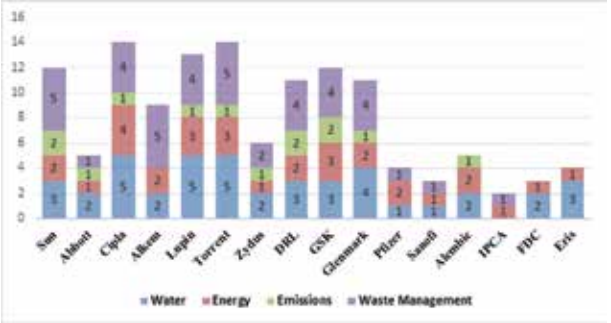
Corporation	EMISSIONS	
	Non-GHG	GHG
Sun	521 MT	3,34,845 tCO_2e
Abbott	-	4,808 tCO_2e
Cipla	-	2,25,562 tCO_2e
Alkem	-	-
Lupin	-	4,48,814 tCO_2e
Torrent	-	1,26,926 tCO_2e
Zydus	-	21% Decrease
DRL	430 MT	46,8713 tCO_2e
GSK	143 $\mu g/m^3$	8,02,637 tCO_2e
Glenmark	-	1,56,961 tCO_2e
Pfizer	-	-
Sanofi	-	-
Alembic	-	38 GJ/ tonne of product
IPCA	-	-
FDC	-	-
Eris	-	-

TABLE 7
WASTE MANAGEMENT IN SELECTED PHARMACEUTICAL COMPANIES

Corporation	WASTE				
	Total Generated	Recycled and recovered/ Co-processed	Disposed	Waste to Landfill	Investment in Natural Capital FY 22
Sun	38883 MT	31054 MT	9380 MT	6587 MT	Rs.220 Cr
Abbott	-	-	-	0 MT	-
Cipla	27751 MT	24822 MT	30% Decrease	1246 MT	-
Alkem	5597 MT	265 MT	663 MT	0 MT	--
Lupin	41467 MT	14229 MT	-	12940 MT	Rs.13.7 Cr
Torrent	8670 MT	6798 MT	20% decrease	588 MT	Rs. 108 Cr
Zydus	--	15% Increase	-	-	-
DRL	47095 MT	14359 MT	32727 MT	0.01	-
GSK	223 MT	0.32 MT	1653 MT	78 % decrease	-
Glenmark	10986 MT	9407 MT	10619 MT	2440 MT	-
Pfizer	-	-	-	-	Rs. 1.4 Cr
Sanofi	-	-	-	-	Rs. 3 Cr
Alembic	-	-	-	-	-
IPCA	-	-	-	-	RS. 161 Cr
FDC	-	-	-	-	-
Eris	-	-	-	-	-

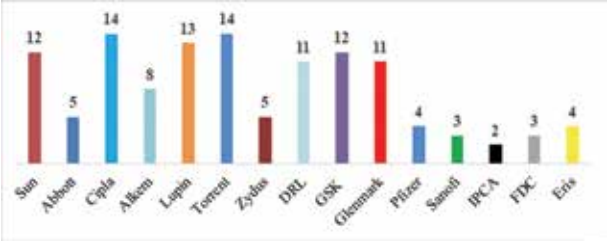
Further, cumulative scores on natural capital calculated on 17 parameters under categories of water, energy, emissions, and waste management (according to disclosures made by the companies in their annual reports) are presented in Graph 1 and 2 hereunder.

GRAPH 1
BREAKDOWN OF TOTAL SCORE ON NATURAL CAPITAL



Source: Self calculated scores on Natural Capital based of binary coding as mentioned in methodology.

GRAPH 2
CUMULATIVE SCORES ON NATURAL CAPITAL



Source: Self calculated Cumulative scores on Natural Capital

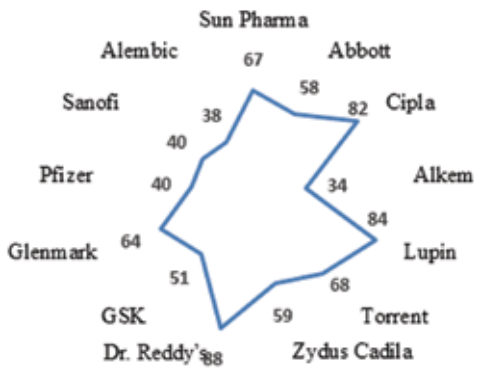
From the 17 parameters that were considered in this study, Cipla and Torrent have emerged highest scorers pertaining to natural capital followed by Lupin, GSK, Sun Pharma, Glenmark and DRL while on the other hand, IPCA, FDC, Pfizer, Eris have shown to be laggards.

It is evident from the graphs above that Cipla, Torrent, Lupin, GSK, Sun Pharma, Dr.Reddy's (DRL) and Glenmark make the highest investments and undertake initiatives towards shifting from extensive use of natural resources to green and sustainable sources throughout their entire value chain. Surprisingly, other highly reputed pharmaceutical MNCs like Abbott, Pfizer and Sanofi rank lowest on reporting of natural capital data.

Already published and available ESG company scores and Environmental Pillar scores (weighted average relative rating of a company based on the reported environmental information and the resulting three environment category scores) as depicted in Graphs 3 and 4 confirm that Dr.Reddy's, Lupin and Cipla are the top performers with highest ESG scores while Alkem, Alembic and MNCs like Pfizer and Sanofi are clearly the laggards. This is consistent with our findings and research results.

GRAPH 3

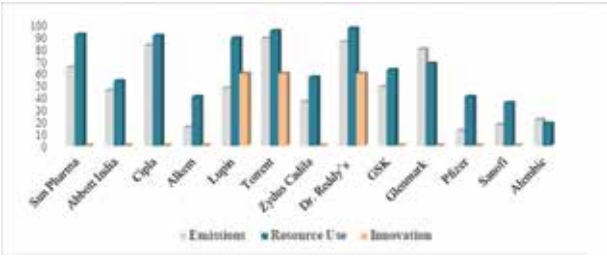
ESG COMPANY SCORES



Source: https://www.refinitiv.com/en/sustainable-finance/esg-scores#

GRAPH 4

ENVIRONMENT PILLAR SCORE



Source:https://www.refinitiv.com/en/sustainable-finance/esg-scores#

CONCLUSION

The present study concludes that among the top 15 listed pharmaceutical companies in India, majority of the companies rank high in all aspects of natural capital. Only a few companies are slack performers who are also working towards attaining better utilization of natural capital for sustainable development. This shows the sense of urgency and intent towards protecting the environment as well as inculcating ESG at the heart of their business operations to ensure long term sustainability. MA

Organizations that are ESG compliant and consider environmental sustainability have an edge in terms of investor engagement, bidder preferences

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CONGRATULATIONS

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We wish CMA Harshad S. Deshpande the very best for his future endeavors.

DEVELOPING THE COUNTRY'S RENEWABLE ENERGY SECTOR: BENEFITS FROM FOREIGN DIRECT INVESTMENT

Abstract

This article tackles the lack of literature on India's renewable energy (RE) sector's FDI factors. This report analyses India's renewable energy sector's foreign direct investment factors. There are many ways to benefit from FDI in renewable energy. The study found that India's institutional structure attracted more FDI in solar and wind energy projects than macroeconomic or environmental considerations. In general, FDI requires economic growth and local financing. Land availability is crucial to attracting foreign direct investment (FDI). FDI in India rose to $ 84.84 billion in Financial Year 2021-22 from $ 81.97 billion during the previous year, according to the RBI.

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INTRODUCTION

One of the most important ways by which the Indian economy grows is through FDI from overseas. . FDI poured into India's economy once the country opened its doors in 1991. The Foreign Exchange Management Act (FEMA) was introduced by the then Finance Minister, Dr. Manmohan Singh, in 1991 to permit flow of FDI into India.

To encourage more FDI inflow into a broader range of Indian businesses, the Indian Government has been implementing regulations to increase the openness and efficiency of the FDI process.

VARIOUS FORMS AND PROCEDURES OF FDI

There are four forms of FDI. All these are discussed in the ensuing paragraphs.

A. Horizontal FDI

When a multinational company invests abroad, it often operates as it does at home. A commonly resorted FDI is horizontal FDI. A firm's production in its home nation closely mirrors its output in other countries. When a firm moves its activities from one nation to another it is known as a horizontal FDI.

B. Vertical FDI

Vertical FDI allows for exports that are then re-exported to the home market; this kind of FDI is known as export platform FDI.Creating trade blocs that construct substantial obstacles to trade with the rest of the world while imposing very little inside their borders is the primary driver of this kind of FDI.

C. Conglomerate FDI

In this case, a company invests in another country's

business that is completely different from its core business. Here FDI is not linked directly to the investor's business.

D. Platform FDI

FDI that serves as a "platform" for exporting goods to a third country is called platform FDI.

PROCEDURES OF FDI

Through FDI, foreign firms can establish operations inside the boundaries of the host country. Following are the different approaches:

- Acquisition and amalgamation
- Partnerships with international companies
- Setting up an office block in a foreign country as a spinoff of a U.S. parent.
- Obtaining a stake in a multinational firm to cast a vote for it.

THE CHOICES AVAILABLE FOR FDI

A. Government Route

Since the Indian Government must approve every foreign company's investment in the country, foreign investors must get Government clearance before working in sectors that the Government regulates. Before making any investments, foreign investors must submit a proposal to the Ministry that gives permission. When this is completed, funding may be released.

B. Automatic Route

Many sectors of the economy do not need Government permission before receiving FDI. If foreign investors want to invest without first applying to the Government, they may utilize the automatic route; nevertheless, they should still read the new rules carefully. Indian Government allows 100 per cent FDI in this route.

BENEFITS FROM FDI IN THE RE SECTOR

The energy industry is the backbone of any economy because it is the only industry that can guarantee long-term growth and improvement. To encourage more FDI from abroad in the solar power sector, this route's FDI cap has been raised to 100 per cent. Higher levels of happiness and wealth tend to follow from success in this endeavour. Since India contains 17.76 per cent of the world's population, the industry is essential to the country's economy. This, along with rising global concerns about climate change and in particular the energy and power sectors' roles in increasing greenhouse gas emissions presents a double whammy for Governments and organizations around the world, and particularly in developing nations.

FDI is a major contributor to India's economic growth

In terms of FDI, solar and wind energy ventures in India are among the top destinations worldwide

and a major source of the country's non-debt financial resources. India's economy and workforce stand to benefit greatly from FDI, particularly in the growing renewable energy industry. The term "renewable energy" refers to power generated by using renewable resources like the sun, wind, water, biomass, and even geothermal heat. Millions of Indians who don't have access to the grid or who experience frequent power cuts could benefit from clean, reliable and affordable electricity generated from renewable sources.

India's abundant solar, wind, hydro, and biomass resources indicate a promising future for the country's renewable energy sector. India plans to become one of the world's largest renewable energy markets by achieving its goal of 450 GW of renewable energy capacity by 2030. As domestic investment alone may fall short, India needs to attract more FDI in the RE sector.

In the last eight years, renewable energy's share of the power-generating pie has grown from 19 to 22.2 per cent. By May of 2022, the world's installed capacity for renewable energy increased by 109.4 percentage points, from 76.37 GW in March of 2014.

The goals of "Make in India" are to increase the number of manufacturing jobs in India, boost the manufacturing skills of the Indian labour force, and attract foreign investment into the country. However, the 'Make in India' initiative's effects on the industry need to be examined from a number of angles.

i. Ease the process of bringing foreign investment into the country's economy. Over the past eight years, India's renewable energy sector has received investments totalling more than $70 billion. FDI into the sector has been on the rise over the past few years, with experts predicting that it will reach $1.6 billion by 2021-22, up from $414.2 million in 2013-14. (Prior to the launch of the 'Make in India' initiative). If this is any indication, the 'Make in India' program has been largely beneficial to India's renewable energy industry. In 2013–14, FDI into India's coal sector fell, revealing foreign investors' clear preference for the electricity sector. What this means is that the energy sector is becoming more open to outside investment. More than $13.3 billion, or 2.1 per cent of total FDI, has entered India's non-conventional energy sector through streamlined FDI channels over the past 22 years.

ii. International partnerships, such as rules and

incentives that make it easier for independent power producers and private actors to do business across the globe, are at an all-time high, providing a boost to innovation while developing good connections with other countries. In 2022, IRENA worked harder to promote the growth of RE by strengthening its partnership with the Ministry of New and Renewable Energy (MNRE). Together, the two organizations hope to improve information sharing and employee training, both of which will help to accelerate the transition to a sustainable hydrogen economy and reduce emissions from the combustion of fossil fuels. Researchers in India have also developed an electro-catalyst system for the efficient electrolysis of urea to produce hydrogen, which could be used to generate electricity. The entire process of creating this system took place during a single sitting. India has established international collaboration efforts for forming partnerships in RE by linking up with the United States and the European Union, Italy and ASEAN, and organizations like the International Energy Agency (IEA). An $ 8 billion MOU for the construction of green hydrogen plants has been signed between India and Egypt.

iii. 'Make in India' is an initiative with the goal of boosting the country's manufacturing sector. The ultimate goal of the program is to develop a manufacturing sector that can compete with the best in the world. In just over eight and a half years, India has seen a 397 percent increase in its renewable energy capacity, which is now at 173.6 GW. As of May 31st, 2018, this amounted to about 41per cent of the total capacity in the country (417.6 GW). Renewable energy potential in the country has increased by 397 per cent. As domestic manufacturing of raw materials and components increases, more space is being made available. to lessen the solar industry's reliance on imported goods, the PLI plan allots 19,500 Crore Rupees to fund the purchase of solar power hardware. Integrated manufacturing units in India are a top priority for the PLI strategy, which aims to speed up the production of solar modules. Several pieces of legislation and programs that provide financial incentives for the development of renewable energy sources and related research have also aided in the shift towards a more sustainable energy system. In the most recent budget, the wind energy industry was allocated $1050 billion.

iv. The Ministry of New and Renewable Energy has been in charge of the *Suryamitra* skill development initiative since 2015-2016 school years. This course is designed to equip high school seniors with the knowledge and abilities necessary to design, build, operate, and maintain PV solar power plants. A total of 51,331 people have benefited from training by June 30th, 2022, with 26,967 of them finding work in the solar industry. Nearly 90 per cent of trainees in the *Suryamitra* program developed by the Skill Council of Green Jobs in December 2020 reported an increase in employment opportunities, and 88 per cent reported an improvement in their technical skills.

FACTORS THAT AFFECT FDI IN INDIA:

- FDI in India's renewable energy sector is affected by a number of variables. These include the country's legal and regulatory framework, its economy, natural resources, and market potential. Among the many things that make India's renewable energy sector attractive to foreign direct investment are:
- PLI scheme, National Solar Mission, National Wind Energy Mission, Renewable Purchase Obligation (RPO), and Renewable Energy Certificate (REC) mechanism are all examples of government measures that encourage renewable energy.
- India's rising global competitiveness and economic influence can be attributed to the country's strong fundamentals, including its rapid economic growth, sizable domestic market, advantageous location and transportation networks, and active participation in regional and international cooperation.
- The accessibility of resources like land and water that can be put to use in renewable energy initiatives.
- Consumer and investor concern about environmental issues, leading to higher electricity demand.

CHALLENGES AND BARRIERS OF FDI IN INDIA

Following are some of the challenges and barriers that may hinder FDI in India's renewable energy sector:

- Regulatory uncertainty and policy inconsistency that may create confusion and risk for investors.
- The infrastructure gaps and bottlenecks that may affect the transmission and distribution of renewable energy.
- The financial constraints and high costs that may limit access to capital and technology for renewable energy projects.
- The social and environmental impacts that may cause conflicts and disputes with local communities and stakeholders.
- The competition and rivalry from other countries may offer better incentives and opportunities for renewable energy investors.

In order to attract more FDI in its renewable energy sector, India must resolve these obstacles and challenges

and capitalize on its strengths and opportunities. This would contribute to global efforts to mitigate climate change and promote sustainable development, as well as benefit India's economy and environment.

POLICY RECOMMENDATIONS

Multiple factors, including the need to reduce greenhouse gas emissions, enhance energy security, provide access to energy for all, and foster economic growth, have contributed to the development of the RE sector in India. FDI has played a crucial role in promoting the expansion of renewable energy capacity, technology transfer, innovation, and job creation. However, FDI in the renewable energy sector is not without its challenges and hazards, such as regulatory uncertainty, environmental and social impacts, investor-state disputes, and resource depletion. In order to maximize the benefits and minimize the costs of FDI in the renewable energy sector, it is essential to adopt a balanced and global approach. Some potential policy recommendations include:

- Strengthening the legal and institutional framework for FDI in the renewable energy sector, such as simplifying the approval process, providing clear and consistent guidelines, ensuring transparency and accountability, and protecting the rights and interests of both investors and host communities.
- Enhancing the attractiveness and competitiveness of the renewable energy sector for FDI, such as providing fiscal and financial incentives, improving infrastructure and grid connectivity, facilitating access to land and resources, and creating a level playing field for domestic and foreign investors.
- Promoting sustainable and responsible FDI in the renewable energy sector, such as encouraging environmental and social impact assessment, ensuring compliance with national and international standards, fostering stakeholder engagement and consultation, and resolving disputes through dialogue and arbitration.
- Leveraging FDI for achieving the broader goals of sustainable development, such as aligning FDI with the national and global commitments on climate change mitigation and adaptation, supporting local value addition and capacity building, creating decent jobs and livelihood opportunities, and enhancing access to affordable, reliable, sustainable, and modern energy for all.

CONCLUSION

This study investigates the factors that influence FDI firms' decisions to engage in India's renewable energy projects. As part of its efforts to attract FDI and facilitate corporate development, the Indian Government has enacted a number of laws, rules and regulations to foster trade and investment. FDI is a significant source of non-debt financing for the expansion and development of India's economy. FDI can also increase investment in renewable energy in developing economies, which is essential for achieving zero-net-energy energy and climate objectives. However, numerous obstacles, including regulatory ambiguity, a lack of transparency, high costs and risks, and limited access to financing, prevent the deployment of private capital in renewable energy projects. In terms of FDI, solar and wind energy ventures in India are among the top destinations worldwide. India has implemented policies and initiatives such as the National Solar Mission, the Renewable Energy Certificate Mechanism, the Green Energy Corridor Project, and the International Solar Alliance to promote the growth of renewable energy. FDI may benefit or harm the renewable energy sector in developing countries, depending on the structure, origin, and destination of the FDI, as well as the policy environment and institutional strength of the host country. India has demonstrated a willingness and capacity to attract foreign direct investment for renewable energy development, but it must also address the associated challenges and trade-offs. MA

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OPPORTUNITIES AND CHALLENGES FOR G-20 COUNTRIES TRANSITION TO RENEWABLE ENERGY: LEADERSHIP ROLE OF INDIA

Abstract

The 21st century experiences the rise of average temperature of Earth's atmosphere by an average of 0.08° C per decade since 1880. The rate of warming since 1981 is more than twice as fast: 0.18° C per decade as a result of climate change & global warming, which, as per evidence, is anthropogenic in nature and as such the energy sector happens to be its largest and yet manageable contributor for a transformation to a sustainable livelihood. World's 77% of energy generation from primary sources took place in G-20 countries (including the latest inclusion of the African Union) which consumed 79% of world's primary energy and contributed to 81% of emissions in the year 2022. It is also evident from the present study that deployment of renewable energy systems is the core of this transformation mission, calling upon India to play the leadership role through initiatives, such as, 'One Earth •One Family • One Future', International Solar Alliance (ISA), Global Biofuel Alliance (GBA), Mission LiFE and so on.

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Introduction:

The human civilization is at the crossroad, towards either a long-term future in harmony with the nature or a short-term dazzling glow of materialism, turning her life-cycle assessment towards a positive or negative cash (value) flow. Stability of Government even has been proved to be a necessity for improvement of green finance for a nation [Citil, M.et al (2022)]. The significance of transitioning to renewable energy for G-20 countries is enormous due to environmental concerns and energy security, and ultimately the health and life-span of human civilization. Attention of world once again fixed at India for a leadership role, as the solution seems to come through combined action of science and spirituality [Choudhury B K (2023)] for stability of our minds and regain vitality with faithfulness and Love, which is also the first condition for stability of the modern civilization.

According to World Economic Forum [1], the following eight countries in the world have self-declared as net carbon zero nations: Bhutan, Suriname, Panama, Guyana, Comoros, Gabon,

Madagascar and Niue. Today, almost 100 per cent of the electricity consumed in Iceland, a small country of 330,000 people, comes from renewable energy [UN (2015)]. Stanford University and the University of California at Berkeley and also LUT University in Finland and Energy Watch Group, independently have released a new scientific study that produced 100% renewable energy roadmaps for 139 individual countries, representing more than 99% of the world's greenhouse gas emissions [Oneearth (2023)] and for the whole world [2].

Energy needs in G-20 Countries, Renewable Energy Use, Net Zero and Sustainability:

The Group of Twenty (G20) is the premier forum for international economic cooperation. It plays an important role in shaping and strengthening global architecture and governance on major international economic issues. India holds the G20 Presidency from December 1, 2022 to November 30, 2023, and India is hosting a series of events aligned with the agenda and themes of the G20 in the run-up to the two-day summit held in New Delhi starting September 9, 2023, with a thumping success.

G20 countries produce about 87% of electricity from hydro and other renewable sources, 92% that of from coal and overall, 86% of electricity produced in the world as shown in Table 1. Electricity production from every type of sources except hydro (which decreased by about 3%) in G20 nations as well as the world as a whole has increased in 2021 with compared to 2020 by about 5%. Electricity production from other types of sources except oil and nuclear (which decreased by about 1% and 5% respectively) has increased in G20 nations as well as the world as a whole in 2022 with compared to 2021 by about 2%. The share of electricity generation from hydro and other renewables were 29% and 30% of total electricity generated in 2022 in world and G20 nations, respectively, which is 1% more than previous year. The values are 35%, 38% and 74% of total electricity that is produced from coal in world, G20 countries and India in 2022, which is a bit less for others but same for India when compared with 2021. Therefore, India has a greater challenge to meet the 'phase down coal' policy and hence a great opportunity to demonstrate the reduction of share of electricity produced from coal by practicing energy efficiency at all levels and enhance the share of renewable, particularly having played the dual role as President of G20 and host country of ISA.

Already 13 out of 21 G20 nations/unions (including AU and EU) are ISA member and signatory, viz. African Union, Argentina, Australia, Brazil, European Union, France, Germany, India, Italy, Japan, Saudi Arabia, the United Kingdom and the US. The eight countries remaining members of G20, who are yet to sign or join the ISA are Canada, China, Indonesia, Mexico, Republic of Korea (South Korea), South Africa, Russia (Russian Federation) and Turkey [2, 3, 4]. As on October 1, 2023, as many as overall 94 countries have already signed and ratified the ISA Framework Agreement out of 116 countries who have signed the ISA Framework Agreement.

Table 1: Electricity Generation (**Terawatt-hours**) in G20 countries/unions and 13 members of ISA as well as G20.

	Oil	Natural Gas	Coal	Nuclear energy	Hydro + Other Renewables	Other#	**Total**
Total World	**728.6**	**6631.4**	**10317.2**	**2679.0**	**8538.5**	**270.5**	**29165.1**
of which: G20 Countries	409.2	4923.5	9510.38	2473.94	7426.49	254.5	24998.1
13 of G20 who signed ISA	334.0	3525.1	3140.3	1548.8	3744.4	174.8	12467.4
Share of G20 nations in Global Electricity generation	**56%**	**74%**	**92%**	**92%**	**87%**	**94%**	**86%**
	84%						
Share of 13 countries/unions in G20 who have signed and ratified ISA	**82%**	**72%**	**33%**	**63%**	**50%**	**69%**	**50%**
	47%						

It is evident from the above table that 59% of world's population, 53% of surface area, 81% of CO2 emission, 84% of world's electricity generation from fossil fuels and 87% that of from renewables happen in G20 nations whereas, those 13 G20 nations who have ratified ISA contributes almost 50% in every respect [4]. It may therefore be well said that G20 nations are extra-ordinarily important in global context and similarly, the 13 nations in G20 who have also ratified ISA, are important players among G20 nations.

A study on present scenario of renewable energy share in G20 countries has been made with the secondary data primarily available in the website of the Energy Institute [Energy Institute, 2023], sustainability achievement score from SD reported by United Nations [UN-SDR, 2023] and also from various other resources as mentioned in appropriate places in this paper.

It is interesting to note, India demonstrated an impressive steady improvement of 22.8% from SDG Score of 51.7 in 2000 to 63.5 in 2022, along with similar remarkable growth of 375% in the Renewable Power Generation during the same period i.e. 2000-2022, thereby implying the influence of renewable energy being very high in attaining 17 SDGs.

Brazil and India being the third and second lowest CO_2 emitter (per capita basis) in 2022 are also world's third and fifth largest generator of electricity from renewable sources of energy overall basis, and eleventh and ninth largest on the basis of renewable power generation per km^2 basis in 2022. Thus, the higher is the renewable energy utilization, the lower the emission.

India has paved the way by setting new records breaking her own in the matter of various renewable energy missions under the unique Ministry of New and Renewable Energy (MNRE), the latest being the National Solar Energy Mission. The target once set at 20 GW peak by 2022 was reset at 100 GW peak by 2022 and then revised at 450 GW peak by 2030 [5]. The NITI AAYOG has developed

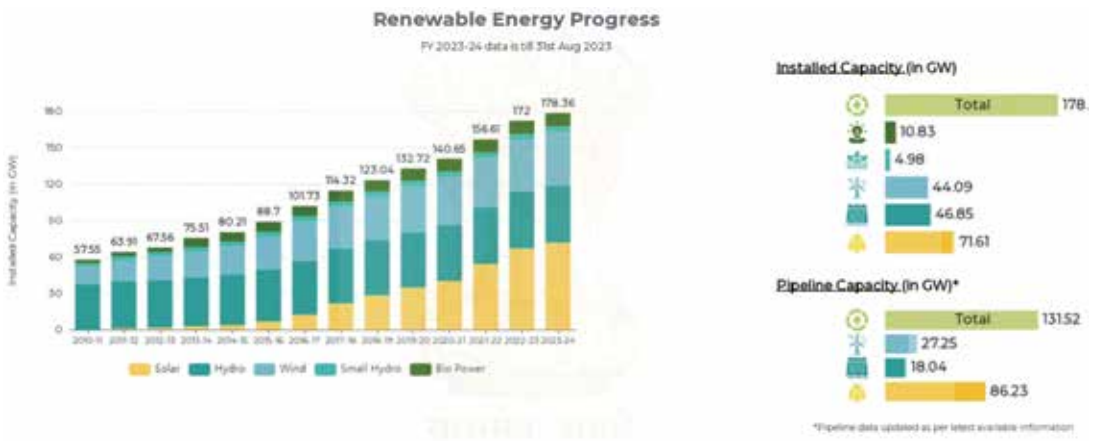
various pathways and the ICED DASHBOARD provides the latest attainments in the Renewable Power Sector as shown in Figure 1.

Opportunities for G-20 Countries and Emergence of a Leader:

G20 nations have huge disparity in parameters mentioned in Tables 1 and 2, and thus can learn from each other. India's presidency role has made the platform more congenial for discussions and negotiations. As deployment of renewable energy would fetch positive impact on multiple frontiers of a nation, viz. emission reduction (help to attain Net-Zero), improve GDP (help improve HDI) and reduce energy intensity (help fulfil the commitments and Missions, such as, to reduce by 2030 energy intensity by 45% and Mission LiFE). Among the G20 Nations, India has shown the highest improvement rate in the SD Score, as mentioned above. It is interesting to note that India met the declared commitment of reducing energy intensity of the economy by 30% by 2030 earlier than the committed period and thus revised the target from 30% to 45% reduction within the same reporting period, i.e. 2030 – a just role of a leader, to preach by practice.

India is progressively decoupling economic growth from greenhouse gas emissions. For example, the Net Zero Emissions target by 2030 by Indian Railways alone will reduce emissions by 60 million tonnes annually [5]. Similarly, India's massive UJALA LED bulb campaign is reducing emissions by 40 million tonnes annually [6]. To further complement these ongoing efforts, India launched the National Hydrogen Mission in 2023 to make India the world's largest hydrogen hub. India's per capita CO2 emissions is the lowest among G20 nations.

Fig 1



Copy Right: India's Climate and Energy Dashboard (ICED)
Figure 1. India's Renewable Energy Progress [ICED (2023)];

Successful leadership of India in G20 already yielding the following benefits to the world [G20 (2023)]:

Firstly, Africa Union of 55 countries (interestingly, among world's lowest emission per capita) joined the G20 Organization and became a member from this year.

Secondly, New Delhi Leaders Declaration has been signed by the country heads as per which Inclusive Growth will be emphasised.

Thirdly, India-Middle East-Europe-USA Corridor (IMEC) has been proposed and passed by the leaders of these countries. As water and rail transport are five times more energy efficient than road and air transport, when implemented, IMEC will not only slash down the travel time, travel emission, cost, fuel consumption, but also create more jobs and new opportunities including trade of green hydrogen. The pact, signed by the governments of the US, the EU, India, Saudi Arabia, the UAE, France, Germany and Italy, calls for a ship-to-rail network in two separate trade corridors — one connecting India to the Arabian Gulf and the second connecting the Middle East to Europe. World Bio-Fuel Association (WBA) would further enhance the standardization, efficient generation and use as well as trade of Bio Fuels.

Additionally, the Declaration acknowledged the increasing threat and committed to mainstream Lifestyle for Environment (LiFE), endorsing a goal to triple global renewable energy capacity and emphasized the necessity for emissions to peak before 2025, implement sustainable energy transitions, provide sustainable finance, reaffirm the pursuit of Sustainable Development Goals (SDGs), address plastic pollution, preserve the ocean-based economy, and more, which can easily be treated as gifts of India's leadership in G20 [G20 (2023)].

Thus, the fact remains that the renewable energy is playing the central role in energy transition and beyond, highly impacting the following:

- **Energy Independence & Sustainability**
- **Job Creation**
- **Technological Innovation**
- **Economic Growth and Huge Potential**

Thus, it can be easily argued that renewable energy deployment is the most effective path towards meeting the 17 SDGs, Net-Zero and delinking carbon from economy to protect our environment.

Challenges for G-20 Countries towards transition to Renewable Energy:

It is evident from the ongoing discussions that transition to renewable energy could fetch multiple and maximum benefits to the G20 Nations. However, such benefits will not be attained without addressing some challenges that G-20 countries might face during their transition to renewable energy:

- **Meeting Committed Targets:** It has been pointed out by UNEP that whereas there is the need to reduce the emission by 45% by 2030 with compared to 2019 level,

for limiting global warming to 1.5 degrees Celsius but in reality, actually about 10% emission is going to increase (UNEP, 2020), creating a backlog of 55%.

- **Intermittency:** To meet the energy demand with the renewable energy supply, there is the need for efficient energy storage solutions and/or breakthrough solutions such as, superconductivity, storage, global grid, i.e. One Sun One World One Grid (OSOWOG) initiative of ISA.
- **Infrastructure Upgrades**: Need for main grid, mini-grid and micro-grid level maturing towards a global smart grid system with IoT in place.
- **Policy Framework and Implementation:** While Mexico yet to declare any Net-Zero target, all other members need to come to the level [Table 2].
- **Investment Requirements**: Green finance investments is going to increase by 2.6 times during 2023 to 2030 [Figure 2].
- **Public Acceptance**: Ultimately, the long-term success will depend on the awareness among all the stakeholders comprising people at all walks of life.

Table 2. Details of Net Zero Targets & Status of G20 Members [UNEP (2020)]

		Fundamentals			Scope and coverage				Carbon removal		Planning, review, reporting		
G20 member	Annex	Source	Target year	Reference to fairness	Covers all sectors	Covers all gases	Covers int'l shipping and aviation	Excludes int'l offsets	Separate removals targets	Removals transparency	Published plan	Review process	Annual reporting
Argentina	Non-Annex I	announcement	2050	✗	?	?	?	?	✗	✗	✗	?	✗
Australia	Annex I	law	2050	[inconclusive]	✓	✓	?	✗	✗	[inconclusive]	[inconclusive]	✓	✓
Brazil	Non-Annex I	policy	2050	✗	✓	?	?	?	✗	✗	✗	?	✗
Canada	Annex I	law	2050	[inconclusive]	✓	✓	?	?	✗	[inconclusive]	✓	✓	✓
China	Non-Annex I	policy	2060	✓	?	✗	?	?	✗	[inconclusive]	✓	✓	✗
European Union	Annex I	law	2050	✗	✓	✓	✓	✓	✗	✓	✓	✓	✓
France	Annex I	law	2050	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓
Germany	Annex I	law	2045	✓	✓	✓	✗	✗	✗	[inconclusive]	[inconclusive]	✓	✓
India	Non-Annex I	policy	2070	✗	?	?	?	?	✗	✗	✗	?	✗
Indonesia	Non-Annex I	policy	2060	✗	✓	?	?	?	✗	[inconclusive]	[inconclusive]	?	✗
Italy	Annex I	policy	2050	✓	?	?	?	✗	✗	✓	✓	[no data]	✓
Japan	Annex I	law	2050	✗	✓	✓	?	?	✗	[inconclusive]	[inconclusive]	✓	✓
Mexico	Non-Annex I	[no net-zero target]											
Russian Federation	Annex I	law	2060	✗	?	?	?	✗	✗	[inconclusive]	[inconclusive]	✓	✗
Saudi Arabia	Non-Annex I	announcement	2060	✗	?	?	?	?	✗	✗	[inconclusive]	✓	✗
South Africa	Non-Annex I	policy	2050	[inconclusive]	✓	✗	?	?	✗	✗	✗	?	✗
Republic of Korea	Non-Annex I	law	2050	✗	✓	✓	?	?	✗	✗	[inconclusive]	?	✓
Türkiye	Annex I	announcement	2053	✗	?	✓	?	?	✗	✗	✗	?	✓
United Kingdom	Annex I	law	2050	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓
United States of America	Annex I	policy	2050	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓

Not fulfilled | Partially fulfilled | Fulfilled | No information

Sources: All indicators are based on a reconciliation of data from Climate Action Tracker (2022), Climate Watch (2022) and Net Zero Tracker (2022) with the following exceptions: "Covers all sectors" is based on Climate Watch (2022); "Review process" is based on Climate Action Tracker (2022); "Annual reporting" is based on Net Zero Tracker (2022); "Removals transparency" and "Reference to fairness" are based on Climate Action Tracker (2022) and Net Zero Tracker (2022).

Conclusion and Policy Directions

Conclusion

G20 countries comprise a total area of 78.76 million km² and about 4.69 billion people. This is 52.02 percent of the habitable area around the world and 59.04 percent of the world population. The corresponding figures for CO_2 emission and population are 81% and 53%. Electricity generation from the renewable energy (hydro and other renewable) was 24.47 TWh in 2022 i.e. only 6% of total generation. If G-20 countries to achieve Net Zero within their proclaimed targets, higher share of renewable energy would be the chosen route. It is shown in this paper that greater understanding through concrete Renewable Energy policies such as Bioenergy Policy and Solar Policy as promoted by the International Solar Alliance would play the prominent role for the most prominent economic groups of the nations.

Policy Recommendations

Fig 2

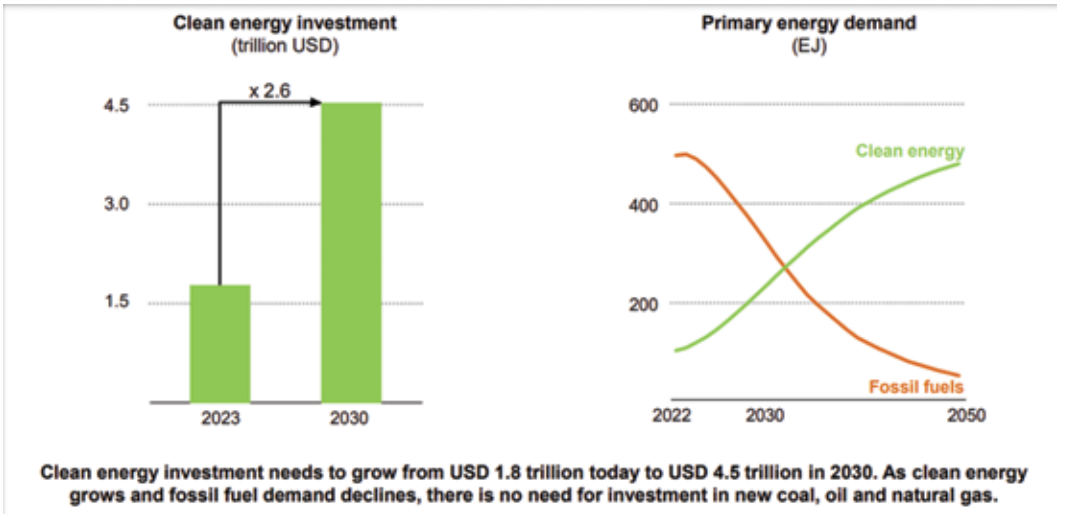


Figure 2. Strong growth in clean energy drives and decline in fossil fuel demand [IEA, 2023]

More recent study, as shown in Figure 2, revealed the trend of strong growth in clean energy drives and decline in fossil fuel demand are happening [IEA, 2023] proclaiming our transition to a renewable energy future.

Limitations of the Study and Way Forward

G20 Apex meeting only completed successfully a few months before, the impacts has begun to reap benefits in near future and to continue for many years. A deeper analysis would then be possible. However, the present study would reveal newer aspects and may help also in the upcoming conclusion session again for the first time going to be held in November 2023. MA

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7. *UN (2015); Iceland's Sustainable Energy Story: A Model for the World? Accessed https://www.un.org/en/ on September 29, 2023.*
8. *UN-SDR (2023); Sustainable Development Rank by Countries; Accessed https://dashboards.sdgindex.org/rankings on September 26, 2023*

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2. *https://greenamerica.org/green-economy-work/could-world-be-powered-fully-renewable-sources*
3. *http://www.g20.utoronto.ca/energy/*
4. *https://isolaralliance.org/membership/countries*
5. *https://pib.gov.in/Pressreleaseshare.aspx?PRID=1762960 etc.*
6. *http://ujala.gov.in/*

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A COMPREHENSIVE ANALYSIS OF PRODUCTION, UTILIZATION AND FUTURE PROSPECTS FOR GREEN HYDROGEN FOR A SUSTAINABLE FUTURE

Abstract

The electrolysis of renewable energy sources to produce green hydrogen has emerged as a promising strategy for addressing climate change and transitioning to a sustainable energy future. This study thoroughly analyses the concept of green hydrogen and its potential to revolutionize multiple industries, thereby nurturing a better future. Results pointed out that in India, there is an imperative need for sustainable alternatives to conventional fossil fuels to overcome the greenhouse effect to alleviate the negative consequences of the emissions of greenhouse gases and the warming planet. This study has significant implications for understanding the concurrent government policy to promote green hydrogen and overcome the challenges of hydrogen production and application.

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INTRODUCTION

Since the turn of the millennium, a substantial body of information has been disseminated pertaining to the formidable challenges associated with achieving the objective of eliminating carbon dioxide (CO2) emissions. The 2015 Paris Agreement, the establishment of this initiative occurred within the scope of the United Nations Convention on Climate Change (UNFCCC), serves as an illustrative instance of endeavours aimed at surmounting these obstacles and mitigating the most severe consequences of climate change (*Kakran et al., 2023*). The principal objective of the Paris Agreement is to enhance global endeavours in mitigating the risks associated with climatic change caused by imposing restrictions on the increase of global temperatures, aiming to keep the rise well below 2 degrees Celsius compared to the levels observed during the pre-industrial era (*Kumar et al., 2023*). This initiative's primary aim is to mitigate global warming, with the specific goal of limiting the rise in the global mean temperature reaching a certain threshold below 1.5 degrees Celsius (*Pal et al., 2023*).

"India on track of becoming a $7 trillion economy by 2030 on the verge of the clean energy transition, rapid financialization and digital revolution" the latest insights from the Deutsche Bank report have *shown the intentions of India marching towards the door to becoming a developed state(Jain, 2023)*. Development needs industries; industries need fuel/energy; fuel means fossils (as in the current case in India). India's fossils import accounts for more than $90 billion per year (depicting its energy demands), but this growth will lack the sustainability feature *(Roy, 2023)*. India has decided to decarbonize its fuel consumption to

become a sustainably developed country to meet the climate targets suggested in the Paris Agreement.

Hydrogen (H_2) is India's best alternative to fossils after decarbonizing the environment and achieving the net-zero emissions target. It will work as a *sanjeevanibooti* for the deteriorating climate of India. Hydrogen energy is a clean energy source with zero emissions and will significantly contribute to clean energy transitions. But there is a catch in this; not all types of hydrogen produced are clean energy; there are various types of hydrogen based on how they are made and on the level of emission. Brown or black H_2 is made from the gasification of fossil fuels. The production of Grey H_2 involves using natural gas through steam methane reforming, but carbon is not captured in this process. Blue hydrogen is also generated from natural gas, but CO_2 is captured, resulting in lower carbon emissions. Green H_2 is produced through electrolysis using renewable energy and is greener hydrogen with no carbon emission. Refineries and fertilizers industries already use hydrogen as their energy requirements, but that is grey hydrogen (derived from natural gas). It is worth noting that these two industries will be the first ones to adopt green hydrogen. Further, if we see the market for green hydrogen will be the iron-making industries, then freight vehicles and domestic gas distribution.

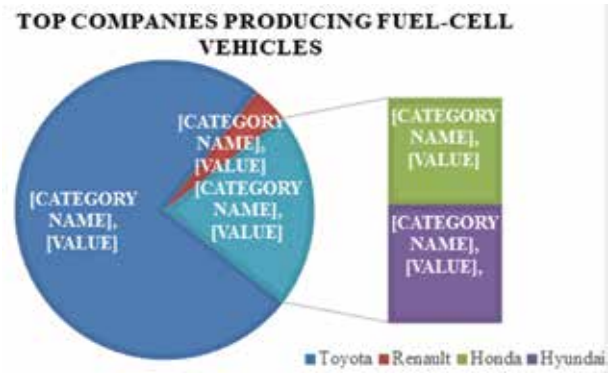
In 2022, India's thermal coal imports were 161.18 million tonnes, 232.4 The total volume of imported crude oil amounts to one million metric tonnes, while natural gas imports reached a *volume of 30.776 billion cubic meters (Varadhan, 2023;Sharma, 2023)*. With the current infrastructure, can we replace these energy demands? The answer is no, but green hydrogen being a clean carbon-neutral fuel in the long term, will help India achieve energy security. India has set the target to consume five million tonnes of green hydrogen by 2030. Government, industry stakeholders and policymakers should work closely to achieve the target. Further, other factors such as technological dependency, materials need and scalable storage and transportation infrastructure will decide whether we will achieve this target.

HYDROGEN PRODUCTION PROCESSES

Among the most prevalent gases on earth in terms of abundance, hydrogen is always present in water, hydrocarbons, and liquor. In the modern era, hydrogen emerged as the energy carrier but not as an energy source. Steam reforming and partial oxidation are some techniques from which hydrogen is derived from fossil fuels *(Chen et al., 2013)*. There are different processes for the production of hydrogen production (Fig.1). Automobile industries are investing in developing fuel-cell automobiles in the following years(*Pudukudy et al., 2014*). The contribution of the companies engaged in the manufacture of fuel cell vehicles is depicted in the Fig.2.

FIG. 1

PROCESSES OF HYDROGEN PRODUCTION FROM DIFFERENT FUELS (RENEWABLE & NON-RENEWABLE)



INDIA AND THE PATH TO THE HYDROGEN ECONOMY

India is looking for different hydrogen production and storage technologies, but they are currently not up to the mark, but many programs are running in India to explore hydrogen. The Green Hydrogen Policy, the National Green Hydrogen Mission (NGHM) and Harnessing Green Hydrogen (HGH) are some of the policies of the Indian Government which promote Green Hydrogen. Under NGHM the Government aims to produce at least 5MMT of green hydrogen annually. In the latest budget of 2023, the Government has announced Rs. 19,744 crores for promoting green hydrogen production under NGHM. Various ongoing projects related to hydrogen in the country are summarized in Table 1. The Government is optimistic about the advancement of green hydrogen production in the country and expects 6 lakh jobs in this sector for the youth. It is pushing its efforts to promote it, reflecting in its actions, including removing the need to pay for cross-State transmission and offering green hydrogen plants open access to the grid. The Solar Energy Corporation of India (SECI) will hold a massive tender to meet the country's fertilizer needs for plants and refineries. Further, as part of the initiative, India has designated Kandla (west coast) and Tuticorin (east coast) ports, as initially, there were green H2 and then green NH3 refuelling hubs. Hydrogen

fuel cell technology is part of the Government's future ambitions to power its eight narrow-gauge trains on heritage routes.

But it has implementation challenges. First and foremost is its economics. Green hydrogen is clean but expensive compared to other alternatives. Next is the availability of renewable energy at affordable prices. Green hydrogen production requires an uninterrupted and inexpensive supply of renewable energy. An observed alteration in the hours of supply and demand fluctuations on daily load curves can occur because of renewable energy use in the grid. Hence calculating the actual rate of renewable energy to be available in real-time at the establishment of green hydrogen plants poses a significant obstacle, the nature of which may differ among States. The investors are concerned about the plant's continued supply of renewable energy over 20-25 years. Another challenge is that the production depends on two limited natural resources, i.e. land and water. For India to meet its 5 MMTPA green hydrogen targets by 2030, 115 GW of on-site electricity from renewable energy will be required, and 50 billion litres of demineralized water (*Kumar, 2023*). The population of India is in ascending trend and hence will demand more water and urbanization. Following this trend, water and land scarcity will challenge large-scale green hydrogen production and adoption.

TABLE 1. CURRENT H_2 PROJECTS IN INDIA

S.No.	Organization	Location	Projects	Description
1	IIT Delhi, in collaboration with Mahindra & Mahindra	Delhi	Dual Fuel	Development of hydrogen fuelled three-wheelers and dual fuel SUVs (hydrogen and diesel)
2	IIT Delhi	Delhi	Hydrogen based vehicle	Combustion engines are hydrogen-driven with a spark ignition engine generator powered by hydrogen.
3	IIT Kanpur	Kanpur	Engine based on hydrogen	Hydrogen laser-powered engines' exhaust signatures.
4	Banaras Hindu University	Varanasi	Metal hydrides	Research on H_2 storage materials.
5	IIT Kharagpur	Kharagpur	Biological treatment	Experiments on hydrogen production by biological routes.
6	Indian Institute of Science	Bangalore	Biomass gasification process	Extracting hydrogen and liquid fuels.
7	MurugappaChettiar Research Centre in Collaboration with IIT Madras	Chennai	Carbon materials for storage	Building a hydrogen storage facility and establishing a biological hydrogen production plant.
8	Indian Institute of Chemical Technology and Yogi Vemana University	Hyderabad and Kadapa	Semi conductors nano composites	Hydrogen from solar-powered photocatalytic water splitting.
9	IOCL R&D center	Faridabad	Hydrogen fuel	Establishing Hydrogen refuelling stations
10	University of Petroleum and Energy Studies	Gwalpahari	Photovoltaic electrolyzer framework	Hydrogen generation and utilization

OVERCOMING THE CHALLENGES

It is necessary to work strategically and in sync with all the stakeholders to achieve India's target of becoming a world leader in hydrogen consumption. Following are some suggestions that should be kept in mind along the journey:

- For the low cost of green hydrogen production, a consistent supply of low-cost renewable energy is needed.
- The setting up of hydrogen valley will be a great initiative in this designated geographical area where producers and consumers form a hydrogen ecosystem.
- India should invest in water treatment plants so that municipal/industrial wastewater can be used for electrolysis.
- Lower the transportation and storage costs by setting the hydrogen distribution hubs near the demand centres.
- Investment to promote indigenous manufacturers of electrolyzers should be made by the Government.
- The Government must maintain good international relations to overcome the challenges of procuring raw

materials for electrolyzers.

- Investment in dedicated R&D related to water and power efficiency usage, storage techniques, and electrolyzer efficiency.
- Government should plan export promotive techniques such as waiver of duties, lower tax rates and subsidies in green hydrogen production.
- The students (the country's future) should be given awareness about the environmental issues and the plans Government expects in the next 5-10 years, along with the expected contribution from the country's young minds.

CONCLUSION

The market demand for H_2 energy may shift the usage of fossils towards green energy, especially in emerging and frontier countries. India is the most populous country globally, where the rising transportation demand for essentials is very high, which can be backed by the potential of green H_2 production. Although India has specific infrastructure development challenges, utilizing the regional production plants must be overcome. Moreover, the Indian market needs more subsidized interest on loans, lower taxation rates and waiver of duties, which should be used by the Government to encourage indigenous green H_2 production. Green H_2 is undoubtedly the cleaner energy and will be used as the primary source for fulfilling energy needs in the next five years. India's Government is looking forward to meeting its target to become a carbon-neutral country by 2050 and is optimistic about green H_2 as a tool for achieving this target. Apart from its environmental benefits, if India develops into an H_2 economy, it will be capable of ensuring its energy security issues.

To achieve sustainable development, India recognizes the need to decarbonize its fuel consumption and meet the climate targets outlined in the Paris Agreement. Green H_2 has emerged as a promising alternative to fossil fuels, offering a clean, carbon-neutral energy source with zero emissions. The Indian Government has introduced several measures and plans like the National Green Hydrogen Mission, to promote the production and adoption of green hydrogen. However, there are challenges to overcome, including the economics of green hydrogen production, the availability of affordable renewable energy, and limited land and water resources. Strategic collaboration among stakeholders, investment in infrastructure and research, and the promotion of indigenous manufacturing and international partnerships will be crucial in realizing India's goal of becoming a world leader in hydrogen consumption and production in the positive inclined direction as India can unlock the potential of green hydrogen, ensure energy security, and contribute to a sustainable future for the nation and the planet. MA

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STEERING TOWARDS A GREENER AND SAFER FUTURE: A STUDY OF ELECTRIC VEHICLES IN MAJOR STATES OF INDIA

Abstract

Amidst a global push for sustainable transportation, this comprehensive study delves into the trends of electric vehicle's (EV) adoption across major states in India, shedding light on the trajectory within each State. The study utilizes secondary data and employs analytical techniques to examine EV registration patterns. The research paints a vivid picture of the escalating EV registrations across major Indian states, indicative of a larger shift towards sustainable transport solutions. This comprehensive analysis not only highlights the positive and diverse landscape of EV adoption but also serves as a vital resource for policymakers, researchers and stakeholders.

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INTRODUCTION

In India, the simultaneous surge in population and infrastructure development has led to a significant increase in transportation demand (*Bansal & Goyal, 2020*). Surging demand raises pollution, congestion, and energy security worries. Automotive expansions crucial for India's economy, yet conventional vehicles drive pollution and oil dependence (*Patidar, 2019*). Globally, transportation accounts for 19 per cent of energy consumption, projected to reach 21 per cent by 2040, encompassing cars, planes, and ships (*Sharma & Chandel, 2020*). To address these challenges, India acknowledges the necessity of transitioning to EVs. Considering India's urban context, EVs are poised to be less polluting than their conventional counterparts (*Sharma & Chandel, 2020*). Is it crucial to study how a developing nation like India is adopting EV and to assess the progress made so far? Limited research has been carried in the area of EV's development in India. For example *Sharma & Anwar* (2021) stated that the Indian Government and State administrations are exploring various incentive programs to ensure the success of this environmentally friendly transportation initiative. Furthermore, *Ahmad & Dewan* (2007) found that adopting EV in Delhi could cut air pollution by about 24per cent, curbing emissions and potentially lowering fuel costs. *Shrilatha, S et.al, (2021)* noted that in Tamil Nadu customers adopting EVs for government subsidies, while others resist due to lower mileage. Likewise, Madhya Pradesh customers prioritize EVs for affordability, charging infrastructure and mileage (*Mahajan et al., 2021*).*Saw & Kedia* (2023) noted that the States of Delhi, Uttar Pradesh, Gujarat and Karnataka have low annual EV registrations: under 2 per cent, 1 per cent, and less than 0.5 per cent, respectively. Amid ample research on Indian EV's preferences, only few have examined State-specific registration and very few delve into EV's registration data and trends. Thus, we try

to explore in this research study the growth and progress of EVs across major States of India.

OBJECTIVES/OF THE STUDY

The overall objective of the study to is evaluate the trend of electric vehicles across major States of India and also to study the trend of electric vehicles segments in the major states.

RESEARCH METHODOLOGY

The research design relies on existing raw data sourced from the Vahan Dashboard https://vahan.parivahan.gov.in/vahan4dashboard/, an initiative by the Ministry/of/Road Transport/and/Highways, Government/of/India and organized by the authors using Microsoft Excel. The study is focused on the registration of EVs including 2-wheelers, 3-wheelers and 4-wheelers in prominent Indian States like Uttar Pradesh, Maharashtra, Delhi, Karnataka, Rajasthan, Bihar, Tamil Nadu, Gujarat, Assam, Madhya Pradesh, and Kerala. These States were chosen due to their collective contribution of approximately 80 percent of all EV registrations in India. The dataset covers the financial years from March 2014 to March 2023, encompassing a span of 9 years. For achieving the objective of the study graph analysis and descriptive analysis have been used.

RESULTS AND DISCUSSIONS

TABLE 1

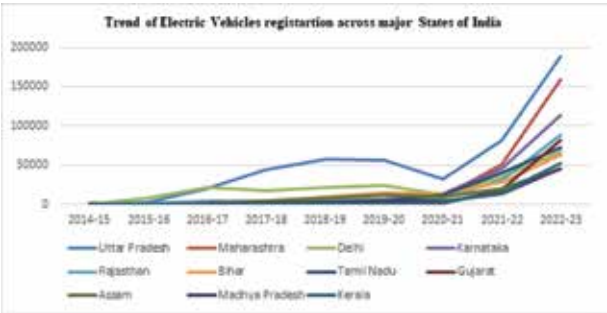
ELECTRIC VEHICLES REGISTRATION DETAILS ACROSS MAJOR STATES IN INDIA FROM MARCH 2014 TO MARCH 2023.

Major States	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Uttar Pradesh	119	2424	19502	44364	57229	56224	31592	82028	188946
Maharashtra	936	999	820	1452	6288	7395	9409	51442	158683
Delhi	52	8647	21556	17956	21429	23682	11809	34522	67124
Karnataka	639	694	626	755	3892	7176	13006	46186	114075
Rajasthan	76	1459	3775	4662	5655	5926	8196	31391	88328
Bihar	11	179	1406	4267	9995	14262	13289	28274	62606
Tamil Nadu	157	81	90	130	2195	4199	11937	39624	71844
Gujarat	67	99	147	218	732	893	1684	19042	81114
Assam	7	27	353	4675	7899	12019	8959	20435	45290
Madhya Pradesh	37	182	957	1741	3238	3564	4382	14099	45284
Kerala	20	27	30	75	401	622	2189	14861	52281

Source: Author's compilation

FIGURE 1

TREND OF ELECTRIC VEHICLES REGISTRATION ACROSS MAJOR STATES OF INDIA.



Source: Author's compilation

The above Table 1 and Figure 1 present the EV registration figures across major Indian States during the period from March 2014 to March 2023. Several significant trends can be deduced from the data. For instance, Uttar Pradesh, the State with the highest population, demonstrated a remarkable surge in EV registrations, commencing at 119 units in 2014-15 and dramatically escalating to an impressive 188,946 units in 2022-23. Meanwhile, Maharashtra exhibited a consistent growth pattern, with registrations progressing from 936 units in 2014-15 to a substantial 158,683 units in 2022-23. Delhi's EV registrations initiated at 52 units in 2014-15 exhibited steady growth, culminating in 67,124 units by 2022-23. Similarly, Karnataka depicted a consistent upward path, starting at 639units in 2014-15 and reaching a peak of 114,075 units in 2022-23. In Rajasthan, EV registrations commenced at 76 units and experienced gradual growth, culminating in 88,328 units by 2022-23. Bihar underwent a significant surge, elevating from 11units in 2014-15 to an impressive 62,606 units by 2022-23. Tamil Nadu showcased fluctuations, beginning at 157 units and reaching 71,844 units registrations by 2022-23. Gujarat's EV registrations displayed consistent growth, starting at 67 units and progressively escalating to 81,114units by

2022-23. Similarly, Assam's EV registrations followed a steady growth trajectory, progressing from 7 units to 45,290 units by 2022-23. Madhya Pradesh's journey commenced at 37 units and progressed to 45,284 units by 2022-23. Kerala's growth path remained consistent, starting at 20units, and culminating in 52,281 units registrations by 2022-23. It is noteworthy that COVID-19 outbreak presented challenges, with several states witnessing a decline in EV registrations. However, post-pandemic, there has been a consistent and promising increase in EV registrations across these states. The data thus under scores a clear upward trend in EV registrations across major Indian states.

TABLE 2

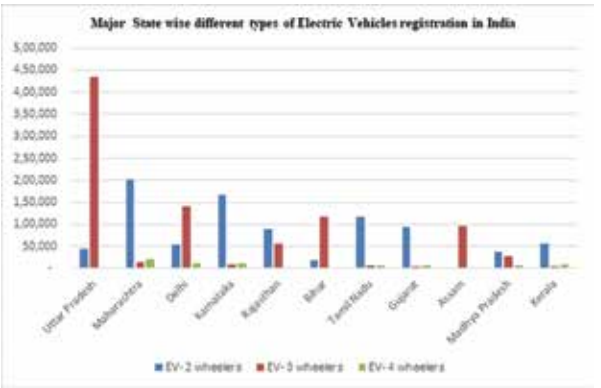
MAJOR STATE WISE DIFFERENT TYPES OF EV REGISTRATION IN INDIA FROM MARCH 2014 TO MARCH 2023.

Major States	EV- 2 wheelers	EV- 3 wheelers	EV- 4 wheelers	Total EV's
Uttar Pradesh	45590	435012	1826	482428
Maharashtra	200804	14803	21817	237424
Delhi	54626	139581	12570	206777
Karnataka	165907	8920	12222	187049
Rajasthan	89478	56890	3100	149468
Bihar	17634	116255	400	134289
Tamil Nadu	116311	7606	6340	130257
Gujarat	94360	3719	5917	103996
Assam	3053	95926	685	99664
Madhya Pradesh	38516	28665	6303	73484
Kerala	57162	5119	8225	70506

Source: Author's compilation

FIGURE 2

MAJOR STATE WISE DIFFERENT TYPES OF EV'S REGISTRATION IN INDIA.



Source: Author's compilation

Table 2 and Figure 2 provide EV's registrations, segment wise across major States in India from March 2014 to March 2023. Uttar Pradesh takes the lead with highest total EV registrations at 482,428 units, attributed to its substantial population and proactive efforts in promoting electric mobility. This is notably clear with strong presence of EV 3-wheelers, catering to densely populated areas' last-mile connectivity needs. Maharashtra secures the second rank with 237,424 EV registrations, driven by urban centers like Mumbai and Pune. These cities contribute significantly to the large numbers of EV 2-wheelers due to their convenience for short distances and traffic congestion. Delhi, as the national. Capital is highly urbanized area, secures the third rank with 206,777 EV registrations. The city's efforts to combat pollution and vehicular emissions contribute to notable figures in both EV 2-wheelers and EV 3-wheelers. Karnataka takes the fourth rank with 187,049 units of EV registrations, benefiting from Bengaluru's tech hub status. Rajasthan secures the fifth position with 149,468 EV registrations, showcasing significant numbers in both EV 2-wheelers and EV 3-wheelers, reflecting trends in urban and rural areas Bihar ranks sixth with 134,289 EV registrations, focusing on EV 3-wheelers to address cleaner urban transport solutions. Tamil Nadu secures the seventh position with 130,257 EV registrations, showing a strong presence in EV 2-wheelers and EV 3-wheelers, coupled with balanced EV 4-wheelers reflecting diverse trends. Gujarat ranks eighth with 103,996 EV registrations, primarily in EV 2-wheelers due to urban commuting needs. Assam secures the ninth position with 99,664 EV registrations, focusing on EV 3-wheelers for sustainable public transport. Madhya Pradesh ranks tenth with 73,484 EV registrations. Kerala ranks eleventh with 70,506 EV registrations, driven by strong EV 2-wheelers adoption for urban commuting. Notably, Maharashtra leads in EV 2-wheelers registrations, followed by Karnataka. In EV 3-wheelers registrations, Uttar Pradesh leads, followed by Bihar. In EV 4-wheelers registrations, Maharashtra leads, followed by Delhi. This comprehensive analysis showcases the positive and diverse landscape of EV adoption across major Indian States.

CONCLUSION

In the journey towards a greener and safer future, this comprehensive study of EV registrations across major States of India has illuminated a path of remarkable transformation. The data presented, spanning from March 2014 to March 2023 provides a clear picture as to how EV adoption has evolved over the years, reflecting a resolute shift towards sustainable transportation options. Notably,

Comprehensive study of EV registrations across major States of India has illuminated a path of remarkable transformation

the surge in EV registrations within populous States like Uttar Pradesh and Maharashtra underscores the potential for change even in the most populous and bustling regions. The consistent growth patterns in almost all the major states of India attest the enduring appeal of EVs, backed by a combination of technological advancements, Government incentives, and growing awareness of environmental concerns. The commitment of these states to combat pollution and emissions is palpable, as seen in the consistent upward trajectory of EV registrations. The post-pandemic recovery phase has breathed fresh life into the EV movement, showcasing the resilience of the transition towards greener alternatives. Furthermore, the diversity in EV adoption across States highlights the significance of localized approaches and solutions. The prevalence of EV 2-wheelers in urban centers like Mumbai and Bangalore and the dominance of EV 3-wheelers in densely populated States like Uttar Pradesh and Bihar and EV-4 wheelers in Maharashtra and Delhi, underline the adaptability of EVs to cater to various transportation needs and infrastructural settings. A greener and safer future is not merely a lofty aspiration, but a tangible reality within reach. The shifts in adoption patterns and the enthusiasm displayed by major States underscore the potential for a nationwide transformation towards electric mobility in India. MA

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We wish CMA (Dr.) Paresh Shah the very best for his future endeavors.

EMPOWERING GLOBAL ENERGY TRANSITION: ASSESSING INDIA'S G20 PRESIDENCY INITIATIVES AND ENERGY EFFICIENCY STRATEGIES

Abstract

G20 member nations have increasingly prioritized energy efficiency measures, yielding substantial advancements in residential, service, transport, and industrial sectors. This collective commitment recognizes energy efficiency as the linchpin for transitioning to cleaner energy sources and ensuring global access to clean, affordable energy. This research paper delves into India's pivotal role during its G20 Presidency, highlighting the power of small actions in driving significant reforms. Energy efficiency consistently holds a central place in G20 Energy Transitions Communiqués, emphasizing its crucial role in the transition to clean energy and universal access to affordable clean energy resources. As India assumes the G20 Presidency in 2023, it can leverage its extensive experience in energy efficiency policies and strategies to guide global efforts towards a more energy-efficient world by 2030, utilizing the G20's unique position to prioritize energy efficiency on the global policy agenda, foster partnerships, and mobilize action.

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INTRODUCTION

G20, an intergovernmental assembly, comprises of 19 major economies and the European Union (EU), collectively representing approximately 80 per cent of the world's GDP, 75 per cent of global trade, 72 per cent of total energy consumption, and encompassing 60 per cent of the global population. India took over the G20 presidency in December 2022, building on previous presidencies' achievements, which prioritized international cooperation in transitioning to clean energy and integrating it into the sustainable economic development agenda. Given its status as the world's third-largest energy consumer in 2022, India plays a pivotal role in the global shift towards cleaner energy sources, actively implementing measures to address its high carbon emissions and environmental concerns. Since 2009, energy has been a focal point in G20 discussions for sustainable global economic development. In 2013, a dedicated Energy Sustainability Working Group was formed to address pressing energy-related issues. India's role in shaping G20 responses while safeguarding energy security is pivotal, as it plans significant growth in renewable energy deployment. Recognizing energy efficiency as the 'first fuel' is vital for an equitable clean energy transition, enabling climate action, renewable

adoption, affordable energy access, economic growth, supply security and reduced dependence on imported energy.

OBJECTIVES

The objectives of this research study are:

- to analyze the key initiatives launched during India's G20 Presidency in the context of collective action and energy transition.
- to analyze the comprehensive energy efficiency strategies for sustainable and substantial global energy savings.

INDIA'S G20 PRESIDENCY: COLLECTIVE ACTIONS

India's G20 Presidency showcased a range of influential initiatives geared towards promoting collective efforts and driving the worldwide energy transition. These efforts underscored India's dedication to tackling climate change challenges, fostering sustainable development, and promoting cleaner energy alternatives. Several factors contribute to India's proactive engagement in this global energy transition which is presented in Figure 1.

FIGURE 1: COLLECTIVE ACTIONS

Green Hydrogen Innovation Centre

The International Solar Alliance (ISA) is poised to inaugurate a Green Innovation Centre during the G20 Ministerial meeting on July 22, 2023. The establishment of the Green Hydrogen Innovation Centre marks a significant stride towards achieving a sustainable energy landscape. This initiative is geared towards spearheading research, development and implementation of green hydrogen technologies, ultimately aiming to curtail carbon emissions in diverse industries. The Centre's emphasis on innovation and technological progress underscores India's commitment to fostering international cooperation for a successful energy transition.

Global Biofuel Alliance

Under India's G20 Presidency, the Global Biofuel Alliance will collaborate with existing bioenergy and energy transition initiatives. Led by Brazil, India, and the United States, it aims to promote sustainable biofuels, particularly in transportation. The alliance seeks to bolster markets, facilitate global biofuels trade, share policy lessons and offer technical support worldwide. It will emphasize best practices, set technical standards for sustainable aviation fuel and adopt a three-category membership structure comprising of member countries, partner organizations, and industries.

National Green Hydrogen Mission

India has set ambitious energy goals, aiming for energy independence by 2047 and net-zero emissions by 2070. Central to this endeavor is an increased adoption of renewable energy across all economic sectors. Green hydrogen emerges as a promising solution, offering the capacity for long-term renewable energy storage, the substitution of fossil fuels in industry, clean transportation and potential applications in decentralized power generation, aviation, and marine transport. The National Green Hydrogen Mission, approved in January 2022, seeks to establish India as a global leader in green hydrogen production and supply. Its objectives include reducing reliance on imported fossil fuels, promoting domestic manufacturing, attracting investments, fostering employment, supporting R&D initiatives, and creating export opportunities for green hydrogen and its derivatives. India's rapid economic growth has doubled energy consumption in two decades, with a 25 per cent rise projected by 2030.

The Bali Declaration (2022)

The G20 Bali Declaration, issued at the conclusion of Indonesia's year-long G20 presidency, serves as a joint statement summarizing member countries' commitments and strategies to address global challenges. It focuses on a range of critical issues, including financial stability, humanitarian crises, poverty reduction, and support for the least-developed countries. India played a pivotal role in negotiating the declaration, emphasizing the need for peace in the contemporary era and actively addressing sustainable development, multilateral reforms, and international cooperation. India's proposal for a pandemic fund to assist developing and underdeveloped nations in coping with the aftermath of COVID-19 was incorporated into the official communique. The Bali summit, spanning two days, saw major global economies echoing India's stance on various issues, including the ongoing Russia-Ukraine conflict.

Just Energy Transition Partnership (JETP)

Just Energy Transition Partnerships (JETPs) seek to address global disparities in transitioning to clean energy. Climate change impacts vary among nations, with some shouldering more responsibility for its causes. As the world targets limiting global warming to 1.5°C, nations' readiness

differs. JETPs act as financing mechanisms where wealthier nations aid coal-dependent developing countries in cleaner energy transitions while mitigating social consequences. However, India has reservations about a coal-focused Just Energy Transition Plan, deeming it unfeasible and unfair. Thus, India's agreement with wealthier nations on a just energy transition this year seems unlikely.

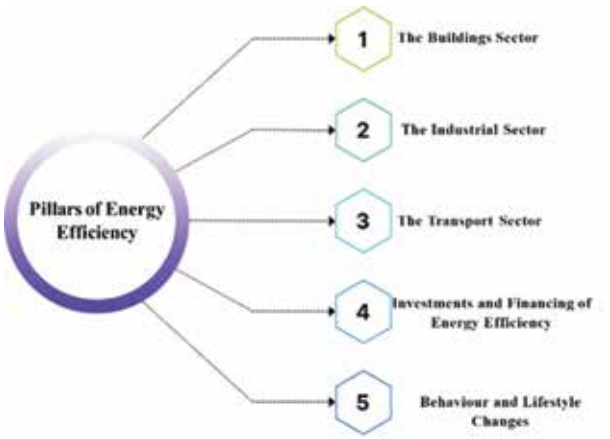
Lifestyle For Environment (LiFE)

Environmental degradation and climate change have profound global repercussions, impacting ecosystems and worldwide population . Without swift action, an estimated 3 billion people could face chronic water scarcity and the global economy might incur an 18 per cent GDP loss by 2050. While significant macro-level measures such as policy reforms and regulations have been implemented globally in the past two decades, individual, community, and institutional actions have received limited attention. To address this gap, Prime Minister Narendra Modi introduced 'Lifestyle for the Environment (LiFE)' at COP26 in Glasgow on November 1, 2021. LiFE advocates a global shift towards mindful resource utilization, prioritizing environmental protection over mindless consumption. It underscores collective responsibility for individuals and institutions to lead lives aligned with Earth's well-being, avoiding harm.

PILLARS FOR ENERGY EFFICIENCY

Enhancing energy efficiency stands as a pivotal imperative, aiming to elevate the quality of life for everyone, guaranteeing accessible and dependable energy provisions, and catalyzing the expeditious shift towards cleaner energy sources, a principle consistently emphasized by G20 member nations. India's G20 Presidency in 2023 presents a distinctive chance to harness its proficiency in formulating energy efficiency policies and strategies, providing global leadership in this vital realm as part of the broader effort to achieve decarbonization by 2030. The strategic plan designed to accelerate energy efficiency improvements revolves around five fundamental pillars, illustrated in Figure 2 for clarity.

FIGURE 2: PILLARS OF ENERGY EFFICIENCY



The Buildings Sector: Pillar 1

Buildings account for about 30 per cent of global energy consumption, making energy efficiency measures crucial for substantial energy savings by 2030 and beyond. A vital aspect of improving building energy performance involves energy codes, setting minimum standards for new constructions and driving upgrades in existing structures. These codes address operational energy use, including building envelopes (walls, windows, roofs) and key equipment such as appliances, lighting, IT systems, and thermal comfort devices (ceiling fans, air coolers, air conditioners, heat pumps, boilers, furnaces, HVAC systems, and ventilating fans), playing a pivotal role in achieving long-term sustainability goals and reducing global energy consumption.

The Industrial Sector: Pillar 2

Industrial efficiency is a linchpin in the energy strategies of G20 countries, accounting for 38 per cent of their energy consumption. Although competitive pressures and regulations have driven some industries to enhance energy efficiency, progress has decelerated, slipping from an average annual improvement rate of nearly 2 per cent during 2010-2015 to just under 1 per cent during 2015-2020. Attaining the 2030 energy intensity targets demands accelerated advancements. However, successfully meeting these objectives hinges on addressing various barriers and challenges inherent in the industrial sector's energy efficiency landscape.

The Transport Sector: Pillar 3

G20 nations, representing about two-thirds of the world's population, carry a significant responsibility for over 80 per cent of the global energy demand within the transport sector. Despite the growing shift towards electrification, fossil fuels continue to dominate the transport industry, accounting for approximately 91 per cent of its final energy consumption. Notably, road transportation alone contributes to approximately 75 per cent of both energy demand and emissions in this sector. While there have been notable enhancements in energy efficiency due to factors like fuel economy standards, advancements in engine technology, increased adoption of electric vehicles, improved road infrastructure, and better fuel quality, significant challenges persist.

Investments and Financing of Energy Efficiency: Pillar 4

Promoting energy efficiency investment is a G20 priority, underscored by the 2017 Energy Efficiency Investment Toolkit for knowledge sharing. Despite policy improvements, financing remains a challenge. Achieving a 4 per ent annual energy intensity improvement by 2030 necessitates tripling annual energy efficiency investments, from an average of $300 billion to $840 billion between 2026 and 2030. Allocation should prioritize 60 per cent in buildings, 30 per cent in transport, and 10 per cent in industry. Electrification

Recognizing energy efficiency as the 'first fuel' is vital for an equitable clean energy transition

and end-use sectors will require $1.6 trillion annually. Expanding these investments depends on enhancing low-cost financing accessibility, especially in emerging economies facing capital costs up to seven times higher due to specific risks and underdeveloped financial systems.

Behaviour and Lifestyle Changes: Pillar 5

Lifestyle changes are pivotal for climate mitigation, with potential to reduce 40-70 per cent of greenhouse gas emissions by 2050. Evidence underscores the need for robust demand-side strategies that empower individuals to make sustainable choices. Behavioral insights are increasingly integral in shaping and assessing policy measures. In the residential and commercial sectors, individual choices are pivotal in optimizing energy efficiency through various policy tools. Integrated policymaking, enriched by behavioral insights, dives deep into cognitive biases influencing information processing. Decisions on energy usage, like thermostat settings or adopting efficient appliances, are rooted in human behavior. Actions and attitudes significantly impact cumulative energy consumption.

CONCLUSION

Small actions can drive significant reforms. While seemingly minor, they can be fundamentally important. Over the years, G20 member nations have placed considerable emphasis on accelerating energy efficiency measures, resulting in notable improvements across residential, service, transport, and industrial sectors. The G20 Energy Transitions Communiqué consistently recognizes energy efficiency as the primary driver for transitioning to clean energy, ensuring universal access to clean and affordable energy. India's prominent role in global energy efficiency further highlights its potential impact. With its 2023 G20 Presidency, India can leverage its experience in energy efficiency policies and strategies, guiding global energy efficiency efforts by 2030. The G20's unique position allows it to prioritize energy efficiency on the global policy agenda, harnessing its wealth of initiatives, tools, and experience to fortify partnerships and drive action and investment in energy efficiency. MA

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INTERVIEW

CMA Pradip Kumar Das

Chairman &
Managing Director

Indian Renewable Energy Development Agency Limited's (IREDA), New Delhi

Shri Pradip Kumar Das, is the Chairman & Managing Director of the Company since May 6, 2020. He is a Fellow Member of the Institute of Cost Accountants of India and Associate Member of the Institute of Company Secretaries of India. He also holds Post-Graduate Diploma in Management from Xavier Institute of Management, Bhubaneswar. Prior to joining the Company, he was Director (Finance) in India Tourism Development Corporation Ltd. (ITDC). He has also worked with REC Ltd. (Rural Electrification Corporation), Bharat Heavy Electricals Limited (BHEL), Nuclear Power Corporation Ltd. (NPCL), Bharat Heavy Plate and Vessels Ltd. (BHPV), Kusum Products Ltd. and other organizations. He has over 33 years of vast experience in various positions in Finance, Banking, Accounts, Audit, Resource Mobilisation & Treasury, Loan & Recovery, Disinvestment/Divestment, etc. both in public as well as private sectors. He is a distinguished Member to various high-level committees constituted by Govt. of India bodies and industry associations for various strategic decisions. He is also the former Vice Chairman of Standing Conference of Public Enterprises (SCOPE).

Q1. "India has taken it upon itself to be carbon neutral by 2070". According to you, what should be the top 3 priorities for the government in the forthcoming years to scale the ambitious peak of net-zero emission?

Ans. India is ranked third as per the Renewable Energy (RE) Country Attractive Index (April 2023) post USA and China which ranks the world's top 40 markets on the attractiveness of their renewable energy investment and deployment opportunities. Further, India is the 3rd Largest energy consuming country globally and 3rd largest greenhouse emitter. However, the Per-capita emissions from India are only one-third of the global average. As per CEA, the annual per capita electricity consumption in India has increased from 18.17 kWh during 1950, has increased to 1255 kWh during the year 2020-22.

India has already submitted its Long-Term Low Emission Development Strategy to the United Nations Framework Convention on Climate Change (UNFCCC), during the 27th Conference of Parties (COP27). Considering rational utilization of national resources with due regard to energy security energy access and employment, the transitions from fossil fuels are decided to be undertaken in a just, smooth, sustainable and all-inclusive manner. Accordingly, the government is all set to leave no stone unturned when it comes to formulate and communicate long-term low greenhouse gas emission development strategies. The Hon'ble Prime Minister of India, Shri Narendra Modi has recently announced Global Biofuel Alliance under India's G20 Presidency in line with the net zero targets. National Green Hydrogen Mission has been announced with an outlay of ₹ 19,744 crore from FY 2023-24 to FY 2029-30 to make India a global hub for production, usage and export of Green Hydrogen and its derivatives. Increased use of biofuels, especially ethanol blending in petrol, the drive to increase electric vehicle

penetration, and the increased use of green hydrogen fuel are expected to drive the low carbon development of the transport sector. India aspires to maximise the use of electric vehicles, ethanol blending to reach 20% by 2025, and a strong modal shift to public transport for passenger and freight. Apart from this, Promotion of energy efficient/ low carbon technologies, digitization of processes, enhance material efficiency and recycling, exploring low carbon options in hard-to-abate sectors and creation of trading schemes and other market-based enablers to achieve these goals will be pursued where relevant.

Q2. How has Indian Renewable Energy Development Agency (IREDA) evolved as an organisation over the years? What has been IREDA's significant achievements in the last couple of years?

Ans. IREDA has been playing a motherly role in the overall development of RE sector since its inception in 1987 via promoting, developing and extending financial assistance at almost each stage of the RE development value chain of the new and renewable energy and energy efficiency/ conservation projects. IREDA is India's largest dedicated green financing non-banking financial company (NBFC). Although we started our operations in 1987, our Term Loans Outstanding have been increasing, showing a CAGR of 30.00% over the last three Fiscals.

The renewable sector has been gaining significant traction over the years and power financing NBFCs have been playing a key role in funding renewable projects. In Fiscal 2023 based on the loan book of six major power financing NBFCs, their credit towards renewable sector reached nearly ₹ 1,500 billion. Among these power financing NBFCs, IREDA shares more than 30% of their total share towards loan books contributing to renewable sector.

IREDA provides a comprehensive range of financial products and related services from project conceptualization to the post-commissioning stage in RE projects and equipment manufacturing. It provides financial assistance through both fund-based and non-fund-based facilities including project finance, short-terms loans, debt refinancing, performance guarantee and letters of comfort. The company mainly finances projects in the wind, hydro, solar, bio-energy sectors as well as emerging areas, such as battery-powered vehicle sectors. IREDA is the largest pure-play green financing NBFC in India.

IREDA is the issuer of first debt security (green masala bond) in India listed on IFSC exchange. IREDA is the first financial institution in India to raise green masala bonds. IREDA is among the first financial institution to raise global funds for climate financing from DFIs / multilaterals in India. IREDA is a nodal agency for MNRE schemes such as Central Public Sector Undertaking Scheme, Phase-II (Government Producer Scheme); National Bioenergy Program; National Programme on High-Efficiency Solar PV Modules under PLI scheme, Tranche-I; and Generation-Based Incentive (GBI) Scheme. As on March 2023, the loan assets of IREDA had reached ₹ 470.7 billion.

Key financial performance summary of IREDA – Consolidated

Particular	Fiscal 2021	Fiscal 2022	Fiscal 2023	First quarter of Fiscal 2024
Loan Book (Rs. Mn)	2,78,539	3,39,306	4,70,755	4,72,066
Revenue from operations (Rs. Mn)	26,548	28,599	34,820	11,432
Profit after tax (Rs.Mn.)	3,464	6,335	8,646	2,946
Net Interest Income (Rs. Mn)	9,922	11,280	13,237	3,830
Total Debt (Rs.Mn.)	2,40,000	2,76,131	4,01,653	3,99,417
Net Worth (Rs.Mn.)	29,956	52,681	59,352	62,904
Return on assets (%)	1.20%	1.89%	1.98%	0.58%*
Return on equity (%)	12.56%	15.33%	15.44%	4.82%*
Net Interest Margin (%)	3.93%	3.75%	3.32%	0.83%*
CRAR (%)	17.12%	21.22%	18.82%	19.95%
Gross NPA (%)	8.77%	5.21%	3.21%	3.08%
Net NPA (%)	5.61%	3.12%	1.66%	1.61%
Provision coverage ratio (%)	38.14%	41.45%	49.25%	48.68%
Basic EPS (Rs)	4.41	8.03	3.78	1.29
Diluted EPS (Rs)	4.41	8.03	3.78	1.29

* Figures have not been annualised for the period ended June 30, 2023.

On 27th September 2023, IREDA has been upgraded from Schedule B to Schedule A CPSE by Deptt of Public Enterprises. DPE also examining the proposal for upgrading the company from Mini Ratna to NAVARATHNA CPSE very soon. The credit rating IREDA has been upgraded from AA+ to AAA (with stable outlo) by three Rating Agencies. In last 3 yrs there have been a complete Turnaround wrt financial performance as well as best quality Corporate Governance. The company has been publishing it's Annual Audited Financial Results and conducting Annual General Meetings much ahead of other CPSEs. The FY 2022-23 results were published on 25th April 2023. The AGM for FY 2022-23 FY Results was held on 30th June 2023. IREDA is a Debt listed Corporate and expected to list it's Equities soon through IPO.

Q3. What is your outlook on the current state of the power sector in India, mainly the renewable energy segment?

Ans. India is the world's third-largest producer and second-largest user of energy. Power demand in the country has been on the rise in the past decade, with an exception during Fiscal 2021 due to the Covid-19 pandemic. Peak energy demand grew at a CAGR of 4.7% from 148 GW in Fiscal 2014 to 216 GW in Fiscal 2023, while peak supply grew at a CAGR of 5.3% over the same time period. The peak deficit stood at 0.5% i.e. 7,582 million units ("MU") in Fiscal 2023.

The all India peak electricity demand projected is projected to reach 277 GW and energy requirement is projected at 1,908 BU in Fiscal 2027, growing at a CAGR of 4.8% and 4.5%, respectively. During Fiscal 2027 to Fiscal 2032, energy requirement and peak demand are expected to grow at a faster CAGR of 5.3% and 5.7%, respectively.

As on July 2023, the total installed power generation capacity stood at 423 GW with renewable sources accounting for 42 % of the installed capacity. Driven by factors such as (i) government's thrust on the RE sector to achieve India's climate targets – 500 GW of non-fossil fuel energy capacity by 2030, 50% of energy requirement to be met through RE by 2030, reduction in carbon intensity of the economy by 45% by 2030 over 2005 levels, becoming energy independent by 2047 and achieving net zero by 2070, and (ii) benefits of RE such as abundant availability of resources, lower tariffs and (iii) technological advancements in renewable power technology, the installed renewable power capacity is expected to increase to 336 GW by Fiscal 2027, with solar, wind and hydro accounting for 55%, 22% and 16% of installed renewable power capacity, respectively. The installed renewable power capacity is expected to reach 595 GW by Fiscal 2032 and account for 66% of the total power generation capacity. A total outlay of ₹ 24.43 trillion is expected towards renewable capacity additions between Fiscal 2023 - Fiscal 2032.

Q4. IREDA has registered its highest-ever loan disbursements and sanctions in FY 2022-23. Elucidate your journey towards such an accomplishment?

Ans. Our Business Policy, Practices and it's effective executions are our key strength. Our employees are our most important resources.

We offer continuous learning programs for our employees to facilitate the ever-growing demand for knowledge from the RE industry and competency building programs. We conduct regular training programs and workshops for our employees on various areas related to our operations. In Fiscal 2023 employees have been imparted training on various topic like general management, strategic leadership program for public sector enterprises, risk management, infrastructure financing, stressed asset management and IBC.

We also promote knowledge sharing and knowledge transfer with continuous rotation of employees within the organization. Our employees have the opportunity to learn, develop and enhance their skills both through offline and virtual modes of training, lecture series and other focused development training programs. Our e-learning policy was introduced for the capacity building of our employees by giving them an opportunity to attend e-learning programs of premier institutes in their relevant fields, technical and managerial competencies, leadership, self-development and general management programs.

We provide specialized training programs from various premium educational institutes/organizations in India and abroad, besides in-house training sessions. There are various training programs conducted along with Department of Economic Affairs and Department of Public Enterprises in association with premier institutes. In Fiscal 2023, various lecture series, focused development training programs and workshops were organized on health, lifestyle and fitness, leading to the achievement of over 1,670 training days.

We offer reimbursement facility to support employees for IT infrastructure such as schemes for providing laptops, mobiles handsets and communication expenses.

Our remuneration structure is primarily driven as per the Department of Public Enterprises, GoI and its guidelines. We offer a perks and allowance package that allows employees to include items as per individual requirements from among available options. For the well-being of our employees, we undertake holistic wellness initiatives. We have yoga and fitness facilities within office premises and meditation routines are scheduled daily for all employees. In cases of hospitalisation, hospitals are empanelled to facilitate smooth cashless treatment to employees and dependent family members. We have instituted a post-retirement medical scheme for our retired employees where they are allowed to avail in-patient treatment in empanelled hospitals.

Q5. How do you think the 500 GW of non-fossil fuel-based capacity by 2030 target announced by the Government has shaped up the opportunities coming up in the sector?

Ans. Power financing NBFCs have seen significant traction supported by increase in demand for funds from power sector, and government's push towards growth of power sector. In Fiscal 2023, the outstanding credit of key power financing NBFCs witnessed a CAGR of nearly 10% over Fiscal 2019. In Fiscal 2024, power-financing NBFCs are expected to continue this growth momentum and this growth is likely to be driven by increase in power demand, rise in population, renewable integration, and sustainability goals of the country. The renewable sector has been gaining significant traction over the years and power financing NBFCs have been playing a key role in funding renewable projects. Over the years, asset quality for this set of NBFCs have seen significant improvement with gross NPAs coming down. The decline in gross NPAs is largely supported by restructuring of stressed assets, write-offs, decline in slippages and increased provisioning.

Power deficit in India has been on a declining trajectory and India is expected to further expand its generation capacity. India is also evaluating opportunities with neighbouring countries such as Nepal, Bangladesh, Sri Lanka, Maldives and Bhutan for better integration and synergies by interlinking electricity transmission systems and allowing surplus power to be exported to other grids.

Q6. What strategic intervention you have outlined to support emerging areas such as E-mobility, Green Hydrogen, Green Transmission, etc.

Ans. Our position as the largest pure-play green financing NBFC in India places us among select players who are well placed to capitalise on the rapid growth in the RE sector. Our brand is strengthened by our role as the implementation agency for several prominent MNRE schemes and policies.

We have focussed on building our reputation in relation to the following:

i. Specialized expertise in technical appraisal of RE projects;

ii. Innovation in structuring specialised financial products for various RE sectors; and

iii. Customer satisfaction and quality of service provided to borrowers.

Our exclusive focus on green finance has led to domain knowledge across various

RE sectors from a technical and financial perspective based on our experience of more than 36 years. As of June 30, 2023, we had 349 RE borrowers across more than 10 RE sectors such as solar, wind, hydro, biomass, co-generation, EV, waste-to energy, EEC, manufacturing, ethanol, among others.

We have offered the following innovative products:

- Loans against securitization of future cashflows of RE projects.
- Guarantee assistance scheme to RE suppliers, developers, manufacturers and engineering, procurement and construction ("EPC") contractors for bid security.
- Credit enhancement guarantee scheme for raising bonds by our developers against their operating RE assets.
- Special product for funding RE projects through bonds, banks loans and other financial instruments.
- Factoring for purchasing receivables of solar power developers payable by eligible government entities.
- Schemes for biomass-based power co-generation, heat application and ethanol.
- Funding for battery energy storage systems and green hydrogen.
- Financing for e-mobility/ green mobility sector, including fleet financing for EV operators and on-lending for e-mobility/ green mobility financing.

Our reputation has been built on our expedited processing of loan applications, structuring of financial products based on the needs of developers and responsiveness to customer queries and issues through the term loan lifecycle.

We have a robust IT infrastructure with an Enterprise Resource Planning System ("ERP System") tailored to our business requirements. We benefit from our integrated ERP comprising business processes such as finance and accounts, payroll, human resource management system, employee self-service, loan origination system and loan management system, liability management system, legal, credit risk rating system, inventory management, and project monitoring and risk management.

Each loan proposal under consideration is graded using our proprietary Credit Risk Rating System ("CRRS"), which captures multiple risks including permitting risk, execution risk, generation risk, operating risk, off-taker risk, sponsor risk, and project funding and financial risk for comprehensive risk assessment. The applicable interest rate is finalised for a project based on the risk grade assigned by CRRS. Credit appraisal proposals are reviewed by an internal screening committee, which includes our Chief Risk Officer, to assess overall viability of the loan proposal. In addition, every credit appraisal undergoes an independent financial concurrence to validate the project viability model, compliances and other relevant documentation. Based on the recommendations of the screening committee and financial concurrence, the final appraisal agenda with detailed terms and conditions is put up for approval before the sanctioning authority.

We have already signed memoranda of understanding ("MoUs") with other banks and NBFCs for co-origination and co-lending of RE projects. We may form partnerships with other financiers to originate and structure large project loans by leveraging our existing relationships with RE developers.

We will continue to focus on identifying new sources of funding and enhancing limits for existing competitively priced sources to further lower borrowing costs and meet the long tenor requirements of our asset base. We will leverage our credit reputation to negotiate lower cost of term loans from bank and lower realization on our medium-term and long- term capital market issuances.

Q7. Which innovative projects are there in your pipeline for the next 2 to 3 years; which you believe will be in demand in the years to come?

Ans. We intend to play a critical role in meeting this financing requirement and enhance our market share in RE sectors such as solar, wind, hydro power and biomass, biofuels and cogeneration. We plan to continue launching financing products to meet the evolving needs of RE developers.

We have identified key areas for diversification and expansion which are in line with the focus areas of the Government of India which include Green Hydrogen and its derivatives, pumped hydro storage power plants, Battery storage value chain (including manufacturing, storage, recycling), Offshore wind, Green energy corridor, Rooftop solar power and Green mobility value chain (fuel cells, charging infrastructure).

Q8. What is your view on the role of a contemporary CMA as a leader in any industry?

Ans. The role and significance of CMAs have increased manifold due to growing competition in the corporate sector, essentially comprising of closely analysing costs and devising ways to reduce them as far as possible. A CMA is necessary across multiple functions in an organization. The present roles of a CMA include significant contributions in Corporate Decision Making, Resource Management, Performance Management, Financial Reporting & strategy, optimization of stakeholder's value, Risk Management, sustainable Development, Corporate social Responsibility, Enterprise Governance and Audit assurance and taxation.

Certified Management Accountants are known to have provided instrumental financial guidance to organizations, discussions, decisions, and businesses. Its best known that CMA professionals have been performing for organizations in the roles like CFO or Financial Controller wherein they exercise their leadership skills to communicate in the most effective and relatable manner and ultimately motivate their teams to achieve their goals. Leaders in every organization are accountable and shoulder significant responsibilities for their team members.

Q9. What are the various ways your organization can integrate with our Institute for the diverse avenues in professional development matters?

Ans. Being the largest lender in pure play green financing NBFC in the country the rich experience of IREDA can be handy for the ICMAI in organising Green Energy and it's Financing related training, seminar, workshops, etc. not only to enhance its awareness but also upskill the future CMAs which can enable them to grow in the profession.

We are already having a good relationship by recruiting CMAs through campus.

Q10. If you have to give one piece of advice to the CMA professionals, what is that going to be?

Ans. My advise would be to the CMAs to be deep rooted to the core values of the Institute by ensuring highest level of honesty, simplicity and constantly updating their knowledge base as well as its application. They must understand well how to manage their need and control their greed by highest level of ethical standards for ensuring sustainability in their existence and growth. MA

BOOK REVIEW

Book Name : MANAGEMENT ACCOUNTING

Author	:	CMA (Dr.) Asish K Bhattacharyya
Published by	:	Nonlinear Insights (OPC) Pvt. Ltd.
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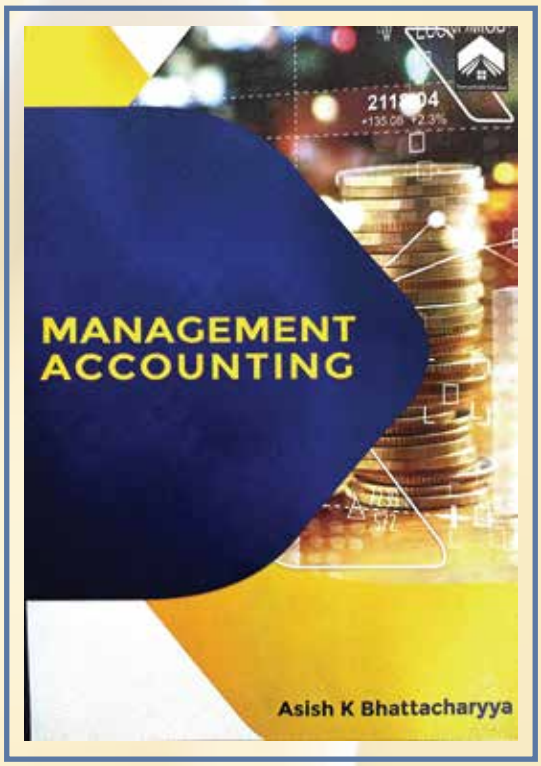

About the author

CMA (Dr.) Asish K Bhattacharyya has fifty years of work experience, twenty years in senior positions in industry and thirty years in teaching. He is a distinguished professor at Shiv Nadar Institution of Eminence Deemed to be University (earlier SNU). He worked as a professor at IIM Calcutta, SPJIMR (Mumbai). IMT Ghaziabad, IMI Kolkata and IICA (Manesar, Gurugram). He served IMT Ghaziabad and IMI Kolkata as Director. He also worked as the Technical Director of the Institute of Chartered Accountants of India.

About the book

The book is a thoroughly revised and substantially streamline edition of the book Cost Accounting for Business Managers (Published by Elsevier). The book draws on the author's fifty years of experience applying and teaching management accounting techniques. The text lucidly explains fundamental and contemporary management accounting techniques and their applications with examples. It shows how qualitative factors often override economic considerations in decision-making. The book also provides an overview of the cost accounting methods and traditional methods for accounting for overheads. It will be useful for commerce and management students and anyone interested in learning management accounting concepts and their applications.

Review

The need of the hour is to cater to diversified and contemporary management accounting methods in a simple manner to the students' community so as to they can perform their level best afterwards when they perform in managerial positions in industry. The world of accounting is rapidly changed in recent times and both the students and teachers need to be equipped with modern methods of management accounting knowledge, which would offer sustainable growth in industry as well as in society.

Recently the book namely, 'Management Accounting' authored by CMA (Dr.) Asish K Bhattacharyya was published by Nonlinear Insights (OPC) Pvt. Ltd. Publication Division, New Delhi.

This book was published by Elsevier in 2009 and the title of the book was then 'Cost Accounting for Business Managers'. Dr. Bhattacharyya changed the book's title as 'Management Accounting' which is more pertinent in the new economic scenario and received overall good response from students' community as well as from teachers' fraternity.

The book has been revised and significantly restructured and the topics are very much useful for the commerce and management students as well as students undergoing professional courses as it covers all the relevant areas as far as the present day's management accounting are concerned.

Dr. Bhattacharyya has explained the concepts and techniques in such a manner that a new student can easily grab the substance. He ingeniously included sufficient solved problems as examples and review problems in depth and he also added new problems to the chapter-end assignments.

The book covers contemporary topics like pricing decisions, divisional performance and transfer pricing, target costing, value chain analysis, life cycle costing and balance scorecard. Dr. Bhattacharyya's work addresses this aspect carefully and comprehensively.

The book contains the following chapters:

Introduction, Cost accounting Terminology, Cost Sheet – Absorption and Marginal Costing, Material Cost and Employee Cost, Overheads Accounting – Conventional Methods, Overheads Accounting – Activity-Based Costing, Short-Term Profit Planning – C-V-P Analysis, Short-Term Decision Making: Marginal Costing, Decision-Making-relevant Information, Standard Costing, Budget and Budgetary Control, Responsibility Centres and Transfer Pricing, Pricing Decisions, Strategic Cost Management, Specific Order Costing and Process Costing and Other Costing Methods.

All the above mentioned chapters are very much essential in the domain of management accounting and the author illustrated all the essential ingredients in an exceptional manner.

The book is a must read for all those who need to develop a goal oriented knowledge in the field of management accounting and develop relevant models in the subject scope of Strategic Financial Management.

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CREATING SUSTAINABLE CITIES – MUNICIPALITIES AND THE POTENTIAL OF SEBI's GREEN BOND FRAMEWORK

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Abstract

Municipalities have an unenviable job - that of ensuring that cities are not only liveable, but are also sustainable. Towards this, one needs funds other than the usual avenue of government grants and revenue through taxes and charges. To be fair, municipalities are primed to be most likely issuers with green objectives owing to the inherent nature of sustainability in the projects like water management, waste treatment etc. This article examines how SEBI 's green bond framework provides an answer to the sustainable finance requirements of municipalities.

In 2018, the Global Infrastructure Hub estimated a $15 trillion global investment gap in the years leading to 2040 that would need to be filled if the world were to make infrastructure resilient to climate impact and qualify to be *Net Zero*. Internationally Cities are looking at various sources of finance to complete their projects, particularly sustainable / green projects. In India, SEBI has allowed municipalities as *'issuers'* under the SEBI (Issue and Listing of Municipal Debt Securities Regulations), 2015 to issue green bonds as a source of finance for such projects.

Potential for municipalities

Presently around 36% % of India lives in cities. (*World Bank data, September 2023*)[1] This figure is expected to go up to 50% in 2047[2]. *Niti Aayog* estimates that more than 60%[3] of India's GDP is generated by its cities. Cities have municipal corporations that run them. The indicative functions of municipal corporations are broadly as follows[4]:

Public Health and Sanitation

Water supply, public vaccination, control of diseases, prevention of pollution, collection/disposal of rubbish, maintenance of sewers.

Medical Relief

Establishment and maintenance of health institutions.

Public Works

Construction and maintenance of roads/bridges, control and regulation of building activity, street lighting, tree plantations, etc.

Education

Establishment and maintenance of educational institutions.

Development

Construction and maintenance of markets, shopping centres, drinking water stand posts, wells, parks, gardens; preparation of plans for development and growth of towns.

Administration

Preparation of annual reports, maintenance and development of municipal property, regulation of traffic, registration of births and deaths.

SEBI's municipal bond framework and reforms

The SEBI (Issue and Listing of Municipal Debt

[1] *https://tradingeconomics.com/india/urban-population-percent-of-total-wb-data.html*
[2] *https://www.business-standard.com/article/economy-policy/urbanisation-set-to-be-key-with-50-population-in-cities-by-2047-niti-ceo-122120800515_1.html*
[3] *https://www.niti.gov.in/sites/default/files/2022-05/Mod_CEOG_Executive_Summary_18052022.pdf*
[4] *http://www.lse.ac.uk/asiaResearchCentre/_files/ARCWP19-Aijaz.pdf*

Securities) Regulations, 2015 (ILMDS Regulations) and circulars issued thereunder, provide the framework for issuance and listing of municipal debt securities in India. SEBI has also specified the continuous disclosure and compliance requirements to be complied with by issuers of Municipal Debt Securities. 12 municipalities have raised around Rs.2400 crore in municipal bonds so far.

In order to assist municipal debt issuers,

- *SEBI has been creating awareness around the country among municipalities about its municipal bond framework through programmes.*
- *SEBI launched an Information Database – accessible through a QR Code –containing a repository of information pertaining to Municipal Bonds which serves as a guide to municipalities and aid awareness.*
- *SEBI allowed Stock Exchanges to introduce the Muni Bond Index. Consequently, NSE, in February 23, launched India's first Muni Bond Index*
- *SEBI is also engaging with states across the country on how municipalities can utilize the municipal bond marketto meet their funding needs*

SEBI framework for Municipalities to issue green bonds

The ILMDSRegulations do not define '*green debt security'*. The SEBI (Issue and Listing of Non-Convertible Securities) Regulations, 2021 (NCS Regulations), defines "*green debt security*". Further, Chapter IX of the SEBI NCS Operational Circular dated August 10, 2021, *inter alia*, provides the initial and continuous disclosure requirements for entities issuing/ proposing to issue green debt securities.

SEBI had received representationsfrom market participants on the compliances an issuer under the ILMDS Regulations would have to undertake in case it is desirous of issuing a green debt security, in the absence of similar provisions in the ILMDS Regulations.

In November 2022, SEBI clarified that an issuer under the ILMDS Regulations may issue a green debt security if itfalls within the definition of *"green debt security",* as per Regulation 2(1)(q) of the NCS Regulations. SEBI also stated that such issuer, shall,in addition to the requirements prescribed under the ILMDS Regulations and circulars issuedthereunder,comply with the provisions for *'green debt security',* as specified under the NCS Regulations and circulars issued thereunder.

Potential for municipalities to issue green bonds

More than any other of bonds, municipalities are most primed to issue green bonds. The reason is many of their projects relate to:

- *Treatment of waste,*
- *Sewage related projects,*
- *Desalination,*
- *Riverfront development,*
- *Coastline protection etc.*

Cities have more green projects than companies. Ghaziabad Municipal Corporation was the first municipality to issue a '*green*' bond though the SEBI clarification was then not in place. Indore became the latest city to issue a green bond. In fact, the response to the Green bond issue of Indore Municipal Corporation was so overwhelming that it got oversubscribed by more than 6 times by the public. With India as a nation providing commitments in the form of Nationally Determined Contributions (NDCs), it is only imperative that these projects will become the mainstay of municipalities in India's drive towards net zero.

NDCs – India's Commitment to United Nations

In its NDCs, which have been communicated to the United Nations Framework Convention on Climate Change (UNFCCC)[5], India has pledged to:

- *Improve the emissions intensity of its GDP by 33 to 35 per cent by 2030 below 2005 levels.*
- *Increase the share of non-fossil fuels-based electricity to 40 per cent by 2030.*
- *Agreed to enhance its forest cover which will absorb 2.5 to 3 billion tonnes of carbon dioxide (CO_2 the main gas responsible for global warming) by 2030 (like a 'carbon sink')*

India's updated NDCs also represents the framework for India's transition to cleaner energy for the period 2021-2030.

Further it is significant to note that India has proposed 'LIFE'– '*Lifestyle for Environment'* as a key to combating climate change. India's updated Nationally Determined Contributions (NDCs) NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.

So municipalities have a responsibility in contributing to the NDCs – this can be done by the tapping the SEBI green bond framework.

Sustainability and cities around the world

Countries around the world have provided significant commitment given to green financing. Cities are trying

[5] *https://unfccc.int/process-and-meetings/the-paris-agreement/nationally-determined-contributions-ndcs*

innovative ways to exist sustainably. Punggol, a city in Singapore has applied *Green Urbanism* approach to create an entire new town aimed at driving sustainability, reducing carbon emissions and promoting a better quality of life for residents.

For example, Belgrade, the capital of Serbia, has come out with an indigenous concept of a *'liquid tree'*[6], an urban photo-bioreactor that harnesses the power of microalgae to improve air quality. Serbia is the owner of an unwanted record – it has the worst per capita record for pollution-related deaths, with 175 per 100,000 people. It is looking at innovative solutions.

India, on the pollution front, is at an alarming place – it is the 8th most polluted country in the world with the 14 most polluted cities out of 20 being Indian[7]. Accordingly, in India too there is a crying need to ameliorate the situation -hence the growing need for municipalities to smartly transition from a carbon intensive to a carbon neutral economy.

Why green bonds for municipalities?

Hence, government grants alone may not suffice for municipalities in India and they need to look at different sources of finance to achieve the commitments. The green bond framework of SEBI is one such source waiting to be tapped. The green bond framework of SEBI is pretty exhaustive inasmuch that:

- *it defines what comprises a green debt security;*
- *it stipulates requirements as to initial and continuous disclosures;*
- *it requires disclosures as per Chapter 6 of the BRSR on Environment;*
- *it requires independent third party analysis, which will boost credibility and*
- *it lays down the DOs and Don'ts for greenwashing.*

Further, the SEBI green bond framework goes on to define *blue* bonds, *yellow* bonds as well as *transition* bonds to suit the needs of the issuer. Urban municipalities should optimize resources to unlock monetary value. Cities can also follow the Infrastructure Trust model - InVIT model – of SEBI to raise funds in which only a share of revenues require to be pledged – this innovative model acts as a shield against indebtedness. At an earlier Conference of parties (CoP 26), India presented the success story of one of its cities – Surat - which has become a model city in the country for its circular economy recycling waste water, releasing it for industrial usage and generating revenue through such reuse[8]. Certain cities are creating a public private partnership for waste recycling.

Conclusion

Cities drive our future – hence, it is important that cities are sustainable and resilient. There is a need to look at various sources like municipal bonds for cities to augment their needs. Studies indicate that in India, while municipal revenue is around 1% of GDP, the infrastructure investment needed annually is around 9% of GDP. Further, Only 1% of urban bodies' financial needs are met through municipal bonds as against 10% in the USA.[9]

OECD estimates that by 2050, the global population living in cities is projected to reach 5 billion and that massive investment in infrastructure will be needed to accommodate this growth, not least given the need to adapt existing, as well as new, infrastructure to climate change and to benefit from the digital transition[10].

Cities need to ensure that their sources of funds and revenue remain diverse – this will only make them resilient and financially sustainable. While they may tap into their own sources of revenue / government grants, the SEBI municipal bond framework emerges as an attractive source of revenue, particularly green municipal bonds, which will aidin creating sustainable cities. MA

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HACKERS, MALICIOUS AND ETHICAL HACKING - TRANSMUTATION FROM WISHFUL OPTION TO A CRITICAL SUCCESS FACTOR

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Synopsis

The title of the paper by itself mirrors the outline of its contents. There are historical evidences of mayhems perpetrated by devils and demons in most of all ancient human civilisations. The present Industry 4.0 era is no exception. Cyber criminals, pirates and malicious hackers are the devils and demons of present era. This paper contains knowledge narratives on multidimensional features, modus operandi and motives of those devils and demons. The extent of damages caused by unethical hackers to corporate world across the world in 2022 have also been included with narratives on the cruel facets of the harms inflicted.

Historically in all civilisations such monsters have been overpowered by human beings only and in many cases have been transformed to good human beings by their masters to serve humanity. This paper also suggests transmutation of the ICT and digital systems hacking professions into ethical hackers for taking the cybercriminals head on, proactively blocking all their points of entry and beating down their tools. For this again knowledge narratives have been included for readers to know more and initiate actions in their respective organisations. The author has also suggested for collective and collaborative actions at global level for incessantly fighting out this menace as the demons keep evolving with their new avatars and advanced digital tools.

Image Source: *https://www.simplilearn.com/white-hat-hacker-article*

Introduction

Classical mythology and epics of almost all civilisations across the world have instances of demons and devils. Indin mythology has Raban and Mareecha amongst others in Ramayana who were killed by Lord Ram. Mahabharata contains stories of *Rakshasas* and *Asuras*, viz. Baka, Hidimba, Jata Kirmira, etc. who created hellish troubles for *Pancha Pandavas* during their 14 years' exile in forests. According to Christian demonology, demons seduce good people to renunciate faith on God and introduces them to sin. Lucifer, Leviathan, Satan, and Belial are the four princes of demons mentioned in the book of Abramelin written in 14th or 15th Century. Gina Konstantopoulos[1] has written that, *"…. during the early third to late first millennia BCE Demons and witchcraft were integrated aspects of the Mesopotamian world. They could threaten individuals, often causing illness or ill fortune, as well as target society as a whole, encroaching upon the protected and ordered world of the Mesopotamian city."* Such stories are endless for many other civilisations.

Travelling down memory lane to present 21st century one cannot expect that there are no demons and devils in digital and ICT ecosystems of this industry 4.0 era. The world is progressing with more and more adoptions and applications of digital technologies at an overwhelming speed with groundbreaking innovations and 'innoventions'. But cybercriminals, hacktivists, cyberpunks, internet pirates, etc. are the new *avatars* or reincarnations of ancient day *asuras,* devils, and demons in the present digital era. Their basic objectives are to extract ransoms by bringing computing systems of any public, private, corporate and/or NGO entities to a halt by wrongful access to systems and spawning malwares. They do not even spare hospitals and other humane service delivery organisations and educational institutions. They have their own dark web for conducting business activities for data assets criminally extracted from those organisations.

There is another group of demons who do live in civilised world. They belong to some political ecosystem and helm executive functions of governments in different countries. There are plenty of examples that one country is keeping surveillance on other countries through digital routes and/or weaponizing unethical hacking for cyberwarfare. Readers will be flabbergasted to see the list of innumerable instances of hacking governmental websites from April 2022 to August 2023 as reported by the Centre for Strategic and International Studies, Washington, USA, which has not been quoted here being not relevant for the stated objective of this paper. There are even allegations that digital cameras, computerised road signalling systems, IoT devices, etc. supplied to other countries contain systems that emit signals to be captured by the digital systems of the supplier country for tracking activities of the buyer countries.

It is being feared that the 3rd World War will be fought in the Cyberspace. Countries under the North Atlantic Treaty Organisation (NATO) have declared cyberspace as the next source of threat and advised associated countries to remain alerted and be prepared with requisite digital defence devices for fighting advanced AI based hacking tools which have already been weaponised. One can get startling information from the following text as reported by Cooperative Cyber Defence Centre of Excellence (CCDCOE)[3]:

Cyber space was declared as *"…. the fifth domain of operations during the foreign ministers' meeting in 2019 in the London Summit Declaration (Para. 6). The affirmation that attacks to, from or within space may invoke Article 5 was also reaffirmed two years later in the Brussels Summit Communiqué (Para. 33). As for hybrid warfare, the statements that it may invoke Article 5 have appeared, for example, in Para. 72 of Warsaw Summit Communiqué (2016) or Para. 31 of Brussels Summit Communiqué (2021). …."*

Objective

Sharing knowledge and information on weaponisation of advanced hacking tools for inter-country hacktivism with ulterior motives and cyberwarfare are not the objectives of this paper. It has been included in introduction section for briefly narrating the disastrous impacts of powerful digital tools for hacking when used by governmental or their associated agencies with vindictive motives. The objective behind such narratives is to reinforce the need for multilateral agencies to come forward to do all that are needed to alleviate sufferings of mankind from such demonic activities.

The paper will deal with various dimensions of hacking activities, types of hackers, ethical and unethical hacking, etc. It will narrate firsthand knowledge on hellacious activities of hacktivists, as a group of dark world computing professionals, who are predominantly driven by greed and gluttony for extracting millions of dollars as ransoms and earn money by selling stolen out data. At times they operate to attain sadistic pleasure and show what all they can do by exploiting the vulnerabilities. Some hackers hack corporate websites to prove that they are efficient and can be considers as an in-house hacker if recruited. There are instances of this.

The paper would narrate how proactive preparatory measures, taken by government and business entities to fight away cybercriminals, can fail due to lack of knowledge and improper sequence of actions. List proactive in-house ethical hacking measures which business entities should take and cautions they should exercise to ensure that hacktivists find it hard to penetrate their systems would also be narrated in this paper. The ultimate objective is to generate a message that ethical hacking is no longer an option which can be wished away. It must now become a part and way of living life and progressing with ICT and digital technologies.

Hackers and Hacking - Knowledge Narratives

The history of first popularised hacking dates back to 1960s which was related to telephonic communication system. The process called 'Phreaking' used to be some unique high-pitched sounds passed through telephonic calls to convey codified messages and taking coded instructions for doing

crimes. This method was relatively better than that of 1878 when pranksters used to switch-off telephone lines and stop communication with ulterior motives.

The chronology of such events continued till 1970s when instances of hacking computers started with governmental organisations like Army, Airforce and Intel Machinery started adopting computers for strategic purposes with decentralised network. At that time groups called 'Tiger Teams', etc., surfaced which comprised of very highly skilled and trained computer specialists. They could hack and breach to gain access to others' computers. At that time only software programs known as 'Computer Worms' started being used by hackers. By 1980s such groups became so active and dominant that the USA had to adopt a preventive measure in the form of a debatable legislation called "Computer Fraud and Abuse Act'. With the advancement of ICTs and advent of cognitive technologies from late 1990s hackers kept on crafting advanced software and tools using AI and concepts of robotic process automation for hacking.

Definition of Hacking

In simple terms hacking means identifying and exploiting the vulnerabilities and weaknesses of any Information and Communication Technology (ICT) and digital systems to first achieve unauthorised access to the computing systems. Immediately thereafter the hackers perform perverse activities for extracting and/or changing master and transactional data, programs, scripts. soft tools, etc., spawning malware to bring functioning of targets' systems to a complete halt and so on. Thus, a hacker must possess superior knowledge about various types of ICT systems and be an expert programmer. In common parlance the word hacker generally denotes negative connotations because the word is predominantly related to the world of cybercrime.

A group of computer specialists of the dark world, engaged in hacking as their money-making profession, are called **Hacktivists**. Hacking any element from ICT and digital systems and devices, ICT network, etc. with the ulterior motives of extracting huge money as ransom and/or inflicting huge harm and damages is a white-collar crime. Such unethical hacking comes under the domain of criminology. Two exceptions from these are Ethical Hacking and Red Hat Hacking which have been further explained in subsequent sections.

Hackers use computing tools to break the firewalls and antivirus protections used by individuals and organisations. Hackers also use the route of internet through which users' computers are connected to the cyber network. In contemporary times they use tools crafted by using AI and RPA for identifying vulnerabilities/weaknesses and penetrating ICT systems for spawning malware. It is a popular statement that cybercriminals run ahead of time and their target victims in terms of their innovative ICT and digital skills. They are highly innovative for writing programs and possess skill sets for breaching protections. Such a statement is vindicated by the statistics quoted in the subsequent section regarding multifarious types of crimes committed and number of victims in calendar year 2022.

Phishing Mails

The cyber pirates at times use trick of using a phonetically and/or visibly same email id or domain name, albeit with marginal spelling difference. for sending phishing mails. They maliciously pose themselves as colleagues, insurance agents, relationship managers for banking and/or offer new earning or business opportunities, etc. Through such mails, they write various types of tempting messages for reaching financial gains and allure recipients to reveal important personal information like bank account numbers, passwords, details of Digital Identity No., etc.

At times they provide website address which are used by them as a tool for entering the internet-based mails and extracting searching history of the user(s). Some time they send files as attachments through mails with alluring and attractive contents and ask the recipients to save. As soon as the file is saved the hacker gets the pathway into the data base and all saved files for either extracting those and/or corrupting those. Hackers also hack vulnerable hand-held mobile devices to hack data, choke the device, send phishing messages and mails for similar malicious purposes.

Types of Hackers

It is a misconception that all hackers can be painted with the same brush and colour. The following graphic delineates six types of hackers whose features have briefly been narrated below:

Source of Idea for recreating the graphic

https://www.techtarget.com/searchsecurity/answer/What-is-red-and-white-hat hacking#:~:text=There%20are%20three%20well%2Dknown,good%20hackers%20from%20the%20bad

Black Hat Hacker: They hack with ulterior motives for getting sadistic pleasure, inflicting ill effects for harming victims and extracting ransoms in the form of money and other benefits. Some of such hackers are also funded by terrorists and drug traffickers for gathering intelligence/ information about their targets before committing their set of further crimes.

White Hat Ethical Hacker: They are the exceptional community of hackers who help their client organisations for achieving a dynamic state of readiness for fighting out all other hackers. Ethical hackers are also recruited by organisations for their ICT and internal audit teams.

Grey Hat Hackers: This group of hackers sit on the fence. They try to be white hat hackers but at times cannot remain firm and get rid of allurement for earning quick money by using their capabilities to hack others' systems for extracting ransom and data for subsequent selling to interested parties.

Green Hat Hackers: These are new and unskilled hackers who have just entered the profession and susceptible to be influenced and trained by any of the other hacker groups.

Blue Hat Vengeful Hackers: This is a unique group of hackers, who after maturing from green hat, originally wanted to become white hat hackers. But during their journey, they encounter some hard-hit experience which might have inflicted harms and losses to them. Such events turn them towards revengeful mindset to settle the score. There are possibilities for them to wear black hat to take revenge against the party which harmed them before. Thereafter they may wear back the white hat or continue to remain unethical hackers with black hat.

Red Hat Vigilante Hacker: These group of hackers are mainly driven by principles of morality, ethics, and justice. Their motive is to build and ensure a safe, secured, and vigilant cyberspace. They want to ensure access for all with the principle of equity and inclusivity. The difference between them and white hat ethical hackers is that the latter group is predominantly driven by monetary considerations either through providing ethical hacking services or as employees of organisations.

Three Steps for Hacking

The following graphic delineates three phases for committing cybercrimes through hacking which are relatively simple processes and any highly skilled computing professional with knowledge of programming can be trained as a hacker.

Source: https://www.startertutorials.com/blog/how-cybercriminals-plan-attacks.html

The following are details for the three major phases as are being revealed by the above graphic.

- Reconnaissance: This word has been from the domain of military and etymologically means conducting exploratory survey of an enemy and their strategic features including arms and ammunitions. Through this process any hacker starts planting subtle footprints and collects details of the target's ICT ecosystem which may be a single computer of an individual and her/ his internet browsing tools and email domains, details of Apps used, antivirus etc. On their way back they erase those footprints. For large organisations they also gather many more information as detailed below:
  - *Passive Reconnaissance* Through this type of exploratory attack hackers try to assess and gather information about ports for internet connectivity, last mile connections, browsers, major IoTs, and social media used, indications of system gestalts and vulnerabilities which unwillingly gets created in the targets system, etc.
  - *Active Reconnaissance*: This is not the final attack but an attack for probing purposes to collect information about the design and actual networks used, various instances used for storage of transactional data, documents software, access control systems, passwords, firewalls, antivirus tools used etc. Through this process hacktivists also reconfirm the information gathered through passive attack.
- Scrutinising and Scanning: Through this process the hackers first scrutinise all that they have gathered through reconnaissance. Thereafter they access and scan the targets ports, networks, operating systems, vulnerabilities, gestalts, valid users' details, ETLs, APIs and various applications that are running in various instances/servers. At this stage they also test efficacy of their own hacking tools, perfect the program scripts based on the findings from this step. They also script for ensuring anonymity and/or erasing/

whitewashing the path travelled for hacking so that the target's detection tools cannot identify the attacker and the speed of their own hacking tools beat the speed of the targets protection systems.

- **Launch Attack**: This is the final action which the predators take all on a sudden with a lightning speed to extract all data, processed information, block software, permanently or temporarily black wash all operating system and data bases to render those inoperative and all that they need to do for achieving their objectives. They also leave messages that pop up for payment of ransoms and/or the purpose for which such criminal offences have been committed.

Global Statistics of Cybercrimes in 2022

According to Nicole Kolesnikov, Editor of Technopedia[4] the following is a summary what all outrageous magnitude of havocs inflicted by cybercriminals through hacking to organisations across the world in 2022:

- 493.33 Mln. ransomware attacks have been identified by various types of organisations,
- Phishing with a count of 0.3 Mln. or 41% of total victims has emerged to be the most common form of cybercrime using about 3.40 Bln. unsolicited/junk emails,
- Average cost of data breaches was USD 4.35 Mln.,
- Stolen or conceded identity details inflicted on an average USD 4.35 Mln. for affected entities, and
- The worst affected industry sector was healthcare for twelve consecutive years with USD 10.10 Mln. as the average data breach cost as the highest.

Readers may refer Appendix - 1 at the end of this paper that contains a table. It will give an idea of the horrific enormity of cybercriminal activities in 2022 across the world and the number of victims for each type of crime as updated up to August 2023. There were about 0.73 Mln. number of victims from 27 types of crimes committed by hacktivists.

Growth Hacking

Readers might have heard about another group of hacking called '**Growth Hacking**'. This type of hacking is diagonally opposite to hacking which is being dealt with in this paper. The hackers of this group have nothing to do with infiltrating into others' ICT and digital systems except for drawing insights from meta and transactional data voluntarily provided by the data scientists of the organisations they officially serve. At time they themselves also perform the role of a data scientist. Such hackers are known as a group of expert strategists, innovators and operating process integrators. They are experienced and skilled in multidimensional disciplines for crafting effective low-cost strategies. The following graphic provides an illustrative example of major subject matter domains in which growth hackers achieve excellence.

Source: https://popupsmart.com/encyclopedia/growth-hacking

Their sole objective of growth hacking is to attain sustainable competitive advantages in delivering goods and/or services to achieve customers' delight. They help to capture and sustain higher market share with higher ROI to be shared by all stakeholders. This in turn helps in building both corporate and product brands. This group of growth hackers function with high esteem either as consultants for client companies or as employees.

Transmutation to Ethical Hacking

Readers of this paper, most of whom are professionals working in industries, entrepreneurs, consultants, service providers and/or future industry leaders, must have by now got a fair amount of idea about what mayhem hackers from dark world can perpetrate and how do they do that for extracting ransom. The Darwinian theory of survival of the fittest and symbiotic coexistence equally applies here also. The cat and mouse game will continue, and cats, being hackers for this paper, will continue with their efforts to remain technically and skilfully much ahead of government agencies and corporate entities. In any case individuals shall remain exposed to all these and must remain ever agile to prevent phishing attacks. The must use the best available protective software. The big question is what the way out is for governmental corporate organisations.

Sooner the better for all organisations to raise to the occasion, adopt and apply all that are needed to reduce the number of attacks and resultant impacts to the minimum possible level. In Bengali there is a proverb apt for such a situation. It sounds like *"Kanta diye kanta tulte hobe*". English translation of this is, uproot the thorn with another thorn. If the first thorn is the dark world community of hackers, the second thorn to be used for uprooting the first one is the community of '**Ethical Hackers**' a brief introduction about whom have been given in a previous section. The message is that some cats must now be nurtured and loved as pet cats to fight out the wild cats.

According to a publication of Deloitte[5], "*Security technology may have progressed considerably; a "silver bullet" solution is still a long way off. As the sophistication and frequency of cyber attacks rises, securing perimeters and externally accessible systems is becoming more time consuming, resource intensive and expensive. Organisations need to continually assess their environments to identify weaknesses and vulnerabilities within their systems before taking the appropriate action to remediate and defend against cyber-attacks*." Deloitte has suggested periodical ethical hacking as the deterrent for the ever-increasing threats from hacktivists. Their prescription for organisations is continuous assessment of weaknesses and vulnerabilities with the help of ethical hackers.

Some readers may be of the view that combination of these two words 'ethical hacking' sounds like an oxymoron because two contradictory words are appearing alongside of each one. But in contemporary ICT and digital technology ecosystem viruses, worms, ransomwares, and malwares are evolving with more powerful forms aided by advanced applications of cognitive technologies. But one must accept without any argument that whatever may be the antidotes and anti-hacking measures corporates adopt must be tested before rolling out and thereafter continuous surveillance must be maintained.

Continuous vigilance is a must because corporates keep on changing computing programs by adding patches and/or new ones, data storage facilities, automate operating systems with RPAs, add ETL and API tools, IoT and IIoT devices, add layers of cognitive tools for analytics, expand network, change devices for last mile connectivity, etc. All these are lucrative targets for hacktivists wherein they search for gestalts, weaknesses, and vulnerabilities which they would use as pinholes for getting into the entire data base, computing, and digital ecosystem of the entity.

Therefore, hacking as an activity and hackers as group of highly skilled computing professionals must be made to trans-mutate from the dark world of unethical cybercriminals to most powerful and sought after professionals of the illuminated ethical world. This is because corporate and governmental organisations are badly in need of their services to protect themselves. The leadership team of any organisation cannot wish this away any further and expose their organisations to ever increasing threats and risks from cybercriminals. In no time ethical hackers would prove to be one of the critical success factors because contemporary business ecosystem cannot function even for a minute without ICT and digital systems,

In today's world credibility of ethical hackers' services have been proved time and again. According to a publication of Cyber Securing Exchange[6] duly supported by other research based data, *"..... ethical hacking skills are in high demand today: A recent report projects that there will be 3.5 million cybersecurity job openings by 2025 (Cybersecurity Ventures, 2021), and ethical hackers in the United States make an average of $102,400 per year (Salary.com, 2021).* If this is the scenario in the USA, can the story of any country, particularly like that of India in any way be different?

Readers may get information about world's most renowned eighteen ethical hackers from Binod Anand's[7] blog of September 18. One of them is Kevin Minick. "*He was previously the FBI's Most Wanted Hacker after breaking into 40 large organisations for no reason. He is now a sought-after security expert for 500 firms and government organisations all around the globe."*

White Hat Ethical Hackers - Definition by Work

Ethical hackers are white hat hackers who are authorised by organisations in compliance with cyberlaws to identify weaknesses, loopholes and vulnerabilities in their entire ICT and digital technology-based computing, storage, and security ecosystems, including additional facilities for analytics and mailing domain, related hardware and software. Organisations, particularly in corporate sector challenge them to penetrate their systems and mock perform what all unethical hackers and other cyber criminals do for inflicting all types of harms, damages and blacking out to bring the entire system to a halt.

Ethical hackers are also asked to crack, breach, and break open all security firewalls, beatdown all AI based agile tools meant for detecting and throttle entry of foreign software before spawning malwares. Thus, in summary ethical hackers perform penetration first tests through all possible routes and find the potential areas threats and spots through which cybercriminals can penetrate.

Let the author reiterate that adoption of ethical hacking is not any longer a matter of choice and cannot be wished away. It is a bare most essential necessity to survive in this Industry 4.0 era infested by devils and demons form the dark web world, who are motivated by only sadistic pleasure and earn money through hacktivism and cyberterrorism. The enormity of the same has been delineated in the Appendix included at the end of this paper. Large organisations cannot remain contented with what security measures they have taken so far. They must strengthen their own Internal Audit and ICT Teams by onboarding experienced white hat ethical hackers and red hat vigilante hackers as briefly defined in an earlier section. They must also train them in a manner that befits the requirements and specificities of individual entities. The following is an illustrative graphic of types of ethical hacking:

Source: https://intellipaat.com/blog/what-is-ethical-hacking/

This group of professionals are given all liberties to initiate surprise hacking actions in addition to routine surveillance and periodical vigilance-oriented hacking. Like beta testing and User Acceptance Test (UAT) of any software and/or patch, hacking by an inhouse white hat hacker is also a must now. At times organisations take help of external ethical hacking service providers of eminence and reputation. According to Jay Bavisi, CEO of EC-Council Group[8] *"Government agencies and business organizations today are in constant need of ethical hackers to combat the growing threat to IT security. A lot of government agencies, professionals and corporations now understand that if you want to protect a system, you cannot do it by just locking your doors.*"

How Ethical Hackers Operate

The following is a summary of seven steps followed by ethical and vigilante hackers for performing all that are expected from them by their employers in their trial server and/or online live transactional server during lean business hours or holidays:

1. Reconnaissance: The process for this is the same as has been explained above in the case of unethical hackers.
2. Scrutiny and Scanning: This process is also the same as has been explained above in case of unethical hackers.
3. Map Network Anatomy and Geographical Spread: This is done for all host information network, routing devices, firewalls, and data storage instances/servers and/or external cloud service providers in an online environment by using automated tools.
4. Scan Vulnerabilities: Objective behind this step is to identify all potential pathways, loopholes, open systems, gestalts, through which cyber pirates can enter.
5. Gain Access: Having completed the first four steps they access in the entity's ICT and digital systems, for which they have duly been preauthorised in compliance with all legal formalities. Post this they mock perform all that a cybercriminal performs for inflicting harms, including spawning of virus, worms, ransomwares, and malwares.
6. Erase Paths: In this step they erase the paths through which they have travelled through systems and log out,
7. Prepare Reports: Finally, they prepare reports of their observations, findings and suggestions for corrective measures for removing weaknesses/vulnerabilities and initiating further steps for strengthening.

Skillsets of Ethical Hackers

The following are the nine must have application-oriented knowledge and skillsets in which Ethical Hackers must be proficient:

- ICT and digital networking systems,
- Computer hardware, appliances, add on digital devices, network ports and devices for last mile connectivity,
- Understanding of operating systems of computer hardware and software,
- Software and systems development life cycle,
- Fundamentals of various types of measures for cyber security,
- Computer coding and scripting of software using various languages,
- Crafting AI and NLP tools, RPA to proactively detect in fraction of a second cyberattacks and antidotes applied,
- Tools, techniques, for penetration and spawning worms, virus malwares, etc., and
- All types of communications skills

Code of Conduct for Inhouse Ethical Hackers

The author is of the view that as far as feasible, every organisation must observe the following operating rules in addition to all those applicable to their human resources for all other functional areas:

- Sould have their own hacking team and support from external services providers should be avoided. Experienced ethical hackers should be a part of ICT, Digital Transformation, and Internal Audit teams. Green hat hackers also should be there for and assistance training up,
- In-house ethical hackers must:
  - Be isolated in a manner that they operate from a secluded and confidential, yet in-house environment,
  - Operate with computers and other devices provided by the company which must not be allowed to be taken out form their isolated operating area,
  - Be given separate internet connectivity not linked to company's domains and systems,
- Terms and conditions of their employment must have additional clauses securing the company's interest in all respects including non-compete clauses with multifaceted protections for at least five years post separation,

Conclusion

The horror and enormity of what all are going on around the world are perhaps clear to all by now. The modus operandi of cybercriminals and the quantum of damages

they have perpetrated are also known. One can predictively extrapolate what more can happen going forward if strategically appropriate actions are not immediately executed. Let the author once more repeat that the mayhem would exacerbate tens of times if quantum computers were allowed to fall in the dreaded hands of cyber criminals and inhumane political agencies for weaponisation. There is no other option but to welcome the professionals from hacking world and trans-mutate them to serve corporate and government organisations as have been detailed above. Because a thorn can only be uprooted by another thorn like sharper object. And for this, ethical hackers would prove to be the critical success factors.

Additionally, the world must unite under the aegis of multilateral agencies, collaborate, and cooperate for doing all that are needed to curb demons from the dark world of cyber pirates, terrorists, and money hungry hackers to the minimum possible extent. Those who buy stolen databases and information from cybercriminals must also be identified, openly called out and equally be condemned and isolated so that they cannot take advantage by using resources acquired from criminals for reaping benefit from the ethical world. MA

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Appendix

Cyber Security Related Crimes in 2022 – Crime Types and Number of Victims

By Victim Count			
Crime Type	Victims	Crime Type	Victims
Phishing	300,497	Government Impersonation	11,554
Personal Data Breach	58,859	Advanced Fee	11,264
Non-Payment/Non-Delivery	51,679	Other	9,966
Extortion	39,416	Overpayment	6,183
Tech Support	32,538	Lottery/Sweepstakes/Inheritance	5,650
Investment	30,529	Data Breach	2,795
Identity Theft	27,922	Crimes Against Children	2,587
Credit Card/Check Fraud	22,985	Ransomware	2,385
BEC	21,832	Threats of Violence	2,224
Spoofing	20,649	IPR/Copyright/Counterfeit	2,183
Confidence/Romance	19,021	SIM Swap	2,026
Employment	14,946	Malware	762
Harassment/Stalking	11,779	Botnet	568
Real Estate	11,727		
Descriptors*			
Cryptocurrency	31,310	Cryptocurrency Wallet	20,781

Source: Artilce of Nicole Kolesnikov, Editor of Techopedia. The data is claimed to be updated upto August 2023. https://www.techopedia.com/cybersecurity-statistics

MEDIATION: THE ROLE ENHANCER FOR CMAs

Abstract

As mediation is increasingly becoming important both in the context of cases piling up in the Courts and in the context of amicable resolution of disputes becoming rare , the Parliament recently passed the Mediation Act, 2023. This article provides an overview of the legal framework for alternative dispute resolution (ADR) in India, an overview of the various ADR mechanisms with focus on mediation, the important features of the Mediation Act, 2023 and the opportunities for Cost Accountants. Commercial disputes are best resolved through mediation as they require technical expertise and professional approach. As Cost Accountants are best equipped to analyse commercial disputes threadbare, mediation may be looked at as an avenue of professional growth and as a way to help businesses and consumers by freeing up the time and money that would otherwise be locked in disputes.

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INTRODUCTION

"*Mediation and reconciliation work is about a profound quest for justice and social transformation. But at the same time, they are about service, solidarity, about exploring and rediscovering the human spirit that has been lost or shattered through human conflict, cruelty, ignorance and greed,"* said Hizkias Assefa[1], the conflict mediator, known for his work as a mediator in major conflict situations in Africa.[2]

A dispute arises due to the absence of meeting of minds on a particular issue and the way to truly resolve disputes is by restoring trust and amicability among the parties. Historically, in India, Panchayats comprising of village elders tried to resolve disputes this way. When disputes are taken to courts, although they come to an end with a judgment, the decision is still one that is imposed on the parties and is not arrived at through an exercise of establishing understanding between the parties. Further, as Courts are overburdened with pending cases, the time taken for getting a remedy through the judicial route may make the remedy seem too little and too late. As per a recent statement given to the Rajya Sabha, over 5 crore

[1] *https://www.azquotes.com/quote/546973#:~:text=is%20about...-,Mediation%20and%20reconciliation%20work%20is%20about%20a%20profound%20quest%20for,%2C%20cruelty%2C%20ignorance%20and%20greed.*

[2] *https://en.wikipedia.org/wiki/Hizkias_Assefa*

cases are pending in Indian Courts.[3] It is in this scenario that alternative dispute resolution (ADR) mechanisms like mediation become indispensable.

AN OVERVIEW OF THE LEGAL FRAMEWORK FOR ADR

In India, ADR mechanisms like arbitration, conciliation and mediation are recognized and encouraged in various legislations and regulatory frameworks. In respect of civil disputes, arbitration has been long recognized. We had the Indian Arbitration Act, 1899, then the Arbitration Act, 1940[4], the Arbitration (Protocol and Convention) Act, 1937, and the Foreign Awards (Recognition and Enforcement) Act, 1961, which were repealed by the Arbitration and Conciliation Act, 1996.[5]The original version of section 89 of the Code of Civil Procedure, 1908 (CPC), which provided for arbitration, was repealed by the Arbitration Act, 1940[6]. The present section 89 as inserted by the CPC (Amendment) Act, 1999, and made effective from July 1, 2002, provides for a gamut of options for settlement of disputes outside the Court.[7]This was an important development as far as ADR is concerned. The section recognises the following methods of ADR in cases where elements of settlement exist: arbitration, conciliation, judicial settlement including settlement through Lok Adalat, or mediation. In respect of the first two, the provisions of the Arbitration and Conciliation Act, 1996 shall apply. In respect of reference to Lok Adalats and judicial settlements, the provisions of the Legal Services Authority Act, 1987 shall apply. In respect of mediation, sub-section (2) of section 89 provides, "the Court shall affect a compromise between the parties and shall follow such procedure as may be prescribed."

A BRIEF OVERVIEW OF ARBITRATION, CONCILIATION AND MEDIATION

It will be pertinent to note the difference between arbitration, conciliation and mediation. It must be noted that the CPC and the Indian Evidence Act, 1872 do not apply to these proceedings.

Arbitration: Existence of an arbitration agreement is necessary and the arbitrator(s) are appointed by the parties concerned. The proceedings are relatively speedier and most importantly, are private. However, here too, the matter is adjudicated and the process in not necessarily an amicable, reconciliatory one. The arbitral award is binding on the parties and can be enforced through Courts of law.

Conciliation: In contrast to court proceedings and arbitration where a decision is imposed on the parties, conciliation and mediation aim at finding a common ground between the parties and aim at amicable dispute resolution. Mediation and conciliation are largely interchangeable terms, with slight differences. For both, prior agreement is not necessary, unlike in the case of arbitration. They are cost-effective and ensure confidentiality. Part III of the Arbitration and Conciliation Act, 1996 provides for matters relating to conciliation. Conciliation proceedings can be commenced only if both the parties agree to commence. The essence of conciliation is that the conciliator tries to arrive at the settlement of dispute by encouraging the parties to arrive at a "settlement agreement". When the conciliator finds that there exist elements of settlement, he may formulate the settlement and present it to the parties. However, this is not binding on the parties unlike an arbitral award. It is only the parties agree to the terms of settlement, a settlement agreement is drawn up and signed, which is binding on the parties. This settlement agreement shall have the same status and effect as an arbitral award on agreed terms rendered by an arbitral tribunal.

Mediation: Mediation is a more informal process that involves enabling the parties to meet eye-to-eye and resolve the disputes through establishing and facilitating communication with each other. This would be most useful when the relationship between parties needs to be preserved in any dispute, especially in matrimonial and child custody matters.

The Alternative Dispute Resolution Rules, 2003 (the ADR Rules) framed in pursuance of the judgment of the Supreme Court in *Salem Advocate Bar Association vs. Union of India* provides guidance in respect of ADR processes referred to in section 89 of CPC and also contains rules for mediation under Part II in respect of mediation opted for under the section.

The definition of 'mediation' under the ADR Rules provides us a detailed view of the role of mediation thus: "'Mediation' means the process by which a mediator appointed by parties or by the Court by facilitating discussion between parties directly or by communicating with each other through the mediator, by assisting parties in identifying issues, reducing misunderstandings, clarifying priorities, exploring areas of compromise, generating options in an attempt to solve the dispute and emphasizing that it is the parties' own responsibility for making decisions which affect them." [8]Part II of the rules provide for various matters on mediation and very clearly says that the mediator

[3] *https://economictimes.indiatimes.com/news/india/cases-pending-in-courts-cross-5-crore-mark-govt-in-rajya-sabha/articleshow/101993830.cms?from=mdr*

[4] *https://www.indiacode.nic.in/repealed-act/repealed_act_documents/A1940-10.pdf*

[5] *https://www.indiacode.nic.in/bitstream/123456789/1978/1/A1996-26.pdf*

[6] *https://www.indiacode.nic.in/bitstream/123456789/11087/1/the_code_of_civil_procedure%2C_1908.pdf*

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[8] *https://www.latestlaws.com/wp-content/uploads/2015/03/ADR-and-Mediation-Rules20031.pdf*

shall not impose any decision on the parties.

While parties can choose their own mediators and mediation process, Mediation Centres have also been established under the National Legal Services Authority established under the Legal Services Authorities Act, 1987. From a recent Parliamentary statement containing the number of cases settled through mediation, it is seen that across the States from 2018-19 till May 2023, over 3.8 lakh cases have been settled through mediation in the said Mediation Centres out of over 15 lakh cases brought to them.[9]

Although mediation is formally recognised under the CPC, Companies Act, 2013, Consumer Protection Act, 2019, and Commercial Courts Act, 2015, among others and has been successful through the court-annexed Mediation Center system, when parties voluntarily opt for a mediation process, there is absence of a formal process and recognition to the settlement arrived at. Hence, to usher in a comprehensive and dedicated legislation for mediation, the Mediation Act, 2023 has been passed by the Parliament recently and notified in the Official Gazette on September 15, 2023.

THE MEDIATION ACT, 2023

The Mediation Bill, 2023 was introduced in the Rajya Sabha on December 20, 2021. Then it was referred to the Parliamentary Standing Committee (PSC) on the same date, and the Committee gave its Report on July 13, 2022.[10]The Bill in its amended form was passed by the Rajya Sabha on August 1, 2023 and on August 7, 2023 by the Lok Sabha. The Bill received the Assent of the President on September14, 2023 and the Act was notified in the Official Gazette on September 15, 2023.The purpose of the Act as observed from its long title encompasses promoting and facilitating mediation, especially institutional mediation, for resolution of commercial and other disputes and encouraging community mediation; providing for enforcement of mediated settlement agreements and for a body for registration of mediators; to encourage community; and recognizing online mediation.

Applicability

The Act shall apply where mediation is conducted in India. Additionally, *any one of the following* conditions should be satisfied for the Act to be applicable:

- all the parties habitually reside in India or are entities incorporated in India or having their place of business in India;
- the mediation agreement entered into between the parties provides that the Act applies;
- it is an international mediation;
- where one of the parties is the Central or State Government or local bodies or Government-owned entities or bodies and the matter pertains to a commercial dispute;
- to any other kind of dispute if deemed appropriate by the aforesaid Government or Government bodies.

It is to be noted that commercial disputes with the Government agencies were left out of purview in the draft Bill, but included based on the Standing Committee's recommendations. Governments are also empowered to frame schemes for mediation for disputes involving them. India has been a signatory to the UN Convention on International Settlement Agreements Resulting from Mediation (Singapore Convention) (UNISA) since 2019[11], and accordingly, provisions for international mediation are included in the Act. However, as India has not yet ratified the UNISA, the provisions of UNISA have not yet been included and the definition of international mediation needs to undergo a change before they can be given effect, as observed from points 3.36 and 3.37 of the PSC Report.[12] [13]

Important Features of the Act

- The Act defines mediation "to include a process, whether referred to by the expression mediation, pre-litigation mediation, online mediation, community mediation, conciliation or an expression of similar import, whereby parties attempt to reach an amicable settlement of their dispute with the assistance of a third person referred to as mediator, who does not have the authority to impose a settlement upon the parties to the dispute." Parties may agree to submit the dispute to mediation even after the arising of the dispute.
- While pre-litigation mediation was earlier proposed as a mandatory step before approaching the Courts for civil or commercial disputes, pursuant to the recommendations of the Committee, it has rightly been made voluntary with mutual consent of the parties.
- Pre-litigation mediation for commercial disputes of specified value shall remain compulsory in accordance with section 12A of the Commercial Courts Act, 2015.
- Mediation has been made a time-bound process with an initial period of 120 days, extendable by another 60 days with the mutual consent of parties.
- The matters, which cannot be subject to mediation, are provided in the First Schedule to the Act. This

[9] *https://legalaffairs.gov.in/sites/default/files/AU3903.pdf*
[10] *https://sansad.in/rs/legislation/bills*
[11] *https://uncitral.un.org/en/texts/mediation/conventions/international_settlement_agreements/status*
[12] *https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/annex_ii.pdf*
[13] *https://sansad.in/rs/committees/18?departmentally-related-standing-committees*

includes matters like disputes relating to claims against minors, involving prosecution for criminal offences, proceedings initiated before any statutory authority and so on.

- The Act includes amendments to the Arbitration and Conciliation Act, 1996 to omit Part III of the latter Act that provides for conciliation. This is done as a measure to subsume the conciliation process in the Act itself. This is a welcome move in line with the international practice of using the terms 'conciliation' and 'mediation' interchangeably.
- Mediation can be conducted as an *ad-hoc* mediation by a mediator chosen by the parties or as an institutional mechanism by a person registered with the Mediation Council or empanelled by the court-annexed mediation centers or under the Legal Services Authority Act, 1987 or by a Mediation Service Provider (MSP). While the mediator is required to disclose his conflict of interest, if any, specific qualifications are not provided for a party chosen by the parties, except in case of a mediator of foreign nationality who shall possess qualification as may be prescribed.
- The mediated settlement agreement (MSA) is final and binding on the parties. There is an option for registering it in a manner as may be prescribed. It can be enforced in the same manner as a judgment or decree of a Court in accordance with the provisions of the CPC, 1908.However, for enforcement of or challenging the MSA, the Court of appropriate territorial jurisdiction must be approached.
- For challenging of MSA on limited grounds of fraud, corruption, impersonation, or in case of matters not fit for mediation a period of only 90 days from the date of receiving MSA is given and the Court or Tribunal may grant another 90 days on sufficient cause being shown.
- Online mediation is recognized. Parties can even choose to conduct the mediation process in a place outside the territorial jurisdiction of Courts of competent jurisdiction. However, the default provision is that the place shall be within the territorial jurisdiction.
- Mediation Council of India is proposed to be established under the Act, *inter alia*, for promoting institutional mediation, to lay down guidelines for mediators, to hold trainings and for registration of mediators.
- The Act shall have an overriding effect on laws except those mentioned in the Second Schedule, which already have a tested mediation mechanism in place like the Family Courts Act, 1984, and certain industrial laws, among others. Consequential amendments to several legislations including the Indian Contract Act, 1872, Commercial Courts Act, 2015, Companies Act, 2013 are proposed.
- Community mediation is provided for as a measure to restore peace and harmony among the residents of a locality.

International mediation also opens up immense opportunities for CMAs, for instance, in case of export-import matters, carriage of goods, technology development agreements

AWAKE, OPPORTUNITIES ARE KNOCKING YOUR DOORS!

Opportunities in life and profession mostly come as uninvited Guests. If we have the mindset and eagerness to grab them, we can make an everlasting impact.

As commercial disputes arise often and usually involve opportunity cost and time value of money in terms of locked-up working capital, speedy resolution of disputes is necessary. This is the reason why pre-litigation mediation is also mandated for specified value disputes. The disputes could relate to pricing, quality or any other terms in the contract like delivery terms, discount, taxation issues involving TDS, GST, etc. Pricing disputes especially in cost-plus contracts, long-term projects, construction agreements, provision of complex services will involve the expertise of Cost Accountants to act as mediators.

Further in case of international commercial disputes, as more countries ratify and adopt the UNISA, mediation is likely to become an attractive resolution mechanism with cross-border enforcement of MSAs becoming possible. International mediation also opens up immense opportunities for CMAs, for instance, in case of export-import matters, carriage of goods, technology development agreements, and much more. Cost Accountants may also appear on behalf of the businesses they work with in the mediation process.

The role of a mediator not only involves technical expertise but also involves patience, understanding of the power dynamics among the parties the ability to communicate with clarity and the tenacity of purpose. The Institute of Cost and Management Accountants of India may provide guidance to the CMAs on gearing up to take up the challenging role of mediators. MA

LEAN THINKING OVERVIEW: STREAMLINING PROCEDURES FOR VALUE AND EFFICIENCY

Abstract

The strong theory and technique of Lean thinking, which aims to maximise value and reduce waste in systems and processes, is discussed in this article. Lean, which has its origins in Toyota's founding principles, focuses on maximising value for consumers while using less resources, promoting continuous improvement and including staff members in waste reduction. Lean's core tenets, value identification, value stream mapping, and waste elimination, as well as its advantages, increased productivity, lower costs, and higher qualityare explored. The adaptability of Lean thinking, which makes it applicable across all industries and sectors, is also highlighted in the abstract.

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INTRODUCTION

The powerful theory and technique of lean thinking, commonly referred to as lean management or lean principles, focuses on maximising the value while minimising waste in any process or system. Lean, which has its roots in the ideas that Toyota first created in the 1950s, has matured into a methodology that is extensively used by a variety of businesses and organisations throughout the world. The main principles, advantages, and applications of lean thinking are highlighted in this article as an introduction to the concept.

Lean thinking is a management philosophy that emphasises on providing customers with the maximum value possible while reducing the waste. The Toyota Production System (TPS) is where it all started in the manufacturing sector, but it has since been adopted by different sectors and businesses. Lean's main goal is to eliminate any tasks that do not directly add value for the client in order to streamline the processes.

Lean thinking's main objective is the identification and elimination of waste, which is any action or process that does not add value to the finished good or service.

Process streamlining and increased productivity are the goals of Lean Thinking. Lean emphasises continuous improvement, which encourages staff members at all levels to actively participate in finding possibilities for improvement and putting in place new procedures.

Lean thinking emphasises the importance of employee engagement since it understands that individuals who are most familiar with the processes are best equipped to spot inefficiencies and make solutions. Employee engagement increases the desire to look for waste and make contributions to fostering a continuous improvement culture within the company.

Lean thinking has been effectively implemented outside the manufacturing in fields like services, healthcare, construction and even software development. Any situation where procedures may be improved to provide more value to consumers can benefit from applying the Lean principles.

A customer-focused strategy called Lean Thinking aims to reduce waste while maximising value. Lean helps businesses increase productivity and better serve customers by emphasising continuous improvement and involving staff in waste reduction initiatives. Across a range of businesses and sectors, adopting Lean concepts can result in considerable gains in productivity, quality, and overall performance.

KEY LEAN THINKING PRINCIPLES

1. Value Identification

In Lean Thinking, the first step is to determine what features customers really value in goods or services. Value is everything that directly helps to fulfill the demands and expectations of the client.

One of the foundational ideas of lean thinking is value identification. In line with this notion, businesses concentrate on comprehending the actual requirements and expectations of their clients. The objective is to determine what features customers value in goods or services and then align the organization's operations and activities in that direction.

Value is determined from the viewpoint of the client and goes beyond a product's features or traits. Anything that a customer is willing to pay for and values highly is included. Organisations can more efficiently spend their resources and efforts to produce the intended results by identifying the particular features of a product or service that customers appreciate the most.

The process of identifying value entails close communication with clients, feedback collection, surveying, and market trend analysis. Organisations can learn more about the preferences, problems, and unmet wants of their customers by doing this. Companies are able to customise their goods to precisely meet the needs of their target market because of this customer-centric strategy.

Once the value has been determined, Lean Thinking places a strong emphasis on getting rid of all non-value-added activities, also known as waste, from the processes. To increase efficiency and make sure that resources are deployed where they may have the biggest influence on customer happiness, this is done.

Lean thinking principle of Value Identification emphasises the need of comprehending client wants and preferences

2. Value Stream Mapping

After determining the value, Lean practitioners map the complete value stream, which is the full process that must be followed in order to deliver the good or service. This mapping makes it easier to see how things move along and locate any potential wasteful regions.

Value stream mapping (VSM) is a vital Lean Thinking technique for visualising and analysing the complete process needed to create goods or services from the beginning to the end. Lean practitioners can locate inefficiencies, bottlenecks, and waste causes inside the value stream using this organised approach.

The entire process of converting inputs or raw materials into the finished good or service that is delivered to the client is included in the value stream. Teams may better understand how value is created and where there are chances for improvement thanks to VSM's clear and comprehensive perspective of the entire process.

The following steps are commonly included in the value stream mapping process:

a) First, a visual representation of the value stream's current state must be made (current state mapping). This entails outlining each phase, including the flow of materials, information and time at each level. This thorough mapping aids in identifying locations that bring value and those that cause waste or delays.

b) Identify Value-Adding and Non-Value-Adding Activities: Lean practitioners examine the current state map to identify waste and value-adding activities, which are those that directly help to satisfy consumer needs. The team can find areas for improvement by detecting waste, such as overproduction, waiting, unnecessary transportation, or excessive inventory.

c) Future State Mapping*:* A future state map is produced based on the study of the existing state and depicts an ideal, more effective value stream. The goal in this future state should be to maximize the value-added activities while minimising or eliminating waste.

d) Develop Improvement Strategies*:* After the team has established a map of the future state, it can decide on improvement measures to bring about the desired state. Process re-engineering, workflow modifications, better resource allocation, or the introduction of new technologies may be necessary for this.

e) Implementation and Continuous Improvement: The team then works to put the improvements into practise in order to transition from the present state to the desired future state. Lean Thinking places a strong emphasis on continuous improvement and the value stream mapping process is a dynamic process that can be periodically reviewed to find new opportunities for improvement.

Value stream mapping gives team members a visual depiction of the whole value stream, promoting collaboration and communication. It aids the stakeholders in comprehending the workflow, recognising potential obstacles and concentrating on activities that would most significantly improve productivity and value delivery.

Value stream mapping is an essential step in the lean thinking process since it helps to find waste, reorganise processes and boost productivity. Organisations may make wise decisions to optimise their operations and better satisfy consumer requests by visualising the full value stream and assessing the activity flow.

3. Eliminating Waste

Lean thinking classifies waste into eight categories, or "Muda": excess production, excess inventory, excess processing, superfluous motion, defects, and underutilised personnel talents. In order to streamline the process, the inefficient actions must be reduced or eliminated.

In Lean, the following eight categories of waste are known:

1. ***Overproduction:*** Creating more than the market will bear results in excess inventory and higher costs.

2. ***Waiting****:* Ineffectiveness and decreased throughput are caused by idle time or delays in the production process.

3. ***Transport that isn't required****:* Moving goods or

commodities that aren't necessary wastes resources and doesn't offer any value.

4. ***Over processing***: It is wasteful to perform more work than necessary to satisfy client demands.

5. ***Excess Inventory****:* Stocking more than what is necessary ties up funds and raises storage costs.

6**.** ***Motion****:* Moving people or things around a lot doesn't provide any value and can make people tired and ineffective.

7. ***Errors and flaws*** in goods or services result in extra labour and expenditures.

8. ***Underutilised Employee Skills***: Under using the knowledge and abilities of employees wastes important resources.

4. Pull Systems

The usage of pull systems, in which production is based on actual customer demand rather than forcing things into the market, is encouraged by lean manufacturing. By ensuring that things are manufactured only as needed, this strategy lowers inventory and related expenses. Lean manufacturing techniques, which seek to improve production processes by making them more responsive and effective, heavily rely on pull systems. Pull systems prioritise creating goods or providing services in response to actual customer demand as opposed to conventional push systems, where production is guided by projections or fixed schedules.

The following is how the pull system works:

Client Demand: The initial focus of the pull system is on comprehending and meeting client demand. Businesses collect real-time information on customer orders or requests, which enable them to precisely predict actual demand.

A signal in the production process is sent whenever a customer places an order or demands a good or service. This signal lets you know that a certain amount of the product is required to satisfy the customer's request.

Production in Response: The production process reacts to the customer demand signal by generating the precise amount of goods or services required to fulfill the customer's order. Nothing is produced in excess of what the customer needs.

Pull system implementation has the following advantages for organisations:

- *Reduced Inventory:* Since actual customer demand drives production, there is no need for excess inventory. As a result, there are significant financial savings because inventory holding expenses including storage, handling and obsolescence risk are reduced.
- *Pull systems help organisations respond more quickly* to changes in consumer demand or market circumstances. Without the threat of overproduction, they are able to swiftly modify production levels to satisfy shifting demand.
- *Pull systems provide for more effective resource allocation* since they deploy resources like materials, labour, and equipment in response to actual need rather than predicted demand.
- *Lead times are decreased* by only creating what is required at the time it is required. These results in quicker delivery times and more customer satisfaction.
- *Enhanced Quality*: Pull systems focus on producing smaller batches and making sure each item complies with customer specifications, which helps uncover flaws or problems sooner in the production process.

Pull systems are frequently employed across a range of sectors, including the manufacturing, healthcare, and service industries. As they assist to reduce overproduction and excess inventory, which are regarded as types of waste, they are in line with the focus placed by Lean Thinking on value creation and waste reduction.

Pull systems, which emphasise customer demand-driven manufacturing and effective resource utilisation, are corner stones of Lean Thinking. Organisations can considerably reduce waste, save costs, raise overall efficiency and improve customer satisfaction by creating products or providing services in response to genuine consumer needs.

5. Continuous Improvement

Continuous improvement, also referred to as Kaizen, is a cornerstone of Lean Thinking. It entails encouraging staff members at all levels to pinpoint issues, make suggestions, and put small changes into action to continuously improve operations.

Lean thinking's fundamental elements of continual improvement include the following.

Employee Engagement*:* Active participation from staff members at all organisational levels is encouraged by continuous development. It acknowledges that individuals who are actively participating in the processes are best suited to spot inefficiencies, bottlenecks, and potential opportunities for change.

Employees are urged to point up any faults, challenges, or problems in their work procedures. To identify the underlying causes of inefficiencies or faults, this may entail performing routine evaluations, getting customer feedback, and performing root cause analysis.

Solutions*:* Once issues have been identified, staff members are given the authority to suggest potential fixes. To develop original ideas for improvement, this may entail brainstorming sessions, cross-functional conversations, or team cooperation.

Change implementation*:* In the process of continuous improvement, suggested solutions are first tested and put into practise on a modest scale before being used more extensively. With this strategy, organisations can evaluate the success of improvements and make necessary corrections.

Monitoring and evaluation: After the modifications are put into place, their effects are closely watched. The success of the enhancements is assessed using metrics and key performance indicators (KPIs), ensuring that the desired results are realised.

Learning and Sharing*:* Continual improvement promotes

an environment where employees are always willing to learn and share. To support organisational learning and foster a spirit of collaboration, successful changes and best practises are disseminated to other teams and departments.

Continuous improvement is an ongoing, iterative process rather than a one-time project. Organisations can make considerable improvements in efficiency and quality over time as long as they consistently aim to enhance their procedures, goods, and services.

BENEFITS OF LEAN THINKING'S CONTINUOUS IMPROVEMENT:

The benefits of continual development for businesses include:

1. **Enhanced Efficiency:** Processes become more efficient as a result of gradual advancements that eliminate waste and inefficiencies.

2**. Better Quality:** The products' and services' quality is improved by proactively resolving issues and flaws.

3. **Employee involvement in efforts** for ongoing improvement generates a sense of ownership and engagement.

4. **Better Customer Satisfaction**: Higher customer satisfaction and loyalty are the results of improved procedures and products.

5. **Adaptability:** Businesses that value continual improvement are better able to adjust to shifting consumer demands and market situations.

Lean Thinking's central tenet of continuous improvement, or Kaizen, encourages constant improvements to both processes and goods. Organisations may increase levels of efficiency, quality and customer satisfaction by promoting employee involvement, problem-solving, and the adoption of small adjustments. This will help them to sustain success in a challenging and competitive business climate.

ADVANTAGES OF LEAN THINKING

Following could be the advantages for organisations resulting from applying lean principles:

1. **Enhanced Productivity**: Businesses can increase their levels of productivity and efficiency by getting rid of unnecessary processes and operations.

2**. Reduced Costs**: Lean thinking assists in eliminating irrational costs like extra inventory or over processing, which results in cost reductions.

3. **Improved Quality**: By locating and eliminating faults with lean manufacturing techniques, products and services are of higher quality.

4. **Improved Customer Satisfaction**: Lean thinking places a strong emphasis on providing consumers with value, which eventually results in increased customer satisfaction and loyalty.

5. **Engaged Workforce**: Involving staff members in CPI initiatives generates an environment of empowerment and engagement, which raises morale and increases job satisfaction.

LEAN THINKING APPLICATIONS

Software development, manufacturing, healthcare, and other industries can all benefit from applying lean principles. Lean is a worldwide strategy for process improvement due to the flexibility of the principle, which enables organisations to modify it to meet their own demands and challenges.

Let's look at a few case studies that show how Lean principles may be successfully applied in various industries:

1. Toyota Production System (TPS), a manufacturing method

The Toyota Production System is the most well-known application of Lean Thinking. Toyota helped to establish the Lean methodology in the manufacturing sector by emphasising waste elimination and ongoing improvement. Toyota boosted productivity, reduced inventory, and streamlined production processes by using pull systems, just-in-time manufacturing, and Kanban systems. Reduced lead times, lower prices, and improved quality were the results of this. Since then, numerous additional industrial firms across the globe have embraced TPS and Lean principles to streamline their processes and maintain competitiveness.

2. Medical Centre of Virginia Mason

Lean principles were effectively used at Virginia Mason Medical Centre in the US to improve patient care and safety. They discovered process inefficiencies like pointless waiting times and duplicative patient care steps. They enhanced patient flow, decreased wait times, and raised patient satisfaction by putting Lean concepts like Value Stream Mapping, 5S, and Kaizen events into practise. Leaning enhanced teamwork and communication within the healthcare industry, enhancing patient safety and leading in better outcomes.

3. Industry Services: Amazon

The e-commerce behemoth Amazon is renowned for its unwavering commitment to effectiveness and client pleasure, which is consistent with Lean concept. To improve order processing, inventory management and delivery, Amazon implemented Lean practises in their fulfilment facilities. To forecast demand and optimise stock levels, they used data analytics and Just-in-time inventory tactics. Amazon was able to deliver goods to clients more quickly and precisely while lowering the cost of extra inventory thanks to this Lean strategy.

4. Spotify software development

The well-known music streaming business Spotify adopted Lean methodology to enhance their software development procedures. To promote iterative development and continuous improvement, they chose agile approaches, a subset of Lean concept. The cross-functional teams at Spotify collaborate to release features and updates in tiny doses while soliciting feedback and making necessary revisions. They are able

A customer-focused strategy called Lean Thinking aims to reduce waste while maximising value

to respond fast to changes in the market and consumer expectations while continuously improving their platform thanks to this lean agile methodology.

These case studies demonstrate how the ideas of Lean Thinking may be applied to various contexts and sectors to produce amazing outcomes. Organisations can improve their processes, products and services, resulting in enhanced competitiveness and long-term success, by putting a strong emphasis on efficiency, waste reduction, continuous improvement, and customer value. Lean Thinking is a useful strategy for businesses looking to streamline their operations and give customers more for their money because of its adaptability.

CONCLUSION

A general overview of the core ideas and concepts of Lean Thinking have been explained in this article..It has examined how Lean Thinking focuses on reducing waste in processes to increase value for consumers while using fewer resources. It6 has also spelt out the benefits and practical uses of the major Lean concepts, including value identification, value stream mapping, removing waste, and continuous improvement.

Lean Thinking has demonstrated to be a potent strategy for increasing productivity, cutting expenses, upgrading quality and boosting customer happiness. Lean organisations may foster a culture of continuous improvement and provide their staff members the freedom to take the lead in enacting positive change.

AUTHORS' MESSAGE TO THE COMMUNITY OF CMAS

The importance of understanding Lean Thinking and its potential impact on process efficiency and value creation cannot be overstated for those of us in the role of professionals charged with steering organisations towards financial success and sustainability. Beyond lowering costs, Lean principles emphasise understanding and providing value to consumers while reducing waste.

CMAs can find possibilities for process optimisation, cost cutting, and improved customer satisfaction by incorporating Lean Thinking into their analytical and decision-making processes. They should encourage the adoption of Lean principles and the development of a continuous improvement culture inside their organisations, work together with cross-functional teams to improve procedures, get rid of unnecessary tasks, and foster creativity.

They should keep in mind that Lean Thinking may be used in a variety of industries, including manufacturing, services, and even financial analysis and decision-making. They may significantly influence their company's success in a constantly changing business environment by embracing Lean principle.

CMAs have the skills and experience to take the lead in adopting Lean practises. They should accept Lean Thinking as a useful tool to improve productivity, streamline operations, and add value for their companies' stakeholders.

Let's work together to promote good change and ongoing development for a future that is more robust, effective, and focused on the needs of the consumer. MA

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CMA Agri Bulletin: December 2023 Issue, Vol. 3, No. 1

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Sub-themes (not limited to):

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Behind every successful business decision, there is always a **CMA**

ESG RATINGS AND FIRM'S PROFITABILITY

Abstract

To address issues related to global development, the world is cooperating. The Sustainable Development Goals (SDGs), a collection of Seventeen global development goals intended to address the most pressing concerns by 2030, were proposed by the United Nations in response to a global call to action. Corporates are anticipated to spark initiatives while nations have begun developing legislation and strategies to meet their SDG commitments. Firms are now disclosing more information about the SDGs as a result of greater awareness and adoption (KPMG, 2020).

Organisations have recognised the significant detrimental impact that climate change can have on their business and have started working to better understand, prepare for and respond to the dangers that climate change poses. Understanding the benefits of ESG ratings as a technique for profit production for businesses is the purpose for the study. The conclusions show that strong business ESG performance improves financial performance as measured by accounting and market-based metrics.

INTRODUCTION

In recent years, businesses have faced increased pressure from stakeholders to incorporate environmental, social, and governance considerations into their corporate plans. Organisations in India have begun to identify and develop larger obligations in relation to the SDGs in order to connect their strategic aims with globally acknowledged sustainability principles and contributions made by countries.

Corporates are recognizing that through contributing to the design of sustainable cities and infrastructure, it can play a vital role in enhancing India's resilience thus aligning their activities with the most important SDGs, and working on KPIs to track their progress towards them. To reduce emissions connected with transportation and logistics, DLF promotes local procurement of raw materials inside the business and among its supply chain partners. The company also has systems in place, such as purchasing from empanelled vendors who meet environmental standards. The relationship between ESG elements and corporate performance were examined by *Carpenter and Wyman* (2009). Ten positive, two negative, and four neutral correlations were found in the results. Because these investigations were carried out using various approaches and at various times and locations, the outcomes were also variable. The authors emphasised the requirement for additional validation. The relationship between ESG and financial success has been the subject of numerous studies worldwide, but there is a dearth of research in the Indian context. Inadequate study has been done on the real condition of ESG practises and their effects on businesses from emerging economies. This study aims to investigate how 48 Indian public limited firms' performance is affected by ESG issues.

In order to evaluate the explanatory relationship between environmental, social, and governance (ESG) ratings and firms' returns, which are characterised as return on equity (ROE), return on assets (ROA) and net profit margin, this quantitative explanatory study applies stakeholder theory .

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WHAT DOES ESG MEAN

"ESG stands for environmental, social, and governance practises, which are used to assess a company's sustainability and ethical influence on the general public. With the aim of better managing and assessing risks beyond "traditional" business and financial performance, many investors, firms, and regulatory agencies are incorporating ESG factors into their business strategies, evaluation models, and legislation". (ESGRisk.ai)

A company's involvement in protecting the environment and upholding environmentally sound practises is referred to as the environmental component. "The company's policies on climate change, carbon emissions, air and water pollution

and deforestation are included in this component, along with other elements like resource optimization, waste minimization, and effective energy use". The social component considers the business's human resources policy as well as its interactions with customers, staff and other stakeholders. Last but not the least, the Governance component considers how a corporation should govern and operate.

ESG standards of a company's operations are used by investors who are concerned about how businesses operate and how it affects the environment and society to select possible investments. "Environmental criteria take into account a company's environmental management practises. Under the social criteria, the management of connections with clients, partners, staff members, and the communities in which it operates is reviewed. According to governance criteria, standards like as board composition, audit structure, political contributions, and CEO remuneration are examined". (ESGRisk.ai)

"ESG risk rating is an objective, unbiased assessment of a company's capacity to manage future and emerging risks related to environmental, social, and governance issues that could materially affect its financial performance. A company's exposure to relevant, industry specific ESG risks is determined by its ESG rating, which also compares its risk management to those of its peers in the sector. An ESG grade can be thought of as a performance indicator showing a company's long-term sustainability, capacity for growth and upcoming performance in a constantly shifting market. The ESG rating enables lenders and investors to make more informed choices". (ESGRisk.ai).

LITERATURE REVIEW

Researchers have been examining the relationship between economic expansion and the ecosystem for a while now.

Ullmann's (1985) theoretical article examined the factors impacting the relationship between corporate social responsibility and profitability. Researchers generated a content analysis approach to examine prior studies. The findings indicated that stakeholders' resource control authority and cultural/generational norms, which are tied to specific forms of ESG information as morally framed variables, are more effective at influencing investment decision-makers.

Waddock and Graves (1997) discovered a connection between ROA and ROS and corporate social responsibility. The study also discovered that institutionalised culture and strategy adjustments produced a positive feedback loop for preserving a valid and reliable corporate social responsibility assessment tool. The findings showed that stakeholders' resource control power and cultural/generational norms as morally framed variables associated to specific forms of ESG information are more influential in investment decision-makers' responses. *Tang et al. (2012)* discovered three variables that affect the relationship between CSR and ROA: (a) the consistency with which firms carry out CSR activities; (b) the degree of similarity between the CSR activities and the resources, skills, and knowledge of the firms; and (c) the manner in which firms initiate CSR activities (i.e., internally/proactively, or externally/reactively). Analysis demonstrated that stakeholders' resource control authority and cultural/generational norms are more effective in influencing investment decision-makers. These factors are tied to specific forms of ESG information as morally framed variables.

Patterns for measuring morally-framed variables were also established by Das and Uma's (2013) quantitative investigation.

Cavaco and Crifo (2014) looked at how CSR affects business success. The study used information from Orbis to assess financial performance and Vigeo's reputation score to rank social performance. They discovered that the complementarities of two or three aspects of corporate social responsibility tasks had an impact on how well organisations performed. The findings showed that cultural and generational norms, which are morally framed variables linked to specific forms of ESG information, had a greater impact on investment decision-makers' reactions.

In his 2016 study, *Rodriguez-Fernandez* looked at the interaction between corporate social responsibility and financial performance. The study measured social performance rankings using the GRI reputation index. Tobin's Q, ROA, and ROE were employed to evaluate financial performance. According to the study, higher ROA and ROE ratings were linked to higher GRI ratings. Additionally, there was a correlation between rising corporate social responsibility activities and rising ROA and ROE. A response from investment decision makers may be influenced more by certain cultural/generational norms as morally framed variables linked to particular types of ESG information, according to research findings.

In order to investigate the connection between corporate social responsibility and financial performance, *Lee et al. (2016)* carried out a quantitative analysis. In order to assess environmental and social performance rankings, the authors used the reputation index of the Korea Corporate Governance Service. In order to assess ROE and ROA as measures of financial performance, they used the Korean Stock Exchange Index and National Information and Credit Evaluations. Environmental management practises, according to them had a considerable beneficial influence on ROA and ROE. In order to measure environmental management, the following definitions were used: (a) creation of an environmental objective and plan; (b) supply chain management; (c) clean manufacturing system; (d) environmental risk management; (e) environmental accounting; (f) environmental performance management; and (g) environmental auditing. Results indicated that specific cultural/generational norms as morally-framed factors linked to particular forms of ESG information are more effective in evoking a response from investment decision-makers.

The findings from the literature review revealed a pattern of stakeholders responding to new information about

firms' socially responsible behaviour by their willingness to diversify a certain amount of firms' assets towards corporate social responsibility to achieve profit maximisation and sales maximisation. This pattern was consistent with the theoretical framework of stakeholder theory. First, some data indicated a favourable correlation between the additional information regarding businesses' socially responsible activity and ROA and ROE (*Saeidi et al., 2015).*

Within the context of stakeholder theory, the findings showed another pattern of addressing stakeholders' needs (i.e., social returns) throughout the literature within the context of cultural/generational norms.

The results of the literature review supported the claims that (a) certain cultural/generational norms morally framed variables linked to particular types of ESG information are more effective at influencing investment decision-makers and (b) these cultural/ generational norms morally framed variables do, in fact, take stakeholders' needs into account (i.e., social returns).

The results of the literature review also supported the following three factors that influence the relationship between corporate social responsibility and return on assets (ROA): The degree to which businesses engage in corporate social responsibility activities can be measured by three factors: (a) consistency; (b) similarity; and (c) the manner in which businesses initiate such activities (internally or proactively versus externally or reactively) (*Tang et al.,2012*).

INDIA'S ESG FRAMEWORK

In 2013, India made its first significant stride towards sustainable corporate growth when the Companies Act, which replaced the Companies Act, 1956. All corporate entities in India are subject to regulation under the Companies Act. After passing of this Act, India became the first country to mandate corporate social responsibility, which carried the National Voluntary Guidelines forward (2011). The National Company Law Tribunal replaced the Company Law Board. With the introduction of the new Companies Act, a number of new provisions were ushered in like self-regulation with regard to transparency and disclosures, independent directors being required for public companies, mandatory formation of CSR committees and policies, increased power for company shareholders, and representation for small shareholders. "The advent of the Companies Act ultimately created a mechanism, at least in theory, to ensure that businesses be held accountable for the vested interests of their stakeholders and to promote openness and disclosures. Additionally, the Securities and Exchange Board (SEBI) instructed the top 500 firms by market capitalization in 2015 to publish a Business Responsibility Report (BRR) in accordance with the format suggested by the National Voluntary Guidelines (2011) (up from the top 100 firms in 2012), in order to ensure proper disclosures and transparency The BRR offers a thorough grasp of corporate governance, business responsibility and social sustainability. It has been a key government initiative in promoting the value of the ESG sector. Business Responsibility Reporting has changed to Business Responsibility and Sustainability Reporting (BRSR) reporting revised in accordance with the National Guidelines on Responsible Business Conduct (NGRBC)". (*SEBI*, n.d.)

"The Business Responsibility Report is broken down into five main sections: the first includes general information about the firm, including its industry/ sector, products, services, markets, etc. The second focuses on the organization's important financial figures, including turnover, profitability, paid-up capital, and contributions to corporate social responsibility (CSR). The initiatives for business responsibility at the company's subsidiaries and the general corporate structure, governance policies, and other policies that align it with the required standards for business responsibility are the subjects of the following two parts. The National Voluntary Guidelines' ninth corporate responsibility principle is described in the fifth and final part on "Principle-wise Performance," which provides information on the metrics used to measure how well the organisation is doing in relation to that principle (2011)" (*SEBI*, n.d.).

"According to their ESG scores, companies are listed in decreasing order. Any significant ESG dispute excludes companies from consideration for inclusion in the index. The combination of the company's float-adjusted market capitalisation and its score-adjusted weight factor score determines its weight in the index. On the first business day of each year, the index is rebalanced annually" (*India Index Services & Products Ltd., 2018).*

Most studies examining the effects of ESG compliance use one of the several accounting-based metrics, including return on assets, return on equity, return on capital used, return on investment, total assets, and return on sales (*Alshehhi et al., 2018*). As a result, the two criteria—profitability and firm value—are used to evaluate the dependent variable, firm performance. Because ROA is one of the most comprehensive indicators of an organization's operating success, Russoetal,(1997) picked it as a measure of profitability The Prowess database provides information on ROA as well as market capitalization and book value of total assets. Tobin's Q has been widely employed to determine a company's market value, as seen in works by *Albertini (2013),Garg (2015), Yu, and Zhao (2015).*

The book value of all assets is utilised as a stand-in for the replacement cost of the assets, as per Chung and Pruitt (1994), to determine Tobin's Q value. In addition, market value is determined by adding market capitalization and dividing the modified weight factor score for the book value of all assets by the net worth less the book value of all assets. On the first business day of each year, the index is rebalanced annually (India Index Services & Products Ltd., 2018).

Leverage and firm size two common control variables in the literature are used in this study. A company using leverage uses borrowed money. The ratio of total assets to net worth is used to calculate it. Because managers often report more ESG information as leverage increases as a result of

increased scrutiny from financial institutions, leverage is included in this study (*Ghosh, 2013*). Finally, size is taken into account as a control variable because prior research suggested that large businesses may prove to be more effective due to their propensity to take advantage of economies of scale, hire more qualified management and formalise processes that may improve performance (*Naik, 2014)*. Natural log of total assets is used as proxy for size in the investigation. The Prowess database provides information on total assets and net worth.

CONCLUSION

This study makes a substantial contribution to the body of knowledge about the impact assessment of ESG in the Indian setting. The paper makes it abundantly evident that businesses with higher ESG scores do better financially. Compared to previous studies, this one employs a higher standard of methodological rigour; the financial performance of the corporation is assessed not only in terms of accounting metrics, which are seen as a short-term performance report, but also in terms of market metrics, which are seen as a gauge of long-term firm performance. The analysis is more thorough when financial performance is evaluated using a variety of metrics. This adds significantly to the body of knowledge already available. The findings have applications for financiers, authorities, policymakers, and Indian businesses.

The findings unmistakably show that investors choose businesses with lower carbon footprints, greater cultural acceptance and open governance practises. Companies with reduced ESG risks are more likely to provide a sustainable financial performance and as a result, can draw investors for a longer period of time. Corporates will have to support sustainable business models and good governance procedures in order to enjoy the investor's preference. The study also emphasises the requirement for sustainability reporting, which includes ESG Score disclosure. The scope of required disclosures, which mostly concentrate on the financial elements of the corporation, has to be expanded by regulators to cover the social and environmental effects of the company's operations also.

An ESG grade can be thought of as a performance indicator showing a company's long-term sustainability, capacity for growth and upcoming performance

This would aid in improving ethical business practises and the wealth of the shareholders over the long term.

LIMITATIONS AND FUTURE RESEARCH POTENTIAL

ESG reporting and indexation are still in their infancy and there is a glaring lack of uniformity among different platforms. It's possible that a longer period of research is necessary to fully understand the effect of ESG on corporate financial performance. ESG scores might not accurately represent a company's actual ESG practises. The chance that other factors, such as business environment or competition, could have an impact on the financial performance of the corporation is the study's final restriction. Future study may focus on these topics. Future studies should additionally examine the effects of each weighted sub-component, such as ESG performance, in isolation.

Future research is advised to investigate which accounting-based indicators and non-financial data that are related in a way that reflects social returns. ESG reporting and indexation are still in their infancy, and there is a glaring lack of uniformity among different platforms. It's possible that a longer period of research is necessary to fully understand the effect of ESG on corporate financial performance. ESG scores might not accurately represent a company's actual ESG practises. The chance that other factors, such as the business environment or competition, could have an impact on the financial performance of the corporation is the study's final restriction. Future study may focus on these aspects. Future studies should additionally examine the effects of each weighted sub-component, such as ESG performance, in isolation. MA

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DIFFERENTIAL VOTING RIGHTS IN NEW AVATAR

Abstract

This Study delves into the connection between ordinary equity and differential voting rights (DVR) shares in India. The study encompasses both statistical and regulatory comparisons with international economies. The analysis reveals a robust correlation between common shares and DVR shares, although a significant price gap exists between them. In contrast, in the United States, there is nearly no price disparity between common equity and dual-class shares. The regulatory frameworks in India and the USA exhibit some variations that could account for this price discrepancy. Also, providing guidance related to swap ratios while merging different classes of shares can provide clarity to investors.

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INTRODUCTION

Section 86 of the Companies Act, of 1956 deals with the power of limited companies to alter their share capital. Before the year 2000, companies in India were allowed to issue common equity and preference share capital under section 85 of the Companies Act, 1956. Section 86 of the Companies Act, 1956 was amended in the year 2000 to permit the issue of another class of shares that have differential rights with respect to dividends, voting rights, and otherwise if permitted by the Articles of Association. The Act permitted issue of shares with both inferior and superior voting rights. The amendment was done with a view of helping companies to raise funds, without losing the control rights over the company and shielding from hostile takeover bids. Additionally, the issue of such shares will provide one more diversified instrument to investors, who may not be interested in participating in the governance of the company but are interested in dividends and capital appreciation value of shares that may be similar to common equity capital.

Two listed companies Tata Motors and Pantaloon Retail issued shares with inferior voting rights ie (1 vote for every 10 shares) and additional dividend of 5 per cent for DVR shares. While Tata Motors offered these shares at a discount of 10 per cent to common equity, Pantaloon issued DVR shares as rights issue to existing shareholders.

In the year 2009, SEBI vide *Circular no. SEBI/CFD/DIL/LA/2/2009/21/7 dated July 21, 2009* issued amended the equity listing agreement preventing listed companies from issuing shares with superior voting rights and dividends,

as compared to the already listed common equity shares. The move was aimed to preserve the rights of shareholders and ensure that executives and directors remain accountable, thereby preserving the corporate governance standards of listed entities. This move was triggered by the decision rendered in the case of *Anand Pershad Jaiswal and others vs. Jagatjit Industries Ltd.* where the promoter acquired 62 per cent voting rights, with only 32 per cent shareholding in the company.

After the issue of the above regulations, there were only 3 more issues of DVR shares by Indian listed companies namely Gujarat NRE Coke, Jain Irrigation and Stampede Capital, with voting right of 1 vote for every 10 shares and no additional dividends, over a period of two decades. As against this, it can be seen that dual-class shares are more widely issued, listed and traded in the stock exchanges in other jurisdictions. As of May 2023, there are 27 companies in the S&P500 index of listed companies in US that have dual-class shares in their capital structure. Thus, the use of DVRs in India has been less popular compared to other countries, the reasons for which are not clearly known.

There are many studies that have analyzed the governance, listing and disclosure issues surrounding the use of dual class shares by companies. The study by *Yan* (2022) argues for the issue of dual-class shares and allowing companies with dual-class shares to list so as to help companies to improve the disclosures and accountability thereby not compromising investor protection. A study by *Aurelio Guerra-Martinez* (2021) argues that the regulation of dual-class shares in capital markets should be tailored to the specific characteristics of each country. In sophisticated markets with strong investor protection and low private control benefits, minimal restrictions on dual-class shares are advisable, while in less developed markets with weak investor protection and high private control benefits, ban or stricter regulations should be considered. The crucial question is not whether dual-class shares should be permitted, but under what conditions, depending on a country's unique circumstances. It is essential to empirically examine the price performance and liquidity of the DVR shares in India and compare the same with global counterparts so that we can come to data-based conclusions on the performance and reasons for the same. There is also a need to analyze the regulatory framework and reflect on the new framework recently proposed in India for dual-class shares.

OBJECTIVES OF THIS STUDY

1. To compare the regulations and policy framework for the issue of dual-class shares in India with global counterparts
2. To understand the price performance of DVR in India and compare the same with global counterparts.

CURRENT REGULATORY FRAMEWORK

In India, the regulations related to issue of dual class shares are contained in the Companies Act, 2013 across sections 43(ii), 48 and 230 to enable the conversion of DVR into ordinary shares. SEBI regulations that address the issue of dual-class shares include SEBI (Listing Obligations and Disclosure Requirements) Regulations 2015 (LODR), SEBI (Substantial Acquisition of Shares and Takeover) Regulation 1997 (SAST) and SEBI (Issue of Capital and Disclosure Requirement) Regulation 2018 (ICDR).

The current status of regulations related to Dual-class shares in India is presented in Table 1.

TABLE 1

REGULATORY FRAMEWORK FOR ISSUE OF DUAL-CLASS SHARES IN INDIA

SEBI Regulations (2019)	**Companies Act 2013**
Under SEBI ICDR regulations any unlisted company with superior voting rights shares (SR shares) are allowed to do an initial public offer (IPO) only for its ordinary shares subject to the conditions that the issuer company should be technology company and the SR shareholder should be a promoter with a networth not exceeding Rs.500 crores. The regulation limits voting rights to be in range of 2:1 to maximum of 10:1	The Companies Act of 2013, section 43(ii) read with Companies (Share Capital and Debentures Rule) empowers the corporation to issue shares with varying rights. According to this section, a company can issue equity shares with differential rights as to voting, if authorized by the Articles of Association. Further, voting power of shares with differential rights can't exceed 74 per cent of the total voting power. The company must not have committed any default in repaying debts or declared dividends on equity shares or in payment of statutory dues like income tax or service tax or, filing financial statements or annual returns.
Coat-Tail Provisions	***Sunset Clauses***

These provisions ensure that SR shares will have equivalent voting rights to regular ordinary equity shares for decisions related to the appointment or removal of independent director, winding up of company, utilization of funds for purposes other than business and significant value transactions as defined by the materiality threshold outlined in the LODR Regulations, thereby preserving the rights related to the governance of the company.	SR shares will be converted into equity shares by the 5th anniversary of listing, with option to extend once upto 5 years. Conversion will also take place upon the occurrence of specific events, such as the passing of resolution by SR shareholders, their resignation, or the loss of control by SR shareholders due to a merger or acquisition. ***Listing & Lock-in conditions*** Obligatory listing following a public offering, with a restriction on transferability of SR shares among promoters and a lock-in period until their conversion into regular shares. Additionally, pledging or placing liens on SR shares is also prohibited.

TABLE 2 –
GLOBAL REGULATORY COMPARISON

	India	**USA**	**Canada**	**Hong Kong**	**Singapore**
Dual Class Structure/ Differential Voting Rights shares	Allowed for Tech-companies only; the company can have only one class of SR shares only.	Dual class share structure is allowed with multiple classes for single company.	Dual-class share structure is allowed; Multiple voting class shares can be issued with approval.	Weighted voting rights (WVR) shares allowed to be listed since 2018.	Dual-class shares also known as multiple voting rights shares allowed since 2018.
Coat-Tail Provisions	Provisions by the regulator.	No specific provisions by the regulator.	Toronto Stock Exchange (TSX) imposes the provisions.	No explicit coat-tail provisions in HKEX rules.	No explicit coat-tail provisions in SGX-ST rules.
Sunset Clauses	Time-based &event based sunset clause specified by regulator.	No sunset clause imposed by the regulator, but few companies have adopted time-based clause.	Time-based sunset clause is imposed by the regulator.	No Time-based clause for WVR, instead event-based sunset clause is imposed.	Event-based sunset clause is available.
Voting Rights	Ratio of Min. 2:1 - Max. 10:1 to ordinary shares allowed.	Voting ratio should not exceed 10:1.	Maximum ratio allowed is 4:1.	Maximum voting rights per share can't exceed 10 times.	Maximum voting rights per share can't exceed 10 times.

From Table 2 it is evident that coat-tail provisions aimed at protecting the interest of common shareholders with respect to key governance issues are well laid out in Cannada and India, but absent in many jurisdictions. Also, the relative swap ratio while combining the shares across different classes (SR DVR etc) is not clearly addressed by regulations.

PRICE PERFORMANCE OF DVR ISSUES IN INDIA AND ITS COMPARISON

DVR shares with fractional voting rights were issued under the old regulatory framework that prevailed before the 2019 amendment. Out of the 5 issues of DVR shares among listed companies in India, the authors have analyzed the price performance of Tata Motors and Jain Irrigation shares, as other companies have either filed for bankruptcy or are currently distressed and their shares are not traded frequently in the exchanges.

The summary details related to the issuances and current market price of shares is given in Table 3.

TABLE 3

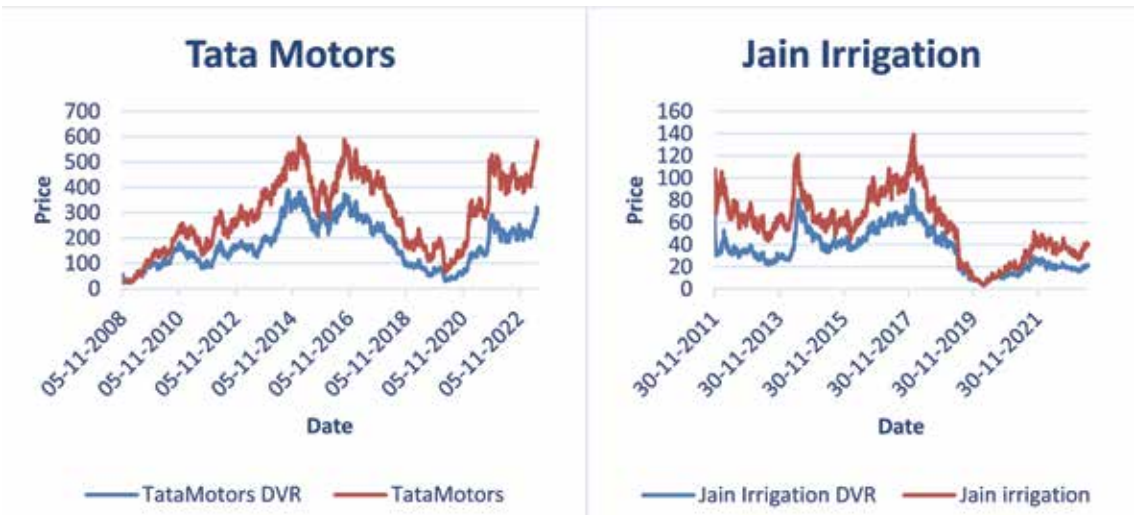
SUMMARY OF PRICES ON ISSUE AND CMP OF DVR VERSUS COMMON EQUITY

Shares	Voting Rights	Dividend	Price comparison on issue			Price as on 27th June,2023		
			DVR Issue price	*Price of Common shares*	*Issue price discount*	*DVR price*	*Price of Common shares*	*Discount*
Tata Motors Ltd	1 vote for every 10 DVR equity shares	5% extra dividend over common equity share	305	340	10.29%	305.5	573.1	46.69%
Jain Irrigation systems Ltd	1 vote for every 10 DVR equity shares	Same as common equity shares	95.5	111.90	14.66%	20.45	40.25	49.19%
Alphabet Inc.	No voting rights for class C	Same as common equity shares	$ 2.49	$ 2.50	0.40%	$119.09	$118.33	-0.64%
Under Armour	No voting rights for class C	Same as common equity shares	$ 41.50	$ 41.61	0.50%	$ 6.74	$ 7.29	7.54%

From the above table, it can be seen that the discount at which the DVR traded on issue was much less when issued and later on has increased to a range of 45to 50 per cent in case of both Indian companies. The discount of DVR to ordinary shares in case of the global peers is negligible as compared to Indian companies.

The comparative charts showing the prices of DVR shares and common equity is given in Chart 1 for the Indian companies.

CHART 1: COMPARATIVE PRICES OF DVR AND COMMON EQUITY



Source : Author's Compilation

From the above chart it can be seen that the discounts of DVR to ordinary shares was less on issue and later seen narrowing in general during the years 2018 to 2020. There was a convergence in the prices of Jain Irrigation's ordinary and DVR shares, with the difference narrowing down to 0 per cent. This occurrence seems to be entirely attributable to trading activities and the interplay of supply and demand for these particular shares. There is a high correlation in the price movement of ordinary shares and DVR (differential voting rights) shares at 0.95 and 0.96 for the shares of Tata Motors and Jain Irrigation respectively. Despite this,

DVR shares on average are trading at a price discount of 45.2 and 36.25 per cent for Tata Motors and Jain irrigation respectively. However, when considering compounded annual growth rate (CAGR) returns, one would expect ordinary shares and DVR shares to closely resemble each other since they are highly correlated. Surprisingly, this is not the case. Since listing DVR shares, Tata Motors' ordinary shares have achieved a CAGR return of 26.52 per cent, whereas DVR shares have only managed a return of 16.48 per cent, resulting in a significant 10 per cent disparity. Similarly, in the case of Jain Irrigation, ordinary shares have experienced a negative CAGR return of -7.84 per cent, while DVR shares have delivered a negative CAGR return of -11.15 per cent.

As compared to the above, Chart 2 presents the price performance of common equity with dual class shares issued by Alphabet and Armour companies listed in the US markets.

CHART 2: CLASS A & CLASS C SHARE PRICE

Source: Author's compilation

On an average, the disparity between ordinary and dual class shares has remained within a 10 per cent range. The share prices of both Alphabet and Under Armour's dual class shares exhibit a high correlation of 0.99. This correlation is reflected in the discount observed between the ordinary and dual class shares, with the average discount between their prices remaining below 10 per cent. The market returns provided by the different classes of shares are also nearly similar. After being listed, Alphabet's Class A (GOOGL) shares achieved a CAGR return of 22.48 per cent, while the Class C (GOOG) shares delivered a slightly higher CAGR return of 22.55 per cent. Similarly the CAGR returns of Class A (UAA) shares is negative [-21.98 per cent], whereas the Class C (UA) shares yielded a slightly lower negative return of -22.79% for Under Armour.

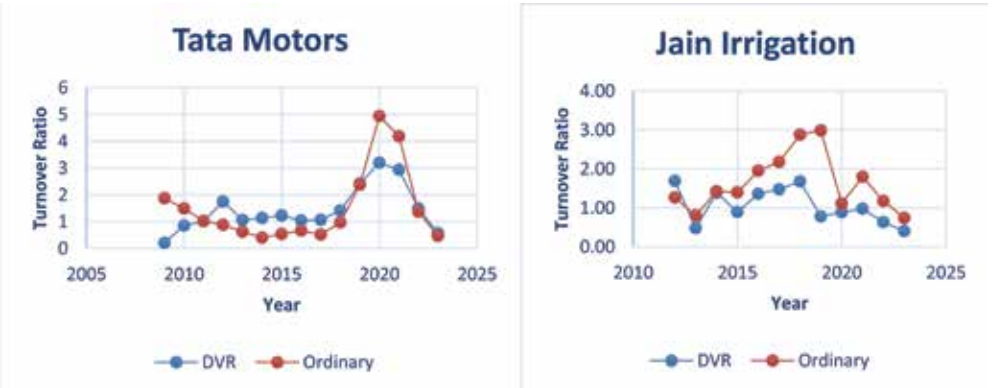
Comparison of Liquidity in the shares

The liquidity has been calculated using the turnover ratio. The equation of turnover ratio is as given below

TURNOVER RATIO = SHARES TRADED/TOTAL OUTSTANDING SHARES

The data of daily turnover of the companies Tata Motors and Jain Irrigation has been collected from the Stock Exchange website and the turnover ratio is calculated for the two categories of shares listed and traded. The graph of the turnover ratio is presented in Chart 3

CHART 3 LIQUIDITY – INDIA DVR VS. COMMON EQUITY

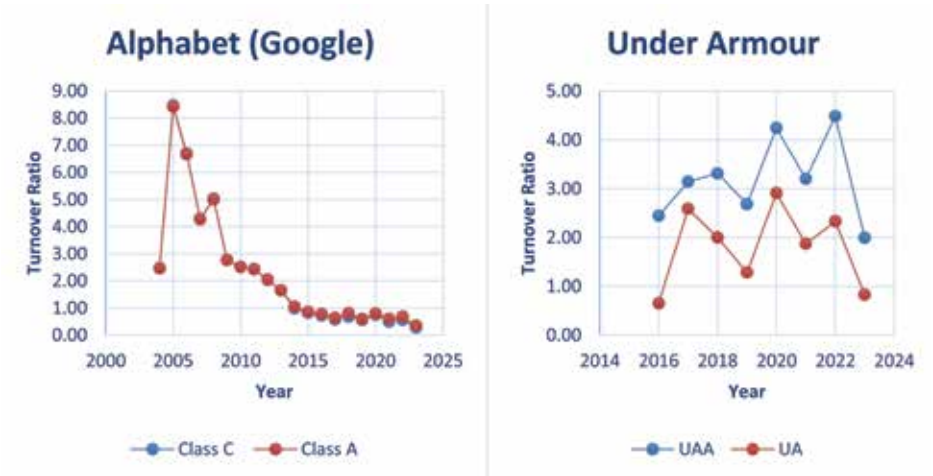


Source: Author's compilation

In the context of Tata Motors, one can observe that the liquidity of both ordinary shares and DVR shares has been relatively synchronized. During certain periods, DVR shares displayed better liquidity than ordinary shares. But since the year 2020, there has been a notable increase in the liquidity of ordinary shares.

The liquidity of the Alphabet class A and Class C shares and those of Under Armour Limited are presented in chart 4.

CHART 4: ALPHABET CLASS A AND CLASS C LIQUIDITY



Source : Author's compilation

When analyzing Alphabet Inc.'s dual class share structure, it becomes evident that both Class A and Class C shares exhibit similar patterns. They demonstrate comparable levels of liquidity, which contributes to the popularity of both share types among investors. The mirroring behavior of liquidity in Class A and Class C shares further enhances the appeal of these shares to investors.

In the case of Under Armour's Class A and Class C shares, both shares demonstrate a similar pattern of mirroring each other. However, it is noticeable that Class A shares have significantly higher liquidity when compared to Class C shares. One potential reason for this disparity could be that Class C shares were listed more recently in 2016. The relatively shorter period since their listing may have contributed to lower liquidity as investors may still be getting acquainted with and gaining awareness of Class C shares.

From the comparative analysis of price, returns and liquidity of the DVR shares with ordinary shares it can be seen that in case of global companies the discount on prices of DVR to common equity is low and the liquidity of the two different class of shares are similar. However, in the case of Indian companies, the discount of DVR share price to common equity was about 10 per cent on issue and has increased substantially in the later years. The trading volume and turnover ratio is also low in the DVR shares. Liquidity plays a vital role in influencing investment decisions, as investors prioritize highly liquid instruments. The ability to easily enter and exit an investment is highly valued, as it provides investors with a sense of security and flexibility. It is evident that in India, ordinary shares exhibit greater liquidity in comparison to DVR shares. Absence of interest in DVR shares with fractional voting rights may also be due to the facts that institutional investors may not prefer to invest in such shares, as voting rights matters. Another important factor is the returns on DVR shares are found to be lower than the returns on common equity across similar period in case of Indian shares. Thus, investments in DVR meant loss of voting rights, returns and liquidity, thereby resulting in low popularity of these shares among investors.

CURRENT STATUS AND CONCLUSION

Under the current regulatory framework, SEBI and the Companies Act, 2013 have permitted companies to issue shares with superior voting rights to promoters. It is envisaged that this structure enables founders to maintain control while raising capital from the public; concerns have been raised about potential abuses of power and inadequate protection of minority shareholders. Consequently, SEBI has introduced coat tail provisions and sunset clauses to ensure that DVR shares do not compromise the interests of minority shareholders and governance standards are upheld.

Further, restrictions on DVR shares, such as capping differential voting rights at ten times that of ordinary shares and requiring a sunset clause, which limits the duration of such shares, are introduced with the objective to strike a balance between encouraging entrepreneurship and innovation while safeguarding minority shareholders' rights.

Consequent to the above

regulations, various companies have issued shares with superior voting rights to promoters. Zomato's IPO featured a dual-class share structure granting enhanced voting rights to its founder and key executives. More recently, the IPO of Jio Platforms, a subsidiary of Reliance Industries, a technology conglomerate in India successfully raised significant capital from global investors while maintaining control through a dual-class share structure. This approach enabled Jio Platforms to pursue its ambitious digital transformation plans while benefiting from the expertise and financial support of its investors.

While these examples are not specific to India, they illustrate how dual-class shares can create an environment where companies with strong founders or innovative business models can retain control over their strategic direction while attracting substantial investments. The introduction of dual-class shares in India could potentially appeal to companies emphasizing long-term growth, innovation, and strategic decision-making.

Zomato's IPO featured a dual-class share structure granting enhanced voting rights to its founder and key executives

However, it is crucial to strike a balance between promoting entrepreneurship and safeguarding minority shareholders' interests. Regulators and policymakers should meticulously evaluate the potential risks and implement safeguards associated with dual-class shares. They must ensure transparency, accountability, and checks and balances to prevent potential abuse of power and protect minority shareholders' rights. MA

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DOES NPA HAVE AN IMPACT ON FINANCIAL PERFORMANCE: AN EMPIRICAL STUDY OF TOP 10 BSE LISTED PUBLIC SECTOR BANKS IN INDIA BY MARKET CAPITALISATION

Abstract

A strong financial sector is essential for economic expansion. During the last ten years, the issue of mounting NPAs has been a strain on Indian banks. Lower profitability for banks is the result of more NPA because it lowers interest income and increases capital erosion. The bank's financial situation will be determined by the status of loan recovery and the level of NPA. A drop in non-performing assets implies that the individual banks' credit evaluation system has been reinforced over the past few years, whilst a spike in non-performing assets will impair the bank's total profitability. The goal of this research study is to take a look at the NPA drivers that may affect public sector bank's financial performance measures.

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INTRODUCTION

Management of liabilities as well as assets is critical for the viability and expansion of any financial institution. However, not all assets demonstrate as predicted and when financial institutions' loans and advances fail to provide the projected earnings, they're referred to as non-performing assets (NPA). The primary cause of NPA is the inability or unwillingness of borrowers to repay their loans as per the agreed terms and conditions. These reasons can range from economic downturns and business failures to fraudulent activities and willful defaults. Irrespective of the cause, NPAs pose a significant challenge to financial institutions as they reduce profitability, tie up capital, and impair the ability to extend credit to deserving borrowers. In recent years, several countries have undertaken reforms to tackle the NPA problem and the regulators, legislators, and stakeholders have paid close attention to the management and settlement of NPAs.

LITERATURE REVIEW

Muhammad Farooq (2020) investigated the association amongst NPAs, financial resilience and economic expansion in Asian countries and the impact of NPAs on banking sector soundness and its transmission to the broader economy. The study emphasizes the importance of effective NPA management in promoting financial stability and sustainable economic growth.

Pankaj Gupta and Deepti Gupta (2019) examined the numbers and trajectories of NPAs in both the private and public sector banks in India. They analysed the factors influencing NPAs, such as loan concentration, credit risk management practices, and governance. The study provides insights into the differences in NPA management between

the two sectors and suggests measures to improve asset quality.

Kaya, H., &Yesin, P. (2019) explored the effect of non-performing loans, equivalent to NPAs, on banking stability in emerging market economies. The authors analyzed data from various countries and employed statistical techniques to examine the relationship between NPAs and banking stability indicators.

Ganesan, S., & Rao, K. S. (2018) examined the impact of non-performing financial holdings on India's and China's banking sector. The authors analysed the trends, causes, and consequences of NPAs in both countries and have provided an insights into the measures taken by the respective regulatory authorities to address the issue.

Isha Aggarwal and Sushil Kumar (2018) analysed the causes and implications of non-performing loans in Indian banking institutions. They investigated the influence of nonperforming assets on bank's profitability, lending capacity and economic growth. The study also discussed remedial measures, including loan recovery strategies and regulatory reforms, to address the NPA problem.

Kaur, H., & Duggal, S. (2018) using dynamic panel data analysis examined the factors of NPAs in Indian banks and investigated how credit growth, interest rates, inflation, and profitability affected NPA levels in the Indian banking system.

Chavan, P., & Patil, V. (2018) analysed the influence of non-performing loans on the earnings potential of banks in India. The authors examined the financial data of selected banks and employed regression analysis to determine the relationship between NPAs and bank profitability.

Singh, A., & Gupta, A. (2017) analysed the association amongst non-performing loans and the financial results of commercial banks in India. The authors evaluated the influence of NPAs on several financial parameters of banks using data from chosen institutions over a defined time period and statistical approaches.

*Durgarani and Vidyadhar (*2017) investigated the causes of NPAs in India's private and public sector banks. The study identified factors such as credit risk, interest rate risk, macroeconomic indicators and bank-specific characteristics that contributed to the accumulation of NPAs. The study provides insights into the causes of NPAs and their implications for different types of banks.

RESEARCH OBJECTIVES

- To evaluate the relationship between public sector bank's financial performance measures and NPA factors.
- To examine how NPA-related factors that affect important financial performance metrics for public sector banks, such as ROA and ROCE.

RESEARCH HYPOTHESIS

H_0: The ROA is not significantly impacted by NPA factors.

H_{01}: The ROCE is not significantly impacted by NPA factors.

RESEARCH METHODOLOGY

When doing investigation into non-performing assets, the data gathering approach is critical to guaranteeing the accuracy and dependability of the results. For this study, secondary data sources have been used to gather information on NPAs. These sources can include publicly available data from banks, financial institutions, regulatory agencies, Government publications, industry reports, academic journals, and research databases. Secondary data sources provide a wealth of information that can be analysed to understand trends, patterns, and factors contributing to NPAs. The data collected for the study pertains to the period from 2013-14 to 2022-23.

DATA ANALYSIS AND INTERPRETATION

TABLE 1: DESCRIPTIVE STATISTICS

	ROA	ROCE	GNPANA	NNPANA	GNPATA	NNPATA	MC	AGE
ROA	1.000000	0.431887	-0.822497	-0.053475	-0.826777	-0.772851	0.402124	0.038918
ROCE	0.431887	1.000000	-0.296867	0.051963	-0.269246	-0.331333	0.194515	0.033139
GNPANA	-0.822497	-0.296867	1.000000	0.111416	0.970777	0.795973	-0.386112	0.022494
NNPANA	-0.053475	0.051963	0.111416	1.000000	0.117858	0.075287	-0.032781	0.022550
GNPATA	-0.826777	-0.269246	0.970777	0.117858	1.000000	0.854821	-0.368376	0.067941
NNPATA	-0.772851	-0.331333	0.795973	0.075287	0.854821	1.000000	-0.442692	-0.008750
MC	0.402124	0.194515	-0.386112	-0.032781	-0.368376	-0.442692	1.000000	-0.270282
AGE	0.038918	0.033139	0.022494	0.022550	0.067941	-0.008750	-0.270282	1.000000

(Source: Self-Compiled)

Table 1 show that the mean and median value of the dependent and explanatory variables like ROA, ROCE, GNPANA,

NNPANA, GNPATA, NNPATA, MC and AGE are more or less same. It means all the variables are very close to their average value which means data are symmetrically distributed where as the standard deviation values are also very less which indicates the consistency of data. The Kurtosis value of dependent variables like ROA and ROCE is more than 3, which indicates that the data are leptokurtic in nature. Independent variables like GNPANA, NNPANA, GNPATA, NNPATA and MC in the table is more than 3 which indicate that the data are leptokurtic whereas the value of AGE is less than 3, which indicates platykurtic of data.

TABLE 2: CORRELATION

Date: 06/21/23
Time: 23:11 pm
Sample: 2014 - 2023

	ROA	ROCE	GNPANA	NNPANA	GNPATA	NNPATA	MC	AGE
Mean	-0.0006	0.0160	0.1031	0.0648	0.0619	0.0270	0.5306	1.9861
Median	0.0020	0.0160	0.0917	0.0391	0.0568	0.0232	0.4609	2.0294
Maximum	0.0103	0.0225	0.2528	1.7000	0.1540	0.0823	1.8208	2.1072
Minimum	-0.0295	0.0000	0.0007	0.0002	0.0154	0.0039	-0.4202	1.7634
Std. Dev.	0.0078	0.0038	0.0551	0.1680	0.0306	0.0163	0.4747	0.0922
Skewness	-1.2808	-0.9400	0.7435	0.3546	0.8102	1.1977	0.8755	-0.9290
Kurtosis	4.3636	5.1842	3.0509	3.5401	3.2635	4.3678	3.6627	2.6094
Sum	-0.0647	1.6039	10.3115	6.4817	6.1927	2.6965	53.0643	198.6147
Sum Sq. Dev.	0.0060	0.0014	0.3008	2.7947	0.0929	0.0263	22.3116	0.8413
Observations	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000

(Source: Self-Compiled)

Table 2 describes about the dependent variable ROA is negatively associated with GNPANA, NNPANA, GNPATA and NNPATA while positively associated with MC and AGE. Here it indicates that more the GNPANA, NNPANA, GNPATA and NNPATA less will be ROA and vice- versa. A positive growth in MC as well as age of the firm leads to increase the ROA and vice-versa. Here ROCE is negatively associated with GNPANA, GNPATA, and NNPATA while positively associated with MC, AGE and NNPANA. It indicates that more the GNPANA, GNPATA and NNPATA less will be ROCE. However the positive growth in MC and age of the firm as well as increase of NNPANA leads to positive flow of ROCE and vice-versa.

TABLE 3: REGRESSION RESULT OF RETURN ON ASSETS (ROA)

Dependent Variable: ROA
Method: Panel Least Squares
Date: 06/21/23
Time: 23:25 pm
Sample: 2014 - 2023
Periods included: 10
Cross-sections included: 10
Total panel (balanced) observations: 100

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.003900	0.010560	-0.369370	0.7127
GNPANA	-0.051293	0.036000	-1.424834	0.1576
NNPANA	0.001645	0.002547	0.645752	0.5200
GNPATA	-0.066265	0.076491	-0.866319	0.3885
NNPATA	-0.106252	0.057785	-1.838749	0.0691
MC	0.001514	0.001104	1.372432	0.1732
AGE	0.007351	0.005163	1.423830	0.1578

R-squared	0.724306	Mean dependent var	-0.000647
Adjusted R-squared	0.706520	S.D. dependent var	0.007792
S.E. of regression	0.004221	Akaike info criterion	-8.029947
Sum squared resid	0.001657	Schwarz criterion	-7.847585
Log likelihood	408.4974	Hannan-Quinn criter.	-7.956142
F-statistic	40.72180	Durbin-Watson stat	2.080706
Prob(F-statistic)	0.000000		

(Source: Self-Compiled)

According to Table 3, the probability figure in relation to the F-value is 0.0000, which is much less than the crucial value at 0.05 level of significance. As a result, in this scenario, the assumption of null is disqualified, and an alternate hypothesis is to be evaluated. Hence there is a significant impact of NPA attributes on the dependent variable ROA. Here the value of DW test is 2.08, which is within the acceptable range of 0 to 4. As a result, no autocorrelation is observed among the variables that are distinct, which is a favourable sign for our inquiry. Here the R square value is 0.7243, which indicates that dependent variable ROA is determined to the extent of 72.43 per cent by independent variables of NPA attributes which is taken in this study. It indicates that there is moderate and positive correlation with all the independent variables.

TABLE 4: REGRESSION RESULT OF RETURN ON CAPITAL EMPLOYED (ROCE)

Dependent Variable: ROCE
Method: Panel Least Squares
Date: 06/21/23
Time: 23:26 pm
Sample: 2014 - 2023
Periods included: 10
Cross-sections included: 10
Total panel (balanced) observations: 100

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.019371	0.008896	2.177559	0.0320
GNPANA	-0.062538	0.030327	-2.062160	0.0420
NNPANA	0.001561	0.002146	0.727473	0.0468
GNPATA	0.126769	0.064437	1.967329	0.0521
NNPATA	-0.112873	0.048679	-2.318721	0.0226
MC	4.01E-06	0.000930	0.004310	0.0966
AGE	-0.000903	0.004350	-0.207587	0.0836
R-squared	0.759334	Mean dependent var		0.016039
Adjusted R-squared	0.605098	S.D. dependent var		0.003759
S.E. of regression	0.003556	Akaike info criterion		-8.372910
Sum squared resid	0.001176	Schwarz criterion		-8.190549
Log likelihood	425.6455	Hannan-Quinn criter.		-8.299105
F-statistic	2.937766	Durbin-Watson stat		1.266780
Prob(F-statistic)	0.011393			

(Source: Self-Compiled)

The probable value associated with the F statistic represents 0.01139, which is beneath the crucial threshold at the 5 per cent level of significance, according to Table 4. As a result, in this scenario, the assumption of nullity is disqualified and an alternate theory is to be evaluated. Hence there is a significant impact of NPA attributes on the dependent variable ROCE. Here the value of DW test is 1.26, which is within the acceptable range of 0 to 4. As a result, no autocorrelation is found among the variables that are independent, which is a favourable sign for our inquiry. Here R square value is 0.7593, which indicates that dependent variable ROCE is determined to the extent of 75.93 per cent by independent

variables of NPA attributes which is taken in this study. It indicates that there is moderate and positive correlation with all the independent variables.

TABLE 5: ANOVA

Test for Equality of Means Between Series
Date: 06/21/23
Time: 23:30 pm
Sample: 2014 - 2023
Included observations: 100

Method	df	Value	Probability
ANOVA F-test	(7, 792)	1404.340	0.0000
Welch F-test*	(7, 314.136)	6597.125	0.0000

*Test allows for unequal cell variances

Analysis of Variance

Source of Variation	df	Sum of Sq.	Mean Sq.
Between	7	327.3696	46.76709
Within	792	26.37505	0.033302
Total	799	353.7447	0.442734

Category Statistics

Variable	Count	Mean	Std. Dev.	Std. Err. of Mean
ROA	100	-0.000647	0.007792	0.000779
ROCE	100	0.016039	0.003759	0.000376
GNPANA	100	0.103115	0.055121	0.005512
NNPANA	100	0.064817	0.168016	0.016802
GNPATA	100	0.061927	0.030634	0.003063
NNPATA	100	0.026965	0.016309	0.001631
MC	100	0.530643	0.474731	0.047473
AGE	100	1.986147	0.092187	0.009219
All	800	0.348626	0.665383	0.023525

(Source: Self-Compiled)

According to Table 5, the estimated figure for F-Statistics is 0.0000, which is significantly below the crucial value at one percent threshold of significance. Thus the hypothesis of 'no significance 'is rejected, indicating that the variables under examination have a meaningful relationship.

CONCLUSION

Based on the foregoing, it is possible to conclude that NPA factors have a considerable impact on the financial results of the selected group of banks. High levels of NPAs can strain liquidity, making it difficult for banks to honour their commitments and provide new credit. To lessen the adverse effect of NPAs on public sector bank's financial performance, it is crucial to focus on improving credit quality, enhancing risk management practices and implementing effective strategies for NPA resolution and recovery. Timely identification and resolution of NPAs, coupled with proactive measures to prevent their occurrence, are essential for sustaining the banks' financial status in the public sector. MA

NPAs pose a significant challenge to financial institutions as they reduce profitability, tie up capital, and impair the ability to extend credit to deserving borrowers

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Down The Memory Lane

October, 2013

At the 8th Sustainability Solutions Summit in Delhi on 14th-15th October, 2013. From L-R, Shikhar Jain, Principal Counselor, CII-ITC Centre of Excellence for Sustainable Development; Rajiv Mishra, Managing Director, CLP India; Paul Druckman, CEO, The International Integrated Reporting Council (IIRC), Shankar Venkateshwaran, Director Sustainability and Climate Change, Pricewaterhouse Coopers; CMA Sanjay Gupta, Council Member of the Institute and Nishikant Ingle, General Manager-Sustainability, Kirloskar Brothers Ltd.

Shri Venkaiah Naidu (MP) lighting the lamp at the inauguration of a symposium on Cost Audit for Inclusive Growth held by the Institute at Mumbai on 25th October 2013. Also seen in the picture Shri Pawan Kumarji Ruia; CMA Dhananjay Joshi; CMA Asish P. Thatte; CMA Neeraj D. Joshi and CMA Vijay Joshi.

October, 2003

President of ICWAI Dr. K.L. Jaisingh's meeting with Chief Minister of Goa, Manohar Parrikar. Also seen, Dr. Vijay Madan, Development Commissioner of Goa, Rammohan Menon, Chairman, Goa Chapter, Sunil Bagi and M Francis, Financial Adviser and Chief Account Officer, Mormugao Port Trust.

October, 1993

Seminar on Cost Accounting – the necessity in present economic scenario at Talcher-Angul Chapter. Seen on the dais from left are N.S. Choudhury, Chairman, EIRC; Harijiban Banerjee, Central Council Member; C. Venkataramana, ED (Finance), Chief Guest; S.S. Agrawal, ED, NALCO, Guest of Honour; U.K. Prasad, Chairman of the Chapter; T.P.C. Rao, Chairman, Seminar Committee and A. Acharya, Secretary of the Chapter.

Down The Memory Lane

October, 1983

Photograph shows Dr. K. Vaidyanathan, Head of Department of Technical cell, Indian Telephone Industries Ltd., Bangalore delivering his Talk. Shri L. Ramamirtham, Chairman and Shri G I Srinivasa Murthy, Vice-Chairman and Chairman, PDC are also seen in the Photo at the Professional Development Meet held on 22nd October 1983 at the Bangalore Chapter premises.

Left to Right: Shri R.K. Yashroy, C.M.E.(P)., BCCL; Shri Sawarup Singh, President, Gurudawa, Prabhadhank Committee and Shri R.S. Ojha, Vice Chairman of the Chapter at the Lecture meeting organized by the Dhanbad Chapter on "Energy Conservation" on 29th October, 1983.

October, 1973

Hon'ble Syed Murtaza Fazal Ali, Chief Justice, Jammu & Kashmir High Court, Chief Guest at the dinner arranged in the evening of 05th October'73 at Regional Cost Conference, Srinagar.

Shri L.K. Jha, Governor of Jammu & Kashmir with N.I.R.C. Member at a 2-days Regional Cost Conference at Srinagar on 5th& 6th October,1973.

Source: Extracted from the various issues of The Management Accountant Journal

EASTERN INDIA REGIONAL COUNCIL

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA BHUBANESWAR CHAPTER

The Chapter organized an Industry Oriented Training Programme (Day-4 to Day-7) of Batch-2 for the period from 26.08.23 to 29.08.23. The Valedictory Session of 7 days IOTP for December, 2023 was conducted by the chapter on 03.09.23. To mark the valedictory session, a seminar was also held on the theme "Rudiments of Investments". CMA Avinash Kotni, Chairman, CC & Students Facilitation Committee delivered on the topic. Valedictory session was graced by Prof. (Dr.) Jayanta Kumar Parida, Director of Social, Financial and Human Sciences, KIIT University as Chief Guest, CMA Debasish Saha, Past Chairman, ICMAI - EIRC and CMA Damodar Mishra, Treasurer, ICMAI EIRC as Special Guests. Other dignitaries such as CMA Surya Narayan Tripathy, Chairman, CMA Sarat Kumar Behera, Vice Chairman, CMA Soumya Ranjan Jena, Treasurer and CMA Avinash Kotni, Chairman, CC & SFC also graced and blessed the students for their bright professional career on the occasion.

The Chapter conducted a Practitioners Meet on the theme "Opportunity, Issues & Challenges in the present scenario" on 26.08.2023 at CMA Bhawan. CMA Surya Narayan Tripathy, Chairman of the Chapter delivered welcome address and CMA Barada Prasan Nayak, Chairman, PD Committee of the Chapter interacted with practitioners on various avenues, facilitated the entire programme and also extended formal vote of thanks. CMA Sarat Kumar Behera, Vice Chairman, CMA Ramesh Chandra Patra, Secretary, CMA Soumya Ranjan Jena, Treasurer, CMA Subhasish Sahoo, Member of MC and CMA Avinash Kotni, Member of MC of the ICMAI-Bhubaneswar Chapter also interacted with participants on the occasion.

The Chapter conducted an interview for internship engagement as Qualified Accounts Trainee (QAT) at NALCO at CMA Bhawan on 06.09.23. A Career Awareness Programme held at Commerce Block, Khordha on 08.09.23. A workshop on "NCLT" was successfully conducted by the Chapter on 09.09.2023 at CMA Bhawan. CS Saradindu Jena, Practicing Company Secretary & Insolvency Professional, Bhubaneswar and CMA S. S. Sonthalia, Practicing Cost Accountant , IBC Professional, Past Chairman, ICMAI-EIRC & Bhubaneswar Chapter delivered in detail as "Resource Person". In a nutshell discussion held on different case laws. CMA Barada Prasan Nayak, Chairman, PD Committee of the Chapter facilitated the entire program, CMA Surya Narayan Tripathy, Chairman of the Chapter delivered the welcome address and CMA Soumya Ranjan Jena, Treasurer of the Chapter extended formal Vote of Thanks. An interaction meeting held at Chapter on 10.09.23 with the qualified CMAs of June, 2022 & December, 2022 term of examination those who have not employed or underemployed. CMA Surya Narayan Tripathy, Chairman, CMA Sarat Kumar Behera, Vice Chairman, CMA Ramesh Chandra Patra, Secretary, CMA Soumya Ranjan Jena, Treasurer and CMA Barada Prasan Nayak, Chairman, PD Committee of the Chapter interacted with the young CMAs.

A Career Awareness Programme & Seminar on " Artificial Intelligence & Machine Learning : A Boon or Bane to Higher Education" was conducted by the chapter in association with the Department of Commerce, Sadhu Goureswar College, Kanikapada, Jajpur at their Campus on 12.09.23. CMA Avinash Kotni, Chairman, Career Counseling and Students Facilitation Committee, ICMAI-Bhubaneswar Chapter delivered in the brain storming session as "Resource Person". Prof. Nikunja Bihari Mohapatra, Principal, S.G.College inaugurated and graced the programme as "Chief Guest", CMA Damodar Mishra, Treasurer, ICMAI-EIRC graced, addressed as "Guest of Honour" and highlighted about CMA Course & Career Prospects in CMA Course. Dr. Sudhansu Kumar Das, HoD (Commerce), Shri Gajendra Kumar Das, Faculty Member (Commerce), Shri Ganesh Prasad Panda, Faculty Member (Commerce) and Riyasat Khan, Faculty Member (Commerce) of S.G.College also addressed on the Occasion.

A "Career Awareness Programme" held at Insight Academy of Commerce, Bhubaneswar on 13.09.2023. CMA Santanu Kumar Rout, Guest Faculty and Past Chairman of the Chapter addressed and highlighted about CMA Course and its career prospects.

A Career Awareness Programme and Seminar on " Investment Decisions : Demystifying the relation between Risk & Reward" was organized by the chapter in association with the P.G. Department of Commerce, Rajdhani College, Bhubaneswar at their Auditorium on 16.09.23 .CMA Avinash Kotni, Chairman, Career Counseling and Students Facilitation Committee, ICMAI-Bhubaneswar Chapter delivered in detail on the topic as "Resource Person". CMA Surya Narayan Tripathy, Chairman, ICMAI-Bhubaneswar Chapter highlighted on CMA Course & Career Prospects. Dr. Bijay Kumar Sahoo, Associate Professor & HoD (Commerce), CMA (Dr.) Maheswar Parida, Faculty Member in Commerce, CMA Samira Kumar Patra, and Faculty Member in Commerce of Rajdhani College graced and addressed on the occasion.

A Career Awareness Programme & Seminar on " Balancing of Cost and Market Price in Services Sector" held on 22.09.23 in association with the Department of Commerce, Prananath College (Autonomous), Khordha at their Auditorium (Maitree Bhawan).CMA Avinash Kotni, Chairman, Career Counseling and Students

Facilitation Committee, the chapter delivered in detail on the topic as "Resource Person". Prof. Srikanta Pattanaik, Chairman, IIMT, Bhubaneswar inaugurated, graced and addressed on the occasion as "Chief Guest". Dr. Ajanta Satapathy, Principal, P N College (Autonomous) graced and addressed on the occasion as "Chief Patron", Dr. Sushil Kumar Pattanaik, HoD, Department of Commerce and Management, P. N College (Autonomous) delivered the Keynote address and brief introduction of guests as " Patron". CMA Damodar Mishra, Treasurer, ICMAI-EIRC graced and addressed on the occasion as "Guest of Honour.

A Career Awareness Programme & Seminar on "Cashless Economy: Is India Ready for it?" Held on 23.09.23 in association with the Department of Commerce, Ekamra College, Bhubaneswar at their Auditorium. CMA Avinash Kotni, Chairman, Career Counseling and Students Facilitation Committee, ICMAI-Bhubaneswar Chapter delivered in the power packed session as "Resource Person". Shri H.K. Biswal, AAO working at Chapter highlighted and interacted with the Students about CMA Course and its career prospects. Dr. Akhaya Kumar Tripathy, HoD (Commerce), Ekamra College delivered the welcome address and keynote address. Smt. Prava Manjari Pattnaik, Reader in History inaugurated, graced and addressed as "Chief Guest". Ms. Soumyashree Behera, Faculty of Commerce delivered the welcome address and facilitated the programme.

A Career Awareness Programme & Seminar on "Cost and Profit Analysis: An Effect on GDP" held on 25.09.23 in association with the Department of Commerce, Maharishi College of Natural Law , Bhubaneswar at their Auditorium. CMA Avinash Kotni, Chairman, Career Counseling and Students Facilitation Committee, ICMAI-Bhubaneswar Chapter delivered in the power packed session as "Resource Person". Shri H.K. Biswal, AAO working at Chapter highlighted and interacted with the students about CMA Course and its career prospects. Dr. Loknath Pattanaik, HoD (Commerce), Maharishi College of Natural Law delivered the welcome address and keynote address. Smt. Manju Pattnaik, , Principal of the Said college inaugurated , graced and addressed as "Chief Guest". Sri Pravat Swain, Faculty of Commerce extended formal Vote of Thanks.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA ROURKELA CHAPTER

A workshop on "India Uninc. - the role of Unorganised sectors in Indian Economy" was organised by the Chapter on 20-08-2023 at its premises. CMA N K Nanda, Chairman of the Chapter inaugurated the workshop along with CMA S. C. Sahoo, Secretary of the Chapter. In his inaugural speech, CMA Nanda thanked the Chapter for various steps taken towards professional development of the members. The main speaker at the workshop CMA R. R. Sarangi, Sr. Faculty of the Chapter covered various aspects of the unorganised sectors including the environment in which it operates, challenges faced by it and the strategies adopted for survival. CMA S.C. Sahoo proposed the Vote of Thanks.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA TALCHER ANGUL CHAPTER

The Chapter organised an electrifying 2-days Seminar titled "Mining: Endless Possibilities - A Quest Within" on 9th & 10th September'23 at Training Institute of NALCO S&P Complex, Angul, where industry leaders, experts and innovators gathered to discuss the evolving landscape of mining and its limitless potential. CMA Ramesh Chandra Joshi, Director (Finance), NALCO inaugurated and graced the seminar as chief guest. Chairman of the Chapter CMA Mihir Ranjan Rath delivered the welcome address and briefed the achievements and growth of the Chapter and the CMA profession. CMA Antaryami Acharya, Founder Member & Past Chairman of the Chapter delivered the keynote address. There were three technical sessions at the seminar. Other dignitaries were Shri Manasa Prasad Mishra, Former Director (P&T) NALCO, Er. D. K. Mohanty, Former ED (M&R), NALCO, Er Amiya Kumar Swain, ED (S&P) NALCO, CMA Sanjay Kumar Sahoo, Chairman Oral Coaching. To commemorate the occasion a souvenir "Knowledge Mines" was released. The Second session was chaired by Er. Anupam Srivastav, GM (Talcher Area) MCL, where compliance and accounting aspects were discussed. The key speaker was CMA Braja Kishore Dash, ED Finance I/C, NALCO. Other dignitaries included Er. Tapan Pattnaik, GGM (Coal Mines), NALCO and CMA Prasanta Kumar Tripathy, GM (Fin) NALCO. Sri Trinath Lenka, MD Wallet 4 Wealth conducted a session on Trend of Economy & Financial Planning drawing attention of financial investors and retirees. The third session began with an address by the founding Member and Chairman, Professional development, CMA Antaryami Acharya about the journey of the Chapter. The Chief Guest of the session CMA Pravakar Mohanty, Former President, ICMAI spoke at length on theme of the session, "Taxation aspect and Challenges before profession". Guest of honour CMA Niranjan Mishra, Former Council Member, ICMAI spoke about the profession and it's challenges. Tax Expert CMA Niranjan Swain, Former SGM (Fin) OPGC also addressed on the problems faced in interpretation of GST by the taxation authorities and the possible remedies thereof. CMA Antaryami Acharya was honoured as Chairman Emeritus of the Chapter. The seminar concluded with felicitation of the meritorious students, former members, teachers, volunteers.

NORTHERN INDIA REGIONAL COUNCIL

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA JAIPUR CHAPTER

The 77th Independence Day was celebrated with zeal and enthusiasm at the Chapter on 15th August 2023. Chairman of the Chapter CMA Harendra Kumar Pareek hoisted the National flag along with Chapter Members, Faculties and staff. Faculty members who had taken IOTP Classes free of charge on virtual mode were felicitated on this occasion. CMA Hirendra Lakhotia who had recently been selected for the post of Asst. Director (Cost) in Indian Cost Accounts Services was also felicitated. The program was conducted jointly by CMA Purnima Goyal, Vice-Chairperson and CMA (Dr.) Deepak Kumar Khandelwal, Secretary.

The Chapter organised an Inaugural ceremony of CMA Foundation, Intermediate and Final Classes on 16th August 2023. The chief guest was Krishna Kant Pathak, IAS, Secretary Finance (Revenue), Govt. of Rajasthan. At the outset Chairman of the Chapter CMA Harendra Kumar Pareek welcomed the chief guest, faculties, members and students. He congratulated the students for selecting this prestigious professional course and wished them bright future. He also advised them to study sincerely and regularly. The Chief Guest shared his experience with the students and gave valuable tips for achieving success in their career. He said that hard work, discipline, regularity and stability are the key to success. On this occasion Treasurer CMA Deeptanshu Pareek, Executive Members CMA Sandeep Chouhan & CMA Govind Sharma, senior members CMA A.K. Shah, CMA S.L. Swami, Sr. faculty Dr. Satish Handa, and Director of Coaching CMA P.D. Agrawal also shared their experiences and motivated the students. The programme was conducted by Vice-Chairperson CMA Purnima Goyal, Secretary CMA (Dr.) Deepak Kumar Khandelwal thanked the chief guest and all the participants.

The Chapter organised a motivational seminar for CMA students on 29th August 2023. The key speaker was CMA Pankaj Bachwani from Dubai. Chairman of the Chapter CMA Harendra Kumar Pareek welcomed the key speaker and apprised the students in detail about various opportunities available after qualifying CMA Final examination. CMA Pankaj Bachwani shared his experiences spanning over more than 12 years in the finance field in various organisations and gave various tips for success in the career. The programme was conducted by CMA

Purnima Goyal. CMA P.D. Agrawal, Director of Coaching thanked the key speakers and all the participants.

The Chapter organised a seminar on 2nd September 2023 on "Stress Management" and "Critical Issues in Income Tax Audit". Chairman of the Chapter CMA Harendra Kumar Pareek, welcomed the key speakers and all the participants. The first technical session was on the topic "Stress Management" where the key speaker Dr. Savita Jagawat, Professor Clinical Psychology, NIMS Hospital explained in detail about the causes and symptoms of stress and how to reduce and control stress. In the second technical session, CMA Tanuj Agrawal, leading Tax Practitioner explained in detail various critical issues in Income Tax Audit. Both the sessions were very interactive. The program was conducted by CMA Purnima Goyal. CMA (Dr.) Deepak Kumar Khandelwal, Secretary of the Chapter thanked the speakers and the participants.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA NAYA NANGAL CHAPTER

The Chapter organized five career awareness programmes in colleges and schools during August and September, 2023. Consent of SGTB Khalsa College Sri Anandpur Sahib for MOU with the Institute and the MOU had been approved by the Institute.

The Institute decided to open a new examination centre at Sri Anandpur Sahib (Punjab) on the pursuance of Chapter.

SOUTHERN INDIA REGIONAL COUNCIL

The oral coaching classes for Certificate in Accounting Technicians (CAT) Course under the Directorate General Resettlement, Department of Ex-Servicemen Welfare (Ministry of Defence, Govt. of India) being organised by the Directorate of CAT, ICMAI from 4th September 2023 to 16th February 2024, commenced at the SIRC premises on 4th February, 2023.

A Memorandum of Understanding was signed on 07.09.2023 between The Institute of Cost Accountants of India, Southern India Regional Council and Jeppiaar Institute of Technology Sriperumbudur, Kanchipuram.

Teachers' day celebrations were held along with the Regional Professional Excellence Seminar on 08.09.2023 at Rani Seethai Hall, Chennai. The guests of honour were Prof. Dr. S. Geethalakshmi, Vice Chancellor, Dr. M.G.R. University and Dr. J. Radhakrishnan, IAS, Additional Chief Secretary & Commissioner, Greater Chennai Corporation. The speakers were CMA Divya Abhishek, Chairperson, SIRC of ICMAI, CMA (Dr.) V. Murali, Council Member, ICMAI & Chairman, Corporate Laws Committee, ICMAI and Dr. CA. Abhishek Murali.

A seven days Industry Oriented Training Program (IOTP) for Final Course pursuing students, who were going to write December 2023 examination was conducted at SIRC Premises from 11.09.2023 to 16.09.2023. The sessions were conducted by well experienced industry experts on various topics like Book-keeping including Bank Reconciliation Statement, Business etiquette, Direct Tax, Career Planning & Interview Skills, Fundamentals of GST, Presentation skill/ Group Presentation, Business Valuation, Finalization of Accounts, Cost Management, Practical Aspects GST and Treasury Management and Statutory Compliance.

A warm welcome was extended to CMA Ashwin G. Dalwadi, President of the Institute for the year 2023 – 2024 by CMA Divya Abhishek, Chairperson, SIRC of ICMAI and CMA (Dr.) V. Murali, Council Member, ICMAI at Chennai Airport on 13.09.2023.

The inauguration of 1st Batch of CAT Course for Defence Personnel under Directorate General Resettlement, Ministry of Defence, Govt. of India being organised by the Directorate of CAT, The Institute of Cost Accountants of India was done on 13.09.2023 at SIRC premises. CMA Rajendra Singh Bhati, Chairman, CAT Committee, ICMAI

gave the welcome address where he encouraged the participants to attend the oral coaching classes regularly. Chief Guest Col. Monesh Kumar Bathre, Director – Recruiting, Ministry of Defence, GOI thanked the Institute for designing this course for JCO/ ORs so as to give them an insight into the civil domain and familiarise them with the financial working environment of the corporate world. After the completion of the course they will be placed suitably. CMA Ashwin G. Dalwadi, President, ICMAI thanked officials of Ministry of Defence for their valuable support provided for the implementation of the CAT Course for retiring/ retired defence personnel as a reskilling and capacity building initiative. CMA Divya Abhishek, Chairperson, SIRC of ICMAI, CMA (Dr.) V. Murali, Council Member, ICMAI, CMA T.C.A. Srinivasa Prasad, Council Member, ICMAI and CMA Rajesh Sai Iyer, RCM, SIRC of ICMAI also graced the inaugural session. CMA Y Srinivasa Rao, RCM, SIRC of ICMAI proposed a Vote of Thanks.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA THRISSUR CHAPTER

The Chapter organized Onam Celebration 2023 on 24th August, 2023 at its premises. The celebration started with Pookkalamatsaram. CMA Vinod T.V, Treasurer welcomed the audience and Chairman CMA Jagadish A D along with Managing Committee Members CMA Narayanan N. and CMA Anshif K.A. inaugurated the function by lighting the lamp. CMA Jagadish A. D. delivered the inaugural address. Chapter members, staff and students participated in various cultural programmes and games, followed by Onasadya.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA HYDERABAD CHAPTER

The 77th Independence Day was celebrated on 15 August, 2023 with the hoisting of the Tricolour at the premises. At Himayatnagar, National flags were carried, in a procession, by committee members, members and staff, to mark this glorious occasion.

On August 18, 2023, the Chapter commenced oral coaching classes for the December 2023 batch, of about 2000 students. CMA (Dr.) K.Ch. A.V.S.N. Murthy, Council Member of the ICMAI, CMA Lavanya K.V.N, Member of the SIRC-ICMAI, and CMA Vijay Kiran Agastya, Member of the SIRC-ICMAI, offered valuable suggestions to the students.

The Chapter organised an online discussion session to solicit feedback on the draft Form 6C for inventory valuation under section 142(2A) of the Income Tax Act of 1961 on August 23, 2023. CMA (Dr.) K.Ch. A.V.S.N. Murthy, Council Member, moderated discussion and summed proceedings of the session.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA VISAKHAPATNAM CHAPTER

The Chapter organized a professional development meet on "GST Assessment, Audit and Inspection Search and Seizure" on 23.09.2023.CMA P. B. Krishnamachary, Practicing Cost Accountant, Chapter Secretary CMA Ramalinga Reddy G. and Chapter members were present during the meet.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA MADURAI CHAPTER

To discuss and to give suggestions on Draft Form 6C, a study circle meeting was conducted by the Chapter on 26.08.2023 at its premises.CMA A. Vijayan and CMA (Dr.) S. Kumararajan jointly analyzed the Form and brought forth many suggestions with regard to Para 6, Item No. 2, 4, 8(7), 8(8), 8(9) and 9(i) of Annexure to Form 6C. CMA A. Vijayan and CMA (Dr.) S. Kumararajan jointly analyzed the said form and proposed modifications on Para 6, Item No. 2, 4, 8(7), 8(8), 8(9) and 9(i) of Annexure to Form 6C. The suggestions brought out in the meeting were forwarded to the Institute for its consideration and inclusion in the consolidated report.

The Chapter conducted a professional development programme on 08.09.2023 at Madurai. CMA TCA Srinivasa Prasad was the chief guest. The meeting was chaired by CMA R.K. Bapulal, Chapter Chairman. The Chairman welcomed the gathering. CMA (Dr.) S. Kumararajan was honored by the Chief Guest for his induction as a member in the Banking, Financial Service & Insurance Board of the Institute. CMA TCA Srinivasa Prasad delivered a special address. CMA R.K. Bapulal spoke on 'Corporate Social Responsibility'. CMA A. Vijayan, Practicing Cost Accountant spoke on 'Practical aspects of Cost Audit - Edible Oil Industry'. The chief guest and the speakers answered the questions raised by the audience. Students who attended the programme expressed the view that such programmes would be helpful for enhancing their knowledge besides helping them to succeed in the examinations. CMA (Dr.) M. Govindarajan proposed the vote of thanks.

A career awareness program on CMA course was organized by the Department of Commerce, Kalasalingam Business School, Kalasalingam Academy of Research and Education (Deemed to be University), Srivilliputhur on 5th September 2023. On behalf of the Chapter, CMA R. Sarath Babu, Chairman, Academic Committee and CMA (Dr.) S. Kumararajan, Member – Academic Committee, attended as speakers. The program was attended by CMA M Govindarajan, Chairman, PD Committee, Faculty of the department and students. Mrs. G Thamaraiselvi, the coordinator, welcomed the gathering. Dr S Karthik, Head-Commerce- KARE informed the students about the programme and introduced the speakers. CMA (Dr.) S. Kumararajan addressed the participants and discussed about the importance of CMA course to the students. Initially the speakers were introduced to Dr. P Ganesan, Dean of the Business School and he requested to participate for special lectures by Chapter Members /Industry professionals.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA COCHIN CHAPTER

The Managing Committee of the Chapter conducted a professional development programme on 11-08-2023 on the topic "Future ready professionals in an era of Generative AI". The session was handled by CMA Anish Shankar.

The Chapter conducted another professional development programme on the topic "Finance Act 2023 - Highlights with major changes and implications". CA P. T. Joy conducted the session.

INDEPENDENCE DAY CELEBRATION

The Chapter members, staff and students assembled at the Cochin Chapter Centre for Excellence building premises on 15 August to commemorate the 77th Independence day Chairman CMA Thomas T. V. hoisted the National Flag and addressed the gathering. He stressed upon the value of sacrifice, hard work, honesty, and character formation.

The Chapter celebrated "ONAM" a national festival of Kerala on 3rd September 2023.

The Chapter's 100th Oral Coaching session was inaugurated on 11th August, 2023 at Hotel Park Central, Kaloor, Cochin. CMA Meena George- Vice Chairperson welcomed the gathering Justice Siri Jagan, Retired Judge and Vice Chancellor of NUALS Inaugurated the function by lighting the lamp and addressing the students. The presidential address was delivered by CMA Thomas T V - Chairman. CMA Renjini R- Secretary, proposed the Vote of Thanks at the close of the inaugural session. After the inauguration CMA Sankar P. Panicker, Past Chairman, SIRC gave an orientation and motivational address to the students. A felicitation programme was also conducted to honous those who cleared the CMA Final examination held in December 2022.

The Chapter conducted various career guidance programmes during August 2023.

WESTERN INDIA REGIONAL COUNCIL

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA AHMEDABAD CHAPTER

The Ahmedabad, Baroda and Trivandrum Chapters jointly organized a CEP Webinar on the need for AI in Fintech on 1st Sept'2023. CMA Malhar Dalwadi, Chairman of PD Committee of Ahmedabad Chapter welcomed the speaker and participants. Key speaker Prof. Kapil Kumar Suri gave a detailed presentation on the subject. The programme was well appreciated by the participants. The Vote of Thanks was proposed by CMA Amruta Vyas, Secretary of Baroda Chapter.

CMA indoor sports tournament 2023 was organized by the Chapter at Kelika Badminton Academy, Nr. Ace Tennis Academy, Ahmedabad on 3rd September'2023. Indoor games like Badminton, Carrom and Chess were organized on the occasion. The event was inaugurated by CMA Sunil Tejwani, Chairman of Sports Committee in the presence of CMA Bhaumik Gajjar, Secretary, CMA Malhar Dalwadi, Immediate Past Chairman of Chapter & PD Committee Chairman, Member, participants and staff members.

The Chapter organized professional and communicative skills enhancement programmes during 11th September'23 to 16th September'23 to develop the communication skills of members and students. Jt. Secretary & Treasurer of Ahmedabad Chapter CMA Mitesh Prajapati inaugurated the programme and gave the welcome address. Eminent faculty members delivered lectures on various topics of communication.

The Chapter organized Sher-O-Shayari, Hindi Kavita & Gazal competition on the occasion of Hindi Diwas on 14/09/2023 in which about 13 students enthusiastically participated. Secretary of Chapter CMA Bhaumik Gajjar, Jt. Secretary & Treasurer, CMA Mitesh Prajapati and Immediate Past Chairman of Chapter CMA Malhar Dalwadi were present at the program.

WIRC, Ahmedabad Chapter and Baroda Chapter jointly organized a CEP webinar on SME Listing – An opportunity for Professionals on 15th September, 2023. The speaker Mr. Chetan Vyas, Regional Manager, SME BD, NSE gave a detailed presentation on the subject. The programme was well appreciated by the participants.

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA PUNE CHAPTER

The chapter jointly with Shree Malhari Martand Devasthan – Jejuri & Dynanyog Seva Trust organised a Blood Donation Camp on 3rd September 2023 at the Chapter, CMA Bhawan, Pune. Shri Chandrakantdada Patil, Cabinet Minister, Ministry of Higher and Technical Education (Maharashtra State) visited the Blood Donation camp at CMA Bhawan and greeted the blood donors. CMA Nagesh Bhagane welcomed & felicitated to the Hon. Minister Shri Chandrakantdada Patil & also gave information about the Institute & the Chapter. Hon. Minister appreciated the Chapter and other Institutions for arranging such important event which is very needful for society in current situation of shortage of blood in various Blood Banks & hospitals. CMA Nagesh Bhagane, Chairman of the Chapter, Mr. Jaydeep Mane Deshmukh, Students' Representative ICMAI-Pune Chapter, Dr.Rajendra Khedekar, Trustee Malhari Martand Devasthan – Jejuri & Chairman Dynanyog Seva Trust, Social worker Mr. Vikas Mane took efforts for success of Blood Donation Camp.

On occasion of birth anniversary of Dr. Sarvapalli Radhakrishnan – Former President of India, the chapter celebrated Teachers Day at Pune CMA Bhawan, and Ness Wadia College of Commerce Coaching Centers.

The chapter jointly with Samarth Bharat arranged a Professional Meet on 13th September, 2023 for the members of ICMAI, ICAI and ICSI. Prof. Bhagwati Prakash Sharma- Well Known Economist was the speaker for the professionals meet. Other dignitaries present on the occasion were CMA Amit A. Apte- Past President of ICMAI, CMA Chaitanya Mohrir- Chairman of WIRC of ICMAI, CMA Nagesh Bhagane-Chairman of ICMAI-Pune Chapter, CA Rajesh Agarwal- Chairman of Pune Branch of ICAI, CS Vishal Patil- Chairman of Pune Chapter of ICSI, Shri Mangesh Ghatpande-Patron of Samarth Bharat and Office bearers of all three Institutes. CMA Rahul Chincholkar, Treasurer of the Chapter welcomed the members of all three institutes.CMA Nagesh Bhagane, Chairman of ICMAI-Pune Chapter introduced the speaker, Prof. Bhagwati Prakash Sharma for the Professional Meet. CMA Amit A. Apte, Past President of ICMAI felicitated Speaker Prof. Bhagwati Prakash Sharma.CMA Nagesh Bhagane, Chairman of the Chapter felicitated CA Rajesh Agarwal- Chairman of Pune Branch of ICAI, CS Vishal Patil- Chairman of Pune Chapter of ICSI and Shri Mangesh Ghatpande-Patron of Samarth Bharat. Prof. Bhagwati Prakash Sharma guided members of all three Institute ICMAI, ICAI & ICSI how they guide Industries on Consortium and how it will help to boost Indian Economy. The lead taken by the Chapter for arranging the joint program was very much appreciated. Vote of Thanks was given by CMA Chaitanya Mohrir, Chairman of WIRC of ICMAI.

Direct & Indirect Tax Updates - September 2023

DIRECT TAXES

- **Notification No. 74 /2023 Dated 1st September 2023**: In exercise of the powers conferred by clause (46) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies for the purposes of the said clause, 'Rajasthan State Dental Council' (PAN AABAR7223E), a body constituted by the Government of Rajasthan, in respect of the following specified income arising to that body: a) sale of application form b) renewal fees of Dentist, Dental Hygienist & Mechanic c) fees of good standing d) Dentist provisional registration fees e) Additional qualification fees f) late fees g) no objection certificate fees h) re-issue of certificate fees (duplicate certificate fees) i) Continuing Dental Education Programme fees and j) interest income on (a) to (i)

  This notification shall be effective subject to the conditions that Rajasthan State Dental Council, Jaipur: (a) shall not engage in any commercial activity (b) activities and the nature of the specified income shall remain unchanged throughout the financial years; and (c) shall file return of income in accordance with the provision of clause (g) of sub-section (4C) of section 139 of the Income-tax Act, 1961.

- **Notification No. 75 /2023 Dated 1st September 2023:** In exercise of the powers conferred by clause (46) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies for the purposes of the said clause, 'E-Governance Society, Department of Food, Civil Supplies and Consumer Affairs, Himachal Pradesh, a body constituted / established by the state Government of Himachal Pradesh in respect of the following specified income arising to that body, namely: a) Grant received from central government b) Grants received from state government c) Interest received on investment and grants d) Tender/ application fees e) Sale of scrap/waster paper and f) Recovery for POS machine issued.

  This notification shall be effective subject to the conditions that E-Governance Society, Department of Food, Civil Supplies and Consumer Affairs, Himachal Pradesh,- (a) shall not engage in any commercial activity (b) activities and the nature of the specified income shall remain unchanged throughout the financial years and (c) shall file return of income in accordance with the provision of clause (g) of sub-section (4C) of section 139 of the Income-tax Act, 1961.

- **Notification No. 76 /2023 Dated 1st September 2023:** In exercise of the powers conferred by clause (46) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies for the purposes of the said clause, 'Real Estate Regulatory Authorities' as specified in the schedule to this notification, constituted by Government in exercise of powers conferred under sub-section(1) of Section 20 of The Real Estate (Regulation and Development) Act, 2016 (16 of 2016) as a 'class of Authority' in respect of the following specified income arising to that Authority, namely: (a) Amount received as Grant-in-aid or loan/advance from Government (b) Fee/penalty received from builders/developers, agents or any other stakeholders as per the provisions of the Real Estate (Regulation and Development) Act, 2016 (c) Interest earned on (a) & (b) above.

  This notification shall be effective subject to the conditions that each of the Real Estate Regulatory Authority- (a) shall not engage in any commercial activity (b) activities and the nature of the specified income shall remain unchanged throughout the financial years and (c) shall file return of income in accordance with the provision of clause (g) of sub-section (4C) of section 139 of the Income-tax Act, 1961.

- **Notification No. 71 /2023 Dated 12th September 2023:** In exercise of the powers conferred by sub-clause (d) of clause (viiab) of section 47 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby makes the following further amendments in the notification of the Government of India, Ministry of Finance, (Department of Revenue), number 16/2020, dated the 5 th March, 2020, published in the Gazette of India, Extraordinary, Part-II, Section 3, sub-section (ii), vide number S.O. 986(E), dated 5th March, 2020. In the said notification, in the first paragraph,

  (i) after clause (vi), the following clause shall be inserted, namely: "(vii) unit of investment trust (viii) unit of a scheme (ix) unit of a Exchange Traded Fund launched under International Financial Services Centres Authority (Fund Management) Regulations, 2022.

  (ii) in the Explanation, after clause (c), the following clause shall be inserted, namely: "(d) "Investment Trust" shall have the meaning assigned to it in clause (d) of sub-regulation (1) of regulation 83 of the International Financial Services Centres Authority (Fund Management) Regulations, 2022. (e) "Scheme" shall have the meaning assigned to it in clause (ii) of sub-regulation (1) of regulation 2 of the International Financial Services Centres Authority (Fund Management) Regulations, 2022."

- **Notification No. 77 /2023 Dated 12th September 2023:** In exercise of the powers conferred by sub-section (23EC) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby specifies the Multi Commodity Exchange Investor (Client) Protection Fund Trust set up by Multi Commodity Exchange of India Limited, Mumbai for the purposes of the said clause for the assessment year 2014-15.

- **Notification No. 78 /2023 Dated 19th September 2023:** In exercise of the powers conferred by clause (46) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies for the purposes of the said clause, 'Uttar Pradesh Expressways Industrial Development Authority' (PAN AAALU0121E), an Authority constituted by the State government of Uttar Pradesh, in respect of the following specified income arising to that Authority, namely: (a) grants received from the state gov-

ernment (b) moneys received from the disposal of land, building and other properties, movable and immovable (c) moneys received by way of rent & fees or any other charges from the disposal of land, building and other properties, movable and immovable (d) Income earned from Tender Fees, Document Fees, License Fees and (e) Interest earned on funds deposited in the banks and on (a) to (d) above.

This notification shall be effective subject to Uttar Pradesh Expressways Industrial Development Authority: (a) shall not engage in any commercial activity (b) activities and the nature of the specified income shall remain unchanged throughout the financial years and (c) shall file return of income in accordance with the provision of clause (g) of sub-section (4C) of section 139 of the Income-tax Act, 1961.

- **Notification No. 79 /2023 Dated 22nd September 2023:** In exercise of the powers conferred by section 43D of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies the following classes of non-banking financial companies (NBFCs), for the purpose of the said section, namely: (a) all NBFCs classified in the Top Layer (b) all NBFCs classified in the Upper Layer (c) all NBFCs classified in the Middle Layer.
- **Notification No. 80 /2023 Dated 22nd September 2023:** In exercise of the powers conferred by clause (da) of section 43B of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies the following classes of non-banking financial companies (NBFCs), for the purpose of the said clause, namely: (a) all NBFCs classified in the Top Layer (b) all NBFCs classified in the Upper Layer (c) all NBFCs classified in the Middle Layer.
- **Notification No. 81 /2023 Dated 25th September 2023:** In exercise of the powers conferred by sub-clause (i) of clause (a) of the Explanation to clause (viib) of sub-section (2) of section 56 read with section 295 of the Income-tax Act, 1961 (43 of 1961), the Central Board of Direct Taxes hereby makes the following rules further to amend the Income-tax Rules, 1962. In the Income-tax Rules, 1962, in rule 11UA, for sub-rule (2), the following sub-rules shall be substituted: the fair market value of unquoted equity shares for the purposes of sub-clause (i) of clause (a) of the Explanation to clause (viib) of sub-section (2) of section 56 shall be the value, on the valuation date, of such unquoted equity shares, as shall be determined under sub-clause (a), sub-clause (b), sub-clause (c) or subclause (e), at the option of the assessee, where the consideration received by the assessee is from a resident ; and under sub-clauses (a) to (e) at the option of the assessee, where the consideration received by the assessee is from a non-resident, in the following manner:

  the fair market value of unquoted equity shares = (A–L)× [PV/PE], where

  A= book value of the assets in the balance-sheet as reduced by any amount of tax paid

  L= book value of liabilities shown in the balance-sheet

  PE = total amount of paid up equity share capital as shown in the balance-sheet

  PV = the paid up value of such equity shares
- **Notification No. 82 /2023 Dated 27th September 2023:** In exercise of the powers conferred by sub-section (2A) of section 142 read with section 295 of the Income-tax Act, 1961 (hereinafter referred to as the Act), the Central Board of Direct Taxes hereby makes the following rules further to amend the Income-tax Rules, 1962. In the Income-tax Rules, 1962 (hereinafter referred to as the principal rules), for rule 14A, the following rule shall be substituted: Forms for report of audit or inventory valuation under section 142(2A):

  (1) The report of audit of the accounts of an assessee which is required to be furnished under clause (i) of sub-section (2A) of section 142 shall be in Form No. 6B. (2) The report of inventory valuation of an assessee which is required to be furnished under clause (ii) of sub-section (2A) of section 142 shall be in Form No. 6D.

  Guidelines for the purposes of determining expenses for audit or inventory valuation: (1) Every Chief Commissioner shall for the purposes of clause (i) and clause (ii) of sub-section (2A) of section 142 shall maintain a panel of (i) accountants, out of the persons referred to in the Explanation to sub-section (2) of section 288; and (ii) cost accountants, out of the persons referred to in the Explanation to section 142.
- **Notification No. 83 /2023 Dated 29th September 2023:** In exercise of the powers conferred by sub-section (5) of section 115BAE, read with section 295 of the Income-tax Act, 1961 (43 of 1961), the Central Board of Direct Taxes hereby makes the following rules further to amend the Income-tax Rules, 1962. 21AHA Exercise of option under sub-section (5) of section 115BAE shall be inserted. The option to be exercised in accordance with the provisions of sub-section (5) of section 115BAE by a person, being a co-operative society resident in India, for any previous year relevant to the assessment year beginning on or after the 1st day of April, 2024, shall be in Form No. 10-IFA.
- **Notification No. 84 /2023 Dated 29th September 2023:** In exercise of the powers conferred by clause (46) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies for the purposes of the said clause, 'Punjab Nurses Registration Council' (PAN: AAABR0094H), a council constituted by the Government of Punjab, in respect of the following income arising to the Council, namely: (a) Fees from Nursing students and affiliated nursing institutions and (b) Interest earned on funds deposited in banks including fixed deposits.

  The provisions of this notification shall be effective subject to the conditions that Punjab Nurses Registration Council - (a) shall not engage in any commercial activity (b) activities and the nature of the specified income remain unchanged throughout the financial years and (c) shall file returns of income in accordance with the provision of clause (g) of sub-section (4C) of section 139 of the Income-tax Act, 1961.
- **Notification No. 85 /2023 Dated 29th September 2023:**

In exercise of the powers conferred by clause (46) of section 10 of the Income-tax Act, 1961 (43 of 1961), the Central Government hereby notifies for the purposes of the said clause, 'National Farmers Welfare Program Implementation Society', (PAN: AAAGN0886J), a society established by Central Government, in respect of the following specified income arising to that Society, namely: (a) Government Grant (b) Miscellaneous receipts from RTI, Tender Fee, Fines & Penalties and sale of obsolete items and (c) Interest on deposits.

This notification shall be effective subject to the conditions that 'National Farmers Welfare Program Implementation Society' (a) shall not engage in any commercial activity (b) activities and the nature of the specified income shall remain unchanged throughout the financial years and (c) shall file return of income in accordance with the provision of clause (g) of sub-section (4C) of section 139 of the Income-tax Act, 1961.

- **Circular No. 16 /2023 Dated 18th September 2023:** Extension of time line for filling of Form No 10B/10BB and Form ITR 7 for AY 2023-24. The due date of furnishing Audit Report under clause (b) of 10th provisio to clause (23C) of Section 10 and sub clause (ii) of clause (b) of sub section (1) of section 12A of I.T Act 1961 in case of a fund or trust or institution or any university or other educational institution or any hospital or other medical institution in Form 10B/Form 10BB for the previous year 2022-23 which is 30th September 2023 is hereby extended to 31st October 2023.

  The due date of furnishing of Return of Income in Form ITR 7 for the AY 2023-24 in case of assesses referred to in clause (a) of explanation 2 to sub section (1) of section 139 of the Act which is 31st October 2023 is hereby extended to 30th November 2023.

INDIRECT TAXES

GST

- **NOTIFICATION No. 45/2023 – Central Tax Dated 6th September 2023:** In the Central Goods and Services Tax Rules, 2017, after rule 31A, the following rules shall be inserted:

  31B. Value of supply in case of online gaming including online money gaming: Notwithstanding anything contained in this chapter, the value of supply of online gaming, including supply of actionable claims involved in online money gaming, shall be the total amount paid or payable to or deposited with the supplier by way of money or money's worth, including virtual digital assets, by or on behalf of the player: Provided that any amount returned or refunded by the supplier to the player for any reasons whatsoever, including player not using the amount paid or deposited with the supplier for participating in any event, shall not be deductible from the value of supply of online money gaming.

  31C. Value of supply of actionable claims in case of casino: Notwithstanding anything contained in this chapter, the value of supply of actionable claims in casino shall be the total amount paid or payable by or on behalf of the player for (i) purchase of the tokens, chips, coins or tickets, by whatever name called, for use in casino; or (ii) participating in any event, including game, scheme, competition or any other activity or process, in the casino, in cases where the token, chips, coins or tickets, by whatever name called, are not required: Provided that any amount returned or refunded by the casino to the player on return of token, coins, chips, or tickets, as the case may be, or otherwise, shall not be deductible from the value of the supply of actionable claims in casino.

- **NOTIFICATION No. 46/2023 – Central Tax Dated 18th September 2023:** Seeks to appoint common adjudicating authority in respect of show cause notice issued in favour of M/s Inkuat Infrasol Pvt. Ltd.

- **NOTIFICATION No. 47/2023 – Central Tax Dated 25th September 2023:** In exercise of the powers conferred by section 148 of the Central Goods and Services Tax Act,2017 (12 of 2017) (hereinafter referred to as the said Act), the Central Government, on the recommendations of the Council, hereby makes the following amendments in the notification of the Government of India in the Ministry of Finance (Department of Revenue) No. 30/2023-Central Tax, dated the 31st July, 2023, published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (ii) vide number S.O. 3424(E), dated the 31st July, 2023. In the said notification, after the words " hereby notifies the following special procedure to be followed" the words and figures " with effect from 1st day of January 2024" shall be inserted and shall be deemed to have been inserted with effect from the 31st July 2023.

- **NOTIFICATION No. 48/2023 – Central Tax Dated 29th September 2023:** In exercise of the powers conferred by sub-section (2) of section 1 of the Central Goods and Services Tax (Amendment) Act, 2023 (30 of 2023), the Central Government hereby appoints the 1st day of October, 2023, as the date on which the provisions of the said Act, shall come into force.

- **NOTIFICATION No. 49/2023 – Central Tax Dated 29th September 2023:** In exercise of the powers conferred under sub-section (5) of section 15 of the Central Goods and Services Tax Act, 2017(12 of 2017), the Government, on the recommendations of the Council, notifies the following supplies under the said sub-section: (i)supply of online money gaming (ii)supply of online gaming, other than online money gaming and (iii) supply of actionable claims in casinos. This notification shall come into force on the1st day of October, 2023.

- **NOTIFICATION No. 50/2023 – Central Tax Dated 29th September 2023:** In exercise of the powers conferred by section 148 of the Central Goods and Services Tax Act, 2017 (12 of 2017) (hereinafter in this notification referred to as the said Act), the Central Government, on the recommendations of the Council, hereby makes the following amendment in the notification of the Government of India in the Ministry of Finance

(Department of Revenue) No. 66/2017-Central Tax, dated the 15thNovember, 2017, published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i),vide number G.S.R. 1422(E), dated the 15th November, 2017. In the said notification, with effect from the 1st October, 2023, after the words and figures "composition levy under section 10 of the said Act", the words and figures ", other than the registered person making supply of specified actionable claims as defined in clause (102A) of section 2 of the said Act," shall be inserted.

- **NOTIFICATION No. 51/2023 – Central Tax Dated 29th September 2023:** Seeks to make amendments (Third Amendment, 2023) to the CGST Rules, 2017 in supersession of Notification No. 45/2023 dated 06.09.2023.

CENTRAL EXCISE

- **Notification No. 28/2023-Central Excise Dated 1st September 2023:** Seeks to amend No. 18/2022-Central Excise, dated the 19th July, 2022 to reduce the Special Additional Excise Duty on production of Petroleum Crude and increase the Special Additional Excise Duty on export of ATF.
- **Notification No. 29/2023-Central Excise Dated 1st September 2023:** Seeks to further amend No. 04/2022-Central Excise, dated the 30th June, 2022 , to increase the Special Additional Excise Duty on export of Diesel.
- **Notification No. 30/2023-Central Excise Dated 15th September 2023:** Seeks to amend No. 18/2022-Central Excise, dated the 19th July, 2022 to increase the Special Additional Excise Duty on production of Petroleum Crude and reduce the Special Additional Excise Duty on export of ATF.
- **Notification No. 31/2023-Central Excise Dated 15th September 2023:** In exercise of the powers conferred by section 5A of the Central Excise Act,1944 (1 of 1944) read with section 147 of Finance Act, 2002 (20 of 2002), the Central Government, on being satisfied that it is necessary in the public interest so to do, hereby makes the following further amendments in the notification of the Government of India in the Ministry of Finance (Department of Revenue),No.04/2022-Central Excise, date the 30th June,2022, published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i),vide number G.S.R.492(E),-dated the 30thJune, 2022. In the said notification, in the Table,-(i) against S.No.2, for the entry in column (4),the entry"Rs.5.50 per litre" shall be substituted. This notification shall come into force on the 16th day of September, 2023.
- **Notification No. 32/2023-Central Excise Dated 15th September 2023:** Seeks to amend No. 18/2022-Central Excise, dated the 19th July, 2022 to increase the Special Additional Excise Duty on production of Petroleum Crude and reduce the Special Additional Excise Duty on export of ATF.
- **Notification No. 33/2023-Central Excise Dated 15th September 2023:** Seeks to further amend No. 04/2022-Central Excise, dated the 30th June, 2022 , to reduce the Special Additional Excise Duty on export of Diesel.

CUSTOMS

- **Notification No. 52/2023-Customs Dated 5th September 2023:** Seeks to amend notification No. 50/2017 -Customs dated 30.06.2017 in order to modify Customs duty exemption provided to textile machineries.
- **Notification No. 53/2023-Customs Dated 5th September 2023:** Seeks to amend No. 50/2017-Customs, dated the 30th June, 2017 February, 2021 in order to revise effecive duty for certain products.
- **Notification No. 54/2023-Customs Dated 14th September 2023:** Seeks to amend notification no. 50/2017-Customs in order to amend various entries relating to Project Imports as a result of Project Import review.
- **Notification No. 55/2023-Customs Dated 14th September 2023:** Seeks to amend notification no 11/2022-Customs and 12/2022-Customs in order to amend entries relating to Phased Manufacturing Programmer for wearables and hearable.
- **Notification No. 56/2023-Customs Dated 15th September 2023:** Seeks to amend No. 19/2019-Customs. In the said notification, in the Table, for Sl. No. 23 and the entries relating thereto, the following Sl. No. and entries shall be substituted,

23	49,73,84,85,90or 93	(I) Parts, sub-parts, inputs for use in manufacture of AK-203 rifle; (II) Machinery, Fixtures, Gauges, Tools, and Jigs for goods mentioned at (I)above;(III) Technical documentation in respect of goods mentioned at (I) and (II) above

- **Notification No. 57/2023-Customs Dated 29th September 2023:** Seeks to amend notification No. 55/2022-Customs dated 31.10.2022, in order to provide export duty exemption on exports of Bangalore Rose Onion.
- **Circular No. 21/2023-Customs Dated 14th September 2023:** Norms for posting of officers and benchmark performance criteria while granting exemption from payment of Cost Recovery Charges (CRC) at Air Freight Stations.
- **Circular No. 22/2023-Customs Dated 19th September 2023:** Circular No. 22/2023-Customs- Implementation of Ex-Bond Shipping Bill in ICES 1.5.
- **Circular No. 23/2023-Customs Dated 30th September 2023:** Mandatory additional qualifiers in import/export declarations in respect of certain products.
- **Circular No. 24/2023-Customs Dated 30th September 2023:** Implementation of Section 16 4 of IGST Act related to restriction on export of certain goods on payment of IGST and coverage under refund mechanism. MA

Sources: ***incometax.gov.in, cbic.gov.in***

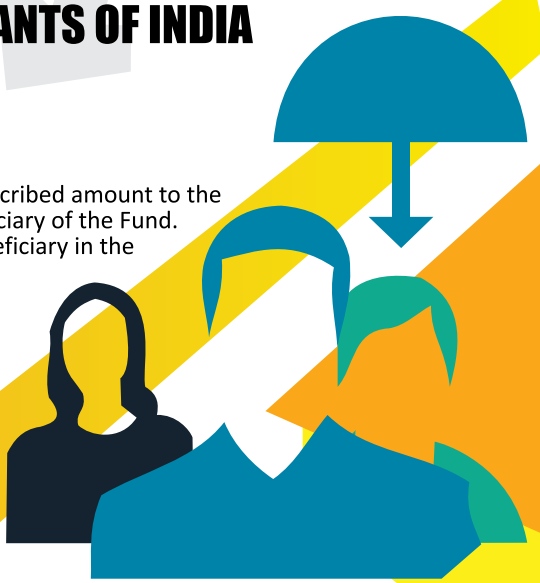
Benevolent Fund

FOR THE MEMBERS OF THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

CMA Bhawan, 12 Sudder Street, Kolkata - 700016

OBJECTIVE

The Fund has been created to provide outright grant of prescribed amount to the member in the event of critical illness of a member / beneficiary of the Fund. It is also for outright grant of prescribed amount to the beneficiary in the event of death of a member of the Fund.



LIFE MEMBERSHIP FEE

Onetime payment of ₹7500/-

BENEFITS

- ***Income Tax Benefit under section 80G***
- ***Outright grant not exceeding ₹3,00,000.00/- in each case to the beneficiary in the event of death of the member.***
- ***Outright grant not exceeding ₹1,50,000.00/- in each case to the member and beneficiary for critical illness duly certified by the doctor under whom the treatment is continuing.***

Coverage of Critical Illness, leading to hospitalization, may cover the following -

- Cancer / Malignancy
- Coronary Artery Bypass Graft Surgery
- Stroke / Cerebral Attack / Paralysis
- Heart Valve Replacement Surgery
- Myocardial Infarction (heart attack) / Heart Failure / Pace Maker Surgery / Kidney Dialysis(CKD)/ Renal Failure
- Major Organ Transplant
- Hemophilia
- Thalassaemia
- Neurological Diseases
- Flue Blown acquired Immune Deficiency Syndrome
- Multiple sclerosis
- Tuberculosis / Bronchopneumonia/ Pleurisy
- Permanent disablement
- Any other disease that may be considered by the Board of Trustees to be critical in nature.

To apply for life membership or for further details please visit
https://eicmai.in/External/Home.aspx#

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

(STATUTORY BODY UNDER AN ACT OF PARLIAMENT)

TIME TABLE & PROGRAMME– DECEMBER 2023

FOUNDATION COURSE EXAMINATION

(Multiple Choice Questions through offline OMR based from Centre)

Day & Date	Foundation Course Examination Syllabus-2016	
	Time 10.00 A.M. to 12.00 Noon. Paper – 1 & 2 (200 Marks)	**Time 2.00 P.M. to 4.00 P.M. Paper – 3 & 4 (200 Marks)**
Sunday, 17th December, 2023	**Paper – 1 :** Fundamentals of Economics & Management (100 Marks 50 Multiple Choice Questions) **Paper – 2 :** Fundamentals of Accounting (100 Marks 50 Multiple Choice Questions)	**Paper – 3 :** Fundamentals of Laws & Ethics (100 Marks 50 Multiple Choice Questions) **Paper – 4 :** Fundamentals of Business Mathematics & Statistics (100 Marks 50 Multiple Choice Questions)
	Foundation Course Examination Syllabus-2022	
	Time 10.00 A.M. to 12.00 Noon. Paper – 1 & 2 (200 Marks)	**Time 2.00 P.M. to 4.00 P.M. Paper – 3 & 4 (200 Marks)**
	Paper – 1 : Fundamentals of Business Laws and Business Communication (100 Marks 50 Multiple Choice Questions) **Paper – 2 :** Fundamentals of Financial and Cost Accounting (100 Marks 50 Multiple Choice Questions)	**Paper – 3 :** Fundamentals of Business Mathematics and Statistics (100 Marks 50 Multiple Choice Questions) **Paper – 4 :** Fundamentals of Business Economics and Management (100 Marks 50 Multiple Choice Questions)

The Institute has decided to conduct December 2023 Foundation Examination through offline OMR centre based.

Examination Fees

Foundation Course Examination	Inland Candidate	`1200/-
	Overseas Candidate	US $ 60

1. Application Forms for Foundation Examination has to be filled up through online and fees will be accepted through online mode (including Payfee Module of IDBI Bank).
2. STUDENTS FROM OVERSEAS HAVE TO APPLY OFFLINE AND SEND DD ALONG WITH THE FORM.
3. (a) Students can login to the website www.icmai.in and apply online through payment gateway by using Credit/Debit card or Net banking.
   (b) Students can also pay their requisite fee through pay-fee module of IDBI Bank.
4. **Last date for receipt of Examination Application Forms is 17th October, 2023. There will be no extension in the last date of receipt of examination application forms for December 2023 examination.**
5. **The Foundation Examination will be conducted in M.C.Q Mode through offline OMR based from Centre.**
6. **Each paper will carry 100 marks 50 Multiple Choice Questions (Each Question will carry 2 Marks). Each session will have a total of 100 Multiple Choice Questions of 200 marks.**
7. **All Candidates/students are to appear in the Foundation examination through offline OMR centre based.**
8. **A candidate/student who is completing all conditions for appearing in the examination as per Regulations will only be allowed to appear for the examination.**
9. **There is no negative marking.**
10. **Detailed instructions will be provided along with Admit Card.**
11. **Examination Centres: Adipur-Kachchh (Gujarat), Agartala, Agra, Ahmedabad, Akurdi, Allahabad, Angul Talcher, Asansol, Aurangabad, Bangalore, Bankura, Baroda, Berhampur – Ganjam (Odisha), Bharuch Ankleshwar, Bhilai, Bhilwara, Bhopal, Bewar City(Rajasthan), Bhubaneswar, Bilaspur, Bikaner (Rajasthan), Bokaro, Calicut, Chandigarh, Chennai, Coimbatore, Cuttack, Dindigul, Dehradun, Delhi, Dhanbad, Duliajan (Assam), Durgapur, Ernakulam, Erode, Faridabad, Gaya, Ghaziabad, Guntur, Gurgaon, Guwahati, Haridwar, Hazaribagh, Hosur, Howrah, Hyderabad, Indore, Jaipur, Jabalpur, Jalandhar, Jammu, Jamshedpur, Jodhpur, Kalyan, Kannur, Kanpur, Kanchipuram, Kolhapur, Kolkata, Kollam, Kota, Kottakkal (Malappuram), Kottayam, Lucknow, Ludhiana, Madurai, Mangalore, Meerut, Mumbai, Mysore, Nagpur, Naihati, Nasik, Nellore, Neyveli, Noida, Palakkad, Palghar, Panaji (Goa), Patiala, Patna, Pondicherry, Port Blair, Pune, Raipur, Rajahmundry, Ranchi, Rourkela, Salem, Sambalpur, Serampore, Shillong, Shimla, Siliguri, Singrauli (Vindhyanagar), Solapur, Srinagar, Surat, Thrissur, Tiruchirapalli, Tirunelveli, Tirupati, Trivandrum, Udaipur, Vapi, Vashi, Vellore, Vijayawada, Visakhapatnam and Overseas Centres at Bahrain, Dubai and Muscat.**
12. **Date of publication of result: To be announced in due course.**

* The Candidates/students are advised to keep regularly in touch with the website of the Institute for further notifications and announcements relating to Foundation Examination of December 2023 and in case of any query or clarification can e-mail us at- exam.helpdesk@icmai.in

CMA Dr. Kaushik Banerjee
Secretary

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA
(STATUTORY BODY UNDER AN ACT OF PARLIAMENT)

INTERMEDIATE AND FINAL EXAMINATION TIME TABLE & PROGRAMME – DECEMBER 2023

ATTENTION: INTERMEDIATE & FINAL EXAMINATION (DECEMBER – 2023 TERM) WILL BE HELD ON ALTERNATE DATES FOR EACH GROUP.

Day & Date	FINAL (Time: 10.00 A.M. to 01.00 P.M.)		INTERMEDIATE (Time: 2.00 P.M. to 05.00 P.M.)	
	PROGRAMME FOR SYLLABUS 2016	**PROGRAMME FOR SYLLABUS 2022**	**PROGRAMME FOR SYLLABUS 2016**	**PROGRAMME FOR SYLLABUS 2022**
Sunday, 10th December, 2023	Corporate Laws & Compliance **(P-13)**	Corporate and Economic Laws **(P-13)**	Financial Accounting **(P-05)**	Business Laws and Ethics **(P-05)**
Monday, 11th December, 2023	Corporate Financial Reporting **(P-17)**	Cost and Management Audit **(P-17)**	Operations Management & Strategic Management **(P-09)**	Operations Management and Strategic Management **(P-09)**
Tuesday, 12th December, 2023	Strategic Financial Management **(P-14)**	Strategic Financial Management **(P-14)**	Laws & Ethics **(P-06)**	Financial Accounting **(P-06)**
Wednesday, 13th December, 2023	Indirect Tax Laws & Practice **(P-18)**	Corporate Financial Reporting **(P-18)**	Cost & Management Accounting and Financial Management **(P-10)**	Corporate Accounting and Auditing **(P-10)**
Thursday, 14th December, 2023	Strategic Cost Management – Decision Making **(P-15)**	Direct Tax Laws and International Taxation **(P-15)**	Direct Taxation **(P-07)**	Direct and Indirect Taxation **(P-07)**
Friday, 15th December, 2023	Cost & Management Audit **(P-19)**	Indirect Tax Laws and Practice **(P-19)**	Indirect Taxation **(P-11)**	Financial Management and Business Data Analytics **(P-11)**
Saturday, 16th December, 2023	Direct Tax Laws and International Taxation **(P-16)**	Strategic Cost Management **(P-16)**	Cost Accounting **(P-08)**	Cost Accounting **(P-08)**
Sunday, 17th December, 2023	Strategic Performance Management and Business Valuation **(P-20)**	**Electives (Any one of three Papers) :** (i) Strategic Performance Management and Business Valuation **(P-20A)** (ii) Risk Management in Banking and Insurance **(P-20B)** (iii) Entrepreneurship and Start up **(P-20C)**	Company Accounts & Audit **(P-12)**	Management Accounting **(P-12)**

Group (s)		Final Examination	Intermediate Examination
One Group	(Inland Centres)	`1400/-	`1200/-
	(Overseas Centres)	US $ 100	US $ 90
Two Groups	(Inland Centres)	`2800/-	`2400/-
	(Overseas Centres)	US $ 100	US $ 90

1. **Application Forms for Intermediate and Final Examination has to be filled up through online only and fees will be accepted through online mode only (including Payfee Module of IDBI Bank). No Offline form and DD payment will be accepted for domestic candidate.**
2. **STUDENTS OPTING FOR OVERSEAS CENTRES HAVE TO APPLY OFFLINE AND SEND DD ALONGWITH THE FORM.**
3. **(a) Students can login to the website www.icmai.in and apply online through payment gateway by using Credit/Debit card or Net banking.**
   (b) Students can also pay their requisite fee through pay-fee module of IDBI Bank.
4. **Last date for receipt of Examination Application Forms is 10th October, 2023. There will be no extension in the last date of receipt of examination application forms for December 2023 examination.**
5. **The mode of examination will be offline-centre based.**
6. **Candidates are required to follow clarifications of DOS related to December 2023 term of examination and the same will be issued by DOS in due course.**
7. **Examination Centres: Adipur-Kachchh (Gujarat), Agartala, Agra, Ahmedabad, Akurdi, Allahabad, Angul Talcher, Asansol, Aurangabad, Bangalore, Bankura, Baroda, Berhampur – Ganjam (Odisha), Bharuch Ankleshwar, Bhilai, Bhilwara, Bhopal, Bewar City(Rajasthan), Bhubaneswar, Bilaspur, Bikaner (Rajasthan), Bokaro, Calicut, Chandigarh, Chennai, Coimbatore, Cuttack, Dindigul, Dehradun, Delhi, Dhanbad, Duliajan (Assam), Durgapur, Ernakulam, Erode, Faridabad, Gaya, Ghaziabad, Guntur, Gurgaon, Guwahati, Haridwar, Hazaribagh, Hosur, Howrah, Hyderabad, Indore, Jaipur, Jabalpur, Jalandhar, Jammu, Jamshedpur, Jodhpur, Kalyan, Kannur, Kanpur, Kanchipuram, Kolhapur, Kolkata, Kollam, Kota, Kottakkal (Malappuram), Kottayam, Lucknow, Ludhiana, Madurai, Mangalore, Meerut, Mumbai, Mysore, Nagpur, Naihati, Nasik, Nellore, Neyveli, Noida, Palakkad, Palghar, Panaji (Goa), Patiala, Patna, Pondicherry, Port Blair, Pune, Raipur, Rajahmundry, Ranchi, Rourkela, Salem, Sambalpur, Serampore, Shillong, Shimla, Siliguri, Singrauli (Vindhyanagar), Solapur, Srinagar, Surat, Thrissur, Tiruchirapalli, Tirunelveli, Tirupati, Trivandrum, Udaipur, Vapi, Vashi, Vellore, Vijayawada, Visakhapatnam and Overseas Centres at Bahrain, Dubai and Muscat.**
8. **A candidate who is fulfilling all conditions specified for appearing in examination will only be allowed to appear for examination.**
9. **Date of publication of result: Inter & Final examination latest by 21st February, 2024.**

*** The candidates/students are advised to keep regularly in touch with the website of the Institute for further notifications and announcements relating to Examination of December 2023 and in case of any query or clarification can e-mail us only at exam.helpdesk@icmai.in**

CMA Dr. Kaushik Banerjee
Secretary

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