



FOSET NEWSLETTER

FORUM OF SCIENTISTS, ENGINEERS & TECHNOLOGISTS

35th Annual General Meeting of FOSET

The 35th Annual General Meeting (AGM) of Forum of Scientists, Engineers and Technologists (FOSET) was held at **Paranchak Shiksha Niketan (H.S), Haldia** on **27th November, 2022**.

The AGM was preceded by a Seminar on **Climate Change, Energy Transition and Employment Opportunity Change** on **27th November, 2021** at the same venue. **Sri Shayamal Gon**, Vice President, FOSET Chaired the seminar. **Sri. Somnath Dutta**, Vice President & Plant Head, Haldia Energy Limited, **Sri. Prasad**, Head Safety & Security, Haldia Refinery, Indian Oil Corporation Limited, **Sri. Joy Chakraborty**, SE, West Bengal Renewable Energy Development Agency (WBREDA) were the speakers in the seminar. Vote of thanks was given by **Sri. Satyajit Ganguli**, CSR, Haldia Energy Limited. The seminar was attended by nearly 120 participants, which includes 50 School Students. 25 School Teachers were present in the seminar. Delegates from State Center of FOSET, Hooghly Sub-Center, Barrackpore Sub-Center and Haldia Sub-Center of FOSET were present in the seminar. Delegates from Fraternal Organizations attended the seminar also.

110 delegates participated in the 35th AGM. Delegates from State Center of FOSET, Hooghly Sub-Center, Barrackpore Sub-Center and Haldia Sub-Center of FOSET were present in the AGM. Delegates from Fraternal Organizations were also present in the AGM. Four members Presidium with Sri Shayamal Gon, Sri Anadi Sankar Basu, Sri Santanu Sengupta and Sri Subrata Ghosh conducted the AGM. They were assisted by the five members Steering Committee of Dr. Ashik Paul, Sri Prabhat Kumar Bera, Sri Debasish Kundu, Dr. Shyam Kishore Mondal and Dr. Nachiketa Das.

Sri Pabitra Das of Hooghly sub-centre delivered welcome address. The condolence note was read by **Sri Debasish Kundu**. FOSET expressed deepest sympathy and unwavering support to all who have lost their lives since the last AGM and will be in the thoughts in the years to come. The house observed silence in the memory of the deceased. The house observed silence in the memory of the deceased.

The inaugural speech was delivered **Sri. Subrata Ghosh**, Chief Engineer, West Bengal Pollution Control Board. He narrated the aims and objective of FOSET and dealt in details about the various efforts being undertaken to mitigate effects of climate change and its impact in socio economic scenario. He commended various precautionary

measures being implemented by the industrial establishments in and around Haldia to restrict such effects of pollution and the CSR activities of various industrial units. He opined that Haldia Sub-Center of FOSET can extend their support for the noble cause.

The minutes of the 34th AGM held on 28th November, 2021 at the **Auditorium of Hooghly Chinsurah Municipality** was read out by **Sri. Gautam Das (Jr.)** and the house unanimously accepted the minutes that were circulated.

The audited accounts report for the year 2021-22 was presented by **Dr. Naciketa Das**, Treasurer, FOSET.

The Annual and Organizational Report for the year 2021-22 was presented by **Dr. Ashik Paul**, General Secretary at length.

- At the beginning he praised a lot for taking the responsibility of organizing 35th AGM at the Paranchak Shiksha Niketan (H.S) and expressed his gratitude for organizing the seminar on 26th November, 2022 on a topic that has immense relevance on present days' scenario. To him the presence of school students; the flag bearer of future India in the seminar was a great motivation.
- As earlier years, the thought provoking presentations in summing up activities of FOSET during last one year, he touched upon all the corners of FOSET activities during the last year.
- He did not forget to welcome the delegates and the members of the fraternal organizations who are the strengths of FOSET and have attended the AGM.
- He did not forget to mention the support of the members, both intellectually and financially to tide over the crisis and to reach a new high in the last year.
- To tide over the financial stress being faced by FOSET, he mentioned that few project proposals have been submitted based on the calls by the Department of Science & Technology.
- Although the threat of Covid is over in a large scale but its impact of was everywhere and FOSET organized a number of in-person programs through thematic discussions on its impact especially on the education sector, he mentioned.
- He mentioned the working of Barrackpore and Hooghly Sub-Center. The success of Baruipur Food Processing unit in receiving the FSSAI Certificate and the crippling of activity of Birati Building Center have not escaped his mind during the presentation.
- In concluding his presentation, He hopes that a new



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leadership with newer visions and policies will take over in the coming years.

Sri. Ramen Ghosh, of Barrackpore Sub-Center, **Sri. Pabitra Das** of Haldia Sub-Center and **Smt. Anneswa Roy** of Hooghly Sub-Center presented activities of respective Sub-Centers during last year.

Sri. Durgapada Das, Secretary, East Midnapore District, Paschim Bangya Vigyan Mancha addressed to delegates of 35TH AGM.

Sri. Ratan Majumder presented a detailed report of Baruipur Food Processing Center. **Sri. Arjun Mukherjee** presented a detailed report of Birati Building Center. **Sri. Sintu Das** presented a detailed report of FOSET State Center office activity.

In the forum discussion delegates attended AGM took part in a vibrant discussion on Annual and Organizational Report placed by the General Secretary.



Sri. Chitta Ranjan Das, Sri. Saroj Kr. Roy, Sri. Bimal Kr. Das, Sri. Saheb Ali Khan, Sri. Ayan Banik, Sri. Goutam Kr. Das, Sri. Arijit Sil, Sri. Sandip Singha, Sri. Shyam Kishore Mondal, Sri. Raypada Kar, Sri. Subhendu Mitra, Sri. Jaydip Dutta took part in the discussion on Annual and Organizational Report placed by the General Secretary. Besides supporting the spirit and content of the report placed by General Secretary, members given certain suggestions where the activity needs improvement like members of the different Sub-Centers may take initiatives to sell food products of Baruipur Unit to improve the earnings of the unit, regular interaction with the members especially old and new members and the effort to involve the members; specially the younger generation in the activities of FOSET, improvement of activity of FOSET with close tie-up with AIPSN, to take part various fairs that are being organized at local levels in various areas as the same will improve the mass communication etc. E C Members should be given specific tasks followed by check up. Steps may be taken for the growth of the organization through new and innovative form and content of activities.

Two Resolutions namely i) India @ 75: Technology, Society & Development Concerns & Possibilities and ii) Global Warming & Our Future were placed, which were unanimously accepted by the house.

The General Secretary clarified all comments made by the delegates in open forum discussion. He also thanked the members for their support in running the organization amidst various odds.

The House unanimously adopted the Annual and Organizational Report and the Audited Accounts Statement for the year 2021-22. **Dr. Nachiketa Das** proposed M/S R. R. Sarkar and Associates as the Auditor for the year 2022-23 with a fee of Rs. 18,000.00 and the House unanimously accepted the same.





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The AGM concluded with vote of thanks.

Sri Biswapati Chatterjee, Election Officer declared the result of the Election of Executive Committee for the year 2021-22.

1ST Meeting of newly elected Executive Committee Members held after the AGM at the same venue.

EXECUTIVE COMMITTEE – 2022-23			
1. Dr. Krishna Kishore Satpathy	President	94320 12466	kks1046@gmail.com
2. Sri Anadi Sankar Basu	Working President	94332 35912	anadi.basu@outlook.com
3. Sri Rabi Mukhopadhyay	Vice President	98317 65982	rabimukh@gmail.com
4. Sri Tushar Ranjan Mukherjee		70440 59004	trmukherjee29@rediffmail.com
5. Sri Shyamal Gan		98308 43025	shyamalgan@gmail.com
6. Sri Goutam Ray		98310 54644	raygautam@yahoo.com
7. Prof. Nil Ratan Bandyopadhyay		98300 46541	nrbbesus@gmail.com
8. Sri Santanu Sengupta		94323 69255	santanusengupta@rediffmail.com
9. Prof. Jaya Sil		94332 83641	jayasil@hotmail.com
10. Sri Manik Ch. Ghosh		98310 44122	ghosh_manik2002@yahoo.com
11. Sri Subrata Ghosh		98300 32287	subrataghwbpceb@gmail.com
12. Sri Prabhat Kumar Bera		General Secretary	83350 37472
13. Dr. Goutam Kr. Das	Joint Secretary	99329 90760 90071 13294	gd_biet@rediffmail.com
14. Sri Debasish Kundu		79802 19736	wdebasishkundu@gmail.com wdebasish_7@yahoo.co.in
15. Dr. Nachiketa Das	Treasurer	94334 50018	nachiketad@gmail.com
16. Dr. Amitava Sil	Editor	94332 10715	amsxii@yahoo.co.in
17. Sri Saibal Sengupta	Publisher	98301 59025	ssen_63@yahoo.co.in saibalerchithi@gmail.com
18. Sri Shyam Kishore Mondal	Office Secretary	94325 39818	to.shyam.k.mondal@gmail.com
19. Sri Gopi Nath Chatterji	Secretariat Member	82405 71723 94334 30687	gopifoset@gmail.com
20. Dr. Nilanjan Sengupta		92316 55726 83369 87744	nsg1962@gmail.com
21. Sri Subhendu Mitra		83369 03954 98307 69171	mitrasubhendu@yahoo.com
22. Sri Prantosh Deb		94330 94561 94320 22157	prantoshdeb@yahoo.com / prantosh@foset.in
23. Prof. Ashik Paul		94333 21862	ashik_paul@rediffmail.com
24. Prof. Manas Kr. Sanyal		98313 52950 72789 01294	sanyal_manas@yahoo.co.in
25. Sri Bimal Das		94341 92815	tepdimacpltd97@gmail.com
26. Dr. Biman Bandopadhyay		98311 02770 98742 22228	biman.bandopadhyay@gmail.com
27. Prof. Sampa Chakraborty		98313 84628	sampac.2008@gmail.com
28. Prof. Souvanic Roy		98360 93392	soy1roy@gmail.com souvanic@arch.iiests.ac.in
29. Sri Swapan Mondal		92332 31209	swapan_mondal@yahoo.com
30. Sri Sumanta Bhattacharya		98303 63909	sumantabhattacharya@gmail.com
31. Sri Biswajit Roy		98303 48288	advbiswajitroy4@gmail.com

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32. Sri Arijit Seal		98048 46391	arijitseal1994@gmail.com
33. Sri Amitava Roy		98318 48098	amitabha.ray1@gmail.com
34. Sri Sourav Ghosh		98313 21034	gsourav50@yahoo.com souravg06@gmail.com
35. Sri Avijit Chakraborty		90078 63673	pikuc2003@gmail.com
36. Sri Saibal Mukherjee		94330 83984	mukhopadhyaysaibal2006@rediffmail.com
37. Sri Deb Kumar Mitra		84205 81160	deb_52199@yahoo.co.in
38. Prof. Mahua Ghosh		94335 15018 94331 12273	mahuag@gmail.com
39. Sri Goutam Roy Biswas		98312 83412	goutam.biswas@cescltd.com
40. Sri Subir Datta		86480 44459	majumderr.ashim@2021@gmail.com
41. Ashim Majumdar			
42. Dr. Jyoti Sekhar Banerjee		98300 18727	tojyoti2001@yahoo.co.in
43. Sri Raypada Kar		94340 17785	raypadakar@gmail.com
44. Sri Dipak Roy		94349 10119	dipakroynewtown@yahoo.com
45. Sri Subhojit Saha		62919 41270	subhajit1966@gmail.com
46. Prof. Partha Sarathy Mukhopadhyay		98312 76459	parthasm@gmail.com parthasm@arch.iests.ac.in
47. Sri Indrajit Pandey		94331 32893 79808 35181	pandey.indrajit@gmail.com
48. Sri Ramendra Chandra Ghosh		82405 07434	ramen3385@gmail.com
49. Sri Chitta Ranjan Das		98624 95045	c.r.das2010@gmail.com
50. Sri Sumanta Bhattacharya		9830363909	sumantabhattacharya@gmail.com
51. Sri Goutam Das (Sr.)	E. C. Member	98309 88199	goutamkdas11@gmail.com
52. Sri Chanchal Hazra		94778 10255	chanchalhazra746@gail.com dasgupta_biswajit@yahoo.com
53. Sri Biswajit Dasgupta			
54. Smt Angela Goswami		89811 01356	angelagoswami@gmail.com
55. Dr. Madhushri Bandopadhyay		86480 44459	
56. Sri Sushil Bhowmick		97481 73283	sushil.bhowmik@gmail.com
57. Sri Soumitra Sanyal		94345 40897	s.sanyal883@gmail.com
58. Sri Joydip Dutta		91633 23494	jaydip.dutta@gmail.com
59. Sri Arkadeb Kundu		72783 22521	arkadebkundu@gmail.com
60. Sri Somnath Roy Choudhury		96749 69352	somnath.rc@dastur.com
61. Sri Pabitra Das		96093 06075	pabitrme23@gmail.com
62. Sri Sanjay Sinha		83369 03968	ssinhawbpdcl@gmail.com
63. Sri Snehasis Sinha		98300 41857	snehashis@sandaindia.com
64. Sri Bikash Bhattacharya		93306 94959	bhattacharyabikash.1950@gmail.com
65. Sri Sarit Banik Choudhury		98311 02770	sarit_chaudhuri@hotmail.com
66. Sri Dilip Kr. Mukhopadhyay		98368 67776	dkmcal@gmail.com
67. Sri Gopal Chandra Ghorai		98311 13310	gopalchandraghorai@yahoo.co.in
68. Dr. Devmalya Banerjee		9433091330	devmalya15@rediffmail.com
69. Sri Somnath Bhattacharya		9477075222	somnathbhatt1960@gmail.com
70. Sri Birenjit Kumar Pal		94330 83317	bkpaul@gmail.com
71. Prof. Nikhil Ranjan Banerjea		99034 55588	nrb_dr@yahoo.co.in
72. Prof. Arunabha Majumdar		98303 05218	arunabhamajumder@hotmail.com
73. Dr. Subimal Sen		98311 88096	subimal_sen@yahoo.com



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The major bottleneck to our communication with the members is lack of database. Out of our 3000 members we have the e mail id of around 950 members. So, all members are requested to inform their email id and also the email id of members proposed by him. This will further the organizational

Organizational Report 2021-2022 35th Annual General Meeting November 27, 2022 Haldia

FOSET has passed another year of its eventful journey. As we meet for the 35th Annual General Meeting (AGM) here today at Haldia, let us cast our mind back to some of our activities for the past one year. This is a time when we should do some introspection on how we could make a turn-around in terms of greater member engagement in our activities. The internal human resource of FOSET is excellent but should be properly nurtured and harnessed in order to achieve our desired goals.

The Haldia sub-centre deserves a lot of praise for their efforts in organizing this AGM at the Paranchak High School on 27th November and arranging a session with school children on 26th November on the topic of environmental issues. Imbibing a sense of self-reliance in science and technology among these students would serve the national interest for future generations. It has also garnered a lot of support from local industries, notable among them being Haldia Energy Ltd. (HEL), Indian Oil Corporation, Haldia Petrochemicals Ltd. to name a few. This AGM takes us back to the very grass-root level which FOSET always aims to address and is being conducted in a very simple down-to-earth manner through the initiatives of this sub-centre. It is a far cry from corporate-style meetings which, often NGOs and voluntary organizations, are found to indulge in due to the surrounding societal compulsions.

During the past year, FOSET members, as always, have again come out in excellent support of its activities through contributions, both intellectually and financially. The inherent human resource of FOSET is exemplary and sufficient to enable it to delve into discussions of science and technology. However, this continues to raise the question of generating project funds for the organization, which is sadly lacking for the past 3-4 years, since the closure of the IWMP project. Few proposals have been submitted based on calls by the Department of Science and Technology (DST), Govt. of India. There is also a possibility of funding under IEEE Smart Village initiative. The Bose Institute funded project on ST specific rural development officially closed last month. However,

there is a new program on similar lines currently being initiated, where FOSET along with other NGOs from the first phase, stand a chance to be awarded a project again.

However, there has to be paradigm shift in our attitude when dealing with externally funded projects. The present-day requirement of adhering to timelines, proper documentation, geotagging (where applicable) and accountability should be more emphasized. These projects should not, in principle, become sources of fund generation for meeting institutional expenses. Rather, there should be whole-hearted efforts to ensure the deliverables, which are often lacking in our endeavors. Given the time constraints that many of our members have in their professional activities, we should discuss and deliberate on the possibility of having a dedicated project management team.

With the threat of COVID having reduced significantly, a number of in-person programs were organized through thematic discussions on the impact of COVID. The number of programs was not high but the quality of the speakers made them very thoughtful discussions. One of the broad impacts of COVID under study was on education – primary, secondary and higher levels. The issue of unplanned rampant urbanization was also noted as one of the potential sources for a pandemic. The program on impact of COVID on education was lively with excellent discourses from the panelists coming from school education and higher education as well as student activists. There was a final rejoinder to this issue wherein the gender bias in school dropouts arising out of this pandemic was also stressed upon.

The second program focused on the role of deforestation and invasive spread of humans into nature as a possible candidate for increased human exposure to viruses earlier found in animals. This indeed had sparked a new line of thought directly hitting out at the ever-increasing city-centric human settlements with its all-pervasive commercial aspects. Reasonable participation from FOSET members were noted along with some from fraternal organizations



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like PBVM, AHSD, ITPI, ASETO and ABTA. There are efforts to compile these lecture notes into publications which may serve as a reference for future dialogues.

Barrackpore subcentre, which has been one of the most active, organized a seminar on similar lines which was well attended. This subcentre also received an accolade from NABL in the form of certification as a Government Drinking Water Testing Laboratory. They are self-sufficient in financial terms and are wholeheartedly engaged in different areas of community welfare through their water treatment plant, which is also endorsed by the Govt. of West Bengal. They are extremely dedicated and methodical in pursuing their activities including conducting AGM and Annual Audit.

Hooghly subcentre organized a seminar jointly with PBVM on the pandemic and future directions which was addressed by Prof. Nandini Mukherjee and Dr. Anup Roy. There were plans to boost the activities of this subcentre through installation of Micro Solar Domes (MSDs) in Hooghly district among beneficiaries belonging to SC/ST category. However, it failed to materialize despite best efforts. This subcentre has the potential to develop more as it could harness young talents to a greater extent.

We look forward to revival of our activities at Bishnupur, which was once a thriving sub-centre. There may also be some initiatives to restart the Siliguri sub-centre.

One of the resolutions adopted at the last AGM was on protection of personal information on the internet. With a view to generate awareness and opinion this issue, a seminar on Cyber Security was organized on 10th September at Guru Nanak Institute of Technology as a prelude to the Academic Meet held on 11th September. This was a highly successful meet where over 200 students participated for presenting papers as well as demonstrating models. This year, there was a noticeable improvement in the quality of the papers which were screened for plagiarism. Some of the papers have been shortlisted for inclusion in a special issue of American Journal of Advanced Computing. The screened papers have also been assigned 'doi'. Formalizing this process will also help the students understand the importance of originality of their work and lead to more sincere efforts on their part.

Baruipur Food Processing unit of FOSET received the FSSAI certificate which will undoubtedly boost the quality of the products and ensure a broader market

for its sale. There have been efforts for the past 3-4 years to develop a business model for sustaining this important activity which is being executed through SHG formed by women. However, it has not yet resulted in any definite output.

Activities at Birati Building Centre; one of our resources of pride, continues to be extremely limited. Recently, we have tried to utilize the space available there for assembly of the automatic drinking water chlorination unit, Zimba, developed by one of our associates. However, there is at present a scarcity of demand for that unit, although it had earlier been exported to some of the African countries.

This is an AGM where FOSET, after many years and the pandemic, feels there is an opportunity to turn around and fight the twin adversaries of non-scientific thought propagation and excessive commercialization of almost all aspects of our life post-liberalization. Within the limitations of time constraint felt by almost all the members in their professional sphere, FOSET must strive forward to undertake ground-level work, as has been done in Bankura and Purulia, while making an effort to create public opinion on socially relevant issues at the same time. The outreach activities of FOSET have been strengthened through a well-maintained updated website (<https://www.foset.org.in>) and the presence in social media platforms like YouTube and Facebook. These efforts are likely to boost the induction of younger generation into FOSET which is much needed these days.

Every organization needs to change with time. This helps unearth talents and potentials of its members which are perhaps not apparent till they are assigned well-defined responsibilities. As a result, a new leadership with newer visions and policies emerges with a new style of functioning, which should be well accepted. FOSET has come to that crossroad where a new leadership with more emphasis on fund generation through industry links should emerge, rather than depending solely on intellectual inputs for sustenance.

Long live FOSET!

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Excerpts of Organizational Report 2021-2022 35th Annual General Meeting November 27, 2022 Haldia

Besides details of proceedings of the 34 TH AGM, the followings activities of FOSET during last one year was presented in the organizational report –

Panel Discussion on Rethinking Urbanization in a time of COVID Pandemic and Climate Change held on 1ST April 1, 2022 at ITPI Auditorium, Salt Lake in association with PBVM, ITPI, AHSD and ASETO:

A Panel Discussion on Rethinking Urbanization in a time of Covid Pandemic and Climate Change was organized by the Forum of Scientists, Engineers and Technologists (FOSET), Institute of Town Planners India (ITPI WBRC), Association of Health Service Doctors (AHSD, WB), Paschim Banga Vigyan Mancha (PBVM) and Association of State Engineers Technical Officers (ASETO WB) at ITPI Auditorium, IB-190, Salt Lake at 5P.M. on April 1, 2022.

The distinguished Panelists were Sri Biswajit Mukherjee, Environmental Activist and former Senior Law Officer, Dept. of Environment, Govt. of West Bengal, Prof. Goutam Gupta, Environmental Economist and former Professor of Jadavpur University, Dr. Anup Ray, Professor, Nilratan. Sarkar Medical College & Hospital, Prof. Parthiba Basu, Calcutta University, Dr. Biman Bandopadhyay, former Register of IEST, Shibpur and Prof. Souvanic Roy, IEST, Shibpur.



COVID Pandemic & Impact on our Education System held on 11th June, 2022 at Sir R N Mookerjee Auditorium, The Institution of Engineers (India) in association with PBVM, ITPI, AHSD and ASETO:

A Panel Discussion on COVID Pandemic & Impact on our Education System was organized by the Forum of Scientists, Engineers and Technologists (FOSET), Institute of Town Planners India (ITPI WBRC), Association of Health Service Doctors (AHSD, WB), Paschim Banga Vigyan Mancha (PBVM), Jadavpur University Teachers Association (JUTA), and Calcutta University Teachers Association (CUTA) at R N Mookerjee Auditorium, Institution of Engineers (India), Gokhale Road, Kolkata at 3P.M. on June 11, 2022.

The distinguished Panelists were Dr Siddhartha Datta, Vice President, PBVM; Sri Kumar Rana, Eminent Educationist; Prof Nandini Mukhopadhyay, Vice President, JUTA; Sri Sukumar Pyne, General Secretary, All Bengal Teachers Association; Prof. Sanatan Chattopadhyay, CUTA; Sri Srijan Bhattacharya, General Secretary, Student Federation of India (West Bengal unit), West Bengal State Committee; and Prof. Souvanic Roy, Former Chairman, ITPI (ER).



12th Inter-University Engineering, Science & Technology Academic Meet – 2022 & Innovative Model Competition for a Sustainable Society held during 10th and 11th September 2022 at Guru Nanak Institute of Technology, Sodepur inn collaboration with MAKAUT, ISTE – West Bengal Section, The Association of Engineers India:

Academic Meet was conducted for two days. First day (10th September) a seminar on CYBER SECURITY was held in the Seminar Hall of GNIT. Dr Saibal Sarkar, Dy Director General, National Informatics Centre, Govt of India was the main speaker of the seminar. He



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took about 1hr 15 min for an interactive session. Prof. Alok Banerjee, Former Vice Chancellor, Kalyani University was the Chief Guest in the above seminar.

Total 74 papers submitted in 12th Academic Meet. 68 papers were selected for presentation on 11th September. Overall 33 papers were go through strong paper reviewed by different expert from different esteemed technical Institute. Out of these, 10 papers are selected for special issue of the journal "American Journal for Advanced Computing". It will be published soon. Rest 58 papers will be published in ISBN proceedings. Overall (14) model were presented (4 B. Tech, 5 Polytechnics and 5 ITI) in the Academic Meet.

In 2nd day (11th September) inaugural program was presided by Dr N.R. Banerjea, Former President of our organization. Prof. Saikat Maitra, Vice Chancellor of MAKAUT was the Chief Guest of the program. Mr. Dibyendu Chakraborty, Dy. Director General (Eastern), Bureau of Indian Standards was the main speaker of the inaugural session. The program was held in GNIT with the association with Indian Society for Technical Education, West Bengal Section; The Association of Engineers, India and Guru Nanak Institute of Technology, JIS Group.

Total 170 Students of 18 different colleges were participated in the 12th Academic Meet. Prof. N. R. Bandyopadhyay, Vice President of our organization delivered excellent vocal tonic to the audiences who are still enthusiastic till late evening. The program is ended with vote of thanks by Mr Debasis Kundu of our Joint Secretary.



Comments, Suggestions & Objections on draft West Bengal Electricity Regulatory Commissions (Open Access) Regulations, 2022:

The West Bengal Electricity Regulatory Commission by public notice No. WBERC/Regu_54(Open Access) dated 10th May 2022 has issued draft West Bengal Electricity Regulatory Commissions (Open Access) Regulations, 2022. Against such draft West Bengal Electricity Regulatory Commissions (Open Access) Regulations, 2022 our comments/ suggestions/ objections have been forwarded to The Secretary, West Bengal Electricity Regulatory Commission. The text of our submission is provided below:

Ministry of Power, Government of India, vide reference no 42/6/2011 – R&R (VOL III) dated 17-04-2020 had come out with an amendment bill on Electricity Act 2003 namely The Electricity Amendment Bill 2020 in the mid of nationwide lock down arising out of COVID 19 situation. The time given for submission of suggestion is only 21 days. Do any democratic country can conceive this type of idea of introducing of such important amendment bill for public consultation when people are struggling in their daily lime with the COVID 19 situation alongwith unexpected prolong lock down period? It seems that the Central Government either is in hurry to pass this bill or suffering from lack of proper bureaucratic oversight in appreciating the lockdown situation while determining the time frame for inviting the comments of stakeholders at initial stage. However ultimately at least good sense prevails among the Ministry and has extended the date of submission of stakeholder's comments to 5th June 2020.

Our submission dealt with the following aspects:

1. Issues on Cross-Subsidy:

Our suggestion is that the existing clause (g) of section 61 of EA 2003 should not be disturbed through the proposed amendment.



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2. Issues on Renewable and Hydro Sources:

Our suggestions are as follows:

- i. A definition of renewable energy shall be introduced in the EA 2003 through proposed amendment of EAB 2020.
- ii. It will be better if a separate policy on hydro is introduced in the EA 2003 through proposed amendment of EAB 2020 or the proposed definition of renewable sources should include hydro and the purchase of hydro shall considered for overall RPO obligation meeting.
- iii. The renewable policies as propped in EAB 2020 under new section 3A in EA 2002 shall be prepared mandatorily by consultation with state government.
- iv. The amendment as proposed for clause (e) of sub-section (1) of Section 86 of EA 2003 should be dropped by GOI, so that State Electricity Regulatory Commission can fixed the percentage of power purchase from renewable sources depending on the availability of renewable energy potential within the state and other ground reality of the state such as need of meeting the climate change commitment by the state. Also, there should not be any technology-specific RPO. It should be left to the judgment and discretion of SERC to decide the over all RPO depending upon the availability and feasibility of a particular RE source in the state as well other factors such as meeting the climate change commitment by the state.
- v. Inter-state transmission charges shall be applied on solar and wind sources also in line of other type of sources. Accordingly EA 2003 shall be modified through proposed EAB 2020 so that in the name of promotion of any particular issue (like renewable) no cross-subsidy can be imposed as already discussed except to the extent it is necessary for retail-tariff.
- vi. In order to maintain commitment on Climate change programme and reduction of environmental pollution, gas based power stations shall be promoted at least for a small part such as (10 to 15%) of the demand by incorporating a clause in the proposed amendment by which certain percentage of Electricity purchased by distribution licensee to be purchase from Gas based source as it is far cleaner energy than the conventional coal-fired power stations. This will help in to reduce the dominance of uncleaned coal based energy sources and in such cases the state like West Bengal which has low RE potential can meet in future the challenge of climate change commitment in better way by attracting investment within the state only.

3. Payment Security Mechanism:

A provision under EA 2003 shall be provided for

introduction of standard payment security mechanism for any kind of agreement in order to satisfy the conditionality of adequacy.

4. Subsidy Issue:

The subsidy in addition to continuance of cross-subsidy can be considered in the way proposed through amendment of clause (d) of sub-section (1) of Section 62 But the proposed subsidy in lieu of cross-subsidy shall not be conceived at all.

5. Tariff Determined Through Competitive Bidding:

After the tariff is discovered through competitive bidding under section 63 of EA 2003 by Distribution Company and an application for adoption of tariff is submitted to commission, the commission has to be give its decision on adoption of price within 60 days from the date of submission of application for adoption. In case of failure by Commission to adopt such price within that period, the price will be considered to be deemed adopted. This is a good decision.

6. Regulatory Commission's Structural Issues:

It is suggested that the existing system of selection for the members/chairman of State Electricity Regulatory Commissions under EA 2003 may be continued through constitution of selection committee under section 85 of EA 2003 and the proposed amendment of section 85 of EA 2003 is dropped. As a consequential action the proposed amendment of Section 78 of EA 2003 have to be revisited so that proposed amendment can only to be done for selections for members of CERC, Appellate Tribunal and Electricity Contract Enforcement Authority.

7. Electricity Contract Enforcement Authority:

8. Appellate Tribunal Related Issues:

9. Issues Related to Distribution Entities:

From study of different issues in paragraph (a) and (b) it appears that there are lots of confusion on the responsibility issues of different components of a distribution licensee and its legal tenability. In fact from above paragraph (a) and (b) above it has been observed that on structural issues of distribution segment (franchisee and distribution sub-licensee) lot of issues had not been adequately addressed and which needs further inputs from experts to formulate a implementable model. Before introduction of this bill in parliament it has to be established very transparently

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the inter-relationship of distribution licensee with distribution-sub licensee and franchisee and the difference between those two models. It cannot be hurried. Thus, Government of India is being requested to meticulously studied the different grey areas as discussed with respect to distribution franchisee and distribution sub-licensee and come with an appropriate new draft of the amendment of EA 2003.

10. The Role of National Load Despatch Centre :

11. Conclusions :

Based on our recommendations and other stake holders also please come out with a refresh amendment before finalization of the said Bill. In this context please refer to number of edition of the original principle Act (Electricity Act 2003 in June 2003) which had gone through at least 10 edition at different stage of finalization of the bill. Considering the sensitivity of the sector as well as the issues related to federal structure of the country, it is requested that such amendment should not be bulldozed to establish the hegemony of any vested interest group.

FOSET's Training cum Food Processing Centre at Baruipur received FSSAI and patronage of Rotary Club, Calcutta Pointers -

The Food Processing Centre at Baruipur has obtained FSSAI certification after fulfilling all norms and regulations required for that.

The Rotary Club, Calcutta Pointers – an organization of ex-students of South Point School visited the centre on 28 May 2022 and provided a substantial amount of vegetables and fruits to help the Food Processing Centre. The team members were Anindya Basu Ray, Madhumita Gupta Chatterjee, Sugato Sanyal, Nivedita Sanyal, Gargee Dutta and Sanjukta Majumdar.



Installation of Micro Solar Domes (MSD)

Micro Solar Dome project is currently the ongoing project work. We were allotted 1000 nos MSDs. Of these 250 were installed successfully at Haldia by the Haldia Sub-centre and it was tested at the time of AMPHAN. The progress of the work hampered due to Pandemic induced Lockdown. However, we facilitated the installation of 290 nos. MSDs in an island at Sandeshkhali Block under Sunderban. These have the additional facility of a Radio along with the light and mobile charger facility. We networked with a local level organization, Joygopalpur Youth Development Centre for the work. One unit as demonstration has also been installed in Baichi and Haringhata by our Hooghly sub-centre. We expect that 300 more units may be installed in Debanandapur and Balagarh in Hooghly district and Haringhata. Presently there are some problems in the manufacturing unit due to lockdown. It is expected that the MSDs would be supplied by next month and the work is expected to complete by March next year.



Integrated Watershed Management Programme - A major Endeavour of FOSET towards Rural Development

FOSET has implemented two IWMP at Ranibandh Block, Bankura District, - IWMP- 14/2011-12 at Chhendapathar and IWMP-15/2011-12 at Ranibandh. The project has been completed.

The treatable area of Chhendapathar Watershed is 3500 hectare with project cost of Rs.525.00 lakhs out of which Rs.157,40,477.00 lakhs was released. Watershed Associations have been formed and all the Associations have been registered under Society Act. The AGM of all the Watershed Associations have been held in presence of central leadership of FOSET. Separate Bank A/c. for all the Watershed Association has been opened and Watershed Development Works are implemented through these Associations on a participatory mode.



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The treatable area of Ranibandh Watershed in 2400 hectare with project cost Rs.360.00 lakhs out of which Rs. 141,31,377.00 were released. Watershed Associations have been formed. Separate Bank A/c. for the Watershed Association have been opened and Watershed Development Works are implemented through these in participatory mode.

The project completion report for the two IWMPs was submitted on 27th August, 2021. Bankura has been declared as the best project implementing district in the state under the PMKSY and FOSET is proud to play its role towards that. There have been differences with the WCDC and the WBSWDA while implementing on certain occasions. But in the overall analysis, it was a great experience for FOSET in implementing such a huge and important Rural Development programme. We will try to associate ourselves in similar programme in Bankura or other district in the coming days.

Up to July 2022 we were associated with the programme. For any assistance the Watershed Associations may consult us. We also think about the villages as our own place where FOSET experimented with its mission of bringing Science and Technology to the Common people.



Membership

Strength as on 34 th AGM	Strength as on 35 th AGM	Addition
L.M : 2443	L.M: 2468	L. M. : 25
S.M : 322	S.M : 323	S. M. : 01

Resolution on "GLOBAL WARMING - CLIMATE CHANGE – ROLE OF INDIA IN THE MITIGATION" –

The five hottest years on record have all occurred between 2015 and 2022. Official accurate record began in 1880. Since then, nine of the ten hottest

years have been recorded after 2005. This clearly indicates that our planet's average temperature has increased following the global industrial revolution in the 1800 and it has been steadily increasing.

The primary cause of global warming is believed to be the accumulation of certain gases and pollutants in the earth's atmosphere. These pollutants absorb solar radiation and trap heat energy coming off the earth's surface that would have otherwise escaped into the atmosphere. Over the years and centuries this trapping of heat energy results in significant rise in average temperature which is known as global warming.

The gases/chemicals which cause entrapment of heat energy in the earth's atmosphere are collectively termed as greenhouse gases (GHG) and their impact resulting in rise of temperature is known as greenhouse effect. Some common examples of such chemicals include carbon dioxide, methane, nitrous oxide, chlorofluorocarbons (CFC), and sulphur dioxide. The chief sources of these GHG can be attributed to various human activities. According to the data from the Center for Climate and Energy Solutions, production of electricity and heat (31%) is the highest contributor of GHG emissions followed by transportation (15%) in second place. Agriculture and industrial processes are the other two sectors that make up the top five GHG emitting fields.

These GHG emissions, pollution and resulting global warming has led to more extreme weather all over the planet. Rising temperature has increased the occurrences of severe heat waves, drought, heavy unseasonal rainfall and more powerful hurricanes. A report published by the National Academies of Sciences, Engineering and Medicine in 2016 directly implicated climate change from human activities for extreme weather events over the last few years. Since the beginning of industrial revolution CO₂ released in the atmosphere owing to human activities such as fossil fuel burning and deforestation has increased from 200 to 400 micro atmospheres (μ -atm) and about 30 percent of that has been absorbed by ocean waters (Feeley et al, 2004). This increase in dissolved CO₂ levels resulting in lowering of ocean pH and carbonate saturation is termed as ocean acidification. Scientists applied computer models of chemical changes associated with historical CO₂ emissions and determined that over the past 200 years average surface ocean pH has dropped by about 0.1 units (equivalent to ~25% increase in [H⁺]). If this trend of CO₂ emissions continues at the current rate it will lead to a further decrease of 0.3 or 0.4 units by the end of this century (Orr et al. 2005). This will result in loss of biodiversity and collapse of marine ecosystems.



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The deleterious effects of pollution and climate change is not limited to weather, ecosystems and environment. Unfortunately, the negative impact of global warming also extends into realms of public health, livelihood, food security and economy. Unseasonal drought has rendered arable land unfit for agriculture and thus jeopardizing food security for vulnerable populations across the planet.

Climate change adversely impacts health and social determinants such as air quality, safe drinking water and food security. Between 2030 and 2050 climate change induced health hazards such as heat stress and malnutrition are expected to result in 250,000 additional deaths (World Health Organization report, 2021). These deleterious effects are even more pronounced in a populous country with a rapidly growing economy such as India, where the increased energy needs are supported by burning of more fossil fuels. The Indo-Gangetic plain of India is one of the most polluted regions in the world and its poor air quality causes the average inhabitants to lose about five years of life expectancy (Energy Policy Institute of the University of Chicago). This public health issues also leads to economic loss for India. It is estimated that lost labour income due to fatal illness from particulate matter pollution in 2017 was between \$30 and \$78 billion, which is about 0.3 per cent and 0.9 per cent of the national GDP (World Economic Forum, 2022).

Primarily relying on fossil fuel to power India's economic growth has not only accelerated GHG emissions but also resulted in increased dependency on imported foreign oil and coal. In the first half of 2022-23 fiscal year alone our crude oil import increased by 15% over previous year to a total of 116.6 million tons which cost the nation \$90.3 billion. In addition to this substantial financial burden, relying on foreign oil also comes with additional challenges posed by geopolitical uncertainties in oil producing countries such as Iran, Russia and Venezuela.

Considering these economic, geopolitical, medical and environmental ramifications of fossil fuel dependency and the toll of global warming it will be prudent and advantageous for our nation to divest from fossil fuels and power the nation's growth through energy sources that does not contribute to GHG emissions. To achieve these goals our nation has committed to reduce emissions of particulate matter by 30% by the end of 2024 and presented ambitious global warming mitigation targets during the 26th session of the United Nations Climate Change Conference of the Parties (COP26) held at Glasgow, UK in October-

November 2021. The Indian delegation at COP26 presented the following five key elements of India's climate action goals (Ministry of Environment, Forest and Climate Change, 2022)

- i) Reach 500GW non-fossil energy capacity by 2030.
- ii) 50 per cent of its energy requirements from renewable energy by 2030.
- iii) Reduction of total projected carbon emissions by one billion tons from now to 2030.
- iv) Reduction of the carbon intensity of the economy by 45 per cent by 2030, over 2005 levels.
- v) Achieving the target of net zero emissions by 2070.

It should be noted that even prior to COP26 India has taken pragmatic steps and made substantial progress in developing its renewable energy production capabilities. These above-mentioned five key targets added further impetus to India's efforts in developing a robust renewable energy power generation ecosystem. Solar, wind, bio-energy, nuclear and hydro power are the key areas of focus in India's endeavor to achieve its ambitious targets regarding generating power from non-fossil fuel sources.

Over the last 8 years the installed power capacity of solar power has increased 18 folds, from 2.6 GW in March 2014 to 49.3 GW by December 2021. As of July 2022, the total installed renewable energy capacity of 161.28 GW represents 40% (approx.) of India's total installed power generation capacity. Solar power is expected to play a leading role in India's renewable energy mix and it has received further boost owing to the implementation of some recent government policies. In the latest union budget (2022-23), Government of India (GoI) allotted Rs 1,000 crores (US\$132 million) for the Solar Energy Corporation of India (SECI), the body responsible for development of renewable energy. GoI has also launched Production Linked Incentive (PLI) scheme to enhance manufacturing of highly efficient photovoltaic modules and allocated Rs 19,500 crores (US\$2.57 billion) of funding in the union budget to support this initiative.

In addition to solar power India has also made progress in generation of wind power. During 2020-21 it has a total installed wind power capacity of 39.25GW and it has generated 60.149 billion units. This makes our nation fourth in the world for wind power generation capacity. The current GoI has initiated multiple schemes such as Generation Based Incentive (GBI) Scheme and custom duty exemption on certain components of wind electric generators to further accelerate development of wind power generation capacity. Government has also initiated a National Offshore Wind Energy Policy in 2015 to facilitate



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development of offshore wind power farms so that it can utilize energy generation take advantage of the opportunity offered by India's 7600km long coastlines. Offshore wind generation is a relatively untapped resource for India, and it has set an initial target of producing 5GW by the end of 2022 and 30 GW by 2030 (Ministry of New and Renewable Energy, 2015).

Along with a long coastline suitable for offshore wind farms, India is also blessed with several mountain ranges with fast flowing rivers. These geographic features present ideal opportunity of generating clean and renewable energy through the establishment of small and medium hydel power plants. Since its independence India built multiple large hydroelectric projects such as the Bhakra Nangal Hydroelectric Power plant on the Sutlej River and the Koyna Hydroelectric Power Plant in Maharashtra which is the largest with a total generation capacity of 1960MW. Contribution of India's hydroelectric power plants add up to a total of 45.8GW. However, the potential of small hydel power plants has not been fully utilized and this represent an opportunity of generating further clean energy. According to the Small Hydro Database prepared in 2016 by Alternate Hydro Energy Centre (AHEC) in IIT Roorkee, 7135 sites of small and mini hydel power across the country has an estimated potential power generation capacity of 21135.37 MW.

Relying only on solar, wind and hydroelectricity will not be adequate for India to fulfill its target of power generation from non-fossil fuel sources. Therefore, India is also focusing on enhancing its capacity of generating power from nuclear energy. Currently India produces 6,790 MW of nuclear energy making this source of energy the fifth-largest contributor to India's energy mix. India's 7 power plants with 23 nuclear reactors makes it seventh ranked nation in terms of number of reactors. GoI aspires to improve contribution of atomic energy to India's power grid from the current 3.2% to at least 5% by 2031. The 755 billion units of electricity that India has generated through nuclear energy so far has saved 650 million tons of CO₂ emissions. The Government allocated a budget of Rs.10,000 crore (US\$ 1.31 billion) for Department of Atomic Energy in 2019 and initiated a plan to increase the budget by 10,000 crores (US\$ 1.31 billion) each year till 2029-30 fiscal year. As of 2021, India has 9 new reactors under construction and sanctioned additional 12 new reactors. The combined contribution of these new reactors will increase India's nuclear power generation from the current capacity of 6,790 MW to 22,480 MW by 2031. This in turn is going to assist the country in meeting zero energy targets along with other clean energy sources. (Ministry of New and Renewable Energy, 2022).

Nuclear energy can be an important contributor because unlike wind and solar it can provide energy round the clock. Another source of energy for India that is often overlooked is organic waste and biomass. These carbon-based compounds can be utilized to generate biogas through bio-methanation. The biogas generated from Bio-methanation process can be burnt in a gas engine to produce electricity. Alternatively, the biogas can be further cleaned to produce Bio-CNG. In India organic wastes from urban and industrial sources has a total estimated energy generation potential of approximately 5690 MW. The Ministry of New and Renewable Energy has implemented Biomass power & cogeneration program is implemented with the main objective of promoting technologies for optimum use of country's biomass resources for grid power generation. A study conducted by the Ministry of New and Renewable Energy indicated estimated surplus biomass availability at about 230 million metric tons per annum. This has a potential of generating 28 GW of energy. In addition to this about 14 GW power could be generated through bagasse-based cogeneration in the country's 550 Sugar mills.

In addition to the renewable or clean energy sources mentioned above India is also exploring new technologies such as tidal turbine for electricity generation, exploiting geothermal energy and developing hydrogen. It is evident that the country needs a wide array of power generation avenues to divest from fossil fuels.

To meet its climate change targets India is also taking initiatives to promote adoption of vehicles powered by hydrogen fuel cells and electric vehicles (EV). GoI has announced that it will strive to ensure majority of vehicles on Indian roads are electric by 2030. According to data from the e-Mobility Revolution for India's Transportation (e-AMRIT) portal till December 2021 there are 796,000 electric vehicles and 1800 EV charging stations in public places. Therefore, it is obvious India has made some progress in EV adoption, but it has long way to go to achieve its target.

To ensure it reaches global warming and climate change targets Indian policy makers need to implement schemes that further incentivizes adoption of clean energy technologies and overcome import-dependence through domestic production plans such as the PLI scheme. ('Decarbonization of India's energy sector: Policy roadmap to achieve clean energy targets, 2022)

India has taken major strides in achieving a future fueled by renewable sources. The total renewable



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energy capacity of our nation has experienced a 250% increase over the last 8 years. India rose one place in the rankings to 3rd position in solar energy as the country's solar sector has grown significantly post the COVID-19 pandemic, and by 2040 energy from Solar PV is forecast to exceed that from coal before 2040. (EY Renewable energy country attractiveness index, 2021).

In 2014, GoI set a target that India would have 175 GW of renewable energy capacity by the end of 2022. According to data from Central Electricity Authority (CEA) as of October 2022 India has developed 116 GW of renewable energy capacity across solar, wind, bio-power, and small hydroelectric sources. In addition to this 116 GW, it has 44 GW of hydroelectricity generation capacity from large hydel projects. This is significant improvement considering India had only 38 GW of total renewable energy capacity in October 2015. As per the CEA India is on track to ensure that by 2029-30, share of renewable energy increases from 18% to 44% while that of thermal power generation falls from the current 78% to 52%.

The Indian renewable energy sector is the fourth most attractive renewable energy market in the world. India was ranked fourth in wind power, fifth in solar power and fourth in renewable power installed capacity, as of 2020. Installed renewable power generation capacity has gained pace over the past few years, posting a CAGR of 15.92% between FY16-22. Clean renewable energy will not only reduce pollution and mitigate climate change but also enable the nation to achieve energy self-reliance. This in turn will result in geopolitical advantage as our economic growth will not be dependent on imported fossil fuels. This growth has also presented entrepreneurial opportunities, offered employment, attracted foreign investments and improved the lives of common citizens.

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