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SHARKARA

VOLUME - 55, No .03

OCTOBER-DECEMBER, 2023

It contains……..

From Director's Desk…

During the period, September-December 2023, institute remained vibrant due to multiple activities including hosting the "International Conference & Sugar Expo". The two day's event witnessed participation from Australia, England, Iran, China, Indonesia, Fiji, Sri Lanka, Thailand and many other countries. As we talk about attaining carbon neutrality by 2070 and role of green hydrogen, demonstration of a pilot plant producing green hydrogen via methane pyrolysis route was also made. The day also marked interactions on various aspects of green hydrogen production, particularly with respect to opportunities and challenges.

With thrust on prime activities of the institute, teaching, research and consultancy continued, institute efforts for making it an institute of global presence continued. Institute while signed a MoU with ICIDCA, Cuba for helping the sugar industry in Cuba particularly by developing value added products through utilization of by-products in an innovative manner, training programme for the technical personnel from PT PG Rajawali I sugar group also commenced. Institute is all set to sign another MoU with Fiji Sugar Corporation so as to conduct training programmes for their technical personnel and to help on modernization of the sugar industry there.

With the reports of lower availability of sugarcane coming from Maharashtra and Karnataka, ISMA revised it's estimates of sugar production from 33.7 MMT to 32.4 MMT. As the various agencies expecting global shortfalls also, to ensure supply of sugar at reasonable prices, Government of India pronounced policy restricting use of process intermediates for production of ethanol and to other alcohols. The country which achieved ethanol blending to the extent of 12.01% during ESY 2022-23 with ethanol supplies of about 506 crore liters is likely to face challenge in achieving the targets during ESY 2023-24.

With the change in the policy with respect to diversion of intermediate feed stocks for producing ethanol and other alcohols, institute got actively associated with industry to render technical support for making required changes in the system. As I said earlier, I reiterate, the industry has to look for alternate feed stocks, particularly, non-food feed stocks to achieve targets in future. The industry is required to work on various permutation and combinations of sugar-ethanol mix, keeping the process house flexible.

I wish all of you a very happy and prosperous new year 2024.

(Narendra Mohan)
Director

❖ OUR PROVISION:

❖ FOUNDATION DAY ORGANIZED:

88th Foundation Day of the National Sugar Institute, Kanpur celebrated on 4th October 2023. Alumni of the institute who turned **"Job Creators"** and also **"Progressive Sugarcane Farmers"** were felicitated by Sadhvi Niranjan Jyoti, Hon'ble Minister of State, Ministry of Consumer Affairs, Food & Public Distribution and Rural Development. In her address, she lauded the efforts made by the institute in growth and development of the Indian Sugar Industry. Hon'ble Minister also released the new Logo of NSI, Kanpur during Foundation Day celebration.

❖ INTERNATIONAL CONFERENCE & EXPO:

International Conference & Sugar Expo on the topic **"Sugar Industry- Modernization & Diversification for Sustainability"** jointly organized by National Sugar Institute and UP Sugar Mills Association commenced on 11th – 12th October 2023. The conference and expo was inaugurated by Shri Sanjeev Chopra, IAS, Secretary (Food & Public Distribution), Government of India.

The conference was attended by large no. of delegates including those from overseas countries viz. Australia, England, China, Indonesia, Fiji, Iran, Sri Lanka, Thailand and Uganda etc. In the inaugural session, 10 distinguished alumni were conferred **"Sharkarshri"**, while **"Excellence Award"** were given to 06 eminent personalities who have contributed immensely in growth and development of Indian Sugar Industry. 12 sugar companies were also felicitated for their exemplary contribution in boosting ethanol production, productivity enhancement and production of specialty sugar & other value added products.

❖ EDUCATIONAL TOUR ORGANIZED FOR STUDENTS:

National Sugar Institute, Kanpur organized educational tours for the students of Post Graduate Diploma Course of Associateship of National Sugar Institute in Sugar Engineering (ANSI-SE), Post Graduate Diploma Course in Industrial Fermentation and Alcohol Technology (DIFAT) and Post Graduate Diploma Course in Sugarcane Productivity & Maturity Management (DSPMM), to sugar factories, distilleries & related organizations of the different areas to learn about sugarcane management, process techniques for producing different sugar qualities, ethanolmanufacturing process, raw & refined sugar manufacturing process, engineering techniques, etc. during the month.

❖ EXPERT LECTURE:

National Sugar Institute, Kanpur organized an expert lecture by Prof. Ikuo Kawauchi, Strategy Advisor for Educational Institutions from Japan on 1st December 2023. He addressed the staff and students of institute on the topic **"The global business development and the role of Indian youth from the view point of Japanese".**

❖ BOOK RELEASED:

मिलों को "**दुर्घटना रहित**, **दक्षता सहित**" चलाने के लिए "चीनी मिलों के कुशल संचालन" पर राष्ट्रीय शर्करा संस्थान**,** कानपुर द्वारा हिंदी मे तैयार की गयी मार्गदर्शिका**,** संस्थान के निदेशक श्री नरेंद्र मोहन द्वारा एक समारोह में जारी की गयी ।

❖ WORKSHOP ON GREEN HYDROGEN GAS:

A workshop on **"Production of Green Hydrogen from Sugar Industry- Opportunities and Challenges**" organized on 6th December 2023 at National Sugar Institute, Kanpur which was graced by Managing Director, Maharashtra State Cooperative Sugar Federation as Chief Guest. Demonstration of a pilot plant based on production of green hydrogen from compressed bio-gas through methane pyrolysis was also made at the Experimental Sugar Factory of the institute. On this occasion, sugar units making commendable contribution in production of clean, green and renewable energy were conferred **"Green Initiative Awards"**.

❖ TRAINING PROGRAMME FOR INDONESIA:

A specially designed training programme of six week's duration organized from 16th December 2023 for three senior technical officers of PT PG Rajawali Sugar Group, Indonesia. Theory classes were taken by NSI officials related to raw-refined sugar production and on the topic such as defecation process, refined sugar process including melt clarification & secondary decolourization process, energy economy, water conservation, equipment designing, etc. The participants shall also undertake in plant training in two reputed sugar refineries for a month under the supervision of institute staff.

❖ **RESEARCH WORK**:

1. **Studies on Sweet Sorghum Bagasse (SSB) value addition:** The purification of crude 5-Chloromethyl furfural (CMF) involved various sets of solvents such as Hexane, after synthesizing CMF from sweet sorghum bagasse derived cellulose. The synthesis occurred in the presence of chlorobenzene and hydrochloric acid at temperatures 80 and 90 degree Celsius accompanied by vigorous stirring for two hours. Further work is in progress.

2. **Comparative study of Five varieties of sweet sorghum for production of ethanol yield:** Five varieties of sweet sorghum viz. SSV 74, SSV 84, CSH 22SS, Phule Vashundhara and ICSSH 28 were sown during August, 2023 and phase wise harvesting started from 14th December. An average stalk yield of 48-55 T/hectare was obtained. In the resultant juice obtained after milling in laboratory crusher, brix% and total reducing sugar content% ranged from 15-17 and 11-13 respectively. The juices were then fermented and distilled for ethanol production in pilot plant. Results are being compiled. In other field trials, sweet sorghum variety viz. CSH 22SS was sown during last week of July, 2023 and harvested during second week of December. 2023 at M/S Balrampur Chini Mills Ltd., Maizapur. Stalk yield of 50 T/hectare was obtained while in the juices, brix%, purity and total reducing content of 17.06, 56.38 and 13.05 was observed. The juices were then fermented and distilled for ethanol production at M/s BCML, Maizapur.
3. **Cane juice syrup study for shelf-life and production of alcohol:** After completion of initial studies on deterioration patterns in syrup for seven months, wherein few units of TRS deterioration (negligible) in the stored syrup was observed, syrup samples were collected from M/s Wave Sugar Mills, Dhanaura, U.P and M/s Saraswati Sugar Mills, Yamuna Nagar, Haryana for

taking up further studies to validate the results. Efforts shall be made to identify the standard conditions for storage of syrup during the off-season.

4. **Comparative study on polarization by using lead, non-lead clarificants and NIR polarimetry:** Analysis carried out on the B- Heavy molasses sample and during the analysis it was observed that the sucrose % of the samples were lower by 3% when clarified with Carrez regent in comparison to sucrose analysis using lead sub acetate. Further analysis on with Carrez reagent and lead sub-acetate will be conducted in the subsequent months to validate the results.

5. **Production of low G.I. liquid sugar/ low G.I. sugar vitamin 'A' fortified liquid sugar:** Low GI liquid sugar as prepared earlier from raw sugar was dosed with monk extract (99 % pure) this time. Quarterly analysis of parameters such as Brix%, Pol%, Purity, RS%, TRS%, Color (IU) is being carried out. The analytical results are as given here under-

   Solids% - 81.70,

   Colour (IU) – 449.99,

   GI Value – 66.33

   It is pertinent to mention that the initial trials with monk fruit extract did not yield promising result. The GI value did not fall under expected range and therefore a repeat trial for the same shall be carried out. The reasons for unexpected reading may be inappropriate dosing of the extract during the process or errors during calculations of the GI value. The same would be monitored carefully to avoid any errors to the best possible.

6. **Shelf life study of press mud over the period of time:** Ten press mud Samples from sugar factories situated in UP, Bihar, Haryana and Chhattisgarh were collected and stored keeping the environment same as at the factory front. 10 Raw + 10 Treated sample of press mud of each factory as being analyzed for following parameters such as pH, Total Solids (moisture content), Ash content, Total volatile solids (TVS), Lignin and Total Convertible Volatile Solids (TCVS) on monthly basis. During eleven months of analysis as observed degradation (Fungal Growth) is occurring in both raw as well as treated press mud samples.

   • pH of the raw press mud was observed to be in the range of 6.80 – 7.38 while

   that for PM stab (treated sample) was observed to be in the range of 4.64 – 6.65.

   • The Total Solids for raw press mud and treated press mud were in the range of

   88.6 – 89.42% and 22.31 – 26.31% respectively.

   • The ash content of the stored raw and treated press mud samples were in the

   range of 29.39 – 36.81 % and 5.23 – 8.23% respectively.

7. **Shelf life study of Vitamin-A fortified sugar:** Vitamin A fortified raw sugar samples (amorphous sugar) prepared using dosing vitamin A @ 15.5 – 16.8 µg/g of vitamin A per gm of sugar is being analyzed for vitamin A content on monthly basis using vitamin A analyzer to observe the reduction of vitamin A content over the storage period of time starting from May. The above observations indicate that the % reduction in vitamin A content of sugar over eight months of storage has been around 33.73%. It is worth mentioning that for the month of November and December the vitamin A content reduction has been observed to be stable with no prominent degradation. Further whether the same trend continues in the coming months is under observation.

8. **Essential Oil Extraction from Sugarcane Molasses:** The process of extracting essential oil from the molasses by hydro distillation was carried out repeatedly for 5-6 hours in the 1:1 ratio (Molasses: Water). After 5-6 hours of hydro distillation a layer of yellow coloured volatile liquid formed which was separated from the distillate. In hydro distillation the same ratio 1:1 (molasses: water) was repeated 10-15 times to collect appropriate amount of essential oil for further analysis and the process of extracting essential oil continues with the same ratio.

❖ RESEARCH PAPERS / PRESENTATIONS:

1. A presentation on topic **"Possibilities of production of green hydrogen from the sugar industry"** was made by Ms. Neelam Chaturvedi, Research Fellow on 6th December 2023, during one day national workshop on **"Green Chemistry from Sugar Industry –Opportunity & Challenges"** at the institute.

2. A presentation on topic **"Vehicular Pollution, Sugar Industry and Green Hydrogen"** was made by Ms. Shalini Kumari, Research Fellow on 6th December 2023, during one day national workshop on **"Green Chemistry from Sugar Industry –Opportunity & Challenges"** at the institute.

3. A research paper entitled **"VEHICULAR POLLUTION, SUGAR INDUSTRY AND GREEN HYDROGEN"** by Shalini Kumari and Narendra Mohan has been sent for publication in the symposium of Bharatiya Sugar February 2024.

4. A research paper entitled **"Sugar Industry & Green Hydrogen"** by Neelam Chaturvedi, Shalini Kumari and Narendra Mohan published in "SHARKARA- October – December 2023", Volume : 55, No. 03.

5. A research paper entitled **"Sugar Production to Meet Changing Market Requirements"** by Anushka Akash Kanodia and Narendra Mohan has been sent for publication in the symposium of Bharatiya Sugar being organized at Kolhapur on 10th February 2024.

6. A paper entitled **"Mitigating Issues with Sugar Consumption"** by Narendra Mohan and Anushka Akash Kanodia has sent for presentation during 8th IAPSIT International Sugar Conference ISC-2024 & Sugarcon-2024.

7. A paper entitled **"Sugarcane Industry: A Possible Bio-Energy Hub"** by Narendra Mohan has sent for presentation during 8th IAPSIT International Sugar Conference ISC-2024 & Sugarcon-2024.

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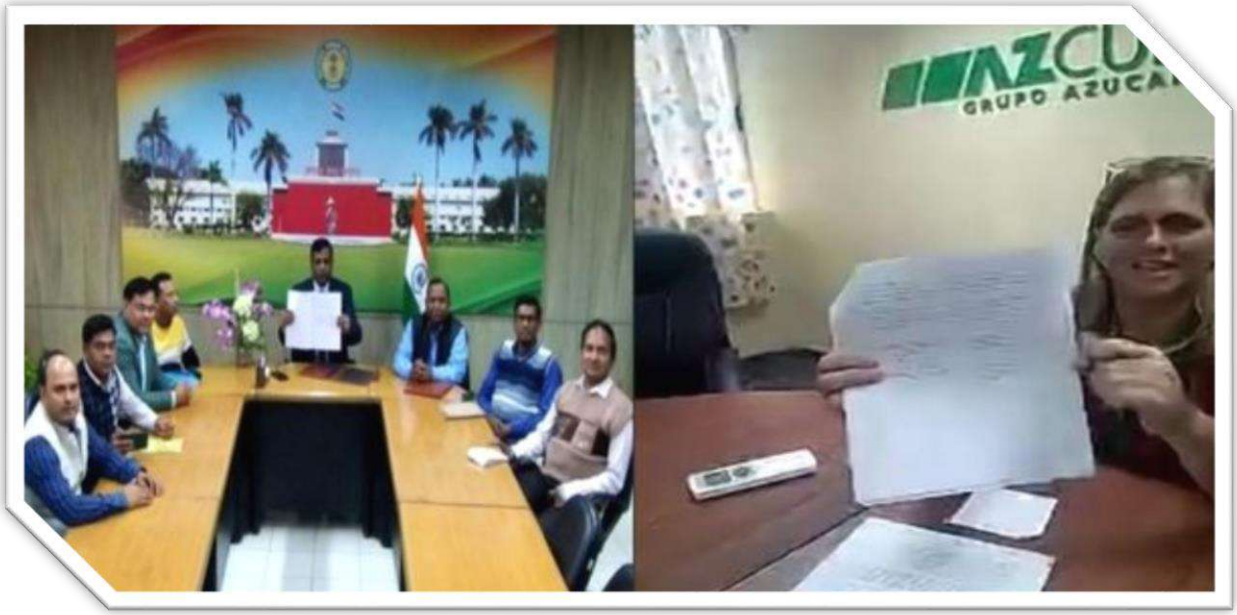
❖ MoU SIGNED:

National Sugar Institute, Kanpur (NSI) signed MoU with Cuban Research Institute on Sugarcane Derivatives (ICIDCA), Cuba on virtual platform on 13th December 2023. NSI, Kanpur to help in modernization of Cuban Sugar Industry. The two institutes to work on developing technologies for producing value added products from by-products and waste from sugar industry.

In the MoU, the two organizations have specified all these areas to work upon i.e. sugar and other sugarcane byproducts technologies and engineering, Industrial instrumentation and process automation and quality control. NSI focus would be to render technical assistance to Cuban sugar industry firstly by developing the competent manpower having required updated knowledge of sugar processing for which it will begin with conducting special lectures and short duration training programmes in consultation with ICIDCA, Cuba.



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❖ OUR ADVISORY:

Besides conducting teaching and training programmes, carrying out research in relevant field, another main functions of the institute are:

1. To function as a **"Think-tank"** to sugar and allied industry for proposing modernization and trouble free functioning of the process on advisory basis / through Extension Services.
2. To formulate strategies and promotes measures for expansion of capacities, energy conservation, co-product utilization etc. for sugar and allied industries.
3. To assist Govt. of India through technical contribution in policy formulation and control of Sugar Industry.
4. To render assistance to various government organizations in implementation of policies, validations and on associated matters.
5. To extend human resource management services to various government and private organizations.

❖ CONSULTANCY:

Requests for availing consultancy services of the institute were received and also provided to various sugar factories ethanol& other allied units on various technical matters relating to diversion of B Heavy molasses/syrup, validation of ETP's, preparation of DPR's, validation of no increase in pollution loads in ethanol units upon enhancement in capacity etc.

Sr. No.	***Unit***
1	*M/s Wave Industries Pvt. Ltd., Bidvi, Saharanpur, U.P.*
2	*M/s Wave Industries Pvt. Ltd., Malasia, Amroha, U.P.*
3	*M/s Wave Industries Pvt. Ltd., Bijnor, U.P.*
4	*M/s PBS Foods (Sugar) Pvt. Ltd., Bijnor, U.P.*
5	*Dhampur Bio Organic Ltd., Asmoli, Sambhal, U.P.*
6	*M/s The Gurdaspur Co-operative Sugar Mills Ltd., Gurdaspur, Punjab*
7	*M/s Dalmia Bharat Sugar & Industries Ltd., Ramgarh, Sitapur, U.P.*
8	*M/s Avadh Sugar & Energy Ltd., Unit – Seohara, Bijnor, U.P.*
9	*M/s L.H. Sugar Factories Ltd., Unit – Pilibhit, Pilibhit, U.P.*
10	*M/s Bajaj Hindusthan Sugar Ltd., Unit – Thanabhawan, Shamli, U.P.*
11	*M/s Dalmia Bharat Sugar & Ind. Ltd., Unit – Ramgarh, Sitapur, U.P.*
12	*M/s Triveni Engineering & Ind. Ltd., Unit – Khatauli, Muzaffarnagar, U.P.*

13	*M/s Dhampur Bio-organic Ltd., Unit – Meerganj, Bareilly, U.P.*
14	*M/s Bajaj Hindusthan Sugar Ltd., Unit – Distillery Kinauni, Meerut, U.P.*
15	*M/s Bajaj Hindusthan Sugar Ltd., Unit – Distillery Kinauni, Meerut, U.P.*
16	*M/s Bajaj Hindusthan Sugar Ltd., Unit – Gangnauli, Saharanpur, U.P*
17	*M/s Triveni Engineering & Ind. Ltd., Unit – Deoband, Saharanpur, U.P.*
18	*M/s Triveni Engineering & Ind. Ltd., Unit – Raninangal, Moradabad, U.P.*
19	*M/s Uttam Sugar Mills Ltd., Unit – Barkatpur, Bijnor, U.P.*
20	*M/s Uttam Sugar Mills Ltd., Unit – Khaikheri, Saharanpur, U.P.*
21	*M/s Uttam Sugar Mills Ltd., Unit – Shermau, Saharanpur, U.P.*
22	*M/s Avadh Sugar & Energy Ltd., Unit – Hargaon, Sitapur, U.P.*
23	*M/s DCM Shriram Ltd., Unit – Ajbapur, Lakhimpur, U.P.*
24	*M/s Triveni Engineering & Ind. Ltd., Unit – Milak Narayanpur, Rampur, U.P.*
25	*M/s Bajaj Hindusthan Sugar Ltd., Unit –Utraula, Balrampur, U.P.*
26	*M/s Bajaj Hindusthan Sugar Ltd., Unit –Pratappur, Deoria, U.P.*
27	*M/s Bajaj Hindusthan Sugar Ltd., Unit –Kundarkhi, Gonda, U.P.*
28	*M/s Magadh Sugar & Energy Ltd., Unit – Bharat Sugar Mill, Gopalganj, Bihar*
29	*M/s Sraswati Sugar Mills Ltd., Yamunanagar, Haryana*
30	*M/s Indian Potash Ltd., Distillery Unit – Rohana Mill, Muzaffarnagar, U.P.*
31	*M/s Balrampur, Chini Mills Ltd., Unit – Mankapur, Gonda, U.P.*
32	*M/s Balrampur, Chini Mills Ltd., Unit – Gularia, Lakhimpur Kheri, U.P.*
33	*M/s Balrampur, Chini Mills Ltd., Unit – Kumbhi, Lakhimpur Kheri, U.P.*
34	*M/s Balrampur, Chini Mills Ltd., Unit – Tulsipur, Balrampur, U.P.*
35	*M/s Bajaj Hindusthan Sugar Ltd., Unit –Palia Kalan, Lakhimpur Kheri, U.P.*
36	*M/s Triveni Engineering & Ind. Ltd., Unit – Chandanpur, Amroha, U.P.*
37	*M/s Rai Bahadur Narain Singh Sugar Mills Ltd., Distillery Division – Laksar, U.K.*
38	*M/s Naglamal Sugar Complex, Unit – Naglamal, Meerut, U.P.*

39	*M/s Harinagar Sugar Mills Ltd., Unit – Harinagar, West Champaran, Bihar*
40	*M/s Magadh Sugar & Energy Ltd., Narkatiaganj, W. Champaran, Bihar*
41	*M/s PBS Foods (Sugar) Private Ltd., Unit – Chandpur, Bijnor, U.P.*
42	*M/s Wave Industries Pvt. Ltd., Unit – Bulandshahar, U.P.*
43	*M/s Wave Industries Pvt. Ltd., Unit –Dhanaura, Jyitba Phule Nagar, U.P.*
44	*M/s Dhampur Bio-Organic Ltd., Unit – Meerganj, Bareilly, U.P.*
45	*M/s Trualt Bio-energy Ltd., Unit – 1, Distillery Division, Karnataka*
46	*M/s Trualt Bio-energy Ltd., Unit – 2, Distillery Division, Karnataka*
47	*M/s Trualt Bio-energy Ltd., Unit – 3, Distillery Division, Karnataka*

❖ ANALYTICAL SERVICES:

Besides analysis of sugar & sugar house products, ethanol and effluents etc., Institute offers testing of Ethyl Alcohol based Sanitizer in its sophisticated, most modern NABL accredited analytical laboratory and other laboratories of the institute. Testing of bagasse for determination of GCV and lime for various constituents also taken up during the period. Analytical services were rendered to following:

Sr. No.	***Factory Name***
1	*M/s Kisan Sahkari Chini Mills, Gajraula, Amroha, U.P.*
2	*M/s Kisan Sahkari Chini Mills, Mahmudabad, Sitapur, U.P.*
3	*M/s Sarju Sahkari Chini Mills, Belrayan, Lakhimpur, U.P.*
4	*M/s Dhampur Bio-Organic Ltd., Unit – Meerganj, Bareilly, U.P.*
5	*M/s Dhampur Bio-Organic Ltd., Unit – Asmoli, Sambhal, U.P.*
6	*M/s Dhampur Bio-Organic Ltd., Unit –, Mansurpur, Muzaffarnagar, U.P.*
7	*M/s Triveni Engineering & Ind. Ltd., Unit – Khatauli, Muzaffarnagar, U.P.*
8	*M/s Triveni Engineering & Ind. Ltd., Chandanpur, Amroha, U.P.*

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❖ OUR OTHER ACTIVITIES:

1. National Sugar Institute felicitated **"Safai Mitra's"** on 1st October 2023 for their untiring and commendable efforts in maintaining cleanliness and for putting special efforts during the Swachhta Campaign.

2. National Sugar Institute, Kanpur paid tributes to the sons of the soil, Mahatma Gandhi and Shri Lal Bahadur Shastri, and made a commitment to continuously strive for India's advancement and development on 2nd October 2023**. "Walkathon" and "Nukkad Natak"** were also organized to create awareness about swachhata.

3. As a part of swachhata campaign **"EKDIN EK GHANTA"**, officers, staff and students carried out **"Shramdaan"** at Parmat Ghat on the banks of holy river Ganges on 1st October 2023. Shri Satydev Pachauri, Member of Parliament also joined the institute campaign. A **"Bio-toilet"** was donated to Shri Kasturba Higher Secondary School, Nawabganj, Kanpur.

4. राष्ट्रीय शर्करा संस्थान, कानपुर द्वारा गत वर्षो की भाँति इस वर्ष भी वार्षिक खेलकूद संस्थान में आयोजित किये गये। दिनांक 08 अक्टूबर 2023 को आयोजित पुरस्कार वितरण समारोह में विभिन्नि प्रतिभागियों को निदेशक, राष्ट्रीय शर्करा संस्थान, कानपुर के द्वारा पुरस्कार से सम्मानित किया गया।

5. Eighteen member delegation of Fiji Sugarcane Grower Council to visit India to study recent developments in the areas of sugarcane agriculture. Programme finalized in a meeting attended by Director, NSI and officials of MEA, Indian Embassy in Fiji and Fiji Sugar Corporation on 17th October 2023.

6. केंद्र सरकार के कार्यालयों एवं अन्य संस्थानों मे हिंदी को बढ़ावा देने हेतु केंद्रीय गृह मंत्रालय के तहत कार्यरत नगर राजभाषा कार्यान्वयन समिति द्वारा भारतीय प्रौद्योगिकी संस्थान (IIT), कानपुर मे दिनांक 25 अक्टूबर 2023 को आयोजित कार्यक्रम मे राष्ट्रीय शर्करा संस्थान को उनके द्वारा राजभाषा हिंदी मे किये जा रहे उल्लेखनीय कार्य हेतु सम्मानित किया गया।

7. उप निदेशक, उत्तर क्षेत्रीय कार्यान्वयन कार्यालय द्वारा राष्ट्रीय शर्करा संस्थान कानपुर के द्वारा किये जा रहे राजभाषा सम्बन्धी कार्यों का निरीक्षण दिनांक 25 अक्टूबर 2023 को किया गया।

8. **"Vigilance Awareness Week"** was organized at the institute from 30th October to 5th November 2023. Integrity Pledge was administered to officers and staff of National Sugar Institute, Kanpur on 30th October 2023 by the Director.

9. On National Unity Day organized on 31st October 2023, after paying floral tributes to Sardar Vallabhbhai Patel, **"Ekta Diwas Pledge"** was administered to the staff and students. **"Run for Unity"** was also organized on this occasion.

10. National Sugar Institute, Kanpur organized meeting on 3rd November 2023 and discussed with UP Sugar Mills Association (UPSMA) & factory officials, regarding water management and particularly for fixing norms for fresh water intake and effluent discharge for various models of sugar -ethanol -power production.

11. Director, NSI, Kanpur inaugurated **"Project Laboratory"** at the institute on 9th November 2023, in the direction of establishing **"Centre of Excellence for Specialty Sugars"** and **"Centre of Excellence for Bio-fuels"**. Project Laboratory is dedicated for analysis of samples related to various projects viz. bio-fuels, specialty sugars and RO technique for juice concentration etc.

12. National Sugar Institute, Kanpur launched awareness campaign about safe and pollution free Diwali on 11th November 2023, in the areas of high footfalls, metro railway station, Bank ATM, Sugar Factory and also in Institute premises. Cloth bags were also distributed in market to inspire people not to use plastic carry bags.

13. Director, National Sugar Institute, Kanpur visited the UP Council of Sugarcane Research, Shahjahanpur on 18th November 2023, and discussed about Breeder Seed Development programme at the institute. NSI thus to help sugar industry in providing seeds of newer varieties in future.

14. Director, National Sugar Institute, Kanpur visited M/s Dalmia Bharat Sugar & Ind. Ltd. Sugar unit -Shahjahanpur and inspected the pilot plant trials for concentrating sugarcane juice by Reverse Osmosis technique.

15. Research Fellows of the Sugar Technology Division of NSI Kanpur succeeded in developing Low Glycemic Index (low GI) Sugar and Low Glycemic Index (Low GI) Fortified Sugar using minimum amount of chemicals. Foods having Low Glycemic Index provide lesser spike in blood sugar levels and are helpful in diabetes management.

16. National Sugar Institute, Kanpur, celebrated **"Indian Constitution Day"** on 26th November 2022. Preamble to the Indian Constitution was read by the Officers and Staff of NSI, Kanpur.

17. राष्ट्रीय शर्करा संस्थान मे तृतीय हिंदी कार्यशाला का आयोजन दिनांक 24 नवंबर 2023, को किया गया। इस अवसर पर वरिष्ठ तकनीकी अधीक्षक (अनुवाद), भारतीय प्रौद्योगिकी संस्थान द्वारा हिंदी के अधिकाधिक प्रयोग हेतु महत्वपूर्ण जानकारी प्रदान की गयी।

18. National Sugar Institute, Kanpur organized a Meditation Programme **"Sahaj Yog"** on 11th December 2023 for the benefit of staff and students of the institute. Methodology for practicing meditation "Dhyan" was explained by the experts of the organization who also detailed its benefit in stress relieving and making a healthier and happier life. On this occasion, Ms. Anandita Basu, a world renowned name in Sufi music carried out vocal recital and sung bhajans and qawwali's. The programme was attended by other dignatiries from industry, institutes and other organizations in large numbers.

19. Director NSI, Kanpur visited M/s Triveni Engineering & Industries Ltd., Chandanpur and newly established M/s Bindals Paper Mills Ltd. (Sugar Division). M/s Bindals Paper Mills Ltd., plant is different in many ways with focus on bagasse saving, de-pithing and utilization of fibre in paper mill. It has unique Evaporator configuration working with seven FFE's with steam consumption of around 26% (with B Heavy molasses diversion).

During his visit to M/s Triveni Engineering & Industries Ltd., Chandanpur, he called upon the sugar industry to develop various business models producing various products using entire sugarcane value chain. We can produce many value added products using by-products and the waste from the sugar industry and thus the future of the Indian Sugar Industry lies in converting sugar factories to "Agri Business Complexes" or to "Bio-refineries", he said.

20. राष्ट्रीय शर्करा संस्थान, कानपुर द्वारा दिनांक 19 दिसंबर 2023 को नगर राजभाषा कार्यान्वयन समिति, कानपुर कार्यालय-3 के तत्वावधान में नगर स्थित केंद्रीय सरकार के कार्यालय में कार्यरत अधिकारियों एवं कर्मचारियों के लिए एक निबंध प्रतियोगिता का सफल आयोजन किया गया ।

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❖ HAPPENING IN THE SUGAR INDUSTRY:

उत्तर प्रदेश: कुछ जिलों में लाल सड़न रोग की चपेट में गन्ना फसल; जागरूकता अभियान शुरू-
रेड रॉट (लाल सड़न रोग), जिसे आमतौर पर "गन्ने की फसल का कैंसर" कहा जाता है, उत्तर प्रदेश के प्रमुख खेती वाले क्षेत्रों में दिखाई देने लगी है, जिससे किसान काफी चिंतित है। टाइम्स ऑफ इंडिया में प्रकाशित खबर के मुताबिक, लखीमपुर खीरी, पीलीभीत, मोरादाबाद, बिजनोर और अमरोहा सबसे ज्यादा प्रभावित हैं। यूपी गन्ना विभाग के अधिकारियों के अनुसार, यह बीमारी तब होती है जब एक विशेष किस्म को लंबे समय तक बोया जाता है और बदला नहीं जाता है। यह रोग तब बढ़ता है जब किसान बीज और मिट्टी का उचित उपचार नहीं करते हैं।

Maharashtra: CPCB orders closure of 45 sugar mills for environmental violations-

Mumbai: In a blow to the sugar industry in Maharashtra, the Central Pollution Control Board (CPCB) has ordered to shutdown of 45 cooperative sugar factories within the state due to violations of the Environmental Protection Act, reported The Times of India. This move comes just as the sugarcane crushing season is set to commence on November 1, marking the first instance of such a large number of sugar units receiving closure notices.

India achieves 12 per cent ethanol blending target-
India has achieved its target of 12 per cent ethanol blending with petrol for the current ethanol supply year, which concludes in October 2023, according to Union Minister for Petroleum and Natural Gas, Hardeep Singh Puri, reported The Hindu Businessline. In the Ethanol Supply Year 2022–23 (December 2022–October 2023), the government had set a target of achieving a 12 per cent ethanol blending with petrol. The target for the next year, Ethanol Supply Year 2023–24 (November 2023–October 2024), has been set at 15 per cent.

जल्द ही चालू हो जायेगा रीगा चीनी मिल: मंत्री-
हार के सीतामढ़ी की चर्चित रीगा चीनी मिल जल्द चालु होने की उम्मीद है। बिहार के उद्योग मंत्री समीर कुमार महासेठ ने कहा की जल्द रीगा चीनी मिल चालू हो जायेगा। दैनिक भास्कर में प्रकाशित खबर के मुताबिक, कांग्रेस के वरिष्ठ नेता सह बिहार प्रदेश कांग्रेस के प्रतिनिधि रकटू प्रसाद के महावीर स्थान स्थित निवास स्थान पर बिहार के उद्योग मंत्री समीर कुमार महासेठ पहुंचे। इस दौरान वहा पर चीनी मिल चालू कराने को लेकर चर्चा हुई जिसपर उन्होंने यह प्रतिक्रिया दिया। मंत्री ने कहा कि राज्य में उद्योग धंधा के विकास के लिए माहौल तैयार है। कई बड़े औद्योगिक प्रतिष्ठान बिहार में उद्योग धंधा लगाने को तैयार है।

चीनी उद्योग अच्छा प्रदर्शन करेगा क्योंकि एथेनॉल एक बड़ा गेम चेंजर है: अतुल चतुर्वेदी-
श्री रेणुका शुगर्स लिमिटेड के कार्यकारी अध्यक्ष अतुल चतुर्वेदी को उम्मीद है कि, आने वाले वर्षों में चीनी उद्योग बेहतरीन प्रदर्शन करेगा क्योंकि एथेनॉल एक बड़ा गेम चेंजर बन गया है। श्री रेणुका शुगर्स लगभग 200 करोड़ रुपये निवेश के साथ यूपी स्थित अनामिका शुगर मिल्स प्राइवेट लिमिटेड को खरीदने के लिए तैयार है। ब्लूमबर्ग में प्रकाशित खबर के मुताबिक, श्री रेणुका शुगर के कार्यकारी अध्यक्ष अतुल चतुर्वेदी ने कहा की, यदि आप 'रेणुका' के संपत्ति आधार को देखें, तो हमारा व्यवसाय बड़े पैमाने पर कर्नाटक और महाराष्ट्र राज्यों में केंद्रित है। इसलिए हमें भौगोलिक रूप से अपने व्यवसाय को जोखिम से मुक्त करना था और यही कारण है कि हम यूपी में निवेश कर रहे है। उन्होंने कहा, कंपनी को चीनी का परिवहन करना कठिन लगा क्योंकि यह केवल पश्चिमी और दक्षिणी भारत में मौजूद थी। चतुर्वेदी ने कहा, मधुर (खुदरा ब्रांड) को पश्चिमी और दक्षिणी भारत से भेजना लोगिस्टिक के दृष्टि से कठिन था, इसलिए देश के सबसे अधिक आबादी वाले हिस्से में मौजूद रहना हमारे लिए अधिक जरूरी था।

भारत और सऊदी अरब ने Green Hydrogen और आपूर्ति श्रृंखला के क्षेत्र में समझौता ज्ञापन पर हस्ताक्षर किए-
भारत और सऊदी अरब ने कल रियाद में विद्युतीय अंतर-संयोजन, हरित/स्वच्छ हाइड्रोजन (Green / Clean Hydrogen) और आपूर्ति श्रृंखला के क्षेत्र में एक समझौता ज्ञापन पर हस्ताक्षर किए। समझौता ज्ञापन पर भारत सरकार के केंद्रीय विद्युत् और नवीन एवं नवीकरणीय ऊर्जा मंत्री श्री आर.के. सिंह और सऊदी अरब सरकार के ऊर्जा मंत्री श्री अब्दुलअज़ीज़ बिन सलमान अल-सऊद ने हस्ताक्षर किए। श्री आर.के. सिंह एमईएनए जलवायु सप्ताह में भाग लेने के लिए रियाद की यात्रा पर हैं।

Engineered enzymes produce biomass optimised for fuel conversion-
Washington [US], October 28 (ANI): Plant biologists at the DOE's Brookhaven National Laboratory in the United States have developed enzymes to change grass plants so that their biomass can be turned

more efficiently into biofuels and other bioproducts. These enzymes, as described in an article just published in the Plant Biotechnology Journal, change molecules that makeup plant cell walls to allow access to fuel-generating sugars that are ordinarily trapped within complicated structures.

Ethanol production: CAQM reviews progress of setting up of 2G bio-refinery plant at Bathinda by HPCL-

Bathinda, Punjab: Hindustan Petroleum Corporation Limited (HPCL), a Central Government PSU, is setting up a Second Generation (2G) bio-refinery plant at Bathinda, Punjab at a cost of more than ₹1,400 crore. The 2G bio-refinery is designed for utilization of paddy straw for production of ethanol for blending with petrol under the Ethanol Blending Program of Central Government. The progress of setting up the plant is also being monitored by the Commission for Air Quality Management in NCR and Adjoining Areas (CAQM) and the Commission had also visited the plant premises in Bathinda and reviewed the progress with CMD, HPCL and District Administration, Bathinda.

Tamil Nadu: Average sugarcane yield declines in state-

Madurai: The Director of ICAR-Sugarcane Breeding Institute, G. Hemaprabha, stated that the sugarcane cultivation area in Tamil Nadu has seen a slight increase, rising from 1.548 lakh hectares in 2021-22 to 1.61 lakh hectares in 2022-23, reported The Hindu. Addressing the 53rd sugarcane research and development workshop of Tamil Nadu and Puducherry in Theni, she noted that, despite this growth, the average sugarcane yield in the state has declined from 109.24 tonnes per hectare in 2021-22 to 104.78 tonnes per hectare in 2022-23, which is a cause for concern.

एथेनॉल को बढ़ावा: भारत की पहली बांस आधारित बायोरिफाइनरी अगले साल करेगी परिचालन शुरू-

ऑयल इंडिया (Oil India) की पूर्ण स्वामित्व वाली सहायक कंपनी नुमालीगढ़ रिफाइनरी (NRL) मार्च 2024 में असम में अपनी बायोरिफाइनरी में एथेनॉल उत्पादन शुरू करने की योजना बना रही है। बायोरिफाइनरी फीडस्टॉक के रूप में बांस (bamboo-based biorefinery) का उपयोग करने वाली देश की पहली कंपनी होगी। मीडिया रिपोर्ट के मुताबिक, बायोरिफाइनरी से सालाना 50,000 टन एथेनॉल, 16,000 टन फ़्यूरफ़्यूरल और 11,000 टन एसिटिक एसिड (50,000 tonnes of ethanol, 16,000 tonnes of furfural and 11,000 tonnes acetic acid) का उत्पादन होने की उम्मीद है।

एथेनॉल उत्पादन को लेकर भारत के नक्शेकदम पर चल रहा है पाकिस्तान-

इस्लामाबाद: भारत ने पिछले कुछ वर्षो में एथेनॉल उत्पादन को बढ़ावा दिया है और इसका लाभ देश में स्पष्ट रूप से देखा जा सकता है। भारत को पेट्रोल में एथेनॉल सम्मिश्रण से विदेशी मुद्रा में हजारों करोड़ की बचत हुई है। जिसके बाद पडोसी देश पाकिस्तान भी भारत के नक्शेकदम पर चल रहा है। अब पाकिस्तान में भी एथनॉल उत्पादन को बढ़ावा देने की बात हो रही है।

इस्लामाबाद स्थित पाकिस्तान-जर्मन रिन्यूएबल एनर्जी फोरम (PGREF) के ऊर्जा विशेषज्ञ फ़राज़ खान ने कहा की, सस्ती ऊर्जा की निरंतर आपूर्ति सुनिश्चित करना एक गंभीर मुद्दा बना हुआ है, जिसका पाकिस्तान दशकों से सामना कर रहा है। नवीकरणीय ऊर्जा स्रोत के रूप में जैव ईंधन, आयातित ईंधन पर देश की निर्भरता को कम करने में मदद कर सकता है, जिसके परिणामस्वरूप देश की ऊर्जा सुरक्षा बढ़ सकती है।

Pakistan: Sugarcane price surge likely ahead of crushing season-

An increase in sugarcane prices ahead of the upcoming crushing season is expected in Pakistan's Punjab which may help to skyrocket sugar rates, reported 24Digital. As per media report, the food department is contemplating a sugarcane price hike ranging from Rs 125 to Rs 150 per maund. The Cane Commissioner's office, in its proposal, suggests a new sugarcane price within the range of Rs 425 to Rs 450 per maund. Meanwhile, the agriculture department has put forward a proposal to raise the sugarcane price to Rs 440 per maund.

Loose sweets are not required to declare 'Best Before Date-

The Food Safety and Standards Authority of India (FSSAI) has withdrawn its order to declare 'Best Before date' on non-packaged loose sweets. The FSSAI order dated September 25 2020, mandated loose sweets to declare 'best before date', which was withdrawn on November 7. FSSAI said that considering that the Food Safety Standards (Packaging and Labelling) Regulations 2011 have been superseded by

the Food Safety and Standards (Labelling and Display) Regulations 2020, the said directive has been reviewed. It said that the same requires further deliberations by the concerned scientific panel regarding the declaration of date marking on non-packaged or loose food products.

भारत में एथेनॉल की मांग को पूरा करने की अपार संभावनाएं हैं: पीयूष गोयल-

केंद्रीय मंत्री पीयूष गोयल ने कहा की भारत में एथेनॉल की मांग को पूरा करने की अपार संभावनाएं हैं। वे नेशनल कोऑपरेटिव फॉर एक्सपोर्ट्स लिमिटेड (NCEL) के 'लोगो' और वेबसाइट के अनावरण कार्यक्रम के दौरान बोल रहे थे।

उन्होंने कहा की, G20 शिखर सम्मेलन में माननीय प्रधानमंत्री मोदी ने ग्लोबल बायोफ्यूल्स अलायंस (Global Biofuels Alliance) की शुरुआत की। भारत इस गठबंधन का नेतृत्व कर रहा है, जो एथेनॉल और बायोयूएल के बारे में दुनिया में जागरूकता पैदा कर रहा है। इससे मांग बढ़ेगी और भारत के पास उन मांगों को पूरा करने की अपार संभावनाएं हैं। भारत में बहुत सारी कंपनियां एथेनॉल का उत्पादन करती हैं। देश में चीनी उत्पादक कंपनियों ने एथेनॉल के अच्छे प्लांट लगाए है। भविष्य में हम मक्के का उपयोग कर एथेनॉल का बड़ी तादाद में उत्पादन कर सकते हैं। यदि सहकारी क्षेत्र इसमें पहल करता है तो हम एथेनॉल की बढ़ती मांग को पूरा कर सकेंगे।

पंजाब: भोगपुर चीनी मिल द्वारा पराली से बिजली उत्पादन-

जालंधर: पराली जलाने को हतोत्साहित करने के उद्देश्य से एक कदम उठाते हुए, भोगपुर सहकारी चीनी मिल ने धान की पराली का उपयोग करके बिजली पैदा करना शुरू कर दिया है। इसके लिए मिल किसानों से सीधे पराली 180 से 250 रुपये प्रति क्विंटल के हिसाब से खरीद रही है। इससे राज्य सरकार को कुछ हद तक राहत मिली है क्योंकि पंजाब प्रदूषण नियंत्रण बोर्ड के आंकड़ों के अनुसार अभी तक भोगपुर और इसके आसपास के इलाकों में पराली जलाने का कोई मामला सामने नहीं आया है।

फिजी चीनी उद्योग का विदेशी राजस्व में $200 मिलियन से अधिक का योगदान: प्रधान मंत्री राबुका-

सुवा : प्रधान मंत्री सितिवनी राबुका ने कहा कि पीढ़ियों से, हमारा चीनी उद्योग सिर्फ आय के स्रोत से कहीं अधिक रहा है।यह लचीलेपन और दृढ़ता का प्रतीक रहा है जिसने लगातार विदेशी राजस्व में सालाना 200 मिलियन डॉलर से अधिक का योगदान दिया है। अपने पश्चिमी डिवीजन दौरे के दौरान बा में रारावई चीनी मिल का दौरा करते हुए, राबुका ने इस बात पर प्रकाश डाला कि फिजी में चीनी उद्योग देश के आर्थिक स्तंभों में से एक के रूप में अपने महत्व को रेखांकित कर रहा है।प्रधान मंत्री राबुका का कहना है कि, गठबंधन सरकार सब्सिडी, प्रोत्साहन और बुनियादी ढांचे में निवेश के माध्यम से चीनी क्षेत्र को बढ़ाने के लिए उद्योग का समर्थन करेगी।महत्वपूर्ण समर्थन प्रदान करने और फिजी के आर्थिक परिदृश्य में उद्योग की महत्वपूर्ण भूमिका को सुरक्षित रखने के लिए चीनी उद्योग के प्रति उनकी प्रतिबद्धता शब्दों से परे है।

भारत द्वारा नेपाल और भूटान में चीनी निर्यात की अनुमति-

भारत सरकार ने नेपाल और भूटान में प्रत्येक 25,000 मीट्रिक टन चीनी निर्यात करने की अनुमति दी है। सरकार द्वारा जारी अधिसूचना में कहा गया है की, आवश्यक वस्तुओं की कीमतों और उपलब्धता की समीक्षा के लिए मंत्रियों की समिति (COM) ने National Cooperative Exports Limited (NCEL) के माध्यम से नेपाल और भूटान को 25,000 मीट्रिक टन प्रत्येक चीनी के निर्यात की अनुमति देने का निर्णय लिया है। जिसकी वैधता सितम्बर 30, 2024 तक है।

India's power demand to stay strong, rise 7 per cent in 2023-24: Fitch-

New Delhi [India], November 17 (ANI): India's power sector demand is expected to rise by around 7 per cent in the financial year ending March 2024 amid robust industrial activity, according to Fitch Ratings. The rating agency said it expects that strong power demand would keep thermal power plant load factors high. However, coal import volume is expected to remain modest, with higher local supply meeting a large part of the increased demand.

Canada: Winnipeg faces sugar shortages due to ongoing workers Strike-

he repercussions of ongoing labor actions in western Canada are reverberating in Winnipeg, where local business owners are expressing apprehension about the uncertain future of their sugar supply, reported Globalnews. The seven-week-long strike at the Rogers Sugar refinery in Vancouver, B.C., has significantly restricted the supply of sugar to businesses in the surrounding regions. Munther Zeid, proprietor of Food Fare in Winnipeg, stated that the strike's impact prevented him from replenishing his sugar stock after the weekend.

Sugar prices expected to rise in Vietnam-

Hanoi: Sugar prices in Vietnam are expected to rise in the remaining months of 2023, according to the Vietnam Sugarcane and Sugar Association (VSSA). The association cited a decrease in supply from major producers India and Thailand as the main reason for the price hike. As the year approaches its conclusion, experts predict that the demand for sugar in Vietnam will increase, particularly in the lead-up to the Lunar New Year holiday. Simultaneously, the existing low inventory levels have raised concerns among experts about potential challenges on the supplier's side in the domestic market.

चीनी की कीमतें, एथेनॉल उत्पादन और उद्योग के अन्य मुद्दों पर अवंतिका सरावगी के साथ इंटरव्यू-

बलरामपुर चीनी मिल्स लिमिटेड की Promoter & Business Lead- New Initiatives, अवंतिका सरावगी ने कहा कि यूपी में चीनी उत्पादन में 5% की वृद्धि होगी, जो ISMA की उम्मीद के अनुरूप है। उन्होंने कहा कि देश में चीनी की कीमतें स्थिर (firm sugar prices) रहने की संभावना है। उन्होंने कहा कि यूपी में गन्ने के राज्य सलाहित मूल्य (SAP) में थोड़ी बढ़ोतरी हो सकती है।

इंडोनेशियाई सरकार की चीनी मिल स्थापित करने की योजना-

जकार्ता : कृषि मंत्री एंडी अमरान सुलेमान ने कहा कि, सरकार ने मेरौके, पापुआ में एक चीनी मिल स्थापित करने की योजना बनाई है। मंत्री अमरान ने इस मामले पर पर्यावरण एवं वानिकी मंत्रालय से चर्चा करने का दावा किया। उन्होंने कहा, मिल के लिए वानिकी महानिदेशालय ने भूमि तैयार की है, और हम क्षेत्र का निरीक्षण करेंगे। हालांकि, उन्होंने यह नहीं बताया कि इस चीनी मिल का काम कब शुरू होगा। मंत्री अमरान के अनुसार, पापुआ में चीनी मिल स्थापित करने के दो कारण हैं। सबसे पहले, इस क्षेत्र में चीनी के कच्चे माल, गन्ना बोने के लिए उपयुक्त स्थिति है। दूसरा, पापुआ में अभी भी भूमि प्रचुर मात्रा में उपलब्ध है। कई निवेशकों ने मिल के वित्तपोषण में रुचि दिखाई है। हालाँकि, अमरान ने मिल के लिए आवश्यक निवेश की आवश्यक राशि का खुलासा नहीं किया।उन्होंने केवल इतना कहा कि, निवेश Rp2.5 ट्रिलियन से Rp3 ट्रिलियन के बीच किया जायेगा।

उत्तर प्रदेश: किसानों को नई प्रजाति के गन्ना बुआई करने की सलाह दी गई-

मुरादाबाद, उत्तरप्रदेश: त्रिवेणी चीनी मिल के महाप्रबंधक टी.एस. यादव ने किसानों को गन्ना उत्पादन में बढ़ोतरी के लिए नई प्रजाति के गन्ने की बुआई करने की अपील की। ठाकुरद्वारा के मुंशीगंज गन्ना केंद्र पर महाप्रबंधक टी.एस. यादव ने बुधवार को औचक निरीक्षण किया। उन्होंने इस केंद्र पर लाल सड़न रोग से प्रभावित गन्ने की खरीद को देखकर नाराजगी जताई। उन्होंने कहा कि, चीनी मिल द्वारा गन्ने की खरीद छह नवंबर तक का 15 करोड़ 10 लाख रुपये का भुगतान किया जा चुका है। उन्होंने किसानों से साफ सुथरे व ताजे गन्ने की आपूर्ति करने की अपील की। साथ ही उन्होंने लाल सड़न से ग्रसित गन्ने की आपूर्ति न करने के निर्देश दिए।

AIDA wants reduced feedstock changeover time for grain-based distilleries, no separate storage tanks-

he All India Distillers' Association (AIDA) has written a letter to the Government on 28th November 2023, representing its views on proposed guidelines for manufacturing ethanol from various feedstock. The letter written to the Joint Secretary, Ministry of Consumer Affairs, Food and Public Distribution, AIDA follows an official meeting between DFPD officials and AIDA on 21st November, where the guidelines were discussed and views were sought.

Demand for jaggery set to increase in Madurai-

Madurai: As the Pongal festival approaches, the demand for jaggery is set to soar, prompting a surge in prices from the usual ₹60 per kg to around ₹90 per kg, reported The Hindu.Producers in various parts of the Madurai district, including Alanganallur, Kottanathampatti, Thirumangalam, and Karumathur, are capitalizing on this seasonal demand for organic sweeteners.

सरकार के एथेनॉल के लिए गन्ना ज्यूस का उपयोग न करने के निर्देश के बाद चीनी मूल्य में ₹100 प्रति क्विंटल की गिरावट आ सकती है: Rahil Shaikh-

सरकार ने सभी चीनी मिलों और डिस्टिलरीज को तत्काल प्रभाव से एथेनॉल के लिए Sugar Cane Juice/Sugar Syrup का उपयोग न करने का निर्देश दिया है। और साथ ही जारी अधिसूचना में कहा गया है की बी-हेवी मोलासेस से OMCs द्वारा प्राप्त मौजूदा प्रस्तावों से एथेनॉल की आपूर्ति जारी रहेगी। सरकार के इस निर्णय के बाद चीनी के दामों में भी कमी आएगी, क्यूंकि अब चीनी उत्पादन में बढ़ोतरी संभव है। MEIR Commodities के Management Director, Rahil Shaikh ने चीनीमंडी से बातचीत में कहा की एथेनॉल

पॉलिसी चीनी उद्योग की लाइफलाइन है और इसमें बहुत इन्वेस्टमेंट भी किया गया है। सरकार के 20 प्रतिशत एथेनॉल ब्लेंडिंग के टारगेट के लिए चीनी उद्योग ने पांच से साढ़े पांच बिलियन लीटर मुहैया कराने के लिए एसेट निर्माण किया है। और यह घोषणा बहुत बड़ा धक्का है। पहले टेंडर में Sugar Cane Juice/Sugar Syrup से 137 करोड़ लीटर का टारगेट था हमारा आपूर्ति करने का। इसमें से 12 या 14 करोड़ लीटर सप्लाय हो चूका होगा। तो लगभग 120 करोड़ लीटर के करीब यह रद्द हो गया। इसका मतलब लगभग 1.6 मिलियन टन चीनी सरकार वापस से सिस्टम में ले आयी है। जहा तक मेरा अनुमान है इसकी जरुरत नहीं थी क्यूंकि हमारे पास पर्याप्त स्टॉक है डोमेस्टिक मार्केट के लिए। इस सीजन 50 लाख टन के करीब ओपनिंग स्टॉक है और 30 मिलियन टन उत्पादन का अनुमान था और इस निर्णय के वजह से उत्पादन 31.5 मिलियन टन तक हो सकता है। और लगभग 28.5 मिलियन टन खपत के साथ ही लगभग 3 से 3.5 मिलियन टन अपने भंडार में हम फिर से जमा कर पायेंगे। और बी हेवी मोलासेस से जो अभी डायवर्जन दिख रहा है वह अभी तकरीबन 1.3 मिलियन टन का ही है।

चालू सीजन में 12 प्रतिशत एथेनॉल मिश्रण लक्ष्य हासिल करना मुश्किल: विजेंद्र सिंह-

चीनी मिलों को गन्ने के रस/सिरप से एथेनॉल उत्पादन पर प्रतिबंध लगाने के सरकार के फैसले के बाद, एक सप्ताह के भीतर आदेश में संशोधन किया गया, और तेल विपणन कंपनियों (OMCs) को गन्ने के रस/सिरप और बी हेवी मोलासेस से एथेनॉल के आवंटन को संशोधित करने की अनुमति दी गई। इस वर्ष के एथेनॉल सम्मिश्रण कार्यक्रम पर आदेश का क्या प्रभाव होगा, और इसका एथेनॉल परियोजनाओं में निवेश करने वाली चीनी मिलों पर क्या प्रभाव पड़ेगा?सरकारी आदेश के निहितार्थ को समझने और चालू वर्ष में घरेलू और वैश्विक चीनी उद्योग की गहन समझ प्राप्त करने के लिए, 'चीनीमंडी' ने विजेंद्र सिंह अध्यक्ष (साउथ इंडियन शुगर मिल्स एसोसिएशन) से विशेष रूप से बात की।

मिस्र जनवरी 2024 में राशन कार्डों पर चीनी 2 किलोग्राम तक बढ़ाएगा-

काहिरा: मिस्र के आपूर्ति और आंतरिक व्यापार मंत्रालय ने घोषणा की कि मिस्र जनवरी 2024 से राशन कार्डों पर चीनी की 2 किलोग्राम की वृद्धि करेगा। चीनी की कीमतों में उछाल से जूझ रहे मिस्र के नागरिकों को राहत प्रदान करने के लिए सरकार द्वारा यह कदम उठाया जा रहा है। मिस्र के बाजारों में हाल के सप्ताहों में चीनी की कीमत 50 प्रतिशत से अधिक बढ़ी है। नए उपायों के तहत, राशन कार्ड रखने वाले व्यक्ति एक अतिरिक्त किलोग्राम चीनी के हकदार होंगे। इसके अलावा, चार या अधिक व्यक्तियों वाले परिवारों को उनके राशन कार्ड पर दो किलोग्राम अतिरिक्त चीनी मिलेगी।

जिम्बाब्वे: स्थानीय चीनी बिक्री में 14 प्रतिशत की गिरावट-

हरारे: सरकार द्वारा सस्ते आयात के कारण स्थानीय चीनी उद्योग को चीनी बिक्री में 14 प्रतिशत की गिरावट का सामना करना पड़ा। मई 2023 में, सरकार ने अगले छह महीनों के लिए आयात पर सीमा शुल्क भुगतान से छूट देने वाली 14 बुनियादी वस्तुओं की एक सूची तैयार की थी, जिसमें चीनी, पाउडर दूध, चावल, मक्का भोजन, आटा, कपड़े धोने और स्नान साबुन, वाशिंग पाउडर, टूथपेस्ट और पेट्रोलियम जेली शामिल थे। सरकार के इस पहल का उद्देश्य उपभोक्ताओं को महंगाई के मार से बचाना था।

Tanzania: Sugarcane shortage impacts sugar production-

Dar es Salaam: In Manyara, the vision of locally-produced sugar has soured as the region's sugar factory grinds to a halt, crippled by a severe shortage of sugarcane, reported The Citizen.Industry and Trade Minister Dr. Ashatu Kijaji's recent visit to the facility laid bare the stark reality: a once prolific factory, capable of producing over 50 tonnes of sugar daily, now stands silent, a casualty of the dwindling sugarcane supply.

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❖ **RESEARCH ARTICLE:**

SUGAR INDUSTRY & GREEN HYDROGEN

by

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ABSTRACT

All nations are concerned with environmental safety and the regulation of pollution, motivating researchers across the world to find an alternate clean, green and renewable fuels. Indian sugar industry while looking beyond sugar has already undertaken production of bio-electricity, bio-ethanol and bio-gas which has improved its viability. However, looking to the targets set by the country for net zero carbon emissions by 2070, manifestation and commercialization of clean hydrogen fuel can help in achieving the goad. This article describes the various forms of hydrogen, present status about technologies for production of green hydrogen, salient features of each and utilization in various sectors. Sugar Industry, producing bio-electricity and compressed bio-gas can also contribute significantly in providing green hydrogen and thus assisting in meeting the targets set under National Green Hydrogen Mission. Various opportunities and challenges with respect to technologies available, cost and safety issues have also been discussed.

KEYWORDS

Green hydrogen; methane pyrolysis, electrolysis, fossil fuels, global warming

INTRODUCTION

With an objective to reduce the carbon emissions, restrict rise in the earth temperature and mitigate the issue of climate change, green hydrogen is being considered as the future fuel [1]. The issues of global warming and climate can be taken care to a larger extent by restricting the use of conventional fossil fuels and going in for fuels which are cleaner, green and renewable [2]. Across the globe there is continuous and serious brainstorming on the environmental issues and government of various countries are now in the process of exploring potential of non -conventional energy resources or the fuels which result in generation of clean and green energy. India has also taken a lead in this direction and we have seen a surge in solar and wind power generation during the last decade or so along with biomass based energy production. Indian sugar industry has also been at the forefront in developing clean and green energy by contributing bagasse-based electricity, juice &molasses based ethanol for EBB and compressed biogas or bio-methane produced from filter cake as automotive or fuel for other purposes [3].

Commitment to achieve net-zero emissions is crucial in addressing the issues related to climate change and transitioning to a more sustainable and environmentally friendly global scenario. Net zero emissions refers to the balance between the amount of greenhouse gases emitted into the atmosphere due to any of the activity and the amount removed or offset [4]. Achieving this balance is crucial to limit

global warming and its associated impacts as indicated in the above paragraph. Various countries have set targets to achieve net zero emissions by 2040 to 2070. Green hydrogen is being looked into as a potential source which can play a significant role in this commitment as it can serve as a clean and sustainable energy carrier. The present article describes the matrix of green hydrogen including its production methodologies, cost components, safety concerns and other challenges. Nation's commitment to explore potential of green hydrogen and is likelihood availability from the Indian Sugar Industry is also briefly discussed.

TYPES OF HYDROGEN

Hydrogen is defined as of many types indicated in shades mainly depending upon the feed stock and environmental impact/carbon footprints [5] :

Grey Hydrogen: This term might be used to describe hydrogen produced using traditional, carbon-intensive methods, such as steam methane reforming (SMR) or coal gasification. These processes emit significant amounts of carbon dioxide (CO2) and other pollutants, making the hydrogen production "grey" due to its environmental impact.

Blue Hydrogen: Blue hydrogen is a concept where hydrogen is produced from natural gas but with carbon capture and storage (CCS) technologies to mitigate the carbon emissions. It's considered an intermediate step toward fully green hydrogen production.

Turquoise Hydrogen: Turquoise hydrogen is made using a process called methane pyrolysis to produce hydrogen and solid carbon. In the future, turquoise hydrogen may be valued as a low-emission hydrogen, dependent on the thermal process being powered with renewable energy and the carbon being permanently stored or used.

Green Hydrogen: This refers to hydrogen that is produced using renewable energy sources, such as wind or solar power. Green hydrogen production has a much lower environmental impact as it doesn't produce greenhouse gas emissions during the hydrogen generation process.

Ministry of New and Renewable Energy has recently defined Green Hydrogen as having a well to gate emission of not more than 2 kg CO_2 equivalent per kg H_2.

Yellow Hydrogen: Yellow hydrogen is a relatively new phrase for hydrogen made through electrolysis using solar power.

Brown Hydrogen: Brown hydrogen is produced from coal through a process similar to SMR and is associated with significant carbon emissions.

Pink Hydrogen: Pink hydrogen is a term sometimes used to describe hydrogen produced using nuclear power as the energy source for electrolysis.

Purple Hydrogen: Purple hydrogen typically refers to hydrogen produced using a combination of renewable energy sources and nuclear power for electrolysis.

Black Hydrogen: Any hydrogen made from fossil fuels through the process of 'gasification' is sometimes called black or brown hydrogen interchangeably.

White Hydrogen: White hydrogen is naturally occurring, geological hydrogen found in underground deposits and created through fracking. There are no strategies to exploit this hydrogen at present.

Fig. 1 : Types of Hydrogen

UTILIZATION, METHODS FOR PRODUCTION OF GREEN HYDROGEN & COST OF PRODUCTION

Green hydrogen has gained significant attention and popularity due to its potential to serve as a clean and sustainable energy carrier in a variety of sectors:

1. **Energy Storage**: Green hydrogen can be used to store excess energy generated from renewable sources, addressing the intermittency of wind and solar power.

2. **Industry**: Industries such as steel, chemicals, and refining can use green hydrogen as a feedstock or fuel, reducing their carbon emissions.

3. **Power Generation**: Green hydrogen can be used in gas turbines to generate electricity, particularly in situations where renewable energy sources are not readily available.

4. **Heating and Cooking**: Hydrogen can be used as a clean-burning fuel for residential and commercial heating and cooking applications.

The cost of producing green hydrogen can vary depending on several factors, including the technology used, the source of renewable energy, and the local market conditions.

- Green hydrogen is produced through a process called **electrolysis**, where water (H_2O) is split into hydrogen (H_2) and oxygen (O_2) using electricity, typically generated from renewable sources like wind or solar power [6].

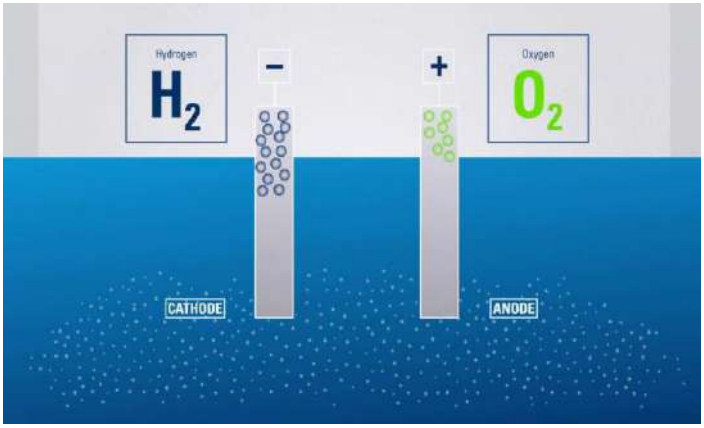

Fig.2 : Production of Green Hydrogen through Electrolysis

- **Methane pyrolysis** is the process in which thermal energy is applied to methane (CH_4) to break the chemical bond between carbon and hydrogen, generating hydrogen gas and a solid carbon product with no CO_2 emissions. (Only a small portion of methane remains unreacted depending on the reactor's efficiency) [7].

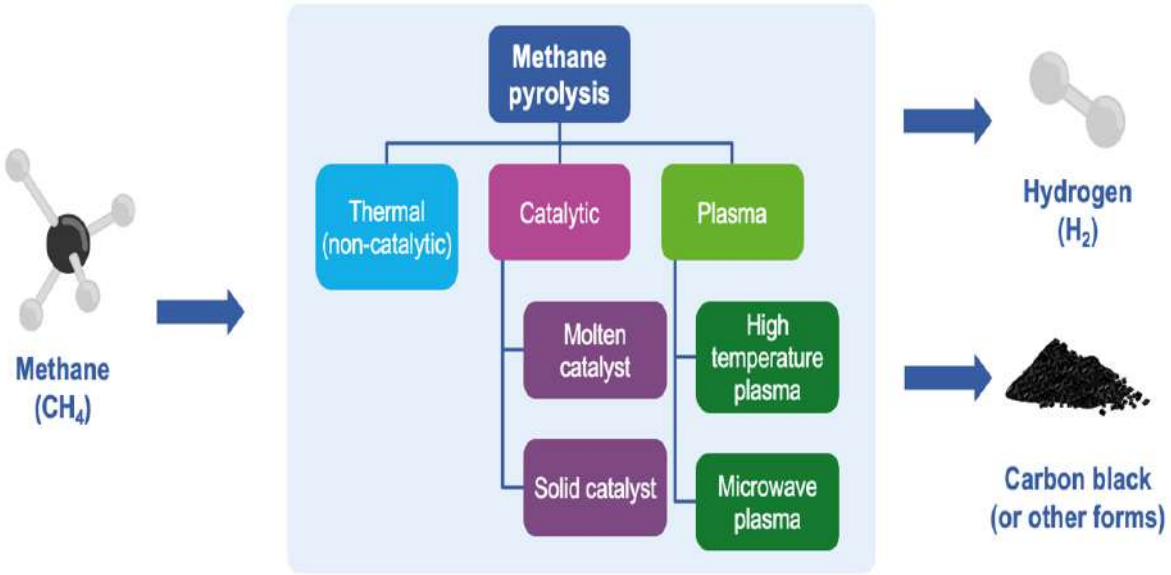

Fig.3: Production of Green Hydrogen by Methane Pyrolysis

Green hydrogen has garnered significant attention as a potential clean energy source, but it also faces several challenges and issues, particularly, with respect to cost competitiveness.

POSSIBLE PRODUCTION OF GREEN HYDROGEN IN SUGAR INDUSTRY

Sugar Industry since produces biomass based clean, green and renewable energy and also the filter cake (press mud), both the routes for production of green hydrogen may be considered as shown in the fig. 4 below. The bio-electricity may either be used for electrolysis (option-1) or may be used in catalytic conversion of biogas (methane pyrolysis) produced from filter cake to green hydrogen and carbon black.

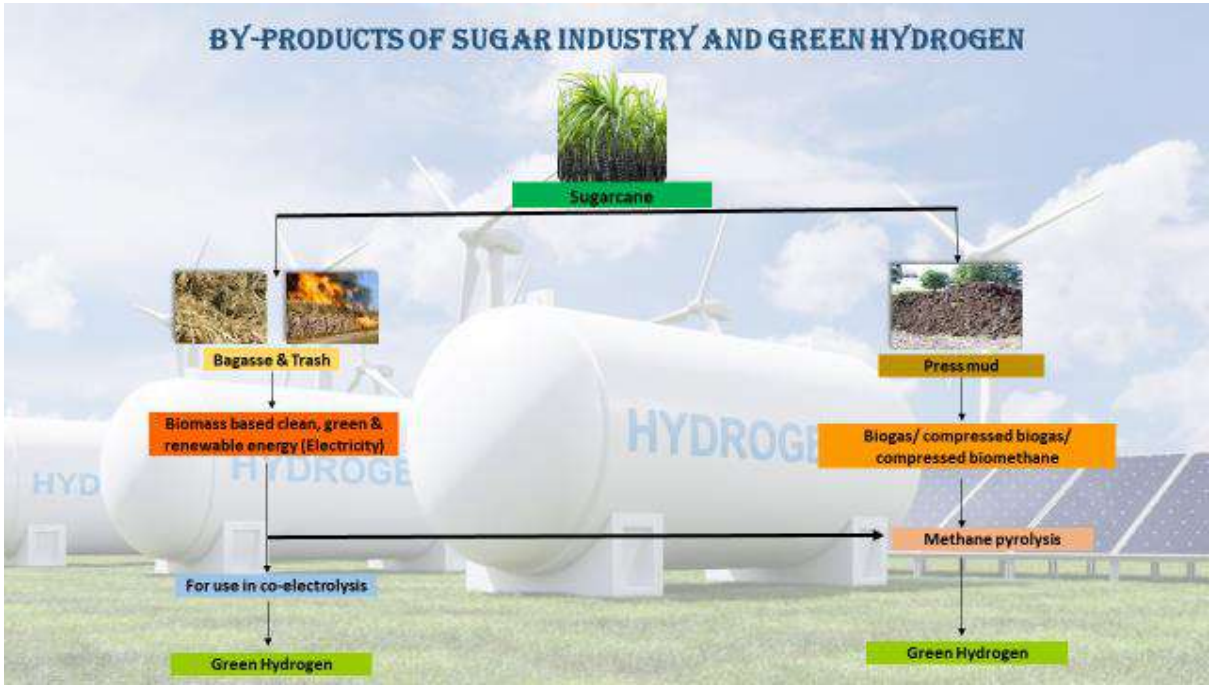

Fig.4 : Possible routes for production of Green Hydrogen in sugar industry

EVALUATION OF ISSUES INVOLVED IN PRODUCTION OF GREEN HYDROGEN

- **Through Electrolysis**

1. **Cost**: High initial capital costs, limited economies of scale, and energy conversion losses can make green hydrogen less economically competitive.

2. **Energy efficiency**: The electrolysis process used to produce green hydrogen from water requires a significant amount of electricity. The overall energy efficiency of the process can be lower compared to other renewable energy applications like directly using electricity or batteries.

3. **Energy storage**: Hydrogen can serve as an energy storage medium, but it faces competition from batteries for this purpose. Batteries have higher round-trip efficiency and are better suited for short-term energy storage and grid stability.

4. **Infrastructure**: The existing hydrogen infrastructure is primarily built around gray hydrogen (produced from natural gas), and transitioning to green hydrogen would require significant investment in infrastructure for production, distribution, and storage.

5. **Limited scalability**: Scaling up green hydrogen production is challenging due to the intermittent nature of renewable energy sources. The need for large-scale storage and grid integration solutions adds complexity and cost.

6. **Carbon footprint of electrolysis**: While green hydrogen production is considered clean, the environmental impact of the electrolysis process, including the manufacturing of electrolysers and the materials involved, must be considered.

7. **Hydrogen transportation and storage**: Hydrogen is challenging to transport and store. It has low energy density by volume, making it less efficient for long-distance transportation. Leakage issues can also arise due to hydrogen's small molecular size.

8. **Safety concerns**: Hydrogen is highly flammable, and ensuring its safe handling and storage can be a significant challenge. Stringent safety measures are necessary to prevent accidents.

9. **Water availability**: The production of green hydrogen relies on the availability of clean water, and in some regions, water scarcity can be a limiting factor for large-scale production.

10. **Technological development**: The widespread adoption of green hydrogen depends on advancements in technology to improve the efficiency and reduce the costs of production, storage, and transportation.

11. **Competition from other clean energy sources**: Green hydrogen faces competition from other clean energy solutions, such as batteries, which have made significant advancements in recent years. Choosing the right technology for a specific application depends on various factors.

- **Through Methane Pyrolysis**

Green hydrogen production through methane pyrolysis, also known as methane cracking or thermolysis, is a promising technology with the potential to reduce greenhouse gas emissions compared to conventional hydrogen production methods. However, it comes with its own set of challenges and considerations. Some of the main challenges through methane pyrolysis include:

1. **Energy Input**: Methane pyrolysis requires a substantial amount of energy to break the strong chemical bonds in methane. This energy input can come from various sources, including renewable electricity, but ensuring a clean and sustainable energy source is a challenge.

2. **Heat Management**: The process generates a significant amount of heat, which must be carefully managed to avoid overheating and equipment damage. Efficient heat recovery and dissipation systems are essential.

3. **Carbon Emissions**: Although methane pyrolysis can potentially be a low-carbon process, it can still produce carbon emissions if the feedstock contains impurities or if there are leaks in the system. Ensuring a carbon-neutral or low-carbon feedstock and system is a challenge.

4. **Scale-Up**: Commercializing methane pyrolysis and scaling it up to meet the demand for green hydrogen is a significant challenge. Developing cost-effective, large-scale reactors and infrastructure is essential.

5. **Catalyst Development**: Efficient catalysts are crucial for methane pyrolysis. Finding and developing catalysts that are durable, cost-effective, and selective for the desired reactions can be challenging.

6. **Methane Sourcing**: Securing a reliable and sustainable source of methane is essential. Renewable sources of methane, such as biogas or synthetic methane produced from captured CO2, are potential solutions.

7. **Environmental Impact**: Like other industrial processes, methane pyrolysis can have environmental impacts, such as water use and waste generation. Reducing these impacts and ensuring environmentally responsible practices is a challenge.

8. **Economics**: The cost of producing green hydrogen through methane pyrolysis needs to be competitive with other hydrogen production methods. Reducing operational and capital costs is a significant economic challenge.

9. **Regulatory and Safety Concerns**: Meeting safety standards and regulatory requirements, especially for handling and storing hydrogen, can be complex. Compliance with safety protocols and regulations is vital.

10. **Integration with Existing Infrastructure**: Integrating green hydrogen produced through methane pyrolysis into existing hydrogen infrastructure and end-use applications is a challenge. Compatibility and retrofitting may be necessary.

11. **Technological Innovation**: Continuous research and development are required to improve the efficiency and reliability of the methane pyrolysis process, making it more feasible and competitive.

- **SAFETY AND STORAGE OF GREEN HYDROGEN**

Green hydrogen is hydrogen gas produced through a process that utilizes renewable energy sources, typically electrolysis of water and pyrolysis of methaneusing electricity generated from renewable sources like wind or solar power.Safety and proper storage of green hydrogen are essential to prevent accidents and ensure its efficient use. Here are some key considerations for the safety and storage of green hydrogen:

Production Safety:

- Green hydrogen production facilities should adhere to strict safety standards and guidelines, including those set forth by local and national regulatory bodies.

Storage Safety:

- Hydrogen is a highly flammable gas, and safety measures are crucial. It should be stored in appropriate containers or tanks designed for hydrogen storage.
- Regular inspections, maintenance, and leak detection systems should be in place to ensure the integrity of storage containers.

Purity and Quality Control:

- Ensure the purity of green hydrogen to prevent contamination by other gases or impurities, as these can impact its safe storage and use.

Ventilation:

- Adequate ventilation in areas where hydrogen is stored and handled is important to prevent the accumulation of potentially explosive concentrations of hydrogen in enclosed spaces.

Leak Detection:

- Implement hydrogen gas leak detection systems to quickly identify and respond to any leaks or releases of hydrogen.

Fire Safety:

- While hydrogen burns with a pale flame that can be difficult to see, it can be extremely hot and can cause fires. Fire suppression systems, such as those using water or foam, may be required at storage and dispensing facilities.

Transportation Safety:

- Transporting green hydrogen in high-pressure tanks or pipelines requires special safety measures, including vehicle and pipeline integrity checks, safety valves, and emergency response plans.

Training and Education:

- Ensure that personnel involved in the production, storage, and handling of green hydrogen receive proper training in safety procedures and emergency response.

Codes and Standards:

- Adhere to relevant safety codes and standards, such as those established by organizations like the National Fire Protection Association (NFPA), the International Code Council (ICC), and the American Society of Mechanical Engineers (ASME).

Emergency Response:

- Develop and practice emergency response plans for hydrogen-related incidents, including fire, leaks, and accidents.

Public Awareness:

- Inform nearby communities and emergency responders about the presence of hydrogen facilities and the safety measures in place.

COMMITMENT FOR NET ZERO EMISSIONS AND ROLE OF GREEN HYDROGEN

Commitment to achieving net-zero emissions is a critical step in addressing climate change and transitioning to a more sustainable and environmentally friendly global economy. Green hydrogen plays a significant role in this commitment as it can serve as a clean and sustainable energy carrier [8].

Following describes how net zero and the role of green hydrogen are interconnected:

1. **Reducing Carbon Emissions**: Committing to net zero means that nations and industries aim to reduce their carbon emissions to as close to zero as possible. This requires a massive shift away from fossil fuels and towards renewable and low-carbon energy sources. Green hydrogen is produced using renewable energy sources like wind, solar, or hydro power, making it a clean alternative to fossil fuels for a variety of applications, including industry, transportation, and energy storage.

2. **Energy Storage**: Green hydrogen can play a vital role in storing excess renewable energy, which is intermittent by nature. When there is an oversupply of wind or solar energy, it can be used to produce hydrogen through a process called electrolysis. This hydrogen can then be stored and used when energy demand is high or renewable energy generation is low. This helps stabilize the energy grid and reduce the need for fossil fuel-based backup power sources.

3. **Decarbonizing Industry**: Many industrial processes rely on fossil fuels, which contribute significantly to carbon emissions. Green hydrogen can replace fossil fuels in industries like steel and cement production, reducing emissions and helping these sectors move towards net zero. Hydrogen can be used as a feedstock or as a reducing agent in these processes.

4. **Transportation:** Green hydrogen can be used as a clean fuel for transportation, especially for heavy-duty vehicles like trucks and buses. When used in fuel cell vehicles, hydrogen emits only water vapour as a byproduct. This can help decarbonize the transportation sector, which is a significant source of greenhouse gas emissions.

5. **International Collaboration**: Achieving net zero is a global endeavour. Green hydrogen can be transported and traded internationally, making it a valuable energy carrier for countries with abundant renewable resources to support regions that may have limited access to renewables. This fosters international collaboration in the transition to a low-carbon future.

6. **Innovation and Research:** Commitment to net zero encourages investment in research and innovation, including the development of more efficient and cost-effective methods for producing, storing, and utilizing green hydrogen. This drives progress in the hydrogen sector, making it a more viable and scalable solution.

   So, the commitment to net zero emissions and the role of green hydrogen are closely linked. Green hydrogen can serve as a versatile, clean energy carrier that helps reduce carbon emissions in various sectors, supports renewable energy integration, and facilitates international collaboration in the fight against climate change.

NATIONAL GREEN HYDROGEN MISSION

India has set its sight on becoming energy independent by 2047 and achieving Net Zero Carbon Emissions by 2070. The National Green Hydrogen Mission was approved by the Union Cabinet on 4 January 2022.The mission outcomes projected by 2030 are:

- Development of green hydrogen production capacity of at least 6 MMT (Million Metric Tonne) per annum with an associated renewable energy capacity addition of about 125 GW in the country
- Over Rs. Eight lakh crore in total investments
- Creation of over Six lakh jobs
- Cumulative reduction in fossil fuel imports over Rs. One lakh crore
- Abatement of nearly 50 MMT of annual greenhouse gas emissions.

India aims to revolutionise its energy landscape by producing 6 million tonnes of green hydrogen annually from 2030 onwards. This ambitious pursuit aligns with India's domestic consumption figures, with a further aspiration to scale production to an impressive 10 million tonnes.

USES OF GREEN HYDROGEN

Various potential uses of green hydrogen are as follows:

- **Clean Energy Storage:** Green hydrogen can be used as an energy carrier and storage medium. Excess electricity generated from renewable sources, such as solar or wind power, can be used to produce hydrogen through electrolysis. The hydrogen can then be stored and later converted back into electricity through fuel cells or other methods when energy demand is high.
- **Industrial Processes:** Hydrogen is a key feedstock for various industrial processes. Industries like chemicals, refineries, and steel production can use green hydrogen as a cleaner alternative to hydrogen produced from fossil fuels.
- **Transportation:** Green hydrogen can be used as a fuel for fuel cell vehicles, providing a clean alternative to traditional internal combustion engines. It can be particularly useful for heavy-duty transport, such as buses, trucks, and trains.
- **Heat Generation:** Hydrogen can be burned directly or used in fuel cells to generate heat for residential, commercial, or industrial heating applications. This can be an alternative to natural gas, with the advantage of being a cleaner- burning fuel.
- **Power Generation:** Hydrogen can be used as a fuel in gas turbines to generate electricity. This can provide a cleaner alternative to conventional power generation methods, especially in areas where renewable energy sources might not be consistently available.
- **Hydrogen Blending:** Green hydrogen can be blended with natural gas in existing natural gas infrastructure. This can help reduce the carbon footprint of natural gas use without requiring significant modifications to existing pipelines and equipment.

- **Chemical Feedstock:** Hydrogen is a crucial feedstock for the production of various chemicals. Green hydrogen can be used in the manufacturing of ammonia, methanol, and other chemical products, providing a cleaner and more sustainable option.
- **Decarbonization of Hard-to-Abate Sectors:** Industries that are challenging to decarbonize, such as aviation and certain industrial processes, could potentially benefit from green hydrogen as a clean energy source.

CONCLUSION

The use of green hydrogen is part of global efforts to transition towards a more sustainable and low-carbon energy system, contributing to the reduction of greenhouse gas emissions and addressing global warming and climate change. Challenges in production of green hydrogen, particularly with respect to cost and competiveness shall have to be addressed to maximize potential of green hydrogen and ensuring its role in a sustainable and low-carbon future. Collaboration among governments, industries, and researchers is crucial for overcoming these obstacles. Sugar industry is likely to play a role in producing this future fuel at an affordable cost looking to cheap source of production of clean and renewable power and bio-gas.

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ABSTRACTS

Evaluation of the Neltee ColourQ 1700CC for measuring the purity of magma from C centrifugals by, D. Pike, S. King, R. Broadfoot and P. Woods, Cooperative Sugar October 2023, Vol-55, No.2

In Australian sugar factories one operator typically manages the high-grade fugalling, sugar-drying and low-grade © fugalling stations. The C fugals are managed leest effectively as there is no process instrumentation to monitor on-line C can change rapidly in the C fugals without the operator being aware, and poor performance can persist for sevsral hours. Tight control of the C sugar purity is important to avoid high srcrose of impurities in the C sugar (magma or remelt) to the pan stage. For the 2017 season, isis mill purchased a Neltec ColourQ 1700CC transducer that had been recently released on the market to measure the colour (Inferred purity) of the total C sugar magma production of the station. The transducer proved effective for the operators to pragmafically achieve tighter control of the purity of the C sugar magma. For the 2018 season, isis mill purchased a second ColourQ 1700CC transducer to monitor the colour of the C sugar on the screen within their lange capacity fugal. Described are the resuhs of extensive testing og the transducer to assist operators achieve tighter control of the magnin purity. The experiences with the use of the transducer on the magma scew for monitoring the plarity of the total C magma production from the station are also descried.

Upgrading the utility plant module for the generic sugar mill model, by K.M Faxon and M. Starznk, Cooperative Sugar October 2023, Vol-55, No.2

The Sugar Milling Research Institute NPC published a MATLAB^{e} model of generic sugar mill, consisting of mass and energy balances of a diffuser facroty with mud filtration, Five-effect evaporation and a three-boiling partial remelt scheme. The original model did not provide a means for balancing electrical power and steam production and demand and therefore was not able to predict t impact of process changes on overall energy consumption The objective of this study was to expand the original model by including a power house and considering steam and electrical power balances. The upgraded utilities model included a simplified mass and energy balance model of the boiler with high pressure (HP) steam generation calculated to meet the various mechanical and thermal demands of the raw sugar factory, and to supply a back-pressure turboalternator.

Cooperative Sugar Sector related initiatives of Ministry of Cooperation, by Prakash Naiknavare, Cooperative Sugar November 2023, Vol-55, No.3

Prior to the historical announcement and formation of independent Cooperation department was under the then Ministry of Agriculture. One Joint Secretary level officer of the Agriculture Ministry used to look after the entire cooperation department of the country. In that role he was also the Central Registrar of the Coopertion Department.

However, w.e.f 6th july, 2021, at the behest of Hon. Prime Minister, Shri Narendra Modi-Ji, a new independent cooperation Ministry has been formed under the dynamic leadership of Hon. Home Minister, Shri Amit Shah ji. There is a sea of change in the entire Cooperative Sector from grass root level to National and International Level.

Key considerations for high-performance continuous vacuum pans, by BStC Moor, S.Tosettenstein and N. du Plessis, Cooperative Sugar November 2023, Vol-55, No.3

The two most important objectives for a high-performance continuous vacuum pan (CVP) are good crystal quality and high exhaustions. To achieve these, the pan design needs to incorporate features that promote plug flow (a narrow crystal residence-time distribution), a high heat-transfer coefficient (HTC) and vigorous circulation. Focussing on these will also achieve and energy efficient pan that can operate on a low steam-massecuite temperature differential. Good plug flow is an essential for good crystal quality (low CV), which enables good exhaustions. This in turn minimises reboiling and its associated energy and sucrose losses. Low CVs also aid affination and for this reason are frequently included in raw-sugar specifications.

Response of selected South African coastal sugarcane varieties to chemical ripeners: Active ingredient effectiveness and associated impacts on grower and miller sustainability, by P.D.R. Van Heerden, Cooperative Sugar December 2023, Vol-55, No.4

Evaluation of varietal responses to ripeners is a necessary sugarcane research function. This paper underlines this necessity through analyses of data from a rainfed trial conducted over two seasons. Ethephon, Fusilade forte and their combination were ground-applied to replicated plots. At harvest, recoverable value percent (RV%), juice purity (JP) and yields (cane and RV) were determined. Recommended input costs and applicable RV price were used to estimate gross margins (GMs). A Sugar-Juice-Molasses (SJM) balance calculation was used to estimate potential implications of JP-driven influences on factory sucrose recovery.

Potential cane and sugar losses from to-shoot borer, Scirpophaga excerptalis (Walker) (Lepidoptera: Crambidae), by Lastus S. Kunuiata, Kaile T. Korowi and Lawwrencia Kikitam, Cooperative Sugar December 2023, Vol-55, No.4

Top-shoot borer, Scirpophaga excerplalis (Walker) (Lepidoptera: Crambidae), is one of the moth borers considered as pests of sugarcane in papua New Guinea. Larvae bore from the top of the cane through the spindle and into the growing point (meristem), killing the stalk. Cane of 4weeks old through to mature cane be damaged. Here, the population dynamics of top-shoot borer at Ramu, Papua New Guinea, and estimated sugarcane juice losses are reported. The life cycle of top-shoot borer is 8-62 days and cane of all ages can be attacked. Populations of top-shoot borer remained low from September to the end of April, but numbers increase from May to July, most likely due to no insecticide spraying.

Indian Sugar Industry: Towards Self-reliance for Sustainability, by S. Solomon & M. Swapna, Indian Sugar – October, 2023

The South-Asian region including India is a major hub of sugar producing countries with ample presence in the global sugar scenario. India has a rich history of sugarcane and sugar production since time immemorial, and the industry has gradually evolved to find a place among the top sugar producing countries of the world. The innovative technological interventions for sugarcane improvement, production and management have helped the industry to progress towards a diversified and bio-based productive, sustainable and profitable one, thereby gradually becoming self-reliant. This self-reliant industry with the right mix of linkages and collaborations, has been successful in tackling the various unforeseen challenges including those that cropped up during COVID-19 pandemic. The industry also fulfils its Corporate Social Responsibilities leading to the overall betterment of its stakeholders. This has enabled the Indian sugar industry to align itself

with the 2030 Agenda for Sustainable Development Goals.

Competitiveness among employees: Descriptive study for the employees of Keynana Sugar Company, by Eltaher Ali Eltaher, Department of Counselling and Psychology, Faculty of Arts and Social Sciences, Abdulrahman Al-Sumait University, Zanzibar, Tanzania, COMMUNICATIONS IN HUMANITIES AND SOCIAL SCIENCES JOURNAL December -2023

This study explores the levels of competitiveness among employees at the Keynana Sugar Company with an aim to establish correlations with key demographic variables, specifically the years of experience and gender. Utilizing descriptive methodology, the primary dataset was obtained through the application of the Hypercompetitive Attitude Scale. The research involved 49 participants (37 males and 12 females), and employed statistical analyses, such as T-tests and Pearson Correlation, to yield comprehensive insights. The findings of this research unveiled a marked prevalence of competitive attributes among employees at Keynana Sugar Company. Notably, the investigation revealed a lack of significant correlation between competitiveness and employees' years of experience. Furthermore, the analysis indicated no statistically significant variations in competitiveness based on gender among the employees at Keynana Sugar Company.

Performance Analysis of Sugar Production in Ngadirejo Sugar Factory, by Afifa Husna, Desiana Nuriza Putri, Hanif Alamudin Manshur, Jurnal Agroindustri Halal ISSN 2442-3548 Volume 9, Desember 2023

The Ngadirejo Sugar Factory (PG) in Kras District, Kediri Regency is one of the business units whose productivity ranks second highest among the 9 PG subsidiaries of PT. Perkebunan Nusantara (PTPN) X reached 6,250 tons of sugar cane daily. With this high productivity, the quality of sap must always be maintained. This study aims to determine the performance of PG Ngadirejo sugar production as investigated from several intermediate products of white crystal sugar, namely raw sap, thick sap, watery sap, and sulphite sap. moisture content have met the standards set by the Indonesian National Standard.

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