

No. 8

January 2019

NEWSLETTER



of the
Fuel & Energy Research Forum



EDITOR'S NOTES:

A Happy New Year to all our readers and may 2019 be better for all of us than 2018.

We are already planning a series of events for 2019 of which our Annual Meeting and AGM in April will be the most important of this year. It is to be held at Aston University and will be a joint meeting of two interest groups the Biomass and Waste Group and the Fuel Characterisation and Carbonisation Group. The two topics for presentation are "Biomass and Waste Fuel Characterisation, and "Waste not Want not", an intriguing title where we shall learn about some of the more unusual reducing of waste products.

Although still some way off, we have begun preliminary discussion for our 2020 conference, which will be the first of the new FERIA Conferences, the 1st European Conference on Fuel and Energy Research and Its Applications, the Successor to the ECCRIA Series of Conferences.

Please note that the frequency of issue of the newsletter has reverted to three issues per year, January, May and September.

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Student Bursaries for 2019-2020

Travel and subsistence bursaries of up to £300 are on offer to bona-fide full-time students who wish to attend appropriate National and International fuel and energy related conferences, (for example, please see the Calendar of Fuel and Energy Research Events for details of future conferences), and whose supervisor is a member of the Fuel and Energy Research Forum. To apply, please send the abstract submitted to the conference with a brief supporting letter from your supervisor together with details of the expected expenditure and other sources of funding applied for, to:

Professor J.W. Patrick,
Dept. of Chemical and Environmental Engineering,
Faculty of Engineering,
The University of Nottingham,
Energy Technologies Building,
Innovation Park, Triumph Road,
Nottingham NG7 2TU

The requirements for eligibility for award of a bursary are that the recipient will submit a short report about his or her impressions of the conference to the Newsletter Editor for inclusion in the next edition. In addition, this report will provide some brief details of the beneficiary, their topic of study and the reasons for wishing to attend the conference. Potential applicants should see the template for these reports on the FERF website, <http://www.tferf.org> where such reports must comply with these requirements.

Please note that these bursaries are only for travel and subsistence to attend the conference, (i.e. not for conference or other fees). In addition, priority will be given to applicants who will be attending the whole of a conference rather than one day of a multi-day event and will be using the conference accommodation provided should this be required. It may not be possible to fund all applications for bursaries or meet the request in full as this will depend on the funds available at the time.

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PRELIMINARY ANNOUNCEMENT

**FERF 3rd Annual Meeting &
Biomass and waste/fuel characterisation and carbonisation
Interest Group Seminar.**
to be held at Aston University, Conference Aston, Birmingham.
Wednesday 10th April 2019.

PROGRAMME.

09.30 – 10.00 **ARRIVAL – COFFEE**

10.00 - 10.10 **Welcome to Aston University and Opening Remarks,**
Dr. Katie Chong, Aston University.

- 10.10 – 12.10 SESSION 1 : SEMINAR OF THE FERF's FUEL CHARACTERISATION AND CARBONISATION INTEREST GROUP, "BIOMASS AND WASTE FUEL CHARACTERISATION".**
 Chaired by Prof. Ed Lester, University of Nottingham.
 Co-ordinator of the Fuel Characterisation and Carbonisation Interest Group.
- 10.10 – 10.30 **"Utilisation of *Miscanthus x giganteus* Grown on Heavy Metal Contaminated Land".**
 Abby Samson, Lincoln University.
- 10.30 – 10.50 **"Characterisation of Self-heating Events at the Macro Scale".**
 Andrew Goddard, Freeland Horticulture Ltd.
- 10.50 – 11.10 **"Characterisation of Self-heating Events at the Meso Scale".**
 Dr. Orla Williams, University of Nottingham.
- 11.10 – 11.30 **"Characterisation and Sourcing of Coals and Cokes at British Steel – past, current and future".**
 Dave Fisher, British Steel.
- 11.30 – 11.50 **"Biomass Use for Activated Carbon and Energy Production**
 Andrew Gill, CPL industries Ltd.
- 11.50 – 12.10 **"Title to be announced".**
 Speaker to be announced.
- 12.10 – 13.00 SESSION 2A : THE FERF ANNUAL MEETING**
 Chairman : Dr Will Quick.

A G E N D A

- i) Report of Year 2018 Annual Meeting
- ii) Review of Actions
- iii) Report by Chairman/Secretary
- iv) Report by Treasurer
- iv) Election for Vacancies on Executive Committee
- vii) Any Other Business

SESSION 2B : REPORTS FROM INTEREST GROUP CO-ORDINATORS.

To include progress in their Interest Groups during the year 2018 :-

Combustion	Dr. Gerry Riley.
Environment	Prof. Bill Nimmo.
Biomass and Waste	Dr. Katie Chong.
Carbon Capture and Storage	Prof. Jon Gibbins.

13.00 – 14.00 LUNCH.

14.00 – 16.00 SESSION 3, SEMINAR OF THE FERF's BIOMASS AND WASTE INTEREST GROUP, "WASTE NOT, WANT NOT".

Chaired by Dr. Katie Chong, Aston University.

Co-ordinator of the Biomass and Waste Interest Group.

14.00 – 14.20 "High value aromatics from non-edible vegetable oil".

Dr Paula Blanco-Sanchez, Sarah Asplin, Aston University

14.20 – 14.40 "Landfill mining – a new source of opportunity".

Stuart Wagland, Cranfield University

14.40 – 15.00 "Waste carbon fibre recovery".

Dr Jude Onwudili, Aston University

15.00 – 15.20 "Biomass and waste resource availability".

Dr Andrew Welfle, University of Manchester

15.20 – 15.40 "Ionic liquid pre-treatment of biomass and wastes".

Prof. Jason Hallett, Dr Agi Brandt-Talbot, Imperial College

15.40 – 16.00 "Title to be announced".

Speaker to be announced.

16.00 – 16.10 SESSION 4 : CONCLUDING REMARKS,

Dr. Will Quick, Uniper Technologies Ltd. Chairman, (Industry), of the Fuel and Energy Research Forum.

Tea will be served between 16.00 and 16.30 hrs. The event organisers will be Dr. Katie Chong, Prof. Ed Lester and Dr. David J.A.McCaffrey.

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THE FUEL & ENERGY RESEARCH FORUM **2018 ANNUAL REPORT.**

The calendar year 2018 has continued the major transformation of the **Forum** into the **Fuel and Energy Research Forum**. The **Forum** has been pursuing and has made progress in achieving its new objectives, which have now broadened considerably with the expansion of the **Forum's** activities. During the year, the **Forum** has organised a number of fuel and energy research events. In April, the **Forum** Annual Meeting was held at the University of Sheffield, which included the election of Executive Committee Members and reports from the Interest Group Chairmen. This event continued with the Inaugural Meeting of the Environment Interest Group entitled, "Materials for Energy Technologies".

In early September, the **Forum** held its biennial three-day conference at Cardiff University entitled, “12th ECCRIA Conference, the European Conference on Fuel and Energy Research and its Applications”. As a direct result of the expansion of the **Forum’s** activities into biomass and waste and other fossil fuels, this has been the most successful Conference in the ECCRIA series of Conferences. There had been a good venue, more abstracts submitted than any previous ECCRIA Conference leading to the introduction of some triple sessions, and where more sponsorship had been received than for any previous ECCRIA Conference. This Conference had covered all aspects of fuel and energy utilisation research currently being carried out in the UK and had attracted participants from most of the major UK organisations carrying out fuel and energy R&D, as well as many participants from overseas.

The Conference had been attended by just over 135 participants, where almost a third of the participants were from overseas representing 14 countries, (Germany, Denmark, Poland, Spain, Portugal, the Netherlands, Norway, Australia, South Africa, China, Malaysia, Russia and Kazakhstan). The conference had 95 oral presentations, some presented in triple sessions, as well as over 30 poster presentations.

The year 2018 has seen the issue of four editions of the new **Forum** Newsletter (January, May, July, and October). During the year, the new **Forum** website has continued to provide information to Members and has been regularly added to and up-dated, (it now has a News Articles section), where many of the presentations from the above **Forum** events can now be viewed on this website. During the year, there have been almost 30 **Forum** E-mailshots. The **Forum** has also actively assisted with the promotion of, and publicity for, several other fuel and energy research events and funding opportunities in the UK, Europe and worldwide, through several **Forum** E-mailshots.

A fund is available from the **Forum** for the funding of PhD students to attend national and international conferences, where the recipients of these awards have provided articles on their impressions of these conferences for the FERF Newsletter.

The **Forum** is at the preliminary stage of its plans for the “1st FERIA Conference, the European Conference on Fuel and Energy Research and Its Applications, the Successor to the ECCRIA Series of Conference”, (there was the need to change the name of the Conference to match the expanded aims and remit of the new Forum), to be held at a venue to be announced in early September 2020.

The Executive Committee has been in discussions with and is actively promoting several other fuel and energy research issues with a number of bodies both in the UK and overseas and has continued to provide an information service to Members. In particular, these discussions have led to the proposal to hold a “Clean Energy Science Lecture” in October 2019 at a London venue.

David J.A. McCaffrey,
FERF General Secretary.

CoalTech 2051 Project

The Future of Coal

A project supported by the European Union

Anne Carpenter

The focus of EU policy has moved towards climate protection and away from fossil fuels. Ambitious goals have been set to reduce greenhouse gas emission (GHG) emissions by 40% below 1990 levels by 2030, with net-zero emissions by 2050. The transition to a low-carbon economy provides new challenges, but also new opportunities, for exploiting coal in a cleaner way and with lower CO₂ emissions. Consequently, the European coal research community needs to prepare for the changes that are required. The RFCS-funded CoalTech2051 project is developing, with stakeholders, a strategic research agenda that is aligned with the overall goals of the EU's energy and climate policies. It will:

- help establish the future research priorities for the Research Programme of the Research Fund for Coal and Steel (RFCS);
- promote the results of projects funded by the RFCS programme at workshops to help achieve wider knowledge of the programme and its benefits; and
- establish a European Network of Clean Coal Technologists that complements the European Commission's targeted platform to support the energy transition in the coal regions and enable the strategic research agenda to be carried forward.

As part of the CoalTech2051 project, funded by the Research Fund for Coal and Steel, the IEA Clean Coal Centre is helping to organise a free workshop on **7th March 2019** in Katowice, Poland, on some of the leading coal technologies and related research and technological development (RTD) projects. It is planned to include an open discussion at the workshop that will help set the future priorities for coal-related RTD in the European Union. Come and hear the presentations, where details about the workshop will shortly be available on the project website, (<https://coaltech2051.eu>), where you can also register your interest in the project. Meanwhile, you can contact Anne Carpenter (Anne.Carpenter@iea-coal.org) for more details. Mark your calendar!

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Reports from the Technical Press

Articles are presented with the most recent first. The following article is from edie and is included in full for its current relevance and content:-

In numbers: The global extent of marine plastic pollution

25 January 2019, [edie newsroom](#)

New research into the extent of the world's plastics pollution problem, which lays bare the environmental consequences of plastic waste entering oceans and waterways, has just been published. Here, edie rounds up the key facts and figures. Undertaken by Bedford-based packaging firm Rajapack, the 'swimming in plastic' study explores how long some of the world's most commonly used plastic items – including cups,

straws and microbeads – take to decompose, and the impact they have on marine environments.

After the Ellen MacArthur Foundation's warning that there will be more plastic than fish in the world's oceans, by weight, by 2050, the study sheds some more light on which kinds of plastics are most commonly found in marine habitats, and how they affect biodiversity. Specifically, it highlights the dangers of some of the common plastic pollution streams that are arguably less "visible" than packaging, such as discarded fishing equipment and microplastics.

"In recent years, brands in a multitude of sectors – food, retail and beauty, to name a few – have been taking measures to ensure that the amount of single-use plastics used daily is reduced," Rajapack's UK managing director Tom Rodda said.

"From microbeads to plastic straws, steps are being taken to ensure that packaging is recyclable, not harmful for the environment or removed altogether. But plastic is something that gets taken for granted and is often used without a second thought."

The publication of the survey results comes shortly after a string of 26 companies from across the plastic industry's value chain launched a new alliance aimed at eliminating plastic waste in the environment, which will invest at least \$1.5bn in projects tackling the issue by 2024.

It also follows the launch of edie's own Mission Possible Plastics Hub, a content-led campaign supporting businesses with their single-use plastics phase-outs and tracking progress towards their plastic targets. With this in mind, the research acts as a snapshot of the harm our reliance on single-use plastic is doing to the environment, as consumer demand for action on the issue reaches a fever pitch. Here, edie rounds up the key facts.

- There are currently 5.25 trillion pieces of plastic in the world's oceans.
- Microplastics account for 92% of all plastic items in seas.
- 30% of turtles and 70% of seabirds have ingested plastic.
- Plastic straws take 200 years to fully decompose in nature.
- 8.5 billion plastic straws are binned or littered in the UK every year
- Polystyrene made during the Jurassic period would still exist today.
- Biodegradable coffee cups, on the other hand, take three to six months to decompose.
- By weight, 73% of the litter on UK beaches is plastic.
- 40% of plastic items produced in 2018 were single-use.

BIOMASS -RELATED

Biomass UK calls CCUS action plan 'a strong step forward'

Biomass Magazine

Biomass U.K., an affiliate of the U.K. Renewable Energy Association, has spoken out in support of the action plan, noting the **biomass** power sector is ...

Drax: Bioenergy carbon capture, storage pilot now underway

Biomass Magazine

Drax Power Station became the largest decarbonization project in Europe by upgrading two thirds of its generating units to use biomass instead of ...

Pöyry selected as EPC contractor for torrefied pellet plant

Biomass Magazine

Once operational, the plant will have the capacity to produce 157,000 metric tons per year of torrefied pellets made from sustainable biomass sourced ...

Report assesses the role of biomass in meeting climate change targets in the UK

The Chemical Engineer

A REPORT by the Committee on Climate Change (CCC) has said that biomass has a role to play in a low-carbon economy, but only if sustainably ...

What is Hemp Biomass? All You Need to Know!

PotStockNews

So hemp biomass is the organic material of the hemp plant that is left over after the flower is harvested and processed. That flower usually goes on to ...

Report finds biomass can play bigger role in UK energy production

Biomass Magazine

On Nov. 15, the U.K. Committee on Climate Change published a report on biomass that has determined sustainably sourced biomass feedstocks can ...

UK Told to Scrutinize Biomass Use by Power Industry

Bloomberg

The government should increase its scrutiny of where biomass is coming from and ensure it isn't used where low-carbon energy alternatives are ...

Abandoned Biomass Used to Produce Wood Pellets for Power Generation

The Korea Bizwire

Biomass left behind due to excessive disposal costs is increasing by approximately 4 million m³ each year, increasing the risk of fire or other natural ...

The Effect of Biomass Fuel on Boiler Refractories

Biomass Magazine

As a clean and environmentally friendly fuel, biomass currently accounts for 6 to 8 percent of the world's energy consumption, and is becoming an ...

[Power from peat—more polluting than coal—is on its way out in Ireland](#)

Science Magazine

For a country with little **coal**, oil, and gas, peat—deep layers of partially decayed moss and other plant matter—is also a ready fuel for power plants.

[Bioenergy crops could be as bad for biodiversity as climate change](#)

A large-scale expansion in bioenergy crop production could be just as detrimental to biodiversity as climate change itself, according to new research.

CARBON DIOXIDE & GHG-RELATED

[Greenhouse gas 'detergent' recycles itself in atmosphere](#)

A simple molecule in the atmosphere that acts as a 'detergent' to breakdown methane and other greenhouse gases has been found to recycle itself to maintain a steady global presence in the face of rising emissions, according to new research. Understanding its role in the atmosphere is critical for determining the lifetime of methane, a powerful contributor to climate change.

[Could an anti-global warming atmospheric spraying program really work?](#)

A program to reduce Earth's heat capture by injecting aerosols into the atmosphere from high-altitude aircraft is possible, but unreasonably costly with current technology, and would be unlikely to remain secret. Those are the key findings of new research which looked at the capabilities and costs of various methods of delivering sulphates into the lower stratosphere, known as stratospheric aerosol injection (SAI).

[Something Living At The Bottom Of The Sea Is Absorbing Large Amounts Of The CO2 In Oceans](#)

IFLScience

The team "discovered that benthic bacteria are taking up large amounts of carbon dioxide and assimilating it into their **biomass** through an unknown ...

[Cars and coal help drive 'strong' CO2 rise in 2018](#)

BBC News

The main factor in the near 3% rise has been **coal** use in China, driven by ... It's not good **news**, says the scientists, who argue that global emissions ...

[Affordable catalyst for CO2 recycling](#)

A catalyst for carbon dioxide recycling, Mineral pentlandite may also be a conceivable alternative to expensive precious metal catalysts. Pentlandite had previously been known as a catalyst for hydrogen production. By adding a suitable solvent, the researchers successfully utilised it to convert carbon dioxide into carbon monoxide. The latter is a common source material in the chemical industry.

[Carbon fuels go green for renewable energy](#)

Phys.Org

Now a discovery by researchers at the U.S. Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab) and Joint Center for ...

[Crunch time for carbon reduction](#)

physicsworld.com

The most talked about carbon negative option is BECCS, Biomass Energy with ... The disadvantage of BECCS is that you need large areas of biomass ..

[Powder could help cut CO2 emissions](#)

Scientists have created a powder that can capture CO2 from factories and power plants. The powder can filter and remove CO2 at facilities powered by fossil fuels before it is released into the atmosphere and is twice as efficient as conventional methods.

[BECCS it, says the CCC](#)

physicsworld.com

The UK government's advisory Committee on Climate Change (CCC) has had another look at **biomass**, following on from its earlier study, and thinks it ...

[Professor models system using baking soda filled capsules to capture CO2 emissions](#)

Coal and natural gas represent the majority of the US energy supply. Even with pollution controls, burning these fossil fuels for energy releases a tremendous amount of carbon dioxide into the atmosphere. Research uses microcapsule technology that may make post-combustion carbon capture cheaper, safer, and more efficient.

[Scientists identify new minerals for carbon capture](#)

Research confirms new minerals are capturing and storing carbon. The minerals, members of the hydrotalcite group, are the first outside of the carbonate family to naturally capture atmospheric CO2 in mine waste, important as society continues to forge ways to lower our carbon emissions and combat climate change.

[Cost Of Carbon Capture Plummets Thanks To Two New Techniques](#)

There are two kinds of carbon capture, which leads to misunderstandings. One kind captures the carbon dioxide going up the smokestacks of coal-powered electrical generating stations before it can get into the atmosphere...[Read more](#)
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[Carbon Capture, Utilisation and Storage Finally Catches the Spotlight](#)

The recent Green House Gas Technologies Summit (GHGT), the biggest global event on carbon capture, was a good place to reflect on a technology that perhaps has the biggest gap between the aspiration of energy...[Read more](#) >

[Global CO2 emissions reach record values](#)

The Weather Network

... research community and study greenhouse gas emissions to ultimately stop ... Meanwhile, world demand for energy is surpassing the mighty increase of ... cooling has pushed up fuel consumption and carbon dioxide emissions. ... The issue, however, is that the growth rate of renewable energy is not ...

[COAL & COAL ASH – RELATED](#)

[Coal question looms large as climate talks begin in Poland](#)

Worcester News

Coal question looms large as climate talks begin in Poland ... Good news: @WorldBank Group announces major new set of climate targets for ...

[Over 40 Percent of Worldwide Coal Plants Are Operating at a Loss, Study Says](#)

Gizmodo

As Donald Trump's administration continues to try to make coal happen despite it being increasingly expensive and a serious tax on the environment,

[Old coal mines can be 'perfect' underground food farms](#)

BBC News

Abandoned coal mines across the UK could be brought back to life as huge underground farms, according to academics. Mine shafts and tunnels are ...

[COP24: Climate conference in the heart of Poland's coal country](#)

CNN

The host city of Katowice is in the center of Silesia, a region that is home to about 90,000 coal workers -- around half of all the coal workers in the EU.

[Thousands march in Germany to demand quick exit from coal](#)

Boston 25 News

Thousands are marching in Berlin to demand that Germany make a quick exit from using coal-fired energy, a day before a U.N. climate ..

[Poland's coal capital encapsulates climate change challenges](#)

Financial Times

As international delegates converge on Katowice in the heart of Poland's coal country for the most significant climate talks in three years, the host city ...

[A life cycle solution to fossil fuel impacts](#)

Pennsylvania's energy history is rich with the quantities of fossil fuels that it has produced, but is also rife with the environmental legacies of coal mining and, more recently, hydrofracturing. Water that finds its way into abandoned coal mines dotted throughout the Commonwealth resurfaces as acid mine drainage (AMD), while freshwater used to fracture or "frack" oil and natural gas deposits re-emerges as "produced" water contaminated with salts, metals, and radioactive material.

[Germany to see 1.4 GW of hard coal plant closures in 2018](#)

Montel

(Montel) Germany will see around 1.4 GW of hard coal-fired power plant closures this year due to poor profitability, according to energy industry group ...

[Plunging Prices Mean Building New Renewable Energy Is Cheaper Than Running Existing Coal](#)

Forbes

A new report reveals 42% of global **coal** capacity is currently unprofitable, and ... Renewable energy cost reductions driven by R&D and deployment.

['It's like tobacco funding health research': should universities take money from fossil fuel?](#)

The Guardian

Imperial is proud of its relationships with fossil fuel companies, from which it receives valuable research funding and ... of the pervasiveness of oil industry funding in academia, especially for climate and energy research," he says.

[China-backed coal projects prompt climate change fears](#)

BBC News

As levels of greenhouse gases reach a new record, concerns are growing about the role of China in global warming. For years, the increase in the ...

[The World Needs to Quit Coal. Why Is It So Hard?](#)

New York Times

Cheap, plentiful and the most polluting of fossil fuels, coal remains the single largest source of energy to generate electricity worldwide. This, even as ...

[Coal pollution to surge in UK if Brexit comes without deal](#)

Energy Voice

That's the conclusion of Bloomberg NEF, which forecasts that burning coal would increase in the first quarter of next year if there's a no-deal Brexit.

[Coal power emissions in the US are even higher than we thought](#)

New Scientist

Coal is a disaster in environmental terms, from the destruction caused by mining it to the planet-warming carbon dioxide emitted when it is burned.

[EPA rolls back coal rule despite climate change warnings](#)

kfor.com

The Trump administration will reverse an Obama-era coal emissions rule as part of its effort to loosen restrictions on the coal industry, just days after a ...

[COP24: Poland shows no signs of breaking coal addiction despite toxic air and warnings of climate ...](#)

The Independent

At 6am, a coal miners brass band struck up and marched through the streets ...
Good news for the miners, perhaps, but bad news for the planet – not to ...

[Australian Mount Pleasant 10.5 mil mt/yr thermal coal mine to see first coal this month: MACH](#)

The 10.5 million mt/year Mount Pleasant thermal coal project in Australia remains on schedule to see first coal this month, a spokeswoman for owner MACH Energy said Tuesday...[Read more >](#)

[Regius developing coal-to-liquids, fertiliser project in Mozambique](#)

UK-incorporated company Regius Synfuels is, through its Mozambican subsidiary Regius Synfuels Mozambique, developing an integrated 10 000 bbl/d clean diesel and gasoline and a 409 000 t/y fertiliser project, in the Tete province of Mozambique...[Read more >](#)

[USA: Energy Department Issues Request for Proposal for Conceptual Designs That Advance the Coal Plants of the Future](#)

The U.S. Department of Energy's (DOE) Office of Fossil Energy (FE) has issued a request for proposal (RFP) seeking conceptual designs for coal-based power plants of the future, with an option to conduct preliminary front-end engineering design (Pre-FEED) studies... [Read more >](#)

GENERAL TOPICS

[What Long Duration Energy Storage Is & Why It Kills Coal](#)

CleanTechnica

The new R&D program practically guarantees that the hurt will continue for **coal** miners, their families and their communities long after Trump leaves ...

[Why 'flammable ice' could be the future of energy](#)

BBC News

Last year, Japan succeeded in extracting an untapped fuel from its ocean ... A Japanese government funded research programme is trying to do just ...

[Fossil fuel emissions increase during droughts as hydropower dries up](#)

Earth.com

"Water is used in electricity generation, both directly for hydropower and ...
The researchers say that understanding how droughts impact fossil fuel ...

[Droughts boost emissions as hydropower dries up](#)

Recent droughts caused increases in emissions of carbon dioxide and harmful air pollutants from power generation in several western states as fossil fuels came online to replace hampered hydroelectric power. A new study quantifies the impact.

HYDROGEN-RELATED

[New catalyst produces cheap hydrogen fuel](#)

Chemistry researchers have discovered cheaper and more efficient materials for producing hydrogen for the storage of renewable energy that could replace current water-splitting catalysts.

[New Technology Facilitates Hydrogen Storage](#)

The Maritime Executive

As a fuel, hydrogen does not release any CO₂, and liquefied hydrogen can be ... A newly-released research paper by DNV GL Hydrogen as an energy ...

[Low-cost catalyst boosts hydrogen production from water](#)

A future powered by carbon-free fuel depends on our ability to harness and store energy from renewable but intermittent sources, such as solar and wind. Now, a new catalyst gives a boost to a number of clean energy technologies that depend on producing hydrogen from water.

SOLAR-RELATED

[Microscopic 'sunflowers' for better solar panels](#)

Scientists have harnessed magnetic fields to control the molecular structure of liquid crystal elastomers and create microscopic three-dimensional polymer shapes that can be programmed to move in any direction in three-dimensional space in response to multiple types of stimuli, including light and heat. The applications of this technology include message encryption, responsive solar panels, and smart buildings.

[Brilliant iron molecule could provide cheaper solar energy](#)

For the first time, researchers have succeeded in creating an iron molecule that can function both as a photocatalyst to produce fuel and in solar cells to produce electricity. The results indicate that the iron molecule could replace the more expensive and rarer metals used today.

[This coal plant closed—now it's being converted to a solar-powered neighbourhood](#)

Fast Company

A little more than two years ago, as the market for coal kept collapsing, a 1-gigawatt coal plant in the U.K. town of Rugeley was one of many that closed ...

[Explaining the plummeting cost of solar power](#)

The dramatic drop in the cost of solar photovoltaic (PV) modules, which has fallen by 99 percent over the last four decades, is often touted as a major success story for renewable energy technology. But one question has never been fully addressed: What exactly accounts for that stunning drop? A new analysis has pinpointed what caused the savings, including the policies and technology changes that mattered most.

[Perovskite solar cells: cheaper production and high efficiency](#)

A team of chemists and physicists is offering a novel approach for the selective layer formation in perovskite solar cells. The molecule assembles itself into a monolayer, which can cover a variety of surfaces and can function as a hole transporting material in a perovskite solar cell.

WASTES, RECYCLING & PLASTICS-RELATED

[Australians Create Battery From Waste](#)

OilPrice.com

Meanwhile, there has been news on the battery recycling front as well. ... contributes to lower costs and higher energy density for the new batteries.

[How plastic waste moves in the environment](#)

A researcher for the first time has modelled how microplastic fibres move through the environment. The work could someday help communities better understand and reduce plastics pollution, which is a growing problem around the world.

[Microplastics pollution in Falklands as high as UK](#)

The first study to investigate microplastics around Ascension Island and the Falkland Islands -- two of the most remote locations in the South Atlantic Ocean -- has found levels of contamination comparable with the waters around the UK.

[Japan generates electricity by recycling 80 ton per day of food waste](#)

Daily News & Analysis

Japan has introduced a new technology to generate electricity by recycling waste food. JFE Engineering Corporation has established a new company ...

[Recycle wood first, says Committee on Climate Change](#)

letsrecycle.com

Waste wood should be "reused and recycled wherever possible" before being used as a biomass feedstock, a high level report for government said ...

[Christmas cleanup has just begun; here's what you can and can't recycle](#)

fox13now.com

With Christmas comes packages, boxes, and bags, but **waste** management ... just skip it," said Peck, "and it ends up going to a landfill or a **wasted energy** option." ... Salt Lake City reps say your Christmas trees can also be **recycled**.

[Agricultural waste: Driving us closer to greener transport?](#)

Composite materials made from agricultural waste could be used to produce sustainable, lightweight and low-cost applications in the automotive and marine industries.

RESEARCH UPDATES

Details of new RFCS coal-related projects starting in 2019 will be disseminated when available.

CALENDAR OF FUEL AND ENERGY RESEARCH MEETINGS AND EVENTS

Date	Title	Location	Contact
30 th January 2019	Rushlight Show	The Royal Society, 6-9 Carlton House Terrace, London, SW1Y 5AG	Clive Hall Chief Executive Eventure Media Ltd 32 Elsynge Road, London, SW18 2HN 020 8870 9345. https://www.rushlightevents.com/rushlight-show/
7 th March 2019	CoalTech 2051 Project Workshop	Katowice, Poland	IEA Clean Coal Centre, Anne Carpenter Anne.Carpenter@iea-coal.org
14 th to 16 th March 2019	5 th International Conference on Pollution Control and Sustainable Environment	London	For more information visit:- https://pollution.environmentalconferences.org/
Wednesday 10th April 2019	FERF 2019 Annual Meeting and Seminars of the Biomass and Waste Interest Group, “Waste not Want not” and the Fuel Characterisation and Carbonisation Interest Group, “Biomass and Waste Fuel Characterisation”	Conference Aston, Aston University, Birmingham	Dr. David J.A.McCaffrey, General Secretary of the Fuel & Energy Research Forum, Tel : 01242-236973. E-mail : mail@tferf.org
27 th to 30 th May 2019	27 th European Biomass Conference and Exhibition	Lisbon Congress Center, Lisbon, Portugal	For more information visit:- http://www.eubce.com/
10 th to 12 th April 2019	4 th International Conference on Combustion Science and Processes (CSP 19)	Rome, Italy	For information visit:- https://cspconference.org/?gclid=EAlaIQoBChMlrfitvLam3gIVzLXtChC4AgmEAAYAyAAEgLkoPD_BwE
3 rd to 7 th June 2019	CCT 2019 Houston	Houston, Texas, USA	For more information visit:- https://www.coalconferences.org/
24 th and 25 th June 2019	7 th World Congress and Expo on Green Energy	Barcelona, Spain	For information visit:- https://greenenergy.environmentalconferences.org/
9 th and 19 th September 2019	Conference on Renewable Energy and Climate Change	London, Details tba	For more information visit:- https://10times.com/renewable-energy-uk

Monday 7 th October 2019	The 1st Clean Energy Science Lecture, Title and Speaker to be announced Organise by the Fuel and Energy Research Forum in association with the APGTF, BF₂RA, BFRC/IFRF, CCS&CFECPT, and the UKCCSRC	Mary Sumner House, Westminster, London.	Dr. David J.A.McCaffrey, General Secretary of the Fuel & Energy Research Forum, Tel : 01242-236973. E-mail : mail@tferf.org
21 st and 22 nd October 2019	International Conference on Renewable, Conventional Power and Green Technology	Grange Rochester Hotel, London,	For more information visit:- https://iotimes.com/renewable- conventional-power-and-green-technology
Wednesday 7 th to Friday 9 th September 2020	The 1st FERIA Conference, the European Conference on Fuel and Energy Research and Its Applications, the Successor to the ECCRIA Series of Conferences.	Venue to be announced	Dr. David J.A.McCaffrey 1 st FERIA Conference Chairman Tel : 01242-236973 E-mail : mail@tferf.org Dr. Robert Berry 1 st FERIA Conference Secretary Tel : 0208-331-9401 E-mail : r.j.berry@gre.ac.uk