



INTERNATIONAL FLAME RESEARCH FOUNDATION

2022

# ANNUAL REPORT

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Including financial statements

**Legal status:**

Company Limited by Guarantee; Company Registration No. 10573161

**Registered office:**

Translational Energy Research Centre, Sheffield Business Park, Europa Avenue, S9 1ZA

**Bank:**

Lloyds TSB Bank, Sheffield Church Street, Chelmsford Legg St OSC,  
1 Legg St, Essex, CM1 1JS, UK

## IFRF Council

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### Directors of IFRF Ltd (Group A)

General Secretary - Mohamed Pourkashanian\*  
Executive Director - Greg Kelsall

### National Committee Representatives

America - Dave Schalles  
China - Yong Yan  
France - David Honoré, Vice-Chair  
Germany - Reinhold Kneer  
Italy - Massimiliano Fantuzzi  
Netherlands - Rob Bastiaan  
Sweden - Nils Skoglund

### Non-Directors of IFRF Ltd (Group B)

President - Sauro Pasini\*  
IFRF Vice President - International - Sébastien Caillat  
Company Secretary - Melissa Ayres

### Co-opted Specialists

New fuels - Chuck Benson\*  
Safety - Jacques Dugué  
Early Career Researchers - Karen Finney  
Academia - Mikko Hupa  
Regional (Asia) - Yong Yan

\*Member of Executive Committee



## IFRF in 2022: Walking the crest of a mountain

Thinking how to title my piece on the annual report, it came naturally to me to compare what happened in 2022 to a walk on the crest of a mountain, a narrow and dangerous path; you could fall left and right, but instead you continue to climb towards the summit.

I say this in recognition of the difficulties we have encountered: the reduced interest in conventional combustion processes, their almost total abandonment in the electricity generation sector, at least in the OECD world, and the consequent reduction in the number of members and the available budget for IFRF.

These external factors were then added to internal problems, generated for example by the issue of the non-uniformity of members' fees, which led some National Committees to leave the Foundation, but is now in the process of being resolved.

Despite all these difficulties, and with the resulting reduced budget, the new Director Greg Kelsall, with the fundamental administrative support of the University of Sheffield Translational Energy Research Centre (TERC) team and the General Secretary Prof. Pourkashanian, have managed to continue the journey on the crest, which lately seems to be turning into a quieter path.



I see evidence of this progress mainly in the reactivation of the network and the meetings on specific topics, the famous ToTEMs, and in the quality of participation, both in terms of number and interest in the discussions.

Fortunately, even fuels that do not contain polluting carbon can burn and generate heat, to be used in industrial processes or in engines for mobility: in this sector, which is strategic for decarbonisation, IFRF can make a significant contribution by encouraging interaction between the specialists present among its members.

# PRESIDENT'S REPORT



This trend is confirmed to be growing in 2023, with two ToTEMs planned on similar topics, one in France and one in Italy, which demonstrate the renewed interest in the benefits that this networking activity can bring and the value that the IFRF can offer to its members.

Then there is another sector, which is still smouldering under the ashes, but which should soon see the light, bringing value to IFRF members, which is that of research on new combustion processes, thanks to the availability of the facilities of the Preferred Research Partners and the potential recourse to European research funds.

This is an area identified by IFRF management as strategic, and is an area in which a development plan is beginning to be consolidated.

In light of the above, I would like to conclude that I am reasonably optimistic about the future of the Foundation, the crest has now widened, but the path is always uphill and we must continue to invest in the strategic paths identified.



A handwritten signature in blue ink that reads "Sauro Pasini". The signature is written in a cursive style.

**Sauro Pasini, IFRF President**



## 2022: A year of consolidation with first signs of recovery

My appointment as Executive Director, to replace Philip Sharman who stood down from the role in December 2021, was confirmed by the IFRF Council early in the year. By way of introduction, I am an independent energy expert, having previously worked for GE, Alstom and British Coal in a range of combustion and future energy related roles.

I took on the Executive Director role as a part-time activity within a portfolio of energy related activities, having acted as the IFRF Deputy Director for most of 2021 as part of the succession plan for the role.

Another significant change to reduce costs and improve the IFRF offering was the transfer of the administration of IFRF to the University of Sheffield TERC team as IFRF's host organisation, in January 2022. The TERC team includes Melissa Ayres, Lisa Shepley, Rhianne Spurden and Siobhan Green. In addition, Melissa Ayres became the IFRF Company Secretary in January 2022 and the registered address of IFRF with Company's House was transferred to the Translational Energy Research Centre in Sheffield in March 2022.

As Covid restrictions were generally relaxed in a number of IFRF's member countries during 2022, IFRF planned and executed its first Topic Orientated Technical Meeting (TOTeM 48) since February 2020.



This was a face-to-face meeting held on the 13th October at Air Liquide's Paris campus, France, entitled 'Hydrogen for decarbonisation'. TOTeM 48, an official side event of the European Hydrogen Week 2022, proved to be a great success with a programme for the day including 3 keynote lectures, 8 oral presentations, 15 posters and a round table with 4 experts. A record number of 110 participants from 13 countries attended, with 45% of participants from academia representing 19 universities.

Industrial participants attending were from 32 companies covering a range of different sectors, from production and transport, to end usage in combustion systems, such as domestic appliance, gas turbines, oil and gas, glass and steel industries.

# DIRECTOR'S REPORT



With the support of sponsorship from Alliance Alice, GRTGaz, Siemens and ThermoFisher, the event generated a positive income of €11,000.



IFRF were also invited by the Combustion Institute (CI) to organise one of the two Industry round tables at the 39th International Symposium on Combustion. Held in Vancouver, Canada in July 2022, the event gathered representatives from all the main combustion laboratories around the world.

Under the auspices of the CI Industrial Committee, with the active support of Benedict Cuenot of Cerfacs, Technical Program Co-Chair, IFRF were able to gather representatives of industrial sectors, responsible for a large share of industrial emissions of greenhouse gases, to exchange with the participants.

The roundtable was hybrid in nature due to ongoing travel restrictions in some locations, but it still attracted some 150-200 participants attending in person, with more joining virtually.

The IFRF's Preferred Research Partner (PRP) network was expanded to six organisations, with Air Liquide in France and Glass Futures in the UK becoming the fifth and sixth PRP organisations, both in June 2022. The PRP network provides test facilities and expertise to IFRF members and supporting organisations giving them preferential access.

In terms of membership, Glass Futures joined as an academic member and a number of organisations in France, namely Cetiat, Cerfacs, IFP Energies Nouvelles (IFPEN) and Babcock Wanson agreed to join as members starting from January 2023. Additionally, the German Flame Committee with 14 members, who had suspended payment of their membership fees in 2021, agreed to return as a fee paying IFRF National Committee from 2023.

This was at a reduced rate however, pending continued development of the IFRF offering, to be reviewed at the next German Flame committee meeting in September 2023.

Finally, opportunities were explored with the IFRF PRP network and member organisations to bid for collaborative research and development external funding opportunities.

Based on feedback from members, this is seen as an important IFRF offering. However, uncertainty regarding the eligibility of IFRF Ltd to access EU funding programmes such as Horizon meant that no bids involving IFRF as a partner were pursued during the year.

# DIRECTOR'S REPORT



## Outlook for 2023

Following the success of TOTeM 48, further technical meetings and workshops are planned for 2023. These include an IFRF one-day satellite workshop entitled 'From lab scale to industrial combustion: challenges for the scale up of experimental and simulation approaches' which will be held at the 11th European Combustion Meeting in Rouen on 25 April 2023.

TOTeM 49 is planned for June 2023 in Mulhouse, France entitled 'Alternative chemical energy carriers for long-term storage and long-distance transport of renewable energies' and TOTeM 50 in Piacenza, Italy is planned for December 2023, entitled 'Decarbonising combustion in hard-to-abate sectors'.

In addition, the IFRF online Handbook and Combustion Journal will be rejuvenated, with increased functionality, to provide better value to IFRF members.



A handwritten signature in black ink, appearing to read 'G. Kelsall'.

**Greg Kelsall, Executive Director**



# MEMBERS

IFRF has members in each corner of the world, from the USA to Japan, and from Finland to South Africa.

Here is how the IFRF Membership looked at the end of 2022:

**5 National Committees**



**22 Countries**



**126 Members**



**120 Organisations**

**6 Individuals**

**52 Large industrial**

**18 Small industrial**

**50 Academic**





# COMMUNICATIONS

IFRF has three main platforms for communicating with its members and beyond. Monday Night Mail (MNM) a bi-weekly member e-newsletter; the IFRF website ([www.ifrf.net](http://www.ifrf.net)); and social media pages.

**MONDAY NIGHT MAIL**  
IFRF'S BI-WEEKLY MEMBER NEWSLETTER

**935**

subscribers at the  
end of 2022

**25**

MNMs published

**23.8%**

subscribers engaged  
with MNM on average

## Top 10 stories of 2022

1. Summary and key learnings from the 48th TOTeM on 'Hydrogen for Decarbonisation'
2. Essar unveils £45m plan to build UK's first refinery-based hydrogen furnace
3. UK Government announces 20 shortlisted decarbonisation projects as part of cluster sequencing competition
4. TotalEnergies and Air Liquide to produce low carbon hydrogen at the Grandpuits Zero Crude Platform
5. Report of Decarbonated Combustion in Industrial Process round table at the 39th International Symposium on Combustion
6. 8 Rivers receives \$100m investment from SK to deploy clean hydrogen technologies in Asia-Pacific
7. 2022 Global status of CCS report issued showing 44% growth in CCUS facilities capacity
8. Lessons and doubts from the Chernobyl disaster
9. Shell to build 200 MW renewable Hydrogen plant in The Netherlands
10. EU approves €5.2 billion for IPCEI Hy2Use



# EVENTS

2022 saw the return of in-person TOTeMs and other events for the IFRF community. Read on for a summary of the 28th TOTeM, the roundtable we hosted at the 39th International Symposium on Combustion and the National Committee Flame Days.

**1**  
**TOTeM**

**1**  
**Industry roundtable**

**4**  
**National Committee  
Flame Days**

## National Committee Flame Days

The **Comité Français de la FRIF (France)** had two General Assemblies. One on 12th January at the Fives building in Paris. Another took place 12th May at the GRTgaz Research & Innovation Center for Energy in Alfortville, near Paris.

The **American Flame Research Committee (AFRC)** held their Industrial Combustion Symposium on September 12-14th in Greenville, South Carolina.

The **Nederlandse Vereniging voor Vlamonderzoek (The Netherlands)** held the Combura 2022 symposium on November 23-24th in Soesterberg, NL.



# EVENTS

## TOTeM 48: Hydrogen for decarbonisation

The 48th TOTeM took was organised by Comité Français de la FRIF, the French IFRF Committee, and took place at Air Liquide's Paris Innovation Campus in Jouy-en-Josas, France, France, on 13th October 2022.

The focus of the event was 'Hydrogen for industrial decarbonisation' and featured talks and roundtable participants from organisations like the French Ministry of Ecological Transition, Air Liquide, Linde, TotalEnergies and the University of Sheffield. The event was supported by sponsors GRTGaz, Siemens, Air Liquide, Thermo Fischer Scientific and Alliance ALLICE and was an official side event of European Hydrogen Week 2022.

Organiser Sébastien Caillat said of the event: As we had hoped, the TOTeM proved to be a great success with a programme for the day including 3 keynote lectures, 8 oral presentations, 15 posters and a roundtable with 4 experts.

The event kicked-off with the the keynote lectures covering an overview of the hydrogen strategy for a climate neutral Europe, an in-depth presentation on the subtleties and complexities of hydrogen combustion, together with a presentation on the challenges and opportunities of hydrogen for industrial process heating.



The day concluded with a roundtable on the safety of new fuels from production to end usage.

A record number of 110 participants from 13 countries attended, with 45% of participants from academia representing 19 universities. Industrial participants attending were from 32 companies covering a range of different sectors, from production and transport, to end usage in combustion systems, such as domestic appliances, gas turbines, oil and gas, glass and steel industries.

The event was a great success with many attendees giving positive feedback on the contents, organisation and format of the event. All presentations and posters are available to the participants on the IFRF website. Thank you to everyone involved in running the TOTeM.



## EVENTS

### Industry Roundtable at the 39th International Symposium on Combustion



IFRF held an Industry Roundtable at the 39th International Symposium on Combustion in Vancouver, Canada in July 2022.

Under the auspices of the CI Industrial Committee, with the active support of Benedict Cuenot of Cerfacs, Technical Program Co-Chair, we were able to gather representatives of industrial sectors, responsible for a large share of industrial emissions of greenhouse gases, to exchange with the participants. The roundtable was hybrid in nature due to ongoing travel restrictions in some locations, but it still attracted some 150-200 participants attending in person, with more joining virtually.

The roundtable was a half-day event held on the Tuesday afternoon of the week-long conference.

Following a scene-setting introduction from Sebastien, the workshop then proceeded with a presentation from IFRF general secretary Mohamed Pourkashanian entitled: 'The challenges and opportunity of industrial decarbonisation'.

Overall, the event was very successful showing IFRF member and supporter organisations being at the heart of the industrial combustion challenge. The intention is for IFRF to collaborate further with the Combustion Institute in the industrial combustion space in the future.



## REPORT OF THE DIRECTORS AND UNAUDITED FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022 FOR IFRF LIMITED

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## IFRF LIMITED

COMPANY INFORMATION FOR THE YEAR ENDED 31 DECEMBER 2022

### **DIRECTORS:**

Dr S Caillat

Professor M Pourkashanian

### **SECRETARY:**

Mrs M J Ayres

### **REGISTERED OFFICE:**

C/O Translational Energy Research Centre

Europa Avenue

Sheffield

South Yorkshire

S9 1ZA

### **REGISTERED NUMBER:**

10573161 (England and Wales)

### **ACCOUNTANTS:**

Bronsens

Chartered Certified Accountants

Hillside

Albion Street

Chipping Norton

Oxfordshire

OX7 5BH



## REPORT OF THE DIRECTORS FOR THE YEAR ENDED 31 DECEMBER 2022

The directors present their report with the financial statements of the company for the year ended 31 December 2022.

### **DIRECTORS**

The directors shown below have held office during the whole of the period from 1 January 2022 to the date of this report.

Dr S Caillat  
Professor M Pourkashanian

This report has been prepared in accordance with the provisions of Part 15 of the Companies Act 2006 relating to small companies.

### **ON BEHALF OF THE BOARD:**

  
.....

**Professor M Pourkashanian - Director**

**Date: 17th May 2022**



**IFRF LIMITED (REGISTERED NUMBER: 10573161)**

**INCOME STATEMENT  
FOR THE YEAR ENDED 31 DECEMBER 2022**

	Notes	31.12.22 £	31.12.21 £
<b>TURNOVER</b>		48,800	63,880
Administrative expenses		<u>46,238</u>	<u>59,388</u>
<b>OPERATING SURPLUS and SURPLUS BEFORE TAXATION</b>		2,562	4,492
Tax on surplus	4	<u>481</u>	<u>691</u>
<b>SURPLUS FOR THE FINANCIAL YEAR</b>		<u><u>2,081</u></u>	<u><u>3,801</u></u>

The notes form part of these financial statements



# FINANCIAL STATEMENTS



IFRF LIMITED (REGISTERED NUMBER: 10573161)

		<b>BALANCE SHEET</b>	
		<b>31 DECEMBER 2022</b>	
	Notes	31.12.22 £	31.12.21 £
<b>CURRENT ASSETS</b>			
Debtors	6	8,729	6,052
Cash at bank		12,490	14,194
		<u>21,219</u>	<u>20,246</u>
<b>CREDITORS</b>			
Amounts falling due within one year	7	13,140	14,248
		<u>8,079</u>	<u>5,998</u>
<b>NET CURRENT ASSETS</b>			
		<u>8,079</u>	<u>5,998</u>
<b>TOTAL ASSETS LESS CURRENT LIABILITIES</b>			
		<u>8,079</u>	<u>5,998</u>
<b>RESERVES</b>			
Income and expenditure account		8,079	5,998
		<u>8,079</u>	<u>5,998</u>

The company is entitled to exemption from audit under Section 477 of the Companies Act 2006 for the year ended 31 December 2022.

The members have not required the company to obtain an audit of its financial statements for the year ended 31 December 2022 in accordance with Section 476 of the Companies Act 2006.

The directors acknowledge their responsibilities for:

- ensuring that the company keeps accounting records which comply with Sections 386 and 387 of the Companies Act 2006 and
- preparing financial statements which give a true and fair view of the state of affairs of the company as at the end of each financial year and of its surplus or deficit for each financial year in accordance with the requirements of Sections 394 and 395 and which otherwise comply with the requirements of the Companies Act 2006 relating to financial statements, so far as applicable to the company.

The financial statements have been prepared in accordance with the provisions applicable to companies subject to the small companies regime. The financial statements were approved by the Board of Directors and authorised for issue on 17th May 2023 and were signed on its behalf by:

A handwritten signature in black ink, appearing to read 'M. Pourkashanian'.

M Pourkashanian - Director



IFRF LIMITED (REGISTERED NUMBER: 10573161)

STATEMENT OF CHANGES IN EQUITY  
FOR THE YEAR ENDED 31 DECEMBER 2022

	Retained earnings £	Total equity £
<b>Balance at 1 January 2021</b>	2,197	2,197
<b>Changes in equity</b>		
Total comprehensive income	3,801	3,801
<b>Balance at 31 December 2021</b>	<u>5,998</u>	<u>5,998</u>
<b>Changes in equity</b>		
Total comprehensive income	2,081	2,081
<b>Balance at 31 December 2022</b>	<u><u>8,079</u></u>	<u><u>8,079</u></u>

The notes form part of these financial statements



## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 DECEMBER 2022

### 1. STATUTORY INFORMATION

IFRF Limited is a private company, limited by guarantee, registered in England and Wales. The company's registered number and registered office address can be found on the Company Information page.

The presentation currency of the financial statements is the Pound Sterling (£).

### 2. ACCOUNTING POLICIES

#### **Basis of preparing the financial statements**

These financial statements have been prepared in accordance with Financial Reporting Standard 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland" including the provisions of Section 1A "Small Entities" and the Companies Act 2006. The financial statements have been prepared under the historical cost convention.

#### **Turnover**

Turnover is measured at the fair value of the consideration received or receivable, excluding discounts, rebates, value added tax and other sales taxes.

#### **Tangible fixed assets**

Depreciation is provided at the following annual rates in order to write off each asset over its estimated useful life.

Computer equipment - 33% on cost

#### **Taxation**

Taxation for the year comprises current and deferred tax. Tax is recognised in the Income Statement, except to the extent that it relates to items recognised in other comprehensive income or directly in equity.

Current tax is recognised at the amount of tax payable using the tax rates and laws that have been enacted or substantively enacted by the balance sheet date.

#### **Deferred tax**

Deferred tax is recognised in respect of all timing differences that have originated but not reversed at the balance sheet date.

# FINANCIAL STATEMENTS



Timing differences arise from the inclusion of income and expenses in tax assessments in periods different from those in which they are recognised in financial statements. Deferred tax is measured using tax rates and laws that have been enacted or substantively enacted by the year end and that are expected to apply to the reversal of the timing difference.

Unrelieved tax losses and other deferred tax assets are recognised only to the extent that it is probable that they will be recovered against the reversal of deferred tax liabilities or other future taxable profits.

## 3. EMPLOYEES AND DIRECTORS

The average number of employees during the year was 2 (2021 - 2).

## 4. TAXATION

### Analysis of the tax charge

The tax charge on the surplus for the year was as follows:

	31.12.22 £	31.12.21 £
Current tax:		
UK corporation tax	487	691
Under/(over) provision prior years	(6)	-
	<u>481</u>	<u>691</u>
Tax on surplus	<u>481</u>	<u>691</u>

## 5. TANGIBLE FIXED ASSETS

### COST

At 1 January 2022

Disposals

At 31 December 2022

### DEPRECIATION

At 1 January 2022

Eliminated on disposal

At 31 December 2022

### NET BOOK VALUE

At 31 December 2022

At 31 December 2021

Computer  
equipment  
£

459

(459)

-

459

(459)

-

-

-

# FINANCIAL STATEMENTS



<b>6. DEBTORS: AMOUNTS FALLING DUE WITHIN ONE YEAR</b>	<b>31.12.22</b>	<b>31.12.21</b>
	£	£
Trade debtors	<u>8,729</u>	<u>6,052</u>
<b>7. CREDITORS: AMOUNTS FALLING DUE WITHIN ONE YEAR</b>	<b>31.12.22</b>	<b>31.12.21</b>
	£	£
Trade creditors	8,386	10,071
Tax	487	697
Accrued expenses	<u>4,267</u>	<u>3,480</u>
	<u>13,140</u>	<u>14,248</u>

## 8. LIMITED BY GUARANTEE

The company is Limited by Guarantee. Accordingly the company has no shareholders and no reconciliation of movement in shareholders' funds is present. The liability of each member shall not be more than £1 in the unlikely event of the company being wound up.

# FINANCIAL STATEMENTS



## ON THE UNAUDITED FINANCIAL STATEMENTS OF IFRF LIMITED (REGISTERED NUMBER: 10573161)

In order to assist you to fulfil your duties under the Companies Act 2006, we have prepared for your approval the financial statements of IFRF Limited for the year ended 31 December 2022 which comprise the Income Statement, Balance Sheet, Statement of Changes in Equity and the related notes from the company's accounting records and from information and explanations you have given us.

As a practising member firm of the Association of Chartered Certified Accountants, we are subject to its ethical and other professional requirements which are detailed at <http://www.accaglobal.com/rulebook>.

This report is made solely to the Board of Directors of IFRF Limited, as a body, in accordance with our terms of engagement. Our work has been undertaken solely to prepare for your approval the financial statements of IFRF Limited and state those matters that we have agreed to state to the Board of Directors of IFRF Limited, as a body, in this report in accordance with the requirements of the Association of Chartered Certified Accountants as detailed at <http://www.accaglobal.com/factsheet163>. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the company and its Board of Directors, as a body, for our work or for this report.

It is your duty to ensure that IFRF Limited has kept adequate accounting records and to prepare statutory financial statements that give a true and fair view of the assets, liabilities, financial position and profit of IFRF Limited. You consider that IFRF Limited is exempt from the statutory audit requirement for the year.

We have not been instructed to carry out an audit or a review of the financial statements of IFRF Limited. For this reason, we have not verified the accuracy or completeness of the accounting records or information and explanations you have given to us and we do not, therefore, express any opinion on the statutory financial statements.

Bronsens  
Chartered Certified Accountants  
Hillside  
Albion Street  
Chipping Norton  
Oxfordshire  
OX7 5BH

Date: .....17 May 2023.....

This page does not form part of the statutory financial statements



IFRF LIMITED (REGISTERED NUMBER: 10573161)

DETAILED INCOME AND EXPENDITURE ACCOUNT  
FOR THE YEAR ENDED 31 DECEMBER 2022

	31.12.22		31.12.21	
	£	£	£	£
<b>Membership fees</b>		48,800		63,880
<b>Expenditure</b>				
Insurance	1,851		1,765	
Sub contractor fees	33,578		52,113	
Telephone, computer and website costs	1,556		1,658	
Accountancy	1,560		1,320	
Subscriptions	-		30	
Consultancy	-		2,000	
Bad debts	7,374		-	
		<u>45,919</u>	<u>58,886</u>	
		2,881	4,994	
<b>Finance costs</b>				
Bank charges		<u>319</u>	<u>502</u>	
<b>NET SURPLUS</b>		<u>2,562</u>	<u>4,492</u>	

This page does not form part of the statutory financial statements