Vol. 12 | No. 1 | April - June 2024

Kañch

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Quarterly Journal of **The All India Glass Manufacturers' Federation**

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Syringes and Cartridges in Clear Glass
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GMP Certified Facility
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HPLC Scientific Vials, Screw Neck /
Crimp Neck Press Fit, Blowback
Ampoules: OPC, Break / Score Ring, Form:
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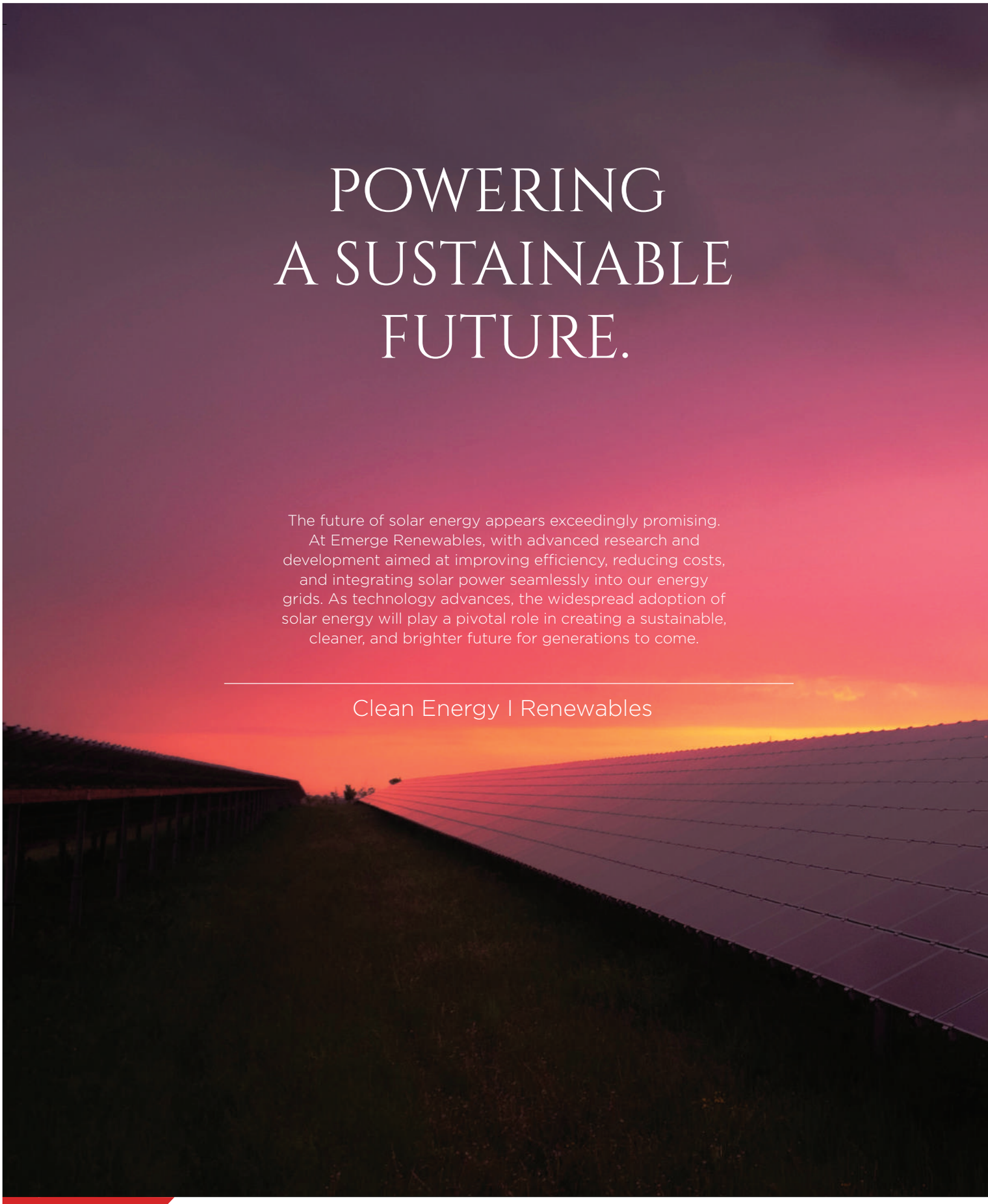

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Quarterly Journal of the Glass Industry, published and printed by Vinit Kapur on behalf of The All India Glass Manufacturers' Federation from 812 New Delhi House, 27 Barakhamba Road, New Delhi – 110001 and printed by New United Process, A-26, Ph-II, Naraina Indl. Area, New Delhi-110028

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Complimentary copy for Members / Government Departments / NGO's and those connected with Glass Industry

Others: Price (excluding bank charges):

Indian Companies : ₹ 125 per copy
Annual Subscription ₹ 450

Foreign Companies : US$ 25 per copy
Annual Subscription US$ 80

Kañch

Quarterly Journal of **THE ALL INDIA GLASS MANUFACTURERS' FEDERATION**

Vol. 12 | No. 1 | April-June 2024

Contents

heye international

SMARTLINE 2

NEXT LEVEL INSPECTION

SMARTLINE 2 STARWHEEL INSPECTION MACHINE
COMBINING FLEXIBILITY AND SPEED

smart plant

+ Flexible inspection options with perfect detection results
+ High operating speed
+ Fast job changes
+ Full connectivity
+ Stable non-round handling

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From President's Desk

We have created a new tab on www.aigmf.com with a link to download complete PDF of the book titled "Celebrating Glass, Achieving Sustainability, Inspiring Transformation", published by the International Commission on Glass.

This book reveals the backstory of the International year of Glass 2022, application to the United Nations and records the year-long party that followed in countries from every continent. The book is a photographic and written record for all who participated and is a guidebook for others on similar journeys in the future.

The Report from RO17 (India, Iran, Pakistan) is covered from page 181-191 with references of India appearing in different sections. Starting with this issue, we will reproduce all articles *(in parts)* in the future issues of KANCH.

Union Minister for Finance Mrs. Nirmala Sitharaman chaired the Pre-Budget Consultations with representatives from Micro, Small and Medium Enterprises (MSME) to gather suggestions for the upcoming General Budget 2024-25, in New Delhi on June 21, 2024.

On the invitation of the Ministry of Finance, Secretary AIGMF participated and presented its Pre-Budget Memo arising out of the industry inputs to the Finance Ministry at North block over an in-person pre-budget consultation meeting along with other stakeholders.

The 33rd China International Glass Industry Technology Exhibition, sponsored by the Chinese Ceramic Society and hosted by Beijing China Silicon Exhibition Co. Ltd., was held from April 25-28, 2024, in Shanghai. AIGMF Members participated in large numbers. The total number of visitors reached 1,26,381, an increase of 18% from the previous exhibition, including 6,532 overseas visitors from 136 countries and regions.

The exhibition featured 877 manufacturers from 29 countries and regions around the world, with all mainstream manufacturers in the global glass industry present. AIGMF in association with its Chinese friends organized two factory visits to Haimen Sanlong Glass and Nantong Huajing Glass. Other meetings on glass recycling and technology etc., were organized on demand for the select members.

The All India Glass Manufacturers' Federation (AIGMF) would be participating at glasstec 2024 via stand # 13A22 from Oct 22-25 at Dusseldorf, GERMANY. The next issue of KANCH/Glass News will be a special issue for wide distribution at glasstec exhibition ■

Sanjay Agarwal
President AIGMF and
Director, Kwality Glass Works, Firozabad (UP)

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- Caps & Closures
- Soft Drink Bottles
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GLASS News

CORNING, OPTIEMUS INFRACOM BREAK GROUND ON INDIA'S FIRST COVER-GLASS FINISHING FACILITY IN TAMIL NADU

Corning Incorporated, one of the world's leading innovators in materials science, and Optiemus Infracom Limited, India's leading telecommunications and manufacturing enterprise, broke ground on the Bharat Innovative Glass Technologies (BIG Tech) facility. BIG Tech will be India's first facility to produce high-quality, finished cover-glass parts for mobile consumer electronics, helping meet growing manufacturer demand in India.

In January, the joint venture firm signed an MoU with the Tamil Nadu government to set up a new factory near Chennai at an investment of ₹1,003 crore to manufacture front-cover glass products, meant for smartphones and electronic products. The unit will come up at SIPCOT-Pillaipakkam Industrial Estate in Kancheepuram district. The project is expected to create job opportunities for 840 people.

Corning's renowned Gorilla Glass cover material has been designed into more than eight billion devices by more than 45 major brands.

"For more than 60 years, Corning has played a vital role in India's technological development. This joint venture with Optiemus Infracom demonstrates our shared commitment to bringing life-changing innovations to the Indian market – and the world," said Mr. David Velasquez, Vice-President and General Manager, Corning Gorilla Glass.

"Our collaboration with Corning exemplifies our shared commitment to driving technological advancements and delivering high-quality products to the market in alignment with the Indian government's Make in India initiative," said Mr. Ashok Gupta, Executive Chairman, Optiemus Infracom. *"Establishing India's first cover-glass finishing operation for mobile consumer electronics is a major milestone in our journey to meet the growing demand for high-quality, advanced cover glass."*

Corning and Optiemus' decision to establish a facility in Tamil Nadu is a testament to the robust infrastructure, skilled workforce, and business-friendly environment that the region offers," said Mr. TRB Rajaa, Minister for Industries, Investment Promotions and Commerce, Government of Tamil Nadu.

Ms. Akshita Tejwani of Maharani Gayatri Devi Girls School, Jaipur RAJASTHAN proudly holds her artwork on solar glass published on the front cover of KANCH

Mr. T.R.B. Rajaa *(tallest in the picture)*, Minister for Industries, Investment Promotions and Commerce, Government of Tamil Nadu, with officials of Corning Incorporated and Optiemus Infracom, at the groundbreaking ceremony

AIGMF at the Pre-Budget Consultation meeting organised by the Ministry of Finance at North Block

भारत सरकार का केंद्रीय बजट: 2024-25

केन्द्रीय वित्त मंत्री श्रीमती निर्मला सीतारमण ने 23 जुलाई, 2024 को संसद में केंद्रीय बजट 2024-25 पेश किया। बजट की मुख्य बातें इस प्रकार से हैं:

- सभी औपचारिक क्षेत्रों में पहली बार रोजगार प्राप्त करने वाले को 3 किस्तों में 15,000 रु. तक 1 माह का वेतन, इससे 2 करोड़ 10 लाख युवाओं को लाभ प्राप्त करने की आशा है।
- सरकार नियोक्ताओं के ईपीएफओ अंशदान के लिए उन्हें 2 वर्षों तक 3,000 रुपए प्रतिमाह की प्रतिपूर्ति करेगी, इससे 50 लाख नौकरियों के सृजन होने की आशा।
- पहली बार रोजगार प्राप्त करने वालों से संबद्ध प्रथम 4 वर्ष से अंशदान के लिए विशिष्ट पैमाने पर ईपीएफओ अंशदान के लिए कर्मचारी और नियोक्ता दोनों को प्रोत्साहन, इससे 30 लाख युवाओं को लाभ प्राप्त होने की आशा।
- उद्योग के सहयोग से कामकाजी महिला हॉस्टलों की स्थापना करके कामगारों में महिलाओं की अधिक भागीदारी को सुविधाजनक बनाना तथा शिशु गृहों की स्थाप्ना करना।
- 5 वर्षों की अवधि में 20 लाख युवाओं को कौशल प्रशिक्षण दिया जाएगा।
- **परिणाम उन्मुख दृष्टिकोण के साथ हब और स्पोक मॉडल में 1,000 औद्योगिक प्रशिक्षण संस्थानों का उन्नयन किया जाएगा।**
- **उद्योग की कौशल संबंधी आवश्यकताओं के अनुरूप पाठ्यक्रम की विषय-वस्तु और फ्रेमवर्क तैयार किए जाएंगे।**
- एमएसएमई को ऋण के लिए नया निर्धारण मॉडल।
- मुद्रा ऋण: 'तरूण' श्रेणी में ऋण सीमा को वर्तमान 10 लाख रुपए से बढ़ाकर 20 लाख रुपए किया गया।
- 5 वर्ष की अवधि में 1 करोड़ युवाओं को शीर्ष 500 कंपनियों में इंटर्नशिप के अवसर उपलब्ध कराने की योजना।
- सीएसआर निधियों के माध्यम से प्रतिमाह 5,000 रुपये का भत्ता और 6,000 रुपए की एककालिक सहायता।
- **सूक्ष्म और लघु उद्योगों को स्वच्छ ऊर्जा अपनाने के लिए वित्तीय सहायता।**
- एयूएससी ताप विद्युत संयंत्र: एनटीपीसी और बीएचईएल का एक संयुक्त उद्यम पूर्ण क्षमता वाले 800 मेगावाट के वाणिज्यिक संयंत्र की स्थापना करेगा।
- 25 महत्वपूर्ण खनिजों पर सीमा शुल्क से पूर्णतया छूट।
- **सोलर सेल और पैनलों के विनिर्माण के लिए अधिक पूंजीगत वस्तुओं पर छूट।**
- वित्तीय परिसंपत्तियों पर लघु अवधि के लाभों पर 20 प्रतिशत कर लगेगा।
- सभी वित्तीय और गैर-वित्तीय परिसम्पत्तियो पर दीर्घावधि के लाभों पर 12.5 प्रतिशत कर लगेगा।
- वित्तीय परिसंपत्तियों पर पूंजीगत लाभ की छूट सीमा को बढ़ाकर 25 लाख रुपए प्रतिवर्ष किया जाएगा।
- विदेशी कंपनियों पर कॉरपोरेट कर की दर 40 प्रतिशत से घटाकर 35 प्रतिशत की गई है।
- वेतनभोगी कर्मचारियों के लिए मानक कटौती 50,000 रुपए से बढ़ाकर 75,000 रुपए की गई है।
- पेंशनभोगियों के लिए पारिवारिक पेंशन पर कटौती 15,000 रुपए से बढ़ाकर 25,000 रुपए की गई है।

AIGMF PRESENTED IT'S PRE-BUDGET MEMO TO THE MINISTRY OF FINANCE AT NORTH BLOCK

Union Minister for Finance Mrs. Nirmala Sitharaman chaired the Pre-Budget Consultations with representatives from Micro, Small and Medium Enterprises (MSME) to gather suggestions for the upcoming General Budget 2024-25, in New Delhi on June 21, 2024.

The Pre-Budget consultation meeting was also attended by Union Minister of State for Finance Mr. M P Chaudhary; Finance Secretary and Secretary, D/o Expenditure; Secretaries of Department of Economic Affairs, officials of the Ministry of MSME and Chief Economic Adviser, Government of India.

On the invitation of the Ministry of Finance, Secretary AIGMF participated and presented it's Pre-Budget Memo arising out of the industry inputs to the Ministry of Finance at North block over an in-person pre-budget consultation meeting along with other stakeholders.

KEY FEATURES OF THE UNION BUDGET OF INDIA 2024-2025

The Union Minister of Finance Mrs. Nirmala Sitharaman presented the Union Budget of India 2024-25 in Parliament on July 23, 2023. The highlights of the budget are as follows:

- One-month wage to new entrants in all formal sectors in 3 instalments up to ₹15,000. Expected to benefit 210 lakh youth.
- Government will reimburse EPFO contributions of employers up to ₹3,000 per month for 2 years for all new hires. Expected to generate 50 lakh jobs.
- Incentive to both employee & employer for EPFO contributions in the specified scales for the first 4 years. Expected to benefit 30 lakh youth.
- Facilitate higher participation of women in the workforce through setting up of working women hostels in collaboration with industry, and establishing creches.
- 20 lakh youth will be skilled over a 5-year period.
- **1,000 Industrial Training Institutes will be upgraded in hub and spoke arrangements with outcome orientation. Course content & design aligned as per skill needs of industry.**
- Mudra Loans: The limit enhanced to ₹20 lakh from the current ₹10 lakh under the 'Tarun' category.
- Scheme for providing internship opportunities in 500 top companies to 1 crore youth in 5 years.
- Allowance of ₹5,000 per month along with a one-time assistance of ₹6,000 through the CSR funds.
- **Financial support for shifting of micro and small industries to cleaner forms of energy.**
- AUSC Thermal Power Plants- a joint venture between NTPC and BHEL will set up a full scale 800 MW commercial plant.
- Comprehensive review of the rate structure for ease of trade, removal of duty inversion and reduction of disputes.
- **Exempted more capital goods for manufacturing of solar cells & panels.**
- Fully exempt custom duties on 25 critical minerals.
- Short term gains of financial assets to attract 20% tax rate.
- Long term gains on all financial and non-financial assets to attract a tax rate of 12.5%.
- Increase in limit of exemption of capital gains on financial assets to ₹1.25 lakh per year.
- Corporate tax rate on foreign companies reduced from 40% to 35%.
- Standard Deduction for salaried employees increased from ₹50,000 to ₹75,000.
- Deduction on family pension for pensioners increased from ₹15,000 to ₹25,000

HEYE AT GLASSTEC

glasstec is a much anticipated event in the glass industry. From brand new innovations to enhancements of existing products, Heye International is excited to showcase its latest advancements at glasstec 2024 in Düsseldorf.

One of the highlights at Heye's exhibition stand will be the introduction of the Multilevel Safety and Protection Concept, featuring the Heye Blank Side Robot and Heye Protection Grids designed to enhance safety and efficiency on the blank side of IS machines.

Heye's Smart Plant, which combines various innovative solutions and elevates glass-making technology to a new level, will be featured at the glasstec exhibition in the form of two products: Heye GobMaster and Heye SmartLink.

In addition to these innovations, Heye will showcase its proven and successful product, the Dual Motor Shears, this time with redesigned shear arms featuring an innovative drop guide for improved rigidity and durability.

As equipment for the cold end, the SmartLine 2 to be presented at the show contains an improved motion control concept, reducing the costs of spare parts inventory and improving performance.

Further new developments have been made in the area of AI. As a complement to the Ranger 2 check detection system, we are launching an additional image processing variant that includes additional AI functions.

Visit Heye's stand 14C18 at glasstec 2024 to discover Heye's product highlights and learn how they can take your glass production to new heights.

O-I GLASS TO INVEST $65 MILLION IN ELECTRIFICATION AND DECARBONIZATION IN VEAUCHE, FRANCE

O-I Glass, Inc. ("O-I Glass" or "O-I") plans to invest approximately $65 Million into the electrification and decarbonization of its plant in Veauche, FRANCE. As the first O-I plant globally to use this technology, one of its two furnaces will be fully renovated and equipped with state-of-the-art hybrid-flex technology. This leading-edge innovation establishes flexibility to replace up to 70% of the conventional fossil-fuel-based energy with electricity. In addition, the furnace will be equipped with heat recovery and an air preheating system, creating further efficiency gains and reductions in energy consumption and emissions. At an average 50% electricity level, on-site CO_2 emissions are expected to drop by approximately 43% compared to a traditional furnace, significantly contributing to the company's global target of a 25% reduction in greenhouse gas emissions by 2030.

The investment is consistent with O-I's sustainability strategy and the company's previously announced investment plan into plant upgrades.

Along with the decarbonization impact, the new technology is set to further reduce NOx emissions on top of the effects from the high performing DeNOx system already installed on site.

In parallel to the construction of the new hybrid furnace, O-I also plans to install a carbon-lowering heat recovery system in the plant. Heat recovered from the furnace will feed a new internal energy distribution network and will supply up to 94% of the plant's heating needs. Once both investments are completed – expected for December 2025 – the Veauche plant will be one of the most modern and sustainable sites for O-I globally. At that time, the entire site is expected to reduce its CO_2 emissions by up to 35% versus pre-2020 levels, when its other furnace was completely rebuilt.

With 2 furnaces and 7 lines, the O-I plant in Veauche produces approximately 300 million bottles each year. It is a role model for a local circular economy leveraging up to 87% of recycled glass ("cullet") sourced from a processing plant no more than 20 km away. The plant in Veauche is well located within a few hours of most of its customers, minimizing delivery and logistics. Built in 1882, the plant is a key site dedicated to modern high-tech glassmaking, manufacturing high quality bottles for premium markets such as champagne, spirits and wine.

"This hybrid flex technology represents another step forward in improving the sustainability profile of our plants. Not only is the glass we produce infinitely recyclable and healthy, our approach to producing it is holistic, and we can see it here technologically, and energy-wise, as well as through partnerships we have with local communities and customers." says Mr. Randy Burns, Chief Sustainability Officer for O-I.

"These investments are set to increase O-I's flexibility to serve premium customers with high quality and more sustainable glass, improve the company's environmental footprint and meet our customers' demand." shares Mr. Walter Ferrer, Managing Director Southwest Europe.

AGI GREENPAC INVESTS ₹230 CRORE TO STRENGTHEN PRODUCTION AND ELEVATE EXPORT CAPABILITIES

With the global glass packaging market poised for significant growth, from $67.28 billion in 2024 to $93.69 billion by 2032, AGI Greenpac, a focused Packaging Products company in India, is implementing a two-pronged strategy to capitalise on this growth.

AGI Greenpac is making a strategic investment of ₹230 crore to modernise its existing furnaces, implement cutting-edge technologies, and optimise production. This initiative will enable the company to better serve the growing demand for high-quality glass packaging solutions.

AGI Greenpac also, manufactures glass containers and speciality glass under the brand AGI Glaspac. This ensures their products meet the stringent and demanding quality standards of the pharmaceutical industry and other industries as well. Their product range varies from a small 5 ml Pharma bottle to a 4000 ml chemical and food jars.

AGI Greenpac is also strategically expanding its reach beyond India's borders to establish itself as a key force in the international glass packaging landscape. Fueled by the growing global demand for high-quality glass packaging, the company is actively exploring export opportunities in the Middle East and Europe, following the establishment of a strategic export channel in the USA.

Mr. Rajesh Khosla, CEO, AGI Greenpac, said, *"Our investment in our production capabilities will ensure we are well-positioned to meet the demand for our innovative, high-quality glass packaging solutions. This commitment to best-in-class practices not only strengthens our domestic offerings but also allows us to venture into new markets."*

SIBELCO COMPLETES ACQUISITION OF STRATEGIC MATERIALS, INC.

Sibelco completed its purchase of Strategic Materials, Inc. (SMI), one of North America's largest glass recyclers.

The acquisition positions Sibelco as a key global player in glass recycling, having already established a leading position in Europe. SMI operates 42 sites across North America, processing around 2 million tonnes of cullet (recycled glass) per year. This capacity adds to the 3 million tonnes of cullet Sibelco processes annually at its 24 recycling plants in Belgium, Estonia, France, Italy, Poland, and the UK.

"We are delighted to have completed this acquisition. Not only will the integration of SMI enable us to extend our leadership in glass recycling outside Europe, it will also expand Sibelco's offering in North America beyond our existing high purity quartz business, thereby building a resilient mineral platform at scale.", said Mr. Hilmar Rode, CEO

SMI employs approximately 800 full-time employees, excluding temporary and contractor workers, at sites in the United States, Canada and Mexico. Its products are used across a range of markets, including container glass, fibreglass insulation, reflective materials, fillers and abrasives.

Mr. Chris Dods, SMI President & CEO, commented, *"Sibelco understands our business and shares our passion about the key role of glass recycling in a circular economy. The two companies' combined expertise and resources will create a true market leader poised for further growth."*

Dr. Manoj Choudhary was awarded the L. David Pye Lifetime Achievement Award at the annual meeting of the Glass and Optical Materials Division of the American Ceramic Society. The meeting was held in Las Vegas during May 19-23, 2024.

With a 125-year history, SMI is one of North America's most comprehensive glass recyclers, with 42 locations in the United States, Canada, and Mexico. The company continues to be focused on passionate advocacy, operational excellence, and collaborative partnership. SMI is a trusted partner to cleaner, more efficient glass production, providing customers and suppliers with economical and environmentally viable recycled products and solutions. Learn more at www.smi.com

RECYCLER SGÅ BOUGHT BY ARDAGH GLASS PACKAGING EUROPE TO CLOSE GLASS LOOP

Ardagh Glass Packaging Europe (AGP-Europe) has agreed to purchase glass recycler Svensk Glasåtervinning (SGÅ), aiming to secure its supply of high-quality glass cullet and prevent exports from taking recyclables out of Sweden.

Reportedly reaching a 90% recycling rate for glass, SGÅ has been in

operation for over thirty years. Due to a recent change in regulation for the collection of post-consumer glass from the start of 2024, Swedish municipalities are now expected to take over the role of collection and introduce property-based glass collection.

In line with the new regulation, AGP-Europe's decision to buy SGÅ is anticipated to keep glass collected in Sweden within the country for use in further glass packaging production, as opposed to exporting it for other industry applications, and help protect Sweden's circular system for glass recycling.

"Buying SGÅ is the perfect complement to our glass production in Sweden," commented Mr. Martin Petersson, CEO at AGP-Europe. *"It will protect glass recycling and ensure we continue to close the glass loop, securing the supply of recycled glass cullet - one of our most important raw materials for lower-carbon glass packaging."*

Mr. Magnus Andersson, CEO of SGÅ, added: *"Ardagh knows and understands the glass industry, including glass recycling, and as a result, the glass industry in Sweden is fully supportive of the new ownership. We look forward to our continuing work with Ardagh to develop long-term goals for the company, and to maintain our position as a world-class glass recycler."*

AGP-Europe is one of five companies in partial ownership of SGÅ since it was founded. Now it is buying the shares of the other four co-owners to become the sole owner. SGÅ will keep its name and operating model, and will focus on receiving and recycling glass packaging waste, as well as selling glass cullet.

One of the co-owners selling its shares to AGP-Europe is the Swedish Brewery Association.

"We, along with the other co-owners, are very pleased to sell to AGP-Europe," said CEO Ms. Anna-Karin Fondberg. "They have been crucial for the development of high-quality glass with a high ratio of recycled glass cullet.

"The next step is very important for the Swedish food and beverage sector to secure the supply of sustainable glass packaging with a relatively low CO_2 footprint."

With this purchase, a circle of almost 40 years has been closed: SGÅ was founded in 1986 by a company called PLM ho, at that time, owned two glassworks in Sweden – one of which was in Limmared. In 2007, the Limmared glassworks was sold to Ardagh Group, where glass packaging continues to be produced for world-leading brands.

33RD CHINA GLASS INDUSTRY TECH EXHIBITION A SUCCESS

The 33rd China International Glass Industry Technology Exhibition, sponsored by the Chinese Ceramic Society and hosted by Beijing China Silicon Exhibition Co., Ltd., was held from April 25-28, 2024, in Shanghai.

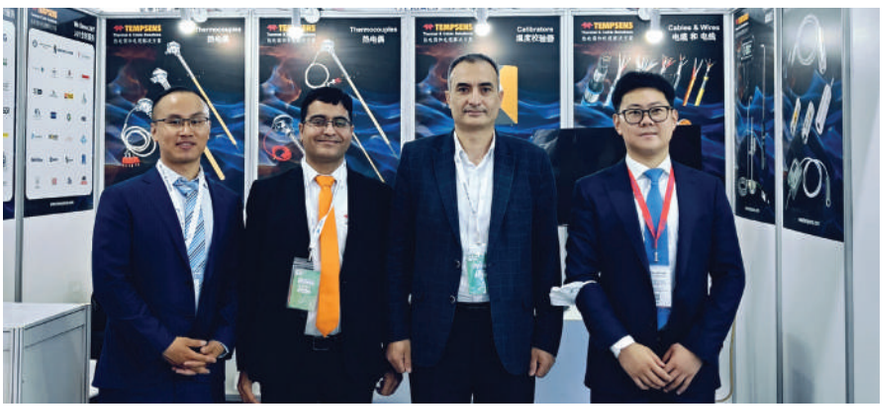
The total number of visitors reached 1,26,381, an increase of 18% from the previous exhibition, including 6,532 overseas visitors from 136 countries and regions. The number of visitors, their country of origin, and the number of foreign visitors all reached record highs. The successful hosting of the China Glass Exhibition plays a significant role in boosting the confidence of the domestic and foreign glass industries, maintaining the stability of the global glass industry chain, and promoting economic and trade exchanges in the domestic and foreign glass industries.

The exhibition featured 877 manufacturers from 29 countries and regions around the world, with all mainstream manufacturers in the global glass industry present. In terms of exhibition display, technical exchanges, and business negotiations, China Glass Exhibition has become a veritable "weatherproof" event in the global glass industry.

This exhibition utilized 7 exhibition halls at the Shanghai New International Expo Center. The halls were divided according to international exhibition areas, domestic mainstream manufacturers, technical glass and scientific research institutions, deep processing equipment, refractory materials and silicone products, daily glass, decorative glass, raw materials, and main and auxiliary materials, including hardware accessories. Hall N1 was the international exhibition area, hosting pavilions from Germany and Italy and many mainstream manufacturers in the international glass industry, including Glaston, LiSEC, Von Ardenne, SIP, Vesuvius, Dip-Tech, Kuraray, Umicore, Bühler Leybold, Kömmerling, Konex, Solutia (Eastman), Air Chemicals, Fives Stein, Grenzebach, Benteler, Bottero, SORG, Fenzi, Horn, Heye, ISRA, Qipei, Honeywell, Carl Zeiss, and others. Hall N2 housed domestic mainstream manufacturers, technical glass manufacturers, and scientific research institutions. Hall N3, Hall N4, Hall N5, and Hall W5 featured manufacturers of deep processing equipment and silica gel and refractory materials.

During the exhibition, many manufacturers followed the industry trends of high-end, intelligent, and green industries in the fields of glass products, new energy glass, and information display glass; glass deep processing technology and equipment; glass melting and molding technology and equipment; and high-quality refractory materials. They showcased innovations and new technologies.

Triumph Technology Group showcased 0.12 mm ultra-thin float electronic glass, 30-micron flexible foldable glass, 8.5-generation TFT-LCD float glass substrates, cadmium telluride power generation glass, copper indium gallium selenide power generation glass, and neutral borosilicate medical glass among



other new products. The China Building Materials Research Institute and other units organized groups to participate in the exhibition, covering the entire industry chain products from "design, process, equipment, supporting materials, and advanced products," showcasing key materials developed for integrated circuits, aerospace, and new energy fields, as well as new energy-saving glass products such as aerogel glass and electrochromic glass.

A series of lectures and manufacturer promotion activities, including "When Archaeology Meets Technology - The Silk Road Story of Ancient Glass," were also held during the exhibition. Themes included improving carbon footprints and reducing carbon emissions in the field of glass production, domestic testing equipment applications in the production of special glass, research on the design and application of fireproof glass, smart factories, and digitalization to assist the research and development of high-end glass equipment. The technical lecture event attracted thousands of attendees, with lively interactions and enthusiastic discussions.

AIGMF Members participated in large numbers. AIGMF in association with its Chinese friends organized two factory visits to Haimen Sanlong Glass and Nantong Huajing Glass. Other meetings on recycling and technology etc., were organized on demand for the select members.

China Glass Exhibition was supported by domestic and foreign industry organizations such as the China Building Materials Federation, the China Architectural Glass and Industrial Glass Association, the China Daily Glass Association, the German Machinery and Equipment Manufacturing Federation, and the Italian Glass Processing Machinery and Accessories Manufacturers Association. With its large scale, professional services, and international influence, it has become an important window and platform to serve the glass industry, helping to build a new development pattern and promote a high level of opening up in the industry.

TRAINING SESSION ON GLASS & GLAZING BY GGKF

One-day training session on Glass and Windows installation for enhancing skills of the existing industry workforce was organized at the skill centre at Gold Plus headquarters on July 21, 2024 in Delhi.

The event saw a participation of 50 industry members where technical sessions were covered by experts from Federation of Safety Glass, uPVC Window and Door Manufacturers Association.

GGKF represents following industry associations: FOSG (Federation of Safety Glass), GSI (Glazing Society of India), CCPS (Confederation of Construction Products and Services), UWDMA (uPVC Window & Door Manufacturers Association), Glass Academy and AIGMF (The All India Glass Manufacturers' Federation).

(News Source: AIGMF Research Team / World Wide Web)

THE EU'S GLASS VALUE CHAIN SUSTAINS A STEADY 80.2% GLASS PACKAGING COLLECTION RATE WITH RECORD VOLUME OF COLLECTED GLASS

The latest data released by Close the Glass Loop shows that the EU average collection for recycling rate of glass packaging remained stable at 80.2% in 2022. Notably, the amount of glass collected kept up with the significant increase in the amount of glass packaging placed on the market (+4.5%), indicating a positive trend in glass collection efforts across Europe.

"More glass packaging was collected in 2022 than ever before, reaching a record level of 12.4 million tonnes, representing an increase of about 5,42,000 tonnes over the previous year. The increase in volumes of collected glass demonstrates the resilience and commitment of the glass packaging value chain to increase the availability of post-consumer glass for the manufacturing of new glass bottles and jars," says Ms. Adeline Farrelly, Secretary General of FEVE (the European Container Glass Federation) on behalf of Close the Glass Loop partners.

To achieve the 90% collection objective by 2030, it is imperative to further promote initiatives in the separate collection of glass packaging from households and the hospitality sector, and support investments that maximise glass recycling outputs towards closed loop glass packaging. The urgency of these measures cannot be overstated, as they are crucial for ensuring a sustainable and effective glass collection and recycling system across Europe. The mobilisation of National Platforms and National Action Plans will be essential to trigger the necessary actions to increase glass collection and recycling in each EU Member State.

This year, we are pleased to welcome Romania and the Netherlands as new National Platforms, further strengthening our network and capacity to implement tailored strategies at the national level. Close the Glass Loop is seeking to develop more partnerships across Europe.

"To achieve our 90% collection target, Close the Glass Loop national Platforms play a pivotal role," adds Mr. Olivier Deweerdt, Secretary General of FERVER (European Federation of Glass Recyclers) on behalf of Close the Glass Loop partners. *"The exchange of best practices and support for projects and activities at the national level are vital for increasing and improving glass collection for recycling. This will be reflected in our upcoming 2025-2030 Close the Glass Loop Action Plan* ■

7th AIGMF Glass Awards

In recognition of the tremendous contribution to Indian Glass Industry, The All India Glass Manufacturers' Federation (AIGMF) announces C K Somany Award for Excellence and Balkrishna Gupta Award for Exports.

C K Somany Award for Excellence will be given to an individual who has made significant contributions to the glass industry in the fields of manufacturing, product development, environmental factors, business performance/growth, research and development, science/technology, etc.

Balkrishna Gupta Award for Exports will be given to a unit who has contributed towards identification or growth of new potential markets/volume of exports/reaching no. of countries or any other area showcasing valuable contribution in Glass Exports.

Winners

Year	CK Somany Award for Excellence	Balkrishna Gupta Award for Exports
2023	Mr. Pulkit Gaur, Gridbots Technologies	M/s Schott Glass India Ltd.
2022	Mr. Eric L'Heureux, Schott Poonawalla Pvt. Ltd.	M/s Schott Poonawalla Pvt. Ltd.
2021	Mr. Udit Kapoor, Kapoor Glass India Pvt. Ltd.	M/s Borosil Renewables Ltd.
2020	Dr. Mukul Chandra Paul, CSIR-CGCRI	M/s La Opala RG Ltd.
2019	Mr. B L Kheruka, Gujarat Borosil Ltd. *(Now, Borosil Ltd.)*	M/s Firozabad Glass Shell Industries
2018	Mr. S K Jhunjhunwala, La Opala RG Ltd.	M/s Piramal Glass Pvt. Ltd. *(Now, PGP Glass Pvt. Ltd.)*

Referral applications can also be submitted by Regional Associations: U.P. Glass Manufacturers' Syndicate (UPGMS)- FIROZABAD; South India Glass Manufacturers' Association (SIGMA)- HYDERABAD; Western India Glass Manufacturers' Association (WIGMA)-MUMBAI; Northern India Glass Manufacturers' Association (NIGMA)- Bahadurgarh, HARYANA and Eastern India Glass Manufacturers' Association (EIGMA)- KOLKATA, who may give recommendations for giving an award to a likely individual.

AIGMF may consult Banaras Hindu University (IIT BHU-Ceramic Glass Division), CGCRI (Central Glass and Ceramic Research Institute), CCPS (Confederation of Construction Products and Services) and FOSG (Federation of Safety Glass) for identifying suitable candidates for the award.

7th Awards in these categories would be given during the Annual General Meeting in Sept 2024.

The jury for the awards comprise of:

- Dr. K Annapurna, Chief Scientist, Glass Division, CSIR-Central Glass & Ceramic Research Institute (CSIR-CGCRI) and Member Editorial Board KANCH
- Mr. Dave Fordham, Former Publisher, Glass Worldwide, London (UK); Member Editorial Board KANCH and Global Engagement Lead, Glass Futures, St. Helens (UK)
- Mr. Amit Malhotra, President, Confederation of Construction Products and Services; Treasurer, uPVC Window & Door Manufacturers Association and Managing Director, McCoy Silicones Ltd.
- Mr. Pawan Kumar Shukla, Executive Committee Member AIGMF and President / Managing Director, Schott Glass India Pvt. Ltd.

Applications are invited at info@aigmf.com from within India from all those connected with the glass industry who may submit a brief write-up/CV in support of their candidature latest by August 14, 2024.

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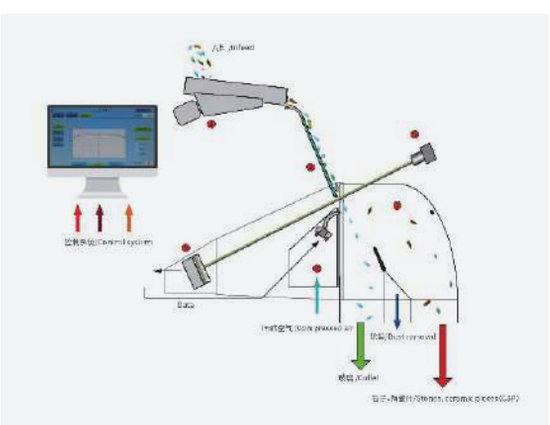

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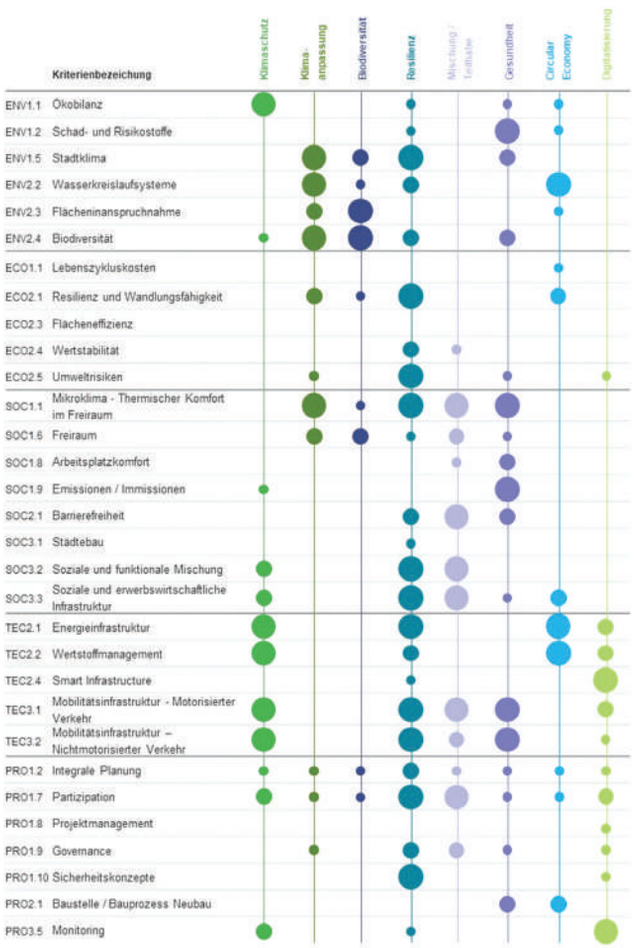
Adapting to Climate Change: Building and Urban Planning in a Changing Climate

Natural daylight supports our circadian rhythm, keeps us alert and productive. This is why humans prefer living and working spaces that are flooded with natural light. However, in a changing climate buildings need also more air-conditioning due to longer and more intense periods of heat. The glass industry offers solutions in the form of highly selective layered systems that make for both high daylight transmission and thermal protection in summer, which reduces the climatic load and the periods of time where shading is required. This can, however, be just one component of many for rising to the growing challenges of climate change. The approaches proposed by planners and architects for adapting to climate change will be discussed at glasstec 2024 (October 22-25, Düsseldorf) at its Architecture Forum. To shed some light on this topic beforehand, the author contacted the German Sustainable Building Council (Deutsche Gesellschaft für Nachhaltiges Bauen– DGNB) and renowned planner Arup on the trade fair's behalf.

Mr. Marc Everling studied media education at the Technical University Brunswick, worked as a consultant in PR and marketing agencies for 14 years, and as Head of Marketing at one of the global flat glass players for six years. In February 2021 he founded his networking agency specialised in communications consulting and press liaison for construction material producers, initiatives, associations, trade fairs and architects which work and produce sustainably in the interests of the ecological transformation of the construction sector.



In the DGNB system the impact of measures is rated in terms of various criteria. The key factors impacting "Climate Change Adaptation" above all include urban climate and micro-climate, closed-loop water systems, land use and biodiversity.

Chart: DGNB

2023 was by far the hottest year since weather records began, reported the World Organisation for Metrology (WMO) in its current climate report: the globally averaged mean temperature was around 1.45 degrees above pre-industrialisation levels. The European Union's Earth Observation Programme Copernicus recorded global warming of 1.48 degrees. While climate researchers rightly sound red alert due to accelerating climate change, it is clear it will get much hotter in many cities in future, especially in urban heat spots. These are urban zones where thermal island effects occur and temperatures rise well above those in surrounding rural areas. It is imperative that urban areas and their development are adapted to changing requirements and sustainable solutions are found.

Climate change adaptations through infrastructural greening. *Photo: Arup*

CLIMATE CHANGE ADAPTATION AS A MULTI-DISCIPLINARY CROSS-SECTORAL TASK

"Climate change adaptation" is also a relatively new discipline for the German Sustainable Building Council (DGNB), which is reflected in the current dynamism in relevant legislation from the EU to federal state levels. Ms. Eva-Maria Stumpp from DGNB's research and development department explains: *"We see a multi-disciplinary, cross-sectoral task here that involves architectural and engineering sciences but also biology, sociology, medicine and other disciplines and which has strong societal and participatory aspects."* Where cities, districts, buildings or even only parts of buildings are planned, the DGNB works at the interface between various disciplines and requirements from practice, and in a currently highly dynamic legal framework. *"Especially in view of heat and drought, precipitation and floods we try to develop proven effective, practicable and climate-protecting approaches that lead to even better buildings in future. The good news is: at least for Germany it can be said that carefully planned buildings in compliance with regulations are already very well positioned for both current and future climatic challenges on account of its high building standards and safety requirements. After all, the protection against environmental and weather influences has always been a core aspect of erecting buildings and settlements,"* explains Ms. Stumpp. A contribution to this has also long come care of the flat glass industry, whose portfolio is very well "equipped" for controlling energy and daylight levels. Leading manufacturers, for example, offer highly selective solar control glass, which reflects most of the heat-

Bosco Vertikale still is one of the most impressive examples of façade greening. Photo: Arup

generating infrared rays of sunlight while transmitting most of the visible spectrum of daylight into the room. This means the climatic load can be reduced through the façade and shading in summer can be limited to shorter periods of the day. "Closed cavity façades" with internal sun shading or electro chromic glazing can optimise light and energy levels in meaningful ways. In the wake of intensifying climate change, however, further measures will be required to keep cities viable, functional and prosperous – otherwise there is a risk of weather-related deaths, e.g. due to prolonged heat waves, and economic losses due to climate-related extremes. These adaptations are often a localised process taking local geographic, climatic, socio-demographic and economic factors into consideration. Ms. Stumpp explains: *"Passive and nature-based no-regret solutions still hold potential not sufficiently exploited."* She adds: *"Short and medium-term climate adaptation measures must be implemented without compromising long-term climate protection goals."* Often, "infrastructural greening" is a solution to "repair" the cityscape and achieve measurable improvements for the urban climate, as numerous studies prove. This has also been understood by rating agencies that increasingly reward cities willing to change if they promote biodiversity and create new green spaces, for example. These measures have a positive impact on the climate, micro-climate and quality of life, as well as on lending and the provision of public funds.

GLASS ARCHITECTURE AND INFRASTRUCTURAL GREEN

Where greenery spreads in parks, backyards and front gardens and also "conquers" façades and roofs, it makes for evaporative cooling and shading thereby reducing local temperatures. Greening is therefore an effective tool for architectural and urban planning, says a convinced Mr. Rudi Scheuermann, who heads the "Cities Business" at Arup in Germany with a focus on the design of sustainable and resilient cities. Arup, which has been operating on the German market for some 30 years now, is one of the major multi-national planners for high-performance buildings and infrastructure; in addition, they have committed to the United Nations' 17 Sustainable Developments Goals. Mr. Scheuermann sees buildings holistically: insulation, ventilation, materials, connections etc. and he advocates the integration of plants in façades and roof greening. *"By having plants in the surrounding space, in the façade and on roofs, the thermal mass can be shaded better during the day and at night this promotes cooling down. In addition, plants filter the fine dust and bind CO_2, so that natural ventilation is possible and makes sense near them. An important factor especially in cities is that they have a sound-dampening effect and reduce "stress levels".* Regarding façade and roof greening Mr. Scheuermann sees clear advantages for the building concept: "Plants on the roof provide evaporative cooling, shading and a noticeable reduction of temperatures; this is why air-conditioning systems on green roofs can draw in cooler air and be downsized from the outset – the building's energy requirements as well as CO_2-emissions are lower in operation. Buildings with green façades and roofs require a little more steel for construction because of the higher wind loads and a well-planned drainage system. As a rule, rain and the grey water produced in daily operation are sufficient for the complete irrigation. It is essential to select plants according to region and microclimate so that they can withstand the local climatic influences all year round and can be cultivated by the local insects. Subsequently, it has proven to be a good idea to 'just let the plants do their thing' and not restrict their growth too much."

Arup's "Pocket Habitat" is a miniature solution that brings immediate improvements through shading and evaporative cooling. *Photo: Arup*

"Climate change adaptation" is one of the Hot Topics at this year's glasstec, the leading international trade fair for the glass industry, and will also be discussed at the Architecture Forum of the trade fair in October 2024 ■

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DATES TO REMEMBER

Abstract Submission Opens	Abstract Submission Closes	Abstract Submission Acceptance	Early bird Registration Opens	Early bird Registration Closes
April 15, 2024	**July 31, 2024**	**August 31, 2024**	**September 1, 2024**	**October 15, 2024**

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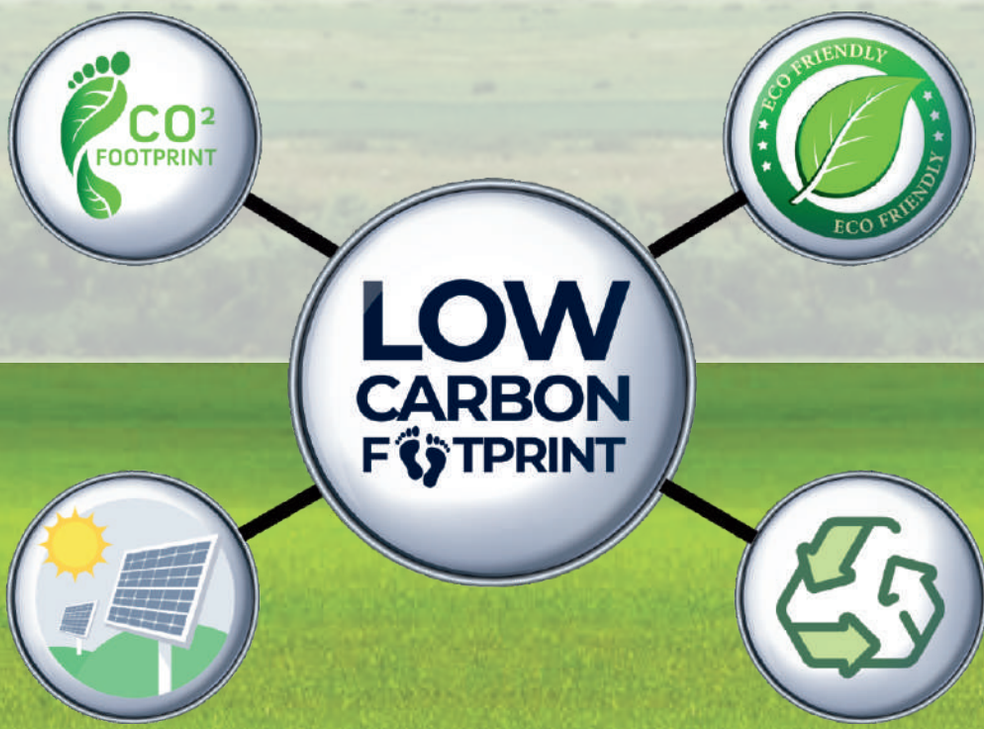

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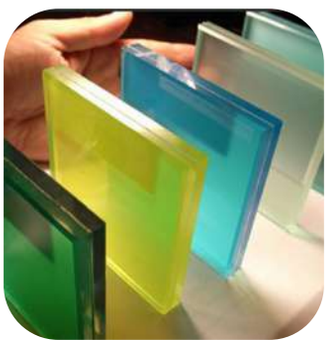


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Opening Ceremony

UN International Year of Glass 2022

Prof. John Parker, Prof. Edgar Zanotto,
Prof. Erik Muijsenberg and Prof. Alicia Durán

1. ORGANIZING THE OPENING IN GENEVA

The Opening Ceremony for the UN International Year of Glass took place from 9th to 11th February at the United Nations Headquarters in Geneva, in the Palais des Nations. The Ceremony was celebrated in the Human Rights Room by the special invitation of Mr. Miguel Angel Moratinos, High Representative for the United Nations Alliance of Civilizations (UNAOC). The Human Rights Room, with its wonderful ceiling decorated by the Spanish ceramists Mr. Miquel Barcelo, was donated by Spain to the UN (Figure 1).

An invitation was issued to all the UN Ambassadors firstly to join the Glass Community so they could be thanked and secondly to learn more of the thinking behind the International Year of Glass. The other side of the coin was a summons to the Glass Community to gather, learn what to expect during 2022 and discover how they could contribute.

The beautiful lecture and debating space officially seated over 800 participants and was equipped with excellent audio-visual facilities that included worldwide internet streaming. Being inside the UN complex, entry was passport controlled; but the formalities were straightforward for those who pre-registered. The nearby Intercontinental Hotel was the recommended accommodation and also offered easy access to both the city center and main travel hubs using Public Transport. Many participants chose to stay more centrally but all the social events were held in the conference hotel.

Unfortunately, in the months immediately preceding the ceremony Covid still held its sway over public transport, cross-border travel and close social contacts; and because of the Omicron variant wave, the number of seats was limited to only 170 in the lecture room. Travelling across country boundaries required certification of inoculation and/or evidence of a negative Covid test. These considerations complicated registration and inevitably reduced applications, even though attendance was free of charge.

Finally, 139 people were registered from 20 countries, with the split shown in Table 1; the number actually present was a little lower because a few applicants who only intended to join online, registered for entry onto the UN site unnecessarily. Sadly too, some larger countries were notably under-represented because of their strict border controls.

Of the 139 attending, 55% were male and 45% female. 30 were speakers;

Figure 1. Human Rights Room at the Palace of Nations in Geneva. *Source:* © IYOG archive

Figure 2. Entrance to the room. *Source:* © IYOG archive

and another 10 were involved in organization, in particular a group of 4 students and volunteers (Dr. Yolanda Castro plus Ms. Emilia Merino, Ms. Eugenia Cruz and Mr. Alberto Lopez) from CSIC in Spain, who worked alongside Mr. P Gavaghan, Mrs. Kun Wang, Dr. Maria J. Pascual and Mrs. M Parker, as members of the IYOG team with Prof. John Parker and Prof. Alicia Duran. Their role was to facilitate conference administration by preparing and distributing conference bags containing registration badges, the conference program and a range of conference freebies. This intense activity was much facilitated by the Managers of the Palace of Nations, Ms. Anna Banchieri and Ms. Aoife Leahy, who were always available from October 2021 when we first met them to familiarize ourselves with the organization. Without their help it would not have been possible to achieve a successful conference in such complicated times. Another important aide for moving around Geneva and contacting embassies, UN organizations and visas was Ms. Ruiz de Gopegui Aramburu, from the Permanent Mission of Spain at the UN, Geneva.

Table 1. Attendance at the Opening Ceremony by country

Country (alphabetical order)	Number
Australia	1
Austria	2
Belgium	8
Brazil	8
Canada	3
China	1
Czechia	2
France	15
Germany	19
India	1
Italy	10
Japan	1
Netherlands	2
Portugal	1
Russian Federation	2
Slovakia	1
Spain	7
Switzerland	20
Turkey	7
United Kingdom	18
United States	12

It had been the intention to give each attendee a free copy of the volume '*Welcome to the Glass Age*' but unfortunately, the books were delayed at the Swiss border. Representatives from each country were left with the task of completing the distribution after the meeting.

Although the IYOG volumes were unavailable, another conference gift was copies of a Roman bowl made in blue glass and handmade by the Royal Glass Factory in Spain as a limited edition did arrive (Figure 3). They were presented to each participant in their conference packs and were much appreciated.

Invited speakers had travel and accommodation expenses paid. Most lecturers were allocated 30 minutes for their presentations and to answer questions; just a few were limited to 20 minutes. The program ran for 4 sessions on each of 2 days (Thursday 10th and Friday 11th February). Session chairs were mainly members of the organizing committee and each session included up to 4 speakers, all of whom were invited. For just 8 talks, the presenters were online. A website was designed and linked to the IYOG main web by Mr. Lewis Wilson from IGS Magazine, who also designed the website for the New York Debriefing event in December.

Figure 3. Roman bowl facsimile, hand-made at the Spanish Royal Factory of Glasses. *Source:* © IYOG archive

The audio-visual facilities were organized by in-house technicians who worked extremely hard to ensure a disciplined presentation that ran to time. Ms. Yolanda Castro and Ms. Emilia Merino managed the Power Point presentations and videos to help in-house technicians achieve perfect coordination. A feature of the theatre was the provision of individual microphones for each attendee. Those on the top table effectively controlled proceedings because their microphones took precedence.

The proceedings were streamed live to the internet and the link to connect had been sent out well in advance. Although the in-house audience had been decimated by COVID, nevertheless over 7000 external visitors joined the proceedings on Day 2, a record for any glass conference in history but also a record for a United Nations event.

A summary of the lecture program is presented ahead in the chapter and the whole proceedings were recorded and archived by the United Nations. They can be accessed through the UN web site. The recordings can be listened to by session, but downloads are not possible.

Figure 4a, b, c, d. The Welcome Reception: a) Prof. Alicia Durán with Mr. Agustin Santos Maraver and Ms. Ana Alonso Giganto, Ambassador and Counselor of the Permanent Mission of Spain at UN; b) Mr. Matthias Muller and Prof. Reinhard Conradt; c) Mr. Fabio Nicoletti and Mrs. Kun Wang; d) Italian delegation sharing drinks. *Source:* © IYOG archive

Figure 5a. The Gala Dinner including conference cocktails and banquet were sponsored by Schott AG. *Source:* © IYOG archive

Figure 5b. The Turkish delegation.

Figure 5c. Some UK representatives on the Red Carpet.

Figure 5d. Prof. John and Ms. Mary Parker.

Figure 5e. The Spanish delegation. *Source:* © IYOG archive

Figure 5f. Mr. Erik and Ms. Jane Muijsenberg with Mr. Jean-Luc Logel.

Figure 6a, b. Flamenco show at the dinner.

Source: © IYOG archive

2. SOCIAL PROGRAM ALONGSIDE THE OPENING CONFERENCE

A welcome reception for attendees was arranged in the Intercontinental Hotel on Wednesday evening from 18:30 to 19:30, sponsored by FEVE and GPI. We were asked to wear masks and maintain social distancing but that did not significantly restrain those able to attend, most of whom had been starved for too long from such face-to-face contact and soaked up the opportunity for renewing long-standing friendships. The room was also large enough to avoid overcrowding (Figure 4).

On Thursday evening from 19:00 to 23:00 we had the Conference Banquet to which all the conference attendees and important United Nations dignitaries were invited. At the red carpeted entry, a photographer captured a record of everyone present against a background which listed all the sponsors. The banquet began with cocktails before guests moved onto the main Banqueting Hall where people were seated around tables of 12.

A Flamenco singing and dancing show closed the dinner.

Here are some pictures from the Red Carpet and Dinner (Figures 5 and 6).

3. SPONSORSHIP

This whole event would not have been possible without the invaluable sponsorship from glass Companies. The sponsors have been individually acknowledged in Chapter "The United Nations International Year of Glass- Its Origins" where there is more information on how these funds were spent.

We would also like to thank profusely the United Nations not only for the facilities provided but also for printing the Opening Ceremony brochure, designed beautifully by Mr. Simon Smith, UK.

4. ARIANA MUSEUM AND EXHIBITIONS OF CONTEMPORARY GLASS ART

Close to the United Nations buildings was the Ariana Museum, housing an historic glass collection, one of the most important in Switzerland. Among these was a significant collection of fine Venetian glass, colorful Fluhli bottles, Bohemian crystal glass, English rummers, Art Nouveau objects, contemporary designer pieces and glass sculptures illustrating the history of glass making.

Although sadly Covid had reduced the number of accompanying persons attending, nevertheless a small group of visitors joined with the Artists and Museum curators attending the main conference for a guided tour on the Friday morning of the conference at 10 am. This included an exclusive preview of Hubert Crevoisier's temporary exhibition: "I'm blue, I'm yellow, I'm green glass and I see red!" with the artist.

The Museum Curator also played an invaluable role in bringing together a collection of beautifully designed glass items for the duration of the conference. These were displayed in the Inter Continental Hotel and at the UN Palais des Nations for the duration of the conference (Figure 7).

Curated by VERARTE and the Permanent Mission of Slovakia, the exhibition included work by 17 Swiss Glass Artists, alongside that of Mr. Yan Zoritchak (Slovakia, 1944), who

Figure 7a, b. Verarte exhibition at the Palace of Nations.
Source: © IYOG archive

invited us to see his artworks 'Echoes of a Universe', an odyssey into space and time, in search of the origin of life and the place of man in the universe.

5. ORGANIZING LECTURE CONTENT

The opening ceremony of the International Year of Glass 2022 in Geneva, Switzerland, featured 30 presentations highlighting the diverse roles and contributions of glass in various fields. Despite the distinct focuses of these presentations, there are connecting threads that illustrate the versatility, sustainability, and innovative potential of glass.

We would like to thank the Organizing Committee: Prof. Lothar Wondraczek, Prof. Edgar Dutra Zanotto, Prof. Setsu Tanabe, Dr. Mathieu Hubert, Prof. Teresa Medici, Dr. Kathleen Richardson, Prof. Hiro Inoue, Dr. Erik Muijsenberg, Prof. John Parker and Prof. Alicia Duran, for the selection of topics and speakers with international expertise covering every corner of glass field.

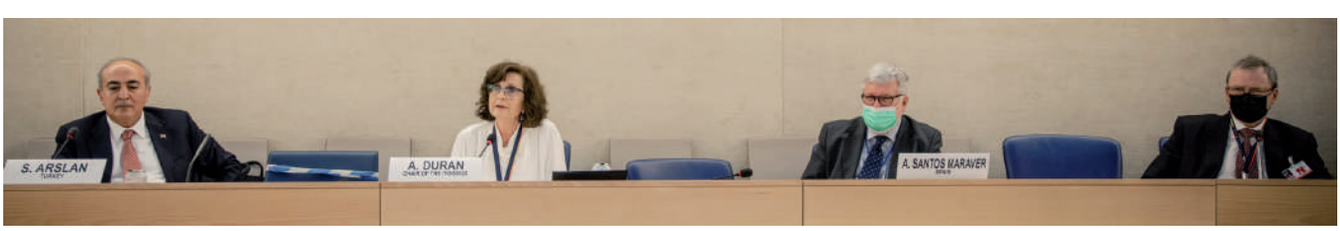

Figure 8a, b. Opening session. Prof. Alicia Durán, Chair of IYOG, with Mr. Agustín Santos Maraver, Spanish Ambassador at UN, H. E. Mr. Sadak Arslan, the Permanent Representative of Turkey UN and Prof. Reinhard Conradt, President of the ICG.
Source: © IYOG archive

We also thank the chairs of our sessions: Prof. Reinhard Conradt (2), Prof. Alicia Duran (3), Dr. Matthieu Hubert, Prof. Teresa Medici (2), Prof. John Parker (1), and Prof. Lothar Wondraczeck (2).

6. PROGRAM

The main program began with an introduction and closed with a summary from IYOG Chair, Prof. Alicia Duran. For the Opening

Figure 9. Prof. Teresa Medici chairing the first panel with Prof. Ian Freestone and Prof. Dedo von Kerssonbrock-Krosigk. Source: © IYOG archive

Session she was joined by Mr. Agustin Santos Maraver, the Spanish Ambassador at UN Spanish Mission in New York; H. E. Mr. Sadak Arslan, the Permanent Representative of Turkey UN, Mr. Ahmed Salama, Minister Plenipotentiary/Deputy Permanent Representative of Egypt, and Mr. SHEN Yanjie, Science and Technology Counsellor, Permanent Mission of China in Geneva. The General Secretary of the UN, Mr. Antonio Guterres sent a message of welcome. The program concluded on Friday afternoon with a 30 minute Panel Discussion after an online presentation from a Japanese Glass Artist.

Glass has for millennia been an important medium that has brought beauty into our lives. It could be argued that the polished obsidian glass mirrors created several millennia ago kick started the cosmetics industry. The Egyptians created perfume bottles for their Pharaohs, the Romans manufactured amazing tableware remarkable for the variety of its colors and forms; they even made prizes for their champion chariot racers. These early traditions have been captured in museums around the world and are now displayed alongside the many beautiful and intricate glass products made, used and collected at different stages of our history up to modern times. Archaeologists have applied sophisticated analytical tools that are allowing these ancient stories to be told in ever more detail.

The first day of the conference began with papers on this historical background and then moved to current commercial applications and new developments. Below are summaries of the presentations, written by Prof. Edgar Zanotto and Dr. Erik Muijsenberg, with a broader analysis of significant themes.

1. Prof. Ian Freestone, Professor of Archaeological Materials and Technologies, University College, London spoke on '*How it all began; the invention and re-invention of glass in the ancient world*'; he started with the production of beads, then talked on glass composition evolution in different parts of the world.

2. Prof. Dedo von Kerssonbrock-Krosigk, is widely experienced in the glass museum world and is Director of the Glasmuseum Hentrich in the Kunstpalast, Dusseldorf, Germany. He spoke on the use of Glass over its 3500 years of history under the title '*Glass: a History of Meaning*'.

3. Ar. James Carpenter is a multi-award winning glass architect with his own company: James Carpenter Design Associates. He spoke on '*Light in the public realm'*. He aims to use innovative strategies that merge program, performance, structure and light to reveal the unique characteristics of place and to embody a deeper collective experience of nature.

4. Mr. Andy McConnell is a journalist specializing in antique and vintage glass.

He has written many books and articles but is probably best known as the first glass specialist on BBC TV's Antique Road Show. His most recent book focusses on The Decanter. He talked on his history, how his interest in glassware developed and his appreciation of the range of skills employed by the glassmaker, under the title: '*Making Glass Visible'*.

5. Another speaker, Prof. Courtney Calahoo spoke on '*Glass: shaping lives'*. Her specific theme was to examine how glassmaking is helping

Figure 10. Mr. Andy McConnell. *Source:* © IYOG archive

to break down barriers between indigenous populations and wider society in Canada. The remainder of the first day continued with themes such as Glass Living, Glasses in Optics, Photonic Technologies and Glass and innovation.

6. Glass for Sustainable Construction was the theme for Prof. Emmanuelle Gouillart, Scientific Director of Gobain Research. Glass is omnipresent in construction, where it is associated with light and solidity for glazings, and thermal and sound insulation for mineral wool. She over viewed the performances of these materials and systems in construction and focused on how thin films and active technologies can optimize the optical and thermal properties of glazing, so reducing heating and cooling energy consumption. Also, she presented a road map of the flat and insulation glass industries designed to reduce their carbon footprint.

7. Prof. Andrea S.S. de Camargo demonstrated that glass research in Brazil is relatively young but developing vigorously. The first laboratory (LaMaV - UFSCar) dedicated to glass research was established 45 years ago, whereas, in 1962, the Brazilian Association of Glass Industries (ABIVIDRO) was founded to promote the production and use of technical glasses. In 2013, a select group of 14 researchers at three major universities in the state of Sao Paulo established CeRTEV —one of the world's largest academic centers dedicated to Research, Technology, and Education in Vitreous Materials. With other labs in the country, it has placed Brazil among the 11 leading players in scientific and technological output in the area. Approximately 1% of the world papers on glasses are generated in Sao Carlos.

8. Dr. Kathleen A. Richardson reviewed general aspects of infrared glasses and glass-ceramics and how their unique capabilities offer solutions to multiple challenges. She demonstrated that new materials with unique functions are essential for new components and systems that are smaller, lighter, and require less power. Security and sensing devices must be versatile to work in a wide range of extreme environmental conditions; materials that transmit light in the infrared allow one to 'see' in these regions when visible imaging is not possible.

Figure 11. Prof. Emma Gouillart. *Source:* © IYOG archive

9. The difficulty of high-frequency 5G radio waves penetrating windows from the outside challenges the establishment of indoor wireless communication links. A novel technology that guides 28 GHz radio signals received from outdoors to indoors using a meta-surface lens was demonstrated by Dr. Naoki Sugimoto. In this way, glass becomes a window for light and the new generation of radio waves.

10. Prof. Masashi Onishi demonstrated that more than 4 billion kilometers of optical glass fibers have been installed and contribute to the efficient telecommunication networks of modern information society. He reviewed the optical fiber technology and its manufacturing process development history. Also, their future possibilities and challenges were presented.

11. Glass has played a crucial role in developing standard and quantum optics, and atomic physics. Prof. Lukas Novotny reviewed the role of glass in quantum science and technology and highlighted recent experiments where light was used to control quantum motion in glass. He dwelt on this topic, emphasizing that glass lenses, prisms, and beam splitters have allowed us to understand the fundamental properties of light on the quantum level and to manipulate atoms and molecules.

12. Dr. Falko Langenhorst addressed the formation mechanisms and significance of glasses for understanding the processes in space. Glasses form by various mechanisms in space: weathering, impacts, and igneous processes. The transition to glass occurs by solid-state processes or by melting/ vaporization followed by a rapid quench. Despite its instability (against relaxation and devitrification), specific glasses are even older than the solar system and thus carry unique information on pre-solar processes.

13. Dr. Frederik Kotz-Helmer described a new material named Glassomer. It is a nanocomposite that can be processed like a polymer by casting, 3D printing, or injection molding. After structuring, the

Figure 12. Prof. Julian Jones. *Source:* © IYOG archive

materials are turned into fused silica glass via thermal debinding and sintering. Sintered Glassomer is chemically and physically identical to commercial fused silica glass, showing the same high transparency in the UV, visible, and near infrared combined with the same mechanical strength, hardness, and chemical and thermal resistance. Glassomer enables many applications, from optics and photonics to life sciences, chemistry, and biotechnology.

14. Opportunities for glasses in healthcare are diverse, as the scientific community better understands how this class of materials interacts on a cellular level. Prof. Steve Jung described new applications of flexible water-soluble glasses that heal previously non-healing soft tissue wounds. The field of orthopedics is seeing increased use of 3D scaffolds made of bioactive glasses to improve bone-grafting products. Glasses are developing as coatings or additive to eliminate biofilm formation on medical devices, while other compositions treat inoperable cancers.

15. Prof. Leonid Glebov described Photothermo- refractive (PTR) glass that his team has helped to develop and optimize in the past 3 decades. It is a multicomponent silicate glass that shows permanent refractive index change after exposure to near-UV radiation followed by thermal treatment. This feature enables the fabrication of highly efficient and stable holographic optical elements that produce complex spectral and spatial operations with optical beams. These passive glass elements allow dramatic increases in the brightness of lasers and the resolution of spectrometers.

16. Dr. Samuel Poulain presented a panorama of the current and upcoming developments in fluoride glasses and their potential answers to future medical, industrial, and ecological challenges. Fluoride glasses and their technology have matured for over 45 years. The quality of fluoride glass fibers has substantially increased, while their costs have decreased significantly; hence, more fluoride glass-based devices have been integrated into scientific and industrial devices.

Talks 13) to 16) were organized as a unique session dedicated to SMES technological companies.

On Day 2, the presentations collectively underscored the ubiquity of glass across industries. The discussions highlighting how glass has evolved from a traditional material to a modern enabler had begun on Day 1 with the presentation by Prof. Emmanuelle Gouillart, which illustrated how glass had adapted to meet the evolving needs of construction. The following summaries list the papers presented on Day 2 and are followed by a broader analysis of significant themes. Whether it's in construction, life sciences, medicine, or packaging, glass plays an enabling role. The common thread is how glass seamlessly integrates these domains to enable progress and breakthroughs.

17. "*Glass – an enabler in life science and pharma*", by Dr. Fran Heinricht considered the role of glass as a structural material in the medical sciences.

Figure 13. Dr. Ilkay Sokmen. *Source:* © IYOG archive

18. Prof. Julian Jones spoke on glass as a regenerative material and its transformative nature in his talk on "*Bioglass: Glass for Regenerative Medicine*".

19. Sustainability and Environmental Responsibility: was the subject of Dr. Florian Kongoli who gave a broader presentation on the three key pillars needed to have a sustainable society, explaining the importance of the scientific principles underpinning these pillars.

20. The paper presented by Mr. Vitaliano Torno was on "*The Role of Sustainable Glass Packaging in the Circular Economy*" and explained the current statistics for recycling of glass within the European Community.

21. In the "*Sustainability in the Flat Glass Sector*" by Mr. Philippe Bastien glass's inherent properties were once seen as magical and now have become understood through scientific knowledge. Glass's continuous reinvention through technological advancements is a recurring theme.

22. '*Human Wellbeing and Innovation*': the discussions mentioned earlier underscore how glass contributes to human wellbeing through various applications. Whether it's in healthcare technologies, medical treatments, or sustainable materials, glass's innovations serve to enhance quality of life and promote progress. Dr. Ilkay Sokmen, the Glass Technologies Director at Şişecam spoke on how "*Glass creates value*".

23. Er. Peng Shou of the Chinese Academy of Science and Chairman of China Triumph International Engineering Co. Ltd. specifically focused on the theme "*Glasses for energy/solar*".

24. The Future of Glass: The closing presentation by Dr. Erik Muijsenberg spoke on the "*Furnace of the Future*" and reflected on the evolving

Figure 14. Er. Peng Shou online presentation. *Source:* © IYOG archive

technologies and designs that will shape the glass industry's future. It is possible to melt most of the produced glass with renewable electric energy, instead of burning fossil fuels that emit carbon into the earth atmosphere. This forward looking perspective aligned with the broader theme of innovation and continuous improvement. The Speakers on Friday afternoon covered the theme of Glass Reaching Out, focusing particularly on Education and Academic Research.

25. Prof. Srikanth Sastry demonstrated that computational and theoretical investigations of the properties of glass formers and glasses have witnessed significant advances in recent years in India, leading to new insights regarding the glass transition and their properties. Improved methodologies have been developed for modeling and simulating these phenomena. He also showed a perspective of the glass science and technology landscape in India in the last decade, placing India amongst the five most prolific countries regarding glass research output.

26. Prof. Edgar Dutra Zanotto reviewed the history of glass research and education, including the pioneering groups in Jena, Alfred, Sheffield and Leningrad (St. Petersburg), which started in the late 1800^{s} and early 1900^{s}. He also covered glass research outputs and developments throughout 2021 with worldwide publication statistics. Prof. Zanotto concluded that the pioneers and most prolific researchers (many were named and cited) played a vital role via active teaching as the building blocks for training skilled engineers and researchers.

27. Two more papers on Education followed. Prof. Marcia Vilarigues spoke on the challenges of interdisciplinarity in dealing with the teaching of Glass Artists, the technical aspects of Glass Making but also pointed out the positives of educating across such boundaries as a result of the differences in approach.

28. Dr. Corinne Claireaux, the manager of the Celsian Academy works on empowering the Glass Industry through training employees to have a more complete understanding of the material glass.

29. Finally, Dr. Jeffery Evensen, the Chairman of the Corning Museum of Glass and their Chief Strategy Officer spoke on how the extraordinary properties of glass, both technically and aesthetically have made it one of the most transformative materials of

Figure 15. Prof. Edgar Zanotto online talk. *Source:* © IYOG archive

all time. He demonstrated how an in-depth understanding is leading to new capabilities at an accelerating pace, with glass being able to solve some of the world's toughest problems.

30. Mr. Kimiake Higuchi, a Japanese artist gave an online presentation of her *pâte de verre* techniques, using experience gained around 1988 in preparing for a glass exhibition in Tokyo. She related her work to creative instincts, honed in a forest environment.

Dr. Erik Muijsenberg has also summarized the presentations given under more general headings:

Glass - an enabler in life science and pharma

Asked about life science and pharma nobody would naturally come up with glass as an enabler. But with a closer look it gets rather obvious,

Figure 16. Dr. Corinne Claireaux.
Source: © IYOG archive

that without glass there would be no modern life science or pharma. Starting with the microscope empowered by Dr. Otto Schott with designed optical glasses, this was and is a key still today: from the invention of Penicillin over our understanding of cell division mechanisms until the latest gene technologies —the indispensable micro insights would not be possible without specialty glass. Another area for glass as hidden champion is state-of-the-art medical treatment technology: endoscopy or minimally invasive surgery are widely known and applied, but rarely is it recognized the role of glass in such technology. Once someone gets a drug injection, it is taken of course as given, that no contaminants or particles come along potentially harming the state of health. Safe drug storage and transportation is a prerequisite and there, glass is really a hero! But modern pharmacology is continuously challenging glass e.g. in areas like mRNA drugs or individual cancer therapy, so reinventing of glass never will stop. Therefore, one can expect for sure in the future further breakthrough achievements for the sake of human wellbeing!

Bioglass: Glass for regenerative medicine

In this talk, we celebrate 50 years of Bioglass, a material discovered by Prof. Larry L. Hench in 1969. It was the first material found to form a bond with bone, changing the mind-set of orthopedic surgeons. All previous biomaterials had triggered scar tissue formation. Bioglass bonds to bone faster than other bioceramics, and encourages more bone growth, which is attributed to the glass' dissolution products stimulating bone cells at the genetic level. Bioglass particulate has been used in more than 2 million patients worldwide and is now an active ingredient in toothpaste for sensitive teeth. More recently, Bioglass has been used to fight bone infections; porous scaffolds have been produced; fibrous glasses are used for healing chronic wounds and nanoparticles can be used as delivery vehicles for therapeutic ions.

Development and Trends of Glass Innovation under Global Climate Change

As materials create a better world, glass ushers in future lifestyles. As a basic functional material with a long history of use, glass connects the macro-universe with microstructures of materials, thus promoting the advances of science and technology and the progress of human civilization. As the era of worldwide low carbon economy has dawned, glass will play a greater role in clean energy, industrial transformation and infrastructural building, becoming a "bridge" to connect us to an international community with a shared future, and contributing the "power of glass" to the global response to climate change and the building of a sustainable society.

Glass Creates Value

Glass, one of the materials that have changed the history of humanity, is among the products of the future, enabling innovative and sustainable solutions for many sectors in addition to its traditional uses. The glass industry, which provides long-term value with its constantly developing

Figure17. Closing panel: Prof. A. Kirman, Prof. G. Zandonella and Prof. N. Sugimoto with Prof. A. Durán and Prof. R. Conradt. *Source:* © IYOG archive

and expanding usage areas, promises endless potential in creating a sustainable future. Once it has been transformed to be a product in the form of a container, tableware, architectural or automotive application, glass is one the most environmentally neutral, safe and functional material we use. Based on this, the presentations provide information about innovative glass products that contribute to sustainable growth and add value to life, such as automotive and architectural glasses with functional coatings that provide significant energy savings by reducing heating and cooling needs, antireflective architectural glasses, antimicrobial glassware, the world's thinnest yet most durable glassware and 100% recyclable glassware.

Sustainability Framework and the Role of Science and Technology

The sustainability framework with its 3 main pillars (1) science & technology (2) governance & management, and (3) education & civil society will be presented along with its applications in various fields such as glass, materials science and engineering, recycling and land filling, economic linearity and circularity as well as automation. The essential and irreplaceable role of science and technology in sustainability and the circular economy in glass industry was highlighted.

The role of sustainable glass packaging in the circular economy

The world is moving from a take-make dispose model to a circular economy where only products and materials which are re-useable and infinitely recyclable will make environmental and business sense. Glass is a permanent material that is good for the planet, people and society. For over 50 years, our industry has been a Circular Economy pioneer at the heart of a closed loop production system. By 2030 our industry wants to collect 90% of all glass packaging put on the market and by 2050 become a climate neutral packaging system. Our industry goals perfectly match with UN Goals 11 and 12. Sustainability in the flat glass sector: a solid track record to transform an industry vision into reality Glass a unique material going through the centuries, thanks to its continuous evolution and adaptability to the needs of people (safety, security, comfort, etc.) and to those of societies as they evolve towards greater energy and environmental conservation. These adaptations were made possible by the glass industry, which embraced these challenges to deliver solutions meeting new architectural and automotive trends. More than ever, the industry is ready to take up the sustainability challenge and to contribute to the fullest to the transition towards a climate neutral Europe. The European flat glass sector takes it as its role to produce the materials essential for renovating Europe's buildings, for supporting the clean mobility transition and for increasing the share of renewable solar energy in Europe. While already providing net carbon avoidance products, the flat glass sector is looking into ways to massively scale up its contributions to the EU's climate neutrality objective, including by developing novel ways to lower its industrial emissions. Mr. Philippe Bastien gave an overview of the glass industry evolution and how the industry takes up this sustainability challenge.

Furnace of the future

With the realities of global warming and plans for CO_2 reduction, the interest in alternative furnace designs such as hybrid electric melting is receiving more attention. The generation of electricity by renewable energy sources is, of course, a great help as it finally brings costs of electricity down and will be CO_2 free. In Europe the average generation of electricity by renewable resources is already above 40%, coming from wind, solar, hydro and bio. Electricity storage however is complex and expensive, while transporting energy in the form of a gas via pipes is cheaper than via electric wires. An alternative renewable energy carrier is hydrogen. Hydrogen can be generated via electrolysis using electricity: this conversion, however, is only in the effective range of 65%. After this, hydrogen can be burned in a glass melting furnace with a typical efficiency of 50%. This paper presented Glass Service a.s. (GS) thermal efficiency studies showing if the future will be more likely using electric heating or hydrogen combustion. Results of mathematical modelling show the efficiency of the different technologies. What will be the furnace design of the future?

From Magic to Science… and Back

Extraordinary aesthetic and technical properties have made glass one of the most transformative materials

of all time. People once believed these properties were the result of magic. Today, our deep understanding of glass science not only explains these phenomena, but also allows researchers to unleash new capabilities that were once unimaginable. Dr. Evenson explained why the pace of glass innovation is accelerating, shared examples of how glass technologies can solve some of the world's toughest problems, and discussed why he believes the most exciting glass discoveries are still ahead.

In summary, the presentations collectively paint a picture of glass as a dynamic and indispensable material that has played a historic role, continues to innovate across sectors, and holds immense potential for the future. The unifying themes of sustainability, innovation, science, and global impact underscore glass's transformative capabilities in various aspects of human life and progress. The final panel for closing the event gathered the most Diamond sponsors

Figure 18a, b. Attendees enjoying moments during the event. *Source:* © IYOG archive

Figure 19. IYOG Opening Ceremony Participants at the close of the event. Source: © IYOG archive

that with their generosity permitted to organize this great event as well as to finance a major part of the international events. This fantastic rich collection of talks, delivered by worldwide known experts, demonstrated the crucial role of glass in human well-being and the indissociability and synergism of science and technology ■

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Membership forms can be downloaded from www.aigmf.com/membership.php

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Prof. Alicia Durán

Prof. John M. Parker

In May 2021 the Glass World was awakening to the possibilities offered by a United Nations sponsored International Year of Glass. Questions flowed concerning finance, organization, communications and they did not then have clear answers. At the same time the consequences of the aftermath of the COVID pandemic were still evident, imposing constraints on social mixing and travel.

This report explores the story leading up to the formal announcement and how events subsequently unfolded, those that were anticipated and those that were not. It begins with an ambitious dream, which then led to the presentation of a formal proposal to the United Nations and ultimately its approval by the United Nations General Assembly. What followed during 2022 went beyond our wildest imaginings and is recorded in subsequent chapters using as far as possible the words of the thousands involved. This record explains the financing, organization and impact, both short- and long-term, of thousands of events around the globe. We hope it will be an appropriate recognition of our debt of gratitude to the United Nations and that it will inspire and inform others so they can transform their own dreams to reality.

1. EARLY BEGINNINGS

The story began in 2014 when Prof. L. David Pye, Past President of the International Commission on Glass and the American Ceramic Society, learned that the United Nations General Assembly had declared 2015 an International Year of Light and Light-Based Technologies.

As editor of *The International Journal of Applied Glass Science (IJAGS)* he grasped the opportunity to showcase "*Glass and Light*" in a special edition. A year later he reacted to the emerging paradigm that we have entered *The Age of Glass*. Dr. David L. Morse and Dr. Jeffrey W. Evenson, senior administrators, Corning Inc., (supported by others) eloquently summarized this new thinking in their contribution "*Welcome to the Glass Age*"[1]. They proposed that we are at a pivotal moment where the arrival of *The Age of Glass* can be declared by glass scientists, engineers, manufacturers, educators and artists around the globe.

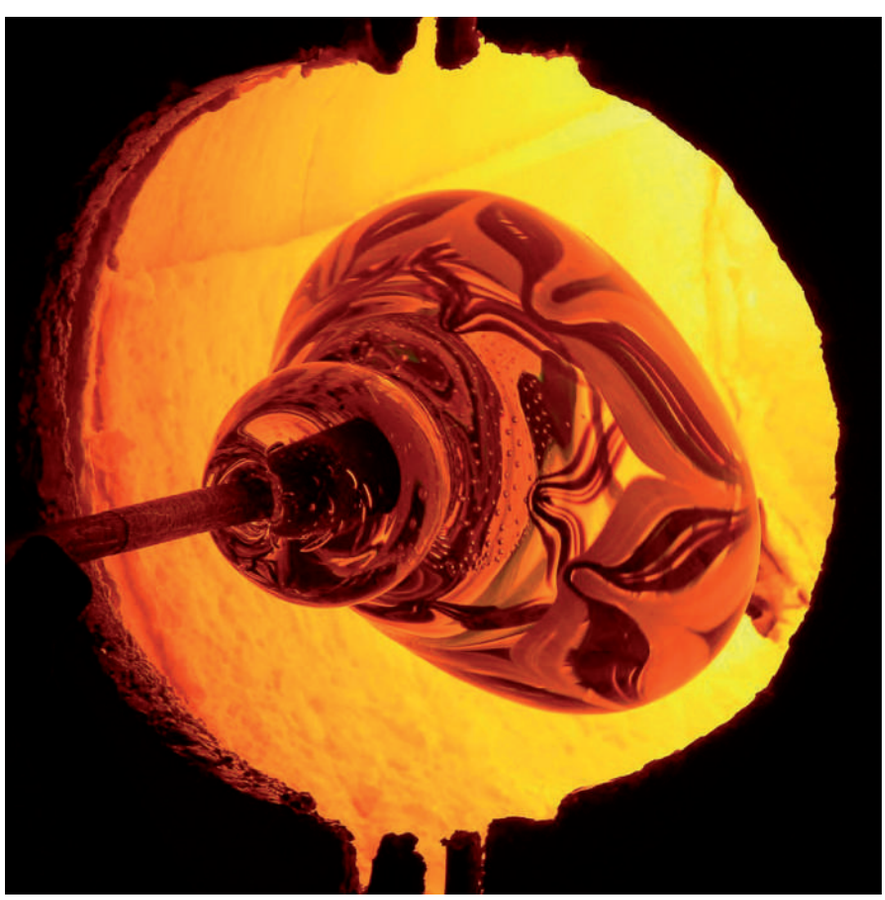

Figure 1. The heat of the furnace and the hand of the artisan offer a world of possibilities.
Source: Del Green from Pixabay

[1]*Welcome to the Age of Glass*, edited by Prof. Alicia Durán and Prof. John M. Parker, publ CSIC. Chapter 1. A. Durán, J. M. Parker and D. Pye. Available online free of charge at www.aigmf.com

They argued that glass had a major role in advancing civilization and mankind throughout history, be it in architecture, the arts, transportation, medicine, communications, or many branches of science. Without glass, the microscopic biological world might never have been revealed, nor would we have discovered the universe beyond the earth, moon and stars. How can we not marvel at the beauty and reverence of stained-glass artistry in cathedrals across the world while excluding cold, rain and snow? Or the simple filament lamp, providing light when darkness falls? Or the extending of our working lives by placing curved glass lenses before our eyes?

While many revolutionary innovations do not have glass at their heart, yet one of the greatest contributions of glass to life today is its role in advancing communication in ways unimaginable a century ago. Has not the world been transformed by the optical glass fiber networks that span the globe? Or by ultra-thin glass plates for television sets and protective covers for mobile phones? Then there is the remarkable story of a small company in Rochester, New York, that realized the potential of a light sensitive semiconducting glass for making possible high-speed reproduction of documents. This company was eventually renamed the Xerox Corporation. Many similar stories can be found in other emerging fields in glass such as healthcare or renewable energies. Notwithstanding this remarkable history, the view here is that the best is yet to come as glass science continues to evolve and be better understood. Heralding the advent of *The Age of Glass* will bring to the attention of the public at large the critical role glass has in our daily lives. Subsequent lectures by Dr. Manoj Choudhary, then ICG President, and Prof. David Pye given to international audiences explored the theme that glass science, engineering and art are entering new and profound chapters in their histories. Based on the above remarks, a sense of history, and appreciation of a seminal idea whose time has come, it is a great honor to chronicle here and affirm the advent of *The Age of Glass*, and by extension the declaration by the UN of an International Year of Glass.

Prompted by the very positive reactions to the above, Prof. David Pye discussed the concept of an International Year of Glass (IYOG) with Mr. Charles L. Craig, Senior Vice President, Science and Technology, Corning Inc. He was strongly supportive and encouraged its pursuit. Soon thereafter Profs. Choudhary and Pye introduced a motion in September 2018 at the Annual Meeting of the Council of the International Commission on Glass in Japan. It read:

The International Commission on Glass, representing organizations and individuals throughout the world dedicated to the promotion of science, technology, artistry and application of glass enthusiastically endorses the exploration of a future declaration of a Year of Glass by the United Nations.

Following its positive reception, Prof. Pye presented the concept to the American Ceramic Society and the Corning Museum of Glass (CMoG). Both embraced the idea, the latter leading Mr. Steven T. Gibbs, a senior administrator, to play a pivotal role in advancing IYOG2022 to the international art community. Buoyed by this groundswell of enthusiasm, ICG's then President, Prof. Alicia Durán, took up the baton to become Chair of an International Steering Committee for the proposed IYOG. The die was cast.

2. PRESENTATION TO THE UNITED NATIONS

Throughout the past 60 years the General Assembly of the United Nations (Figure 2) has honored contributions to society in many fields by declaring '*International Years*'.

A UN badged International Year requires a United Nations Resolution. The Spanish ambassador at the Spanish Permanent Mission at the UN in New York, Mr. Agustín Santos Maraver, agreed to lead the process through the General Assembly of United Nations and explained the steps and documents needed. The application finally submitted had 1) a main document confirming the role of glass in supporting the Goals of Agenda 2030 (Figure 3), 2) an eco-social document reporting the state of the art in the glass industry

Figure 2. Flag of the United Nations adopted in December, 1946.
Source: Miguel Á. Padriñán from Pixabay

and 3) an Executive Summary. Together they showed how the glass community is supporting the 2030 UN developmental goals: responsible production and sustainability; innovation and infrastructure; affordable and clean energy; climate action; unpolluted water and oceans; sanitation, health and well-being; education and gender equality. From these documents, the final Resolution was written promoting glass, its past and its future potential.

Figure 3. Sustainable development goals of Agenda 2030.

Source: United Nations

The chair of the group that led to the 2015 International Year of Light, Prof. John Dudley, University of Franche-Comté, willingly shared his experiences on the negotiation process with an initial IYOG team consisting of Professors Durán, Pye and Parker and explained more of the procedures involved.

Being aware of their reputations and potential contributions the International Commission on Glass approached several glass-based organizations as possible working partners. The International Committee of Museums, along with the Community of Glass Associations promoted by VITRUM and the Italian Government, accepted the challenge and joined ICG, with its links to many national Glass Societies, as sponsors of IYOG.

A formal application for a *United Nations International Year of Glass for 2022* to celebrate the technological, scientific, artistic and economic role of glass as an enabling material crucial to many technologies and cultures was shifting from a possibility to a probability.

Many factors influenced the choice of year but high on the list were several important anniversaries. Of particular importance administratively was that 2022 was the Centennial Anniversary of the German Society of Glass Technology but there were other noteworthy anniversaries too: the 100th anniversary of the opening of King Tutankhamun's tomb with its glass rich treasure, 200 years since the invention of the Fresnel lens, the 70th Anniversary of the Float Glass process, the 60th anniversary of the Studio Glass movement, and remarkably 670 years since the first painting showing someone wearing eyeglasses!

3. ASSEMBLING AN APPLICATION

Throughout these initial negotiations written documentation was in preparation. A 20 page position statement created from an initial draft prepared by Prof. John C. Mauro, The Pennsylvania State University, was enhanced by drawing on information from numerous other sources. More than 40 experts, mainly from ICG Technical Committees, participated in this main document. With the help of Mr. David Moore, Managing Editor, The Society of Glass Technology, it subsequently became an eight-page illustrated brochure. A paper on the global economics of the glass industry was also generated from a variety of sources and national reports; it finally became the eco-social document submitted to the UN. These documents can be downloaded from the IYOG website.

To supplement these written texts, a twenty-minute video was created by Prof. Julian Jones, Imperial College, and Dr. Mathieu Hubert, Development Associate, Corning Inc. In addition to the main authors, many experts and colleagues collaborated in creating this splendid film and the documentation justifying our project; while too many to mention individually we would like to acknowledge their support; they were always ready to assist and overflowing with ideas. The film can be viewed at this link; a version with Japanese subtitles has also been produced.

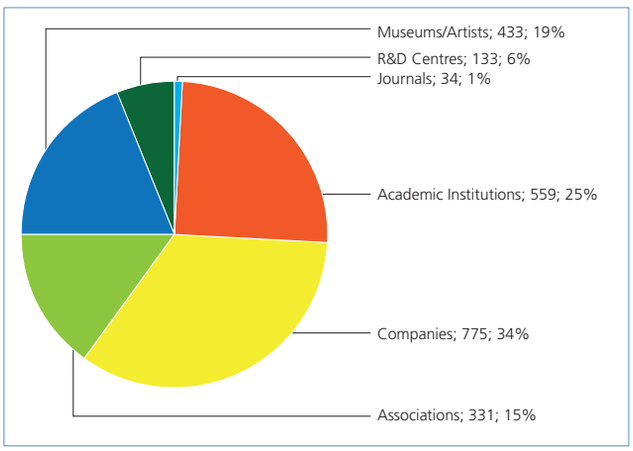

Figure 4. Showing the distribution of expressions of interest from various types of Institution.

Source: IYOG endorsers database

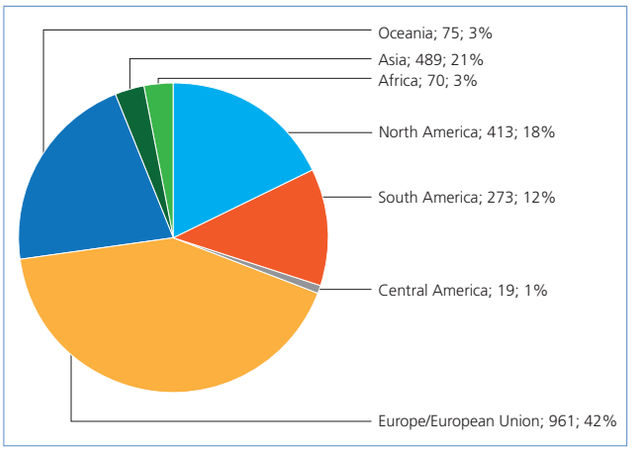

Figure 5. Showing the distribution of expressions of interest from different continents.

Source: IYOG endorsers database

4. AN ADVERTISING CAMPAIGN

Before the final submission to the UN the next step was to generate international awareness and interest in the proposal for an International Year of Glass. Articles were written in Journals and Trade Magazines and a web site was developed (www.iyog2022.org). The documentation and videos created for the UN were helpful as publicity. A LinkedIn site was started and Glass Societies throughout the world were contacted to circulate information, particularly to disseminate links.

To harness the enthusiasm generated, a contact form was released on the International Year of Glass web site to gather the details of interested organizations and individuals. Subsequently this created an invaluable database, but initially the associated statistical information garnered became a significant plank in the evidence submitted to the United Nations. Figure 4 is a chart showing the types of Institutions offering support and Figure 5 indicates their geographical distribution.

By the end of 2021 enthusiastic support had been received from almost 2500 Universities and research centers, societies and associations, museums, artists, educators, manufacturers and companies in 96 countries spanning all five continents. Almost 1400 of these submissions were received in time for inclusion within our final documentation submitted to the UN. Dealing with communications on this scale required the use of specialist software such as Mailchimp which fortuitously was just becoming available on the market at low cost.

5. THE PROPOSAL IS ACCEPTED BY THE UNITED NATIONS

The UN submission process was far from smooth; false starts were frequent, caused by the effects of the COVID-19 pandemic and the political sensitivities behind such submissions. Dates anticipated for a formal submission came and went without action because important meetings were delayed or not everyone agreed on the details of the submission. A further problem was the change of the approval method in the General Assembly, from majority to unanimity; this required a detailed and longer negotiation process amongst the participants of the GA. Eventually a draft Resolution outlining our ambitions was negotiated and accepted by the Missions of a significant number of UN countries during April 2021. It successfully passed a silent process of approval on 11th May —that is no one objected. The formal resolution was agreed at the United Nations General Assembly on May 18th, 2021 during a meeting broadcasted by UN TVE; several IYOG committee members sat glued to their seats listening to the proceedings and their response to the unanimous vote echoed around the world.

Heartfelt thanks go especially to the Spanish Mission at the UN, particularly the Spanish Ambassador Mr. Agustín Santos Maraver and Ms. Ana Alonso, who led this process through the difficult twists and turns of diplomacy in stressful times. We are also grateful to the 19 countries that lent invaluable support as Co-Sponsors, formally endorsing the UN resolution.

6. SETTING UP AN ADMINISTRATION TEAM

The initial planning had been mostly supported by the International

Commission on Glass, a voluntary organization made up of officers of the main National Glass Societies around the world. Others from the much wider, global constituency were drawn in over time. Representation from Museums, History, Education and the Arts was also vital – each had their own important membership supporting different aspects of Glass. Some, still recovering from the aftermath of COVID, could not commit significant resources but finally *The International Committee of Museums (ICOM)* and *the Community of Glass Associations* joined ICG as major supporters. Other international working groups and associations with related aspirations also provided significant administrative support (Vitrum, FEVE, NGA, GE) and some have submitted individual reports. Other commercial organizations took on specific tasks such as the preparation of a Web Page for the Opening Ceremony at no charge.

Once approval for IYOG2022 had been given by the United Nations a rapid gear shift was needed. A Core Team (Table 1) with the responsibilities listed sprang into action.

Table 1. Core Team (Images shown in Figure 6)

Prof. Alicia Durán (Spain):	Chair
Prof. John Parker (UK):	Documentation and Website
Mr. Patrick Gavaghan (Australia):	Fund Raising and Grants
Prof. Teresa Medici (Italy):	Museums and Art
Dr. Mathieu Hubert (USA):	Youth Outreach

Two more people deserve a very special mention for their tireless support in vital administrative roles: Mrs. Kun Wang and Dr. Maria Pascual.

Mrs. Kun Wang of Triumph International, China and also the Executive Secretary of the International Commission of Glass provided invaluable support throughout: setting up online meetings, keeping records in shared online storage, creating Agenda and Minutes, and mostly undertaken in spite of the seriously antisocial working hours caused by international time differences.

Secondly Dr. Maria Pascual took on the task of Treasurer, a particular onerous position because many countries with different banking systems and currency were involved. She had already been an effective treasurer for ICG for many years and was able to create a parallel account within that of the ICG so that no new bank charges or auditing costs were incurred.

They met frequently on Zoom/ Teams throughout the second half of 2021 and the whole of 2022. Frequent emails, often with panic written between the lines of their brief messages, flew around the world and helped to solve the issue of time differences. Holidays taken that summer were brief!

United Nations protocol placed two major obligations on the IYOG2022 Organizing Committee. The first was to arrange an Opening Ceremony at the United Nations Headquarters in Geneva. Its theme was primarily to present to the UN ambassadors and secondly a worldwide audience a summary of the arguments used in the Application to justify the award of a UN sponsored International Year. It had to demonstrate how glassy materials were aiding the aspirations embodied within the UN 2030 humanitarian goals.

A further constraint was that this event had to be undertaken without charging a conference fee; at the same time some COVID restrictions were still being applied. A Closing Ceremony at the end of the year celebrating what had been achieved was the second requirement; it took place in Tokyo, Japan.

These events were of particular significance, and they merit extended commentaries in this report. The Opening Ceremony and the closing

Figure 6. The Core team.

Source: © IYOG archive

Table 2. List of Regional Organizing Committees (ROs)

RO01	Brazil
RO02	Germany; Liechtenstein
RO03	China
RO04	Turkey, Greece, Cyprus, Malta, Jordan, Saudi Arabia, Lebanon, United Arab Emirates, Bahrain, Israel, Bulgaria
RO05	Argentina, Bolivia, Chile, Peru, Uruguay
RO06	Mexico, Costa Rica, Dominican Republic, Ecuador, Guatemala, Colombia, Venezuela, El Salvador, Panama
RO07	USA, Canada
RO08	Spain, Portugal, Andorra
RO09	France, Belgium
RO10	Japan, Korea
RO11	Denmark, Finland, Norway, Sweden, Netherlands, Luxembourg, Latvia, Estonia, Lithuania
RO12	UK, Ireland
RO13	Russia, Poland, Armenia, Kazakhstan, Belarus, Uzbekistan, Moldavia, Ukraine
RO14	Hungary, Slovenia, Serbia, Romania, Slovak Republic, Czech Republic, Switzerland, Austria, Croatia
RO15	Algeria, Angola, Egypt, Eritrea, Morocco, Nigeria, South Africa, Swaziland, Tanzania, Ghana
RO16	Australia, Malaysia, New Zealand, Singapore, Vietnam, Indonesia, Philippines, Thailand
RO17	**India,** Iran, Pakistan
RO18	Italy

event in Japan, both through the eyes of the event organizers and others who were present. The program organizing committee for the Opening Ceremony was chaired by Prof. L. Wondraczek from Germany while the Closing Ceremony organizing Committee was chaired by Profs. H. Inoue and S. Tanabe.

At the suggestion of the Spanish Ambassador to the UN, a prime mover in organizing the whole year and a vital contact point between the organizers and the UN, a shorter Debriefing Meeting was also held in December in the United Nations building in New York to present selected noteworthy outcomes from the Year in an easily digestible format for the UN Ambassadors.

From the start, the core team realized the importance of a contact list and that the varied and multidimensional celebrations which an International Year deserved could not be organized solely by one central committee. Regional Organizations were created based on location, language and the geographical distribution of endorsers across the planet, 18 groups in total, listed in Table 2. Each group focused on coordination, advertising, sharing best practice and providing a supportive environment. An online database was created to collect and collate a list of planned activities. Its purpose was to be both an advertising resource and also a long-term record with more information than the wider public needed to see. Several Regional Organizing Committees also organized their own web sites which could then use the local language. Many of these sites can be found through online links, which

Table 3a. List of sponsors offering unrestricted funding, with their logos

Diamond sponsors	Avventurina	Cristallo	Lattimo
AGC CORNING VITRUM ŞİŞECAM	LIBBEY SAINT-GOBAIN	glaston SPIE. NAZENG GLASSWORKS NIPRO	GLASS FOR EUROPE VICAL GRUPO VIDRIERO CENTROAMERICANO VERESCENCE Abividro GLASS FOR FUTURE Nippon Electric Glass Sumitomo SGD PHARMA NGA Springer

Table 3b. List of sponsors that paid for specific items

Gala Dinner	Welcome reception	Attendee bags/Red Carpet photographs	Lanyards	Technical Sponsors	Charge Station and Coffee Break
SCHOTT glass made of ideas	FEVE; glass for Packaging	IRIS Inspection machines	GS GLASS SERVICE	verarte	SG Stevanato Group

has reports from each committee summarizing their achievements.

Additionally, a Council, based principally on 2 or 3 representatives from each of the 18 Regional Organizations, Associations and magazines, promoted the best ideas, so multiplying their impact and was able to identify issues, react quickly and offer guidance as the need arose. They met monthly from October 2021 to December 2022, continuing through 2023 at a lower frequency.

From the date of the United Nations approval, the task of diffusion and coordination of thousands of activities across the planet began: congresses and seminars, industrial fairs and glass schools co-existed with artistic exhibitions, books, social media, scientific, technical and general-interest magazines. Event planning relied on grass roots input, and delegation was indispensable. The huge network of volunteers is sadly too large to acknowledge individually. In the later chapters with its reports from each Regional Organization will illustrate the level of activity across the world.

7. FINANCING A PROGRAM

Financial arrangements for local activities were dealt with at a local level but a Sponsorship Program was created early in the process to provide financial support for the Opening and Closing Ceremonies required by the United Nations. Here we give a detailed account of the fund-raising campaign, the financial arrangements in place that underpinned the organization of the year and the funding available, with recognition of the many generous sponsors who facilitated the successful running of the year.

A major feature of the year was that our generous sponsors contributed sufficient funds so that not only were we able to sponsor the conference sessions required by the United Nations but we were also able to part-fund more than 80 additional projects around the globe. The sources and details of the financing of this program are described fully in the next chapter.

Our fund-raising campaign began towards the end of 2021 and was led by Mr. Patrick Gavaghan. He defined from the beginning different levels of sponsorship and created a prospectus with a clear description of the benefits attached to each category. These requirements were presented to the industry in an 18-page prospectus. The most important sponsorships were categorized in relation to different styles of glass art; Diamond, Avventurina, Cristallo and Lattimo. Other opportunities to sponsor were related to particular cost-centers, the most prestigious being the Conference Dinner at the Opening Ceremony.

In total almost € 440,000 was raised. The Sponsors are listed in Tables 3a and 3b. Table 3a lists those who gave specific sums for unrestricted expenditure. Five sponsors each contributed € 50,000, seven Avventurina sponsors gave € 25,000 each, while four Lattimo sponsors committed € 10,000. Table 3b lists those who paid for specific items such as the conference dinner, reducing significantly the costs of running the Opening Ceremony in Geneva. In particular, the cost of the Gala Dinner was equivalent in value to a Diamond Sponsorship. Table 3c lists four organizations which contributed in kind by providing administrative and organisation support throughout the year.

We were also fortunate to gain access to lecture rooms in the United Nations Buildings that provided high quality conference space, namely the beautifully decorated and furnished Human Rights Room in the 'Palace of Nations' at no charge; this came with audiovisual and recording facilities,

Table 3c. Contributions in kind to the administration

Organizers
ICG International Commission on Glass; COMMUNITY of GLASS ASSOCIATIONS; GLASS
Supporter
CNBM | CTIEC

Figure 7. Official Logo of IYOG and a derivative logo.

Source: © IYOG archive

and manpower. The AV equipment was particularly important for the Opening Ceremony. It meant that the event could be streamed live around the world as well being recorded for posterity.

8. CREATING AN ONLINE PRESENCE

An early step was logo design. The one used (Figure 7) was created by a communications agency, paid for by the GlaSS group of Prof. Alicia Durán, and incorporating the logo for the International Commission on Glass. It was made available in a variety of electronic formats to the whole IYOG community as a download from the IYOG web site and could be added to individual emails or used in event promotional material. Those using it were asked to respect the UN humanitarian goals and not use it for merchandising or to endorse purely commercial activities.

The simplicity of the logo made small changes for local use straightforward: so modifications were suggested by the Japanese and in the case of Spain and Portugal/Brazil it was adapted by Marco Demichelis, Marco audiovisual". RO03 also had their own version.

Since the close of 2022 a further adaptation has made it the symbol for 'The Age of Glass'.

The web pages created for IYOG were used for many purposes but particularly to create links to the downloadable Logo files, individual and event registration, and for documents and events of global significance, such as the forms submitted to the UN. The Opening and Closing Ceremonies had their own web sites. The IYOG web pages will be maintained and visible to the public for a further five years; they retain the facility for recording and advertising organized events. An early attempt to collect donations through the web site failed because of limitations to the commercial software available, that made it vulnerable to misuse. Social media communications were via LinkedIn and were regularly monitored by one of Prof. Duran's students Ms. Maria Eugenia Cruz. She also supported and dealt with the endorsers lists, its updating, and the preparation of individual lists for each of the 18 Regional Organizations, including the frequent sending of messages during 2021 and 2022 by Mailchimp. The list of endorsers finally surpassed 2500 endorsers from 96 countries.

Many regional organizations created their own Social Media accounts and web sites. This facilitated regular updating and meant that the local language could be used. Examples are presented in the Regional Organization accounts which will come in the later chapters.

9. HANDLING FINANCES

Local expenses were mostly covered by the local regional committees who in turn expected individual event organizers to provide their own funding. This included almost all the conferences that took place during the year; the two exceptions were the Opening Ceremony in Geneva and the final Debriefing Event in New York because United Nations rules meant that a conference fee could not be charged. In both cases though the UN provided lecture rooms and AV facilities free of charge. The other significant cost was the provision of grants to groups around the world chosen using a competitive selection process. The breakdown for these costs is outlined in the next chapter.

Dr. Pascual has created a closing account summarizing incomings and outgoings in Table 4.

Table 4. Summarizing the overall income and outgoings for the IYOG2022

	2021	2022	Total
Income	€55,255	€384,362	€439,617
Expenditure	€54,486	€374,641	€429,127
Balance	€769	€9,721	€10,490

Figure 8. United Nations Headquarters, New York. *Source*: Jörg Peter from Pixabay

The final balance on 30th May 2023 was € 11,604 and was allocated for spending on 1) Maintenance of an IYOG web site for 5 years, and 2) production of this IYOG final report as a book by CSIC and distribution to all the ROs. Specifically, 87 IYOG projects were funded at a cost of € 193,182. The remainder was spent on the Opening Ceremony in February 2022 in Geneva (€ 150,000), at the Debriefing event in December in New York (€ 48,500), on IYOG book printing and exhibitions/ posters (€ 11,300). Other minor costs were for support staff's travel expenses and the IYOG web site. Some financial service costs as well as an administrative load were occurred for money transfer across country boundaries, particular for the project grants, costs that were a significant fraction of the sums being transferred.

10. CONCLUDING REMARKS

As well as providing a background of the events leading up to the International Year of Glass, we have recorded here the organizational structure, the initial preparations and the running of the International Year of Glass. This volume in its entirety offers a snapshot of all the events of 2022 through the eyes of the many organizers, the participants and the major sponsors (Chapter- Regional Organizations; Chapter- Education and Young People; Chapter- Art and Museums report; Chapter- Associations Report; Chapter- A Retrospective from the major sponsors). The reader can discover links to material that can be downloaded and used for its educational context, for example recordings of important conferences, short video clips demonstrating the importance of Glass, and Posters on Sustainability. Later chapters will also provide an account of the identification of the Seven Glass Wonders of the World as seen through the eyes of a wide range of Glass Experts. We offer the volume as a record of an amazingly successful global event and hope too that it will be a useful guide to others organizing UN sponsored years in the future.

Following the example of the International Year of Light a committee continues to work on exploiting the many positive outcomes of 2022, outcomes that have been based on the UN 2030 goals —for example on equality, education and sustainability. Other outcomes have included the breaking down of geographical boundaries by recording numerous videos, printed texts, and online lectures. But perhaps the biggest success has been the bringing together of artists, scientists, museum curators, archaeologists, teachers, gifted speakers, writers, even musicians to share and build the amazing Story of Glass!

In her closing speech by Prof. Alicia Durán at the United Nations Building in New York, emphasized that 2022 had been the start and not the conclusion of a journey to 'The Age of Glass'. The further chapters will demonstrate the veracity of that statement ■

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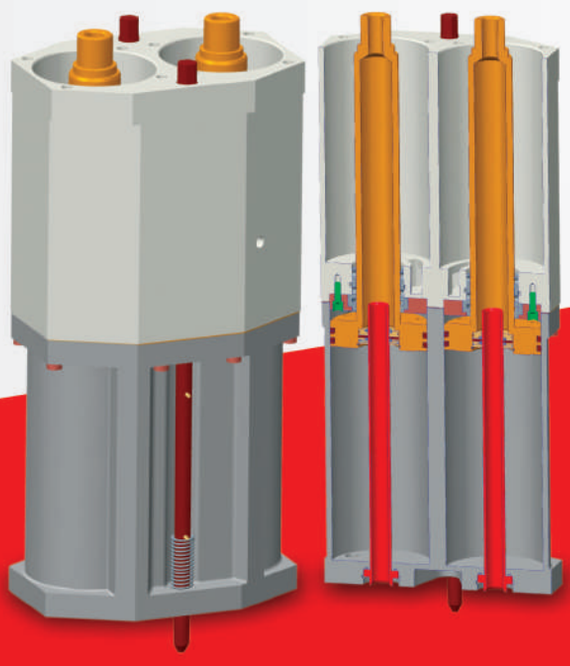

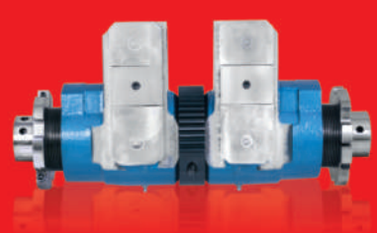

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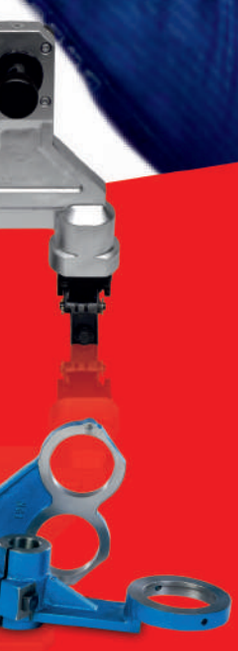

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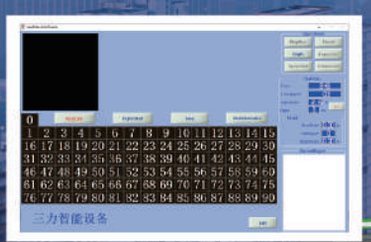

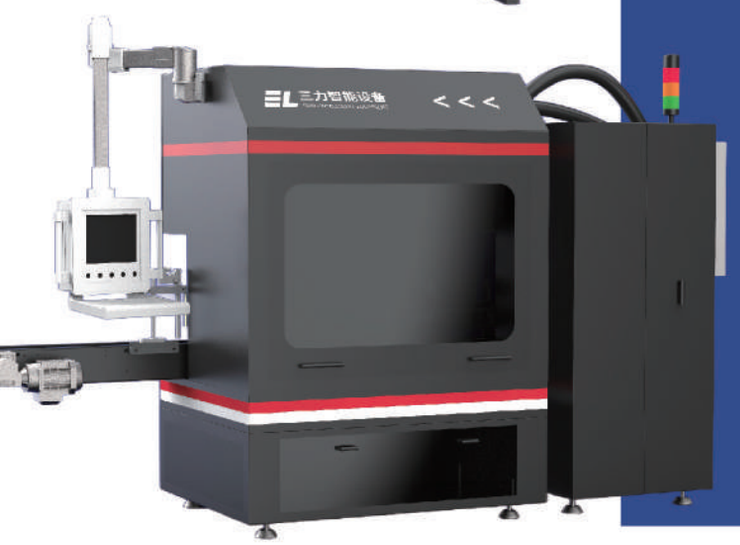

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Seed Funding Programme

Mr. Patrick Gavaghan, Prof. Teresa Medici, Prof. Alicia Durán, Dr. Mathieu Hubert and Prof. John M. Parker

1. INTRODUCTION

Although International Ceremonies had a significant role in the International Year of Glass, local activities represented the major part of what was achieved and had at least as much long-term impact. Too many events were recorded in our database to list them all and we know that they under-represent all that happened. Also, the future chapters will give a full account region by region of the activities took place across the globe through the eyes of the 18 regional organizing committees.

Most of these events were entirely funded locally. Nevertheless, the monies raised through sponsorships part-funded a significant number of activities (87). After the Opening Ceremony in Geneva, near half of the funds obtained in the Fund raising campaign remained unspent. An ambitious Seed Funding program was designed to give opportunities of co-financing to different initiatives across the world. These selected events were perceived: a) to be novel, b) to involve a large and all age audience, c) to carry an important message related to IYOG with its UN sustainability goals and d) to have the potential to generate income from other sources. The allocation of funding was based on team evaluations of the merits of different submissions; the members of this team were the authors listed for this chapter.

2. SELECTION PROCESS

The process was subdivided into several steps:

1. Call for applications,
2. Receipt and recording of submissions,
3. Assessment by the team members, following defined assessment criteria,
4. Decision on which proposals were not suitable,
5. Once accepted, a decision on proportion of funding that could be allocated,
6. Offer letters sent with request for banking information,
7. Funding sent in one or two tranches depending on total amount allocated,
8. Checks on completion,
9. There were 2 rounds, in April and August with roughly half the funding allocated to each.

These steps were supplemented by online meetings to compare our thinking in making evaluations and to ensure that we used a consistent approach. Detailed instructions on the philosophy of the awards and the information required was clearly set out. Our application forms were carefully designed to match these requirements. Applications were only accepted if they were on the official forms and so everyone followed a standard layout.

These forms could be downloaded from the web and their existence was advertised through the Regional Organizations. An absolute deadline was imposed, a month after the initial announcement and launch of the call.

An example of the wording of the Application Form for Round 2 follows and was similar to that for Round 1.

The International Council for IYOG 2022 has successfully completed Round one of the IYOG 2022 Seed funding project. Thanks to our sponsors' support, we supported over 40 activities across the world, promoting glass across all sectors through an amazing variety of events. We now launch Round 2 for projects later in 2022.

How will the round 2 funds be allocated?

The International Council has limited funds to distribute to appropriate activities across all the regional organizations. Allocation will be based on the "Seed funding" principle and will only be awarded where they supplement other grants, income and in-kind costs, to amplify their value. They are not designed for a few costly activities or for personal research but to ensure that as many, varied ideas as possible have the opportunity for financial support and a chance to blossom in 2022 with the potential for continuity into the future.

What is an activity?

The International Year of Glass 2022 has given all sectors of glass the opportunity to develop a range of activities supporting IYOG 2022 aspirations. An activity is anything that promotes glass positively. It can be across any sector and involve different disciplines. Engagement with the wider public and events with an educational flavor are encouraged. We hope to see applications for a diverse, novel and exciting range of activities. For information, the events page of the IYOG web site lists current plans. Activities must commence in 2022 but may complete in 2022 or 2023.

Measuring success of the activity

With the range of activities anticipated,

creating a single set of success criteria applicable across all activities is inappropriate. Nevertheless, your application should: demonstrate clear and achievable outcomes as these will contribute to your success; name collaborators and confirm their willingness to be involved; and give a brief breakdown of anticipated costs.

Application process

The window for submitting an application for seed funding is:

1st to 31st July. Decisions by mid-August with funds dispersed by early September.

To ensure each application is treated equally, applications will only be accepted using the "Application for IYOG 2022 Activity seed funding Rd 2" pdf form attached. A word version is available if required. Funding will be in Euros and all local costs should be given in Euros.

All boxes must be completed. You will need to name your activity as this will become the reference for future communications. Types of activities are in a drop-down menu. You must select the one that best fits your activity. This is to ensure we can collate activities.

NOTE: Your total stated income and your anticipated outgoings (costs) must balance.

Applications will be assessed by the Executive Committee and decisions approved by the IYOG International Council. Funds will be transferred quickly (goal: within 2 weeks). Any local taxes or charges will be the responsibility of the applicant. Please only return your completed application to fundallocation@iyog2022.org. Receipt will be acknowledged.

The Executive Committee looks forward to receiving your proposal.

The 90 funding requests received in Round 1 (deadline 1st -30th April) exceeded the available financial resources by a factor of 8 and therefore required very careful selection. An early decision was that major research projects could not be considered, nor should any projects for commercial gain or solely for advertising; such proposals were immediately rejected. Projects that had the potential for supplementary funding through other channels were more likely to be considered. Proposals that could create a long-term legacy were also favored and the probability of successful completion was also taken into account. Another factor was whether the application team were perceived as being capable of completing a particularly ambitious proposal.

Unsuccessful applicants from Round 1 were allowed to revise and resubmit proposals. The number of applications received for round 2 was similar to that for Round 1; the sums requested were more realistic though but still exceeded by a significant margin that funds that were available, in spite of a cap of € 8000. Judging therefore had to be strict and followed an agreed set of criteria like those in Round 1. Every project received at least 3 assessments and for those accepted, judges were also asked to rank the level of funding to be awarded. Ultimately, the approach adopted in both rounds was to award funds to almost half of the applications, but to give each only around 40% of what had been requested. A sliding scale was used which gave a larger proportion of the request to smaller applications; additionally, in all cases individual factors were taken into account.

3. DISTRIBUTION OF GRANTS

We present the results of the allocation process in Tables 1 and 2, covering Rounds 1 and 2 submissions respectively. These tables give the amounts awarded, the country from which the application came, and the title of the proposal along with a category. The variety of subjects proposed is impressive.

Once an offer had been decided, a letter was sent out, giving the amount allocated, the conditions of acceptance, which had to be signed and returned and a form requesting bank transfer details. Recipients of awards were universally grateful; just one was withdrawn because of COVID related constraints.

Figure 1 illustrates the geographical distribution of i) applications and ii) financed projects, while the chart shown in Figure 2 gives the breakdown of successful applications by topic.

4. EXAMPLES OF SUPPORT

A few applications were received from Conference organizers, particularly the ICG Congress in Germany and the Closing Ceremony in Japan, both central to the IYOG celebrations. Discussions with the event organizers led to a policy of supporting younger people who otherwise would have been unable to raise the funding to cover transport and accommodation costs. For the ICG celebrations in Germany € 15,000 was allocated to 17 candidates, termed Glass Future Fellows. This included 3 runners-up, who received "only" a conference fee voucher. Of the 17, 12 were female, 5 male; they represented 14 different countries (listed in Table 4).

For the closing ceremony the sum allocated was € 6,500. The candidates selected were given the title 'Future Generation Speakers' and allocated 15 minutes to present a paper at the Closing Ceremony. Eight delegates were selected, six in technical or scientific fields. Those chosen

Table 1. Seed funding grants awarded to applications in Round 1

Grant	Country	Title	Category
€2,500	Australia	GLAAS INC program of events 2022	Artistic Glass
€800	Australia	Glass: Vision Reflection Imagination	Conference
€3,000	Australia/NZ	Mosaic for Afghan Women: Human Rights through Mosaic Art	Exhibition/Community
€7,000	Brazil	IYOG K to 12 Educators Forum	Education
€3,000	Canada	Le verre: reflet de société, fenêtre sur les avancées technologiques	Conference
€3,000	China	Int. Contemporary Glass Art Exhibition	Artistic Glass
€3,000	Costa Rica	Glass Fashion Show	Artistic Glass
€2,500	Finland	The Glass Age, Exhibition of new glass art from Finland	Museums & Exhibitions
€3,000	Germany	Vignelli Dialogue 02 -Translucida	Artistic Glass
€3,500	Germany	Roman Glass Reloaded	Education
€2,500	Germany	Borg Furnace Project 2022	History/Archaeology
€2,000	Germany	GlasSpass	Education
€2,000	Germany	IYOG Picture and Video Contest among Students	Education
€ 550	Ireland/ Romania	Bringing the Light	Art & Sustainability
€4,500	Italy	The Floating Furnace	Museums & Exhibitions
€2,000	Jordan	ZUJAJ workshops	Artistic Glass
€2,000	Philippines	Mappy's Arts Painting on Glass	Education
€1,000	Philippines	Glass is COOL: Webinar Series for Engineering students	Education, Sustainability
€800	Philippines	Emerald Glass Excellence Award (TEGEA)	Sustainability
€1,000	Scotland	Stories Exhibition - Taster Glass Workshops and Expert Talks	Artistic Glass
€2,000	Serbia	Creative Glass Laboratory	Education
€1,000	Slovakia	Junior FunGlass School	Education
€3,200	South Africa	Fired Up! - Celebrating Southern African Glass Art	Artistic Glass
€700	Spain	Exposicion de Peces De Cristal Artesano	Artistic Glass
€2,500	Spain	Towns Twinned by Glass	Glass Manufacture
€3,500	UK	Glass Lab Exhibition	Museums & Exhibitions
€900	UK	Celebrating Glass Day	Education
€1,800	UK	Community glass sculpture project	Artistic Glass
€700	UK	Celebrating the Birth of English and Irish Crystal Drinking Glass, 1640-1702	Conference
€2,500	Uruguay	Glass Woman uy 2022	Glass in Architecture
€2,500	USA	American Glass Guild Conference at Corning Museum of Glass	Conferences
€3,000	USA	2022 UrbanGlass' Artist Fellowship Program	Artistic Glass
€1,300	USA	Ginny Ruffner: Reforestation of the Imagination	Museums & Exhibitions
€2,500	USA	Hot Glass Outreach for MS&T 2022	Education
€3,000	USA	Project FIRE	Education
€3,500	USA	GEEX Talks: Expanded Glass Histories (Glass history & glass art virtual lectures)	Publications
€3,000	USA	The Gathering: A Fusion of Glass Art & Technology	Conference
€3,000	Uzbekistan	Innovative Technologies for Producing Glass, Ceramics & Binding Materials	Conference
€3,000	Wales	Gwydraid: Gwydr: Glass	Museums & Exhibitions

Table 2. Seed funding grants awarded to applications in Round 2

Grant	Country	Title	Category
€2,160	Argentina	The force of grisailles	Museums & Exhibitions
€1,470	Argentina	Fabricación de placas con vidrio reciclado	Glass recycling
€1,000	Argentina	"Horno de soplado para Mendoza Argentina"	Artistic Glass
€1,920	Australia	GLASS@VILLA ALBA	Artistic Glass
€1,890	Australia	Documentary: War Commemoration in Glass	Education
€1,200	Australia	'Cutting Edge', Vicki Torr Retrospective	Artistic Glass
€1,200	Australia	Drysdale Community Hot Glass Art Workspace	Museums & Exhibitions
€1,000	Australia	Artistic Glass Workshops In Regional Australia.	Artistic Glass
€1,200	Belarus	Photo exhibition "Through the Glass"	Exhibitions
€2,880	Brazil	Reflections on reflections - cultural history of glass in architecture	Publications
€2,640	Brazil	Science and Art of Glass	Education
€1,000	Finland	Multidisciplinary Glass - exhibition	Museums & Exhibitions
€600	France	Exhibition Art Fair in Provence (France)	Artistic Glass
€2,520	Germany	Glass as a Medium of German-Czech Relations	Artistic Glass
€2,400	Germany	12. Int. Exhibition. Glass Sculpture & Garden 2022	Museums & Exhibitions

Grant	Country	Title	Category
€3,360	Hungary	Life cycle of glass in lighting technology	Education
€3,360	Indonesia	Indonesian Glass Art Festival	Conferences
€2,100	Ireland	Glass Festival Masterclasses	Education
€6,500	Japan	Support for the presentations of the Future Generation in the Closing Conference	Conferences
€2,697	Jordan	Flamework Training - Beyond Panels and Slumping	Education
€1,256	New Zealand	Recycled glass online workshops	Glass recycling
€1,000	New Zealand	Focus on Glass 2022 Exhibition	Museums & Exhibitions
€1,440	Norway	Norske glasskunstnere - Glassets år 2022	Museums & Exhibitions
€1,000	Norway	Renovation of a Sandberg Furnace	Glass manufacture
€2,678	Philippines	Project GLASS is BEST	Glass manufacture, recycling
€1,157	Philippines	PROJECT BRIDGES (Philippines)	Education
€985	Philippines	Cuadro Anexo de Vidrio	Artistic Glass
€3,840	RSA	MineGlass	Glass Science/Research
€2,940	Serbia	Glass in focus	Museums & Exhibitions
€2,400	South Korea	Int. Glass Art Object Project in Homage to IYOG2022	Artistic Glass
€4,050	Spain	Glass Well, a historical recovery for future	Education
€3,360	Spain	Closing Ceremony, IYOG, Spain	Museums & Exhibitions
€1,500	Thailand	Glass Industries-Thailand Best Practice Sharing	Conferences
€3,213	UK	Glass Garden, RHS Chelsea Flower Show 2022	Artistic Glass
€2,160	UK	Collaborations Catalogue	Artistic Glass
€2,100	UK	North Lands Creative Glass Tour Scotland	Education
€900	UK	Promoting glass history @ Catcliffe Cone, 1740	Education
€1,500	UK	International Festival of Glass	Artistic Glass
€1,584	Uruguay	Diseño, Arte, Ciencia e Industria del Vidrio	Conferences
€3,150	USA	Glass Comes Alive: Celebrating Interdisciplinary Approaches to Glass	Education
€2,932	USA	Elements of Style: Glass City Chic	Museums & Exhibitions
€2,196	USA	Bottle Underground	Glass recycling
€1,920	USA	Exhibition - To See a World in a Grain of Sand	Museums & Exhibitions
€1,764	USA	Vitreonics: Art Glass Shines in the Crystal City	Artistic Glass
€ 1,763	USA	The Glass Wing	Museums & Exhibitions
€ 1,181	USA	Wheaton Conversations	Museums & Exhibitions
€ 982	USA	Inspired by Glass	Education

Table 3. List of countries from which applications were received and success rates. Over 2 rounds, 165 applications were received and 87 were accepted.

Country	Applications	Successful
Argentina	3	3
Australia	11	8
Belarus	1	1
Belgium	1	0
Brazil	3	3
Bulgaria	1	0
Canada	2	1
China	4	1
Costa Rica	1	1
Denmark	1	0
Finland	7	2
France	2	1
Germany	11	7
Ghana	1	0
Hungary	2	1
India	1	0
Indonesia	1	1
Ireland/ Romania	5	2
Israel	1	0
Italy	8	1
Japan	2	1
Jordan	2	2

Country	Applications	Successful
Kenya	1	0
Netherlands	2	0
New Zealand	2	2
Norway	2	2
Philippines	6	6
Romania	2	0
RSA	4	2
Russia	1	0
Scotland	1	1
Serbia	2	2
Singapore	1	0
Slovakia	1	1
South Korea	1	1
Spain	5	4
Switzerland	3	0
Thailand	1	1
UK	17	9
Uruguay	3	2
USA	38	15
Uzbekistan	1	1
Wales	1	1
TOTALS	164	86

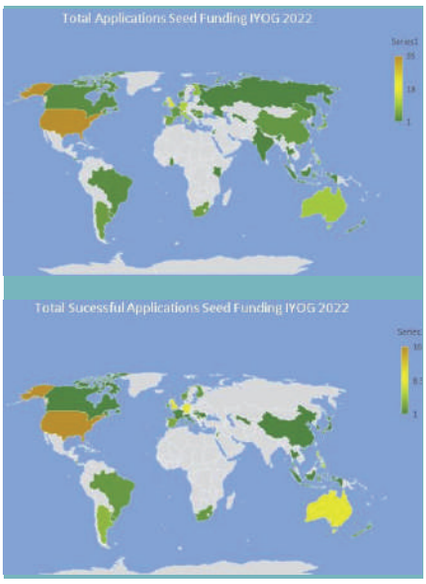


Figure 1. Shows a World Map indicating the applications and successful projects by country over both calls.
Source: © IYOG archive

Table 4. List of applicants receiving support to attend the ICG Congress in Berlin, Centenary of DGG **Fees waived*

Compos, João Vitor	Brazil
Cruz,MariaEugenia	Spain
Eriksson,Elin	Finland
Farrukh,Erkinov	Uzbekistan
Kirchner,Katelyn	USA
Layher,Anne-Marie	Germany
Mutlu,Nurshen	Slovakia
Nakamura,Takuma	Japan
Patra,Pritha	India
Sassi,Meriem	Hungary
Soubelet,Clara	Argentina
Szczodra,Agata	Finland
Tran,ThiNgocLam	Vietnam
Zhou,Qi	USA
Dr.So,BJ*	Korea
Chahal,Shweta*	India
Lancelotti,RicardoFelipe*	Brazil

represented 6 different countries and were balanced between male and female. They are listed in the conference program in the future chapters.

The reports from the Regional Organizations describe the outcomes of a great many IYOG activities, both supported and not. Future chapters on Education, Museums and Publications will also highlight numerous success stories. These successes range from enhancing the lives of disadvantaged children in less well-off communities

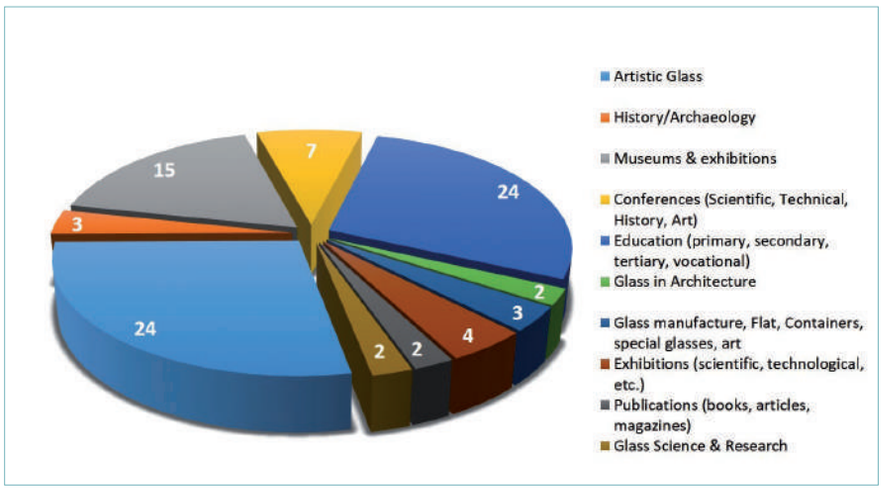


Figure 2. Distribution of the successful projects in the Seed Funding Initiative by topic.
Source: © IYOG archive

to encouraging cross border and cross-cultural collaborations to the mutual benefit of all involved. Some stories show how sustainability can be woven into people's lives, positive actions both scientific and practical can bring hope to struggling individuals and communities, and how small ripples can have long-ranging effects. They make a heart-warming read and also affirm the value of the effort that went into organizing the International Year.

A significant proportion of the support for funded activities went to projects with an educational flavor. The outcomes of many of these are described in more detail in the future chapters. Other common themes in applications were art, museums and festivals. Many of the sponsored projects and their outcomes are described in the reports of the appropriate Regional Organizations. Some are listed below with a link to the sections in the book where there is more detail. The selection made demonstrates the broad range of countries involved and the wide range of activities undertaken using the funding provided.

Figure 3. Awards ceremony for the competition 'World with and without Glass', financed as an IYOG seed project. Presentation to the prize winners by Prof S. Tanabe.
Source: © IYOG archive

Figure 4. Imagination Station Toledo fused fashion and science during a catwalk show. Elements of Style: Glass City Chic - presented by Comfort Line FiberFrame, NGA.
Source: © IYOG archive

Figure 5. The UrbanGlass Visiting Artist and Designer Fellowship provides four artists or designers the opportunity to develop a new body of work using the medium of glass. a) UrbanGlass studios; b) Ghislaine-Sabiti; c) Work by Ghislaine-Sabiti.
Source: © IYOG archive

- One project promoted at the Closing Conference in Tokyo, concerned the judging of essays imagining a world without glass (Figure 3).
- Brazil ran some imaginative children's activities. Some were sponsored and had an international flavor.
- A Grant in Germany helped create a photographic map of architectural features with a significant glass content, a variant of this approach used videos.
- A project (China and USA) on Art Glass Education during an epidemic.
- Glass making in Jordan. A joint program of training particularly with unemployed youths in mind involving Canadian and Thai expertise.
- An imaginative project in Bulgaria used a ham radio station in a

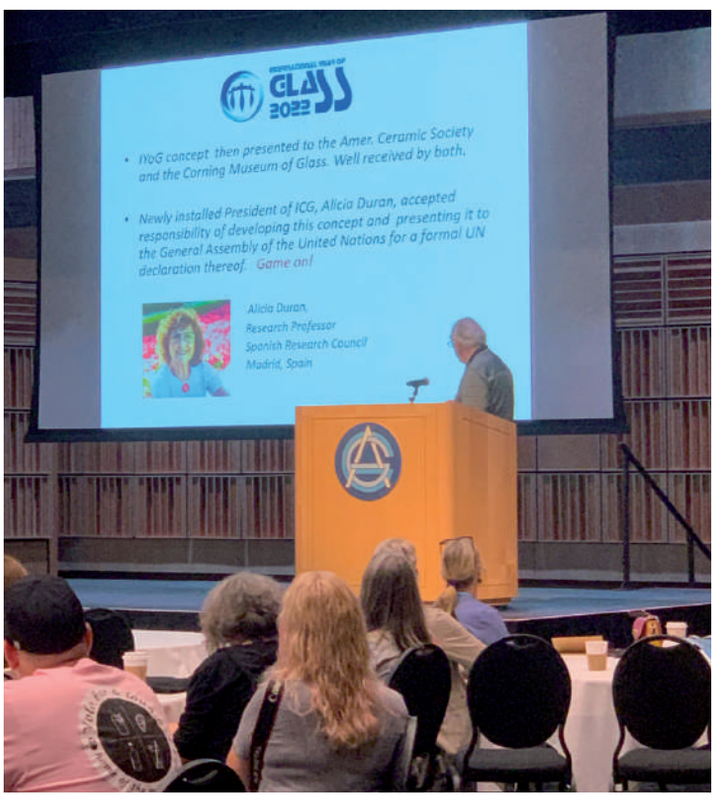


Figure 6. Lecture series on Glass Art during 2022 Summer Conference at Corning Museum of Glass. a) Ms. Kathy Jordan speaking about Rose Windows; b) Prof. David Pye talk.
Source: © IYOG archive

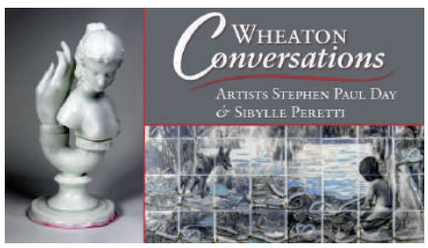


Figure 7. Wheaton Conversations is a virtual series highlighting a diverse community of Artists.
Source: © IYOG archive

primary school and pupils had to identify international Glass events.

- A glass fashion show in Costa Rica.
- The USA received several grants with an educational emphasis.

Figure 8. Map of the Towns twinned by glass in Spain. *Source:* © ECOVIDRIO

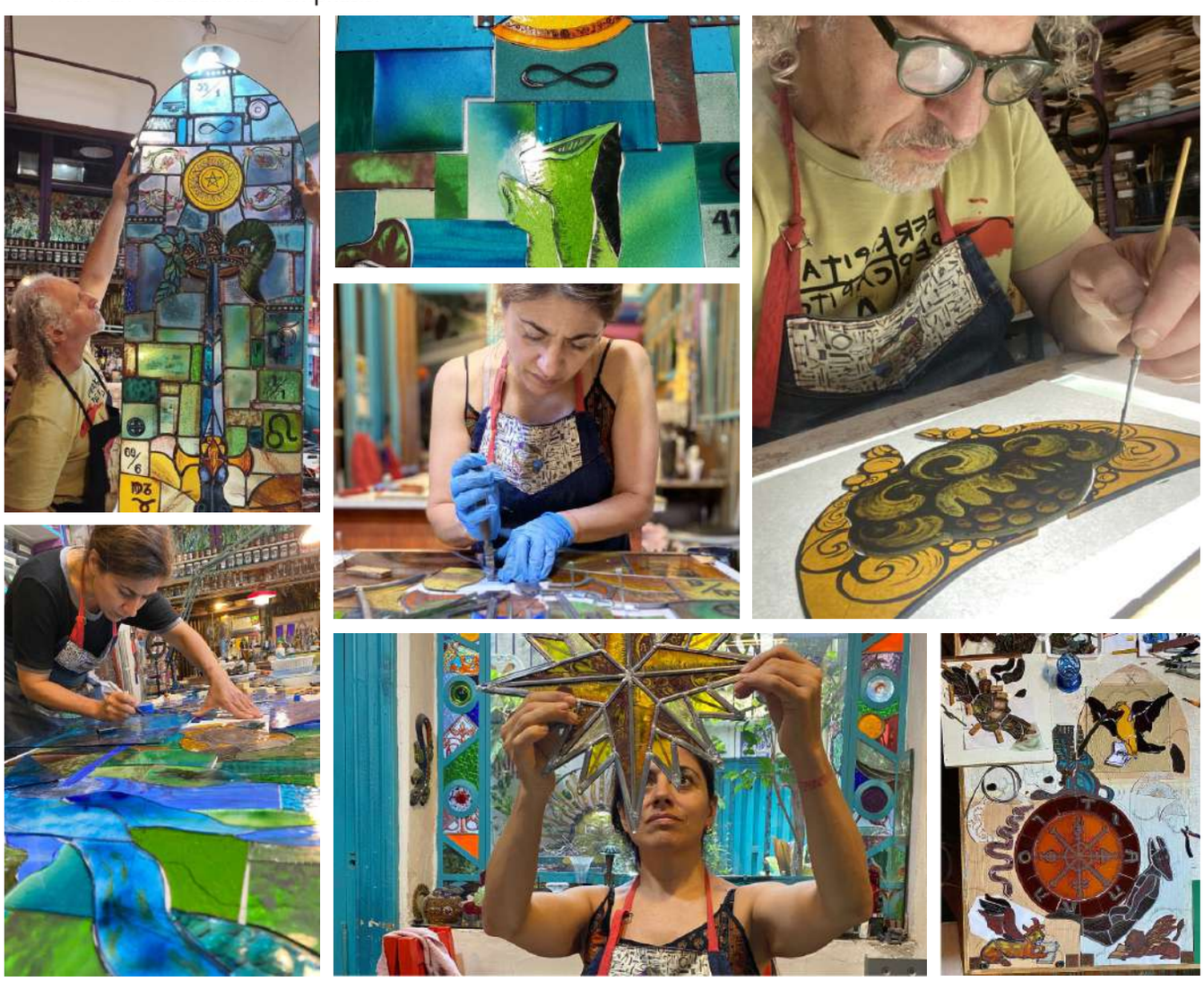


Figure 9. Mariela De Maio & Pablo Schapira, Randomness. Seven stained glass windows in Gothic window frames of 160 x 60 cm, with the symbology of the tarot cards: The Tower, the Wheel of Fortune, the Wizard, and the Star. They are located outdoors, on the ground, forming a circle with an open space that allows entry.
Source: © IYOG archive

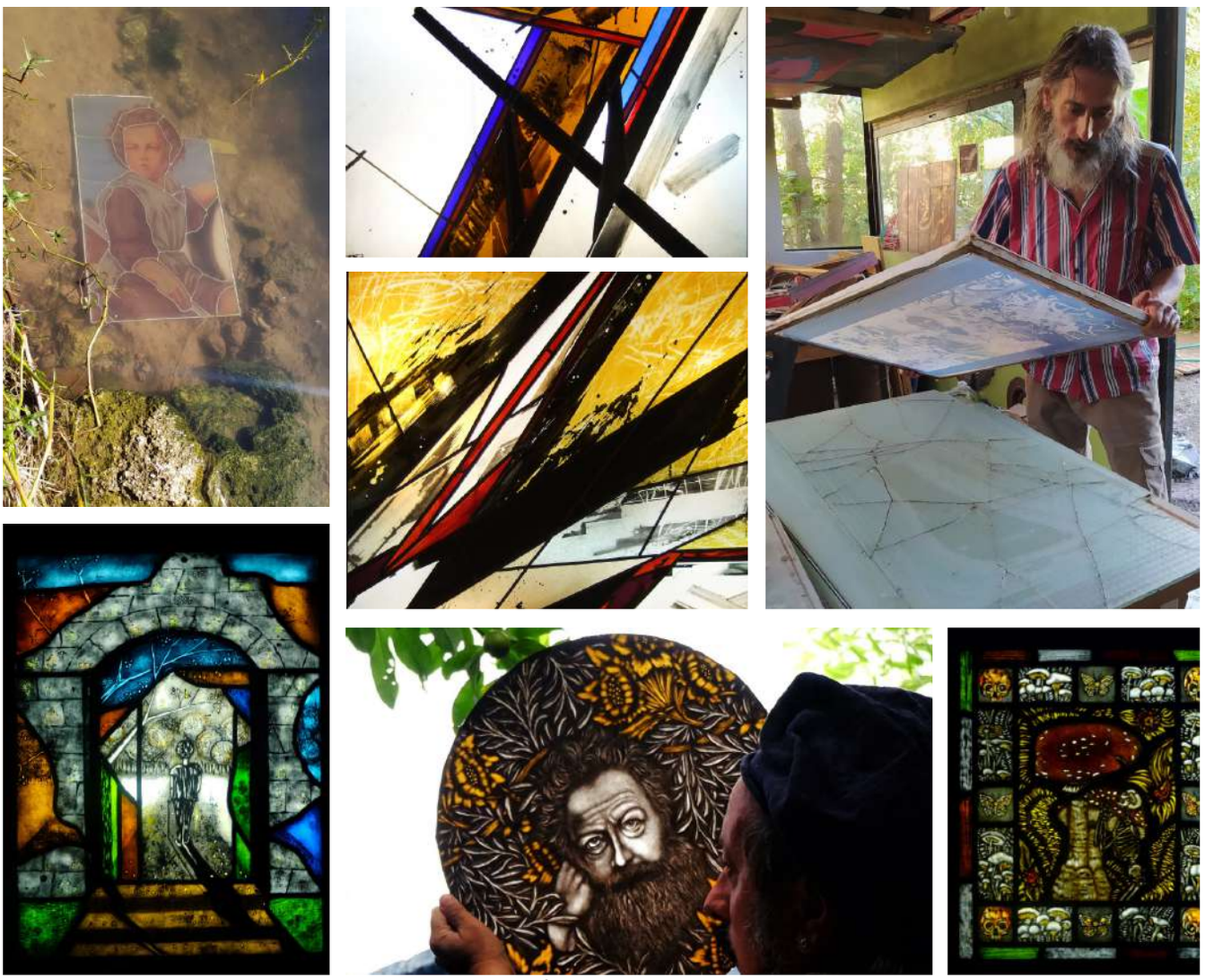


Figure 10. Alejandro Badillos, Guillermo Blanco & Gonzalo Álvarez. The force of grisaille. *Source:* © IYOG archive

Figure 11. Painting bottles at FunGlass School in Slovakia. *Source:* © IYOG archive

Figure 12. A glass mosaic capturing the complex patterns created by Afghan women. *Source:* © IYOG archive

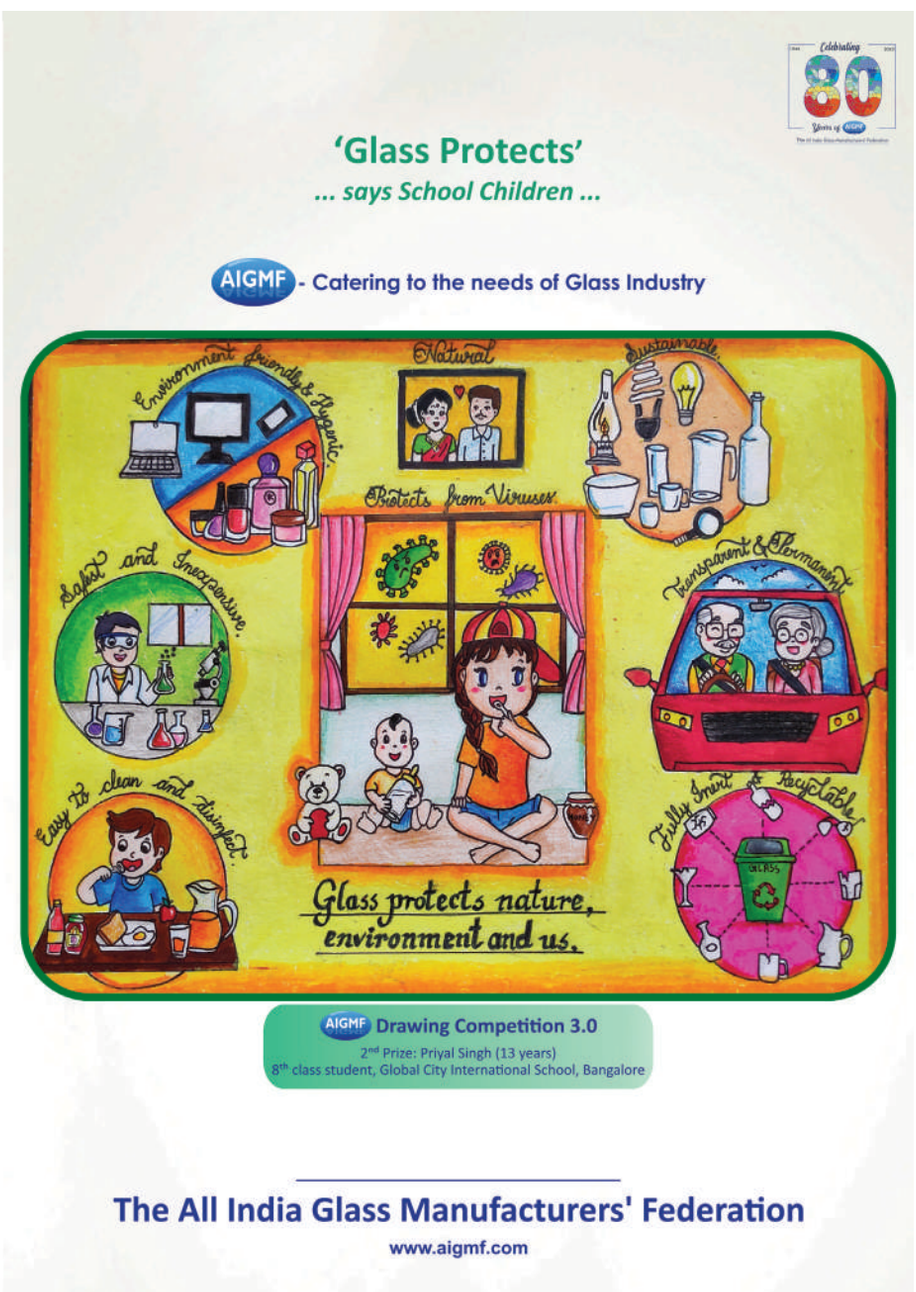
One was run jointly with several other countries, particularly Brazil, and examined new approaches to teaching at the secondary school level. Several others were focused on art, museums and exhibition.

- Towns twinned by Glass (Spain).
- In Japan the glass community created a comprehensive subject map and distributed it to school kids and students nationwide. The subject adopted for 2022 after a highly competitive national selection process was: "Glass, almighty material coexisting with and supporting human beings".

Figure 13. Creative Glass LAB at Creative Glass of Serbia. *Source:* © IYOG database

This was translated into English and Portuguese.

- Ireland, Romania, Scotland, Greece and the USA worked together on a Sustainability Theme with an IYOG grant.
- Argentina received support for 3 seed projects all focused on art and exhibitions.
- A grant to a Leeds Museum (UK) introduced a local ethnic minority group to creating glass art.
- Glass Art created by young artists was displayed at a flower show, and introduced topics such as sustainability.
- A Junior FunGlass School in Slovakia.
- Sustainability was the theme of a significant workshop in Egypt, students' Glass Art was on display in Nigeria and South Africa.
- Encouraging younger children in the Philippines.
- An international initiative to highlight the plight of Afghan women by creating sections of a mosaic.
- 'Creative Glass of Serbia' is an initiative that connects glass heritage, creative industries, and handmade glass production in Serbia ■



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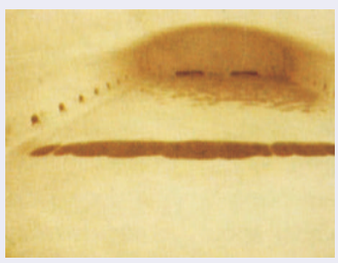







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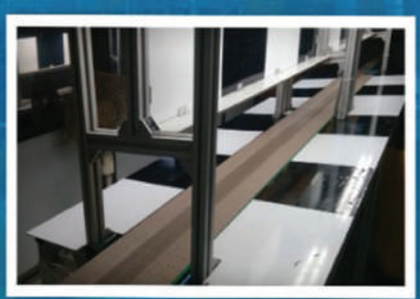
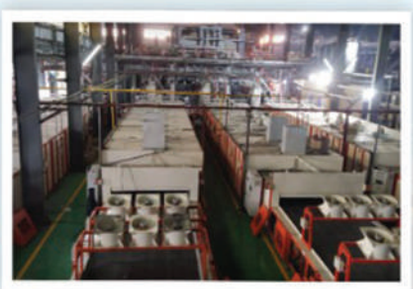


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Quarterly Journal of Glass Industry, published and printed by Vinit Kapur on behalf of The All India Glass Manufacturers' Federation from 812, New Delhi House, 27 Barakhamba Road, New Delhi – 110001 and printed by New United Process, A-26, Ph-II, Naraina Industrial Area, New Delhi-110028
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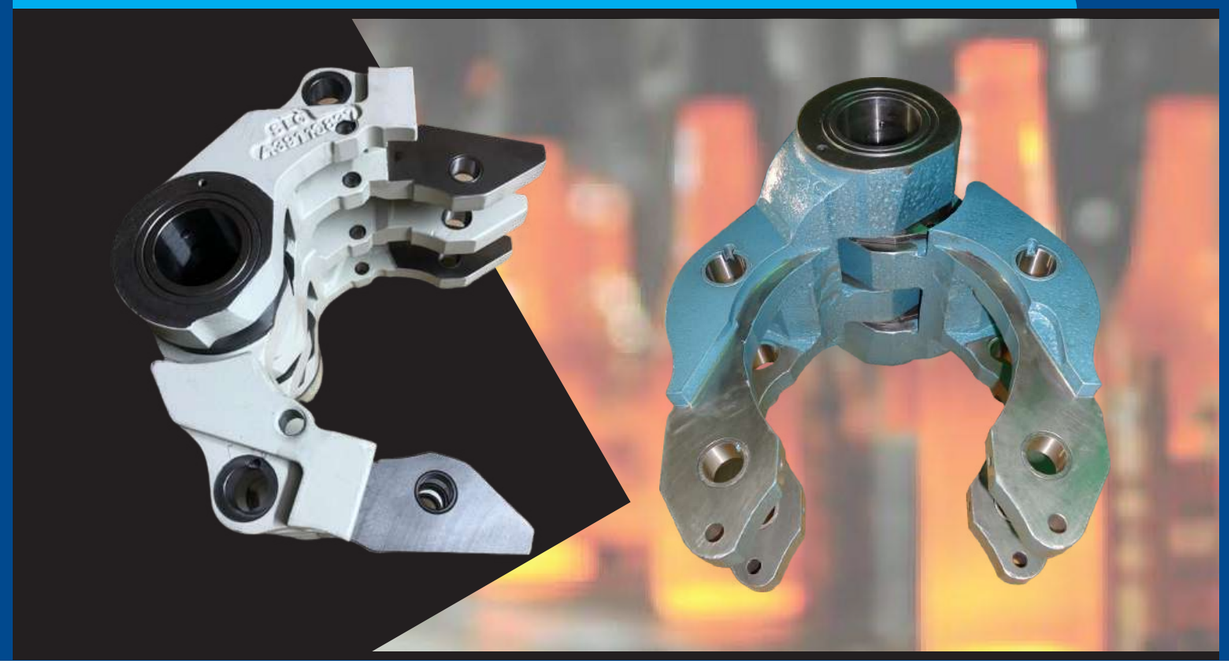

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