The buildingSMART International
Annual Report
2021

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buildingSMART
International

Contents

Chairman's Welcome

Dear buildingSMART colleagues and friends,

Our leader and good friend, Richard Petrie, passed away suddenly in April 2022. Richard dedicated the last 8 1/2 years to creating the organization we enjoy today, with a large chapter network spanning four continents, a growing membership community and a professional standards process serving the building and infrastructure industries. This buildingSMART Annual Report for 2021 is his legacy.

Richard Petrie was immensely proud of the leadership team he assembled – Operations Director Richard Kelly, Marketing Director Aidan Mercer, and Technical Director Léon van Berlo – supported by a dedicated group of specialists. Céline Bent will join the leadership team as our new Compliance Director, a key component in Richard's vision for buildingSMART.

Ian Howell has agreed to serve as interim CEO until a permanent replacement can be recruited. Ian recruited me to join the International Alliance for Interoperability (IAI) in 1995, later renamed buildingSMART international. Ian shares Richard Petrie's dedication to our mission and has the full support of the buildingSMART leadership team.

Richard Petrie was a friend to all of us in buildingSMART. Join with me to honor his memory by continuing our mission to transform the global building and infrastructure industries.

Patrick MacLeamy

Chairman

buildingSMART International

A large chapter network spanning four continents, a growing membership community and a professional standards process serving the building and infrastructure industries

Chief Executive's Statement

I am writing this letter to you as Interim CEO due to the tragic loss of Richard Petrie in April 2022. Richard's vision, leadership and management for the past 9 years has transformed buildingSMART International from a group of well-intentioned volunteers into a professional organization with process and governance. He has also built a very capable full-time management team supported by dedicated staff, growing membership, additional chapters, and the expansion of IFC to support the information exchange needs for infrastructure and buildings. Richard deserves full credit for all the achievements, growth, and success during 2021 that are summarized in this annual report.

I am committed to serve as Interim CEO until such time as the Board can recruit and appoint a full-time replacement CEO. I had the privilege of working for and with Richard for the past 2 years as the US Representative for buildingSMART International (responsible for reinstating the US Chapter) and as an extended member of the bSI leadership team. However, my passion, belief and support for open standards dates back to being a founder of the International Alliance for Interoperability (IAI) in 1994 (later renamed buildingSMART International) and recruiting Patrick MacLeamy as our esteemed Chairman. As a buildingSMART Fellow, I am honored to have the trust of the Board and support of the leadership team to do everything I can to carry forward Richard Petrie's vision and help sustain the momentum achieved under his leadership. I look forward to working with the entire buildingSMART community to continue to advance our core mission, or as Richard would say, "to enable the full benefits of digital ways of working for the built asset industry" through the use of open standards.

Ian Howell

Interim CEO

buildingSMART International

In memory, 1959-2022

Richard Petrie

Chief Executive

buildingSMART International

Richard's vision, leadership and management for the past 9 years has transformed buildingSMART International from a group of well-intentioned volunteers into a professional organization with process and governance

Control your digital destiny

In 2021, buildingSMART International launched the "Control Your Digital Destiny" message to align with the growing international support for openBIM. This message is a crucial next step for buildingSMART as a community as it fully aligns with the need for all organizations to be able to control their data, safeguard their future and have an open dialogue with the community about these requirements.

The built asset industry needs to discuss how to deliver a more sustainable future by ensuring no data is locked in proprietary data formats. The focus is very aligned with the openBIM concept. The industry can find real benefits by extending the use of openBIM for all and ensuring that the data models used by the industry remain accurate, valuable and accessible.

This fundamental principle drives the industry to find better solutions and standards for collaboration, alignment, and future growth opportunities. Without complete control, there is a real lack of certainty for these organizations in navigating a future that will be more digital and more complex.

buildingSMART was founded on community-based endeavours and core principles that seek to ensure a better way of working. It is also good to pause for reflection, and we thank everyone that has gotten us here so far. The foundation has been laid, and now it is time to accelerate the digital future.

Why does it all matter?

Quite simply, if the industry doesn't focus on collaborating and accelerating the developments needed, then it will continue to find itself in an unproductive and inefficient mode. Gaining control of your data will enable great things. However, the prospect of enabling digital twins and the ecosystem to support future use cases can only happen if the rules of data management and governance are open and accessible. Digital twins are meaningless if they cannot be described in many different formats.

Development and adoption of standards are also critical. Making sure they are used and used correctly all adds to the future support and development of the roadmaps outlined in much of this report.

There is also a collective fear of failure. If we do not deliver against our goals, then the concern is there is no alternative for the industry, and this will not do.

What's in it for you?

The real answer lies in the ability for more organizations to take the lead in the development of standards and services. With the ongoing success of IFC, and the developments of a more agile set of data models, there has never been a better opportunity to get engaged. The demand for a more digital future means now is the time to act. If you aren't involved and setting the pace, you don't have input to control your own digital future.

The whole premise of IFC was to ensure a non-proprietary information layer as part of the entire ecosystem. It underpins the foundations of activities for ISO19650 and is used to help structure exchange information requirements. This is critical as it sets the foundations for all digital exchanges based on open standards. The future is exciting, and as long as it remains open, then everyone can have the ability to control their future.

The industry can find real benefits by extending the use of openBIM for all and ensuring that the data models used by the industry remain accurate, valuable and accessible

The buildingSMART Programs

Solutions and Standards

Compliance

User

Technical Service

Solutions & Standards Program

Summary

The Solutions & Standards Program had a significant 2021 with completion of the latest iteration of IFC to include infrastructure and railway entities and finished the year with the formation of a new Room for Sustainability Energy Management.

The program's achievements are due to strong community leadership of the Rooms, and their delivery projects, supported by a robust procedural and governance structure as defined by the bSI Process.

All activities in the program follow the bSI Process, and they are managed within specialist domains, called Rooms. Activities define standards, toolkits or reports that are delivered through projects overseen by the Room Steering Committees.

buildingSMART has its world-renowned Industry Foundation Classes (IFC) standard, which is ISO certified. The ISO 16739 standard was published in 2013 and is now being revised to incorpora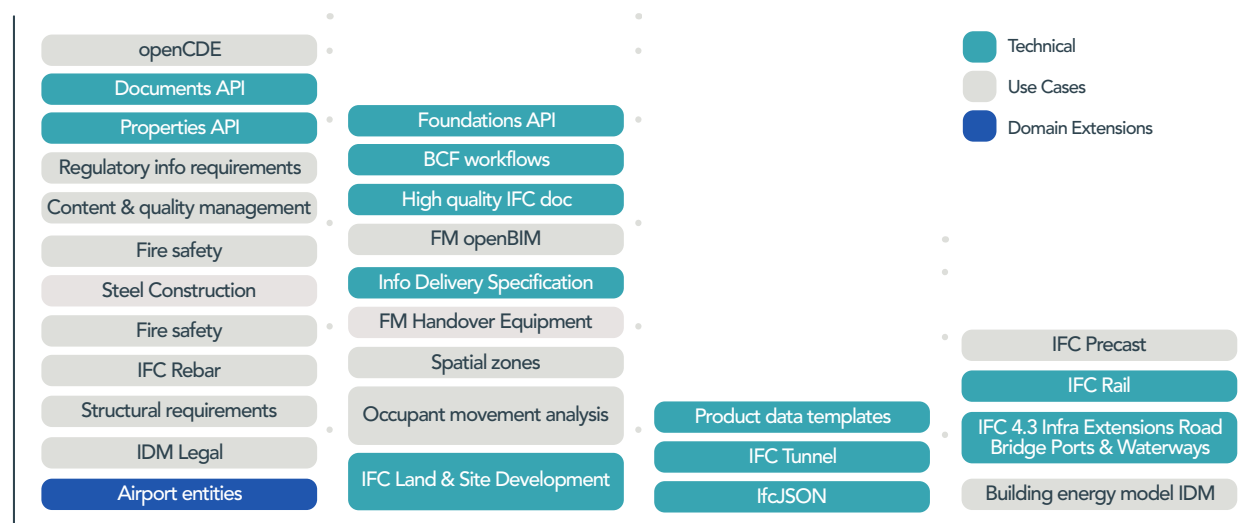te the IFC 4.3 Production Standard that was completed in 2021. The latest ISO revision is expected to by published in 2023.

During 2021, the eight existing Rooms went to the Standards Committee twelve times to ask for endorsement of activities as they progress through the bSI Process.

This included the Occupant Movement Analysis, openCDE and IFC JSON standard proposals, Spatial Zone technical report, , FM openBIM industry insights commencement, IFC 4 Precast IDM standard and of course the IFC 4.3 Production Standard.

In order to reach out to the user community and express the benefits of digital transformation to the executives of asset portfolio owners a White paper, Liberating built asset information to achieve your organisational objectives was published. This paper explains the whole life benefits that could be achieved through better decision making if organisations were to have a software agnostic connected data environment. A second whitepaper expressing how this might be achieved is due in 2022. These papers act as a gateway to the development activities in the bSI community.

Portfolio of Activities

openCDE			
Documents API			
Properties API	Foundations API		
Regulatory info requirements	BCF workflows		
Content & quality management	High quality IFC doc		
Fire safety	FM openBIM		
Steel Construction	Info Delivery Specification		
Fire safety	FM Handover Equipment		IFC Precast
IFC Rebar	Spatial zones		IFC Rail
Structural requirements	Occupant movement analysis	Product data templates	IFC 4.3 Infra Extensions Road Bridge Ports & Waterways
IDM Legal		IFC Tunnel	
Airport entities	IFC Land & Site Development	IfcJSON	Building energy model IDM

Legend:
- Technical
- Use Cases
- Domain Extensions

Initiation — Development — Approval

The bSI community met during two more virtual International Standards Summits, reaching over one thousand people and with each Summit delivering over 80 hours of content across more than 100 sessions. The virtual Summits have proved a very effective way of keeping the community together during the pandemic and there is now a huge wealth of recorded material for the industry to access. We are very much looking forward to meeting in person again in 2022 of course.

Governance & Leadership

Each Room has a Steering Committee made up of industry representatives who create the Room's long-term roadmap.

They oversee the delivery of projects that respond to that roadmap and hence meet the requirements of that industry sector.

The Room Roadmaps and the Project Plans, which will deliver new solutions and standards, consist of a balanced approach to ensure that the functional needs are met, as well as the requirements for quality, longevity and relevance.

Infra Room Steering Committee elected five new members of industry leaders from asset portfolio owners, construction companies and a software vendor, joining designers and educationalists, thereby continuing to represent all the major players in the community.

The program's achievements are due to strong community leadership of the Rooms, and their delivery projects, supported by a robust procedural and governance structure as defined by the bSI Process.

The Airport Room now has a full complement of industry leaders for their Steering Committee and is running regular industry forum meetings for all those in the community that are invested in the airport domain. The Construction Room launched its new Steering Committee in January 2021 and has commenced with new activities as well as determining the roadmap plan to respond to the construction industry requirements.

The bSI Process also continues to be improved, and certain projects, such as the Rail and Infra Extensions, have been at the leading edge, testing out the requirements such as software validation.

Organisation definition, communication channels and document access are also key elements of the bSI Process, and we continue to make significant improvements in these areas.

The introduction of technical deployment guidelines is ensuring proper quality control and publishing of new standards and making the delivery of new standards more efficient with clearer instructions for the project teams.

The web-based platforms that support project management and information flow are now in good use across the program and training continues to be delivered in their use to ensure efficiency and conformity.

International Standards

There is a broad portfolio of activities across all Rooms.

The IFC4.3 version of the schema, which has been expanded to incorporate infrastructure aspects, is now complete and published as a bSI Production Standard. This means software vendors can start to use it to produce compliant software. The IFC 4.3 has been formally submitted to ISO who have accepted it as a Draft International Standard (DIS) which means it is on track for a revision of ISO 16739 in early 2023.
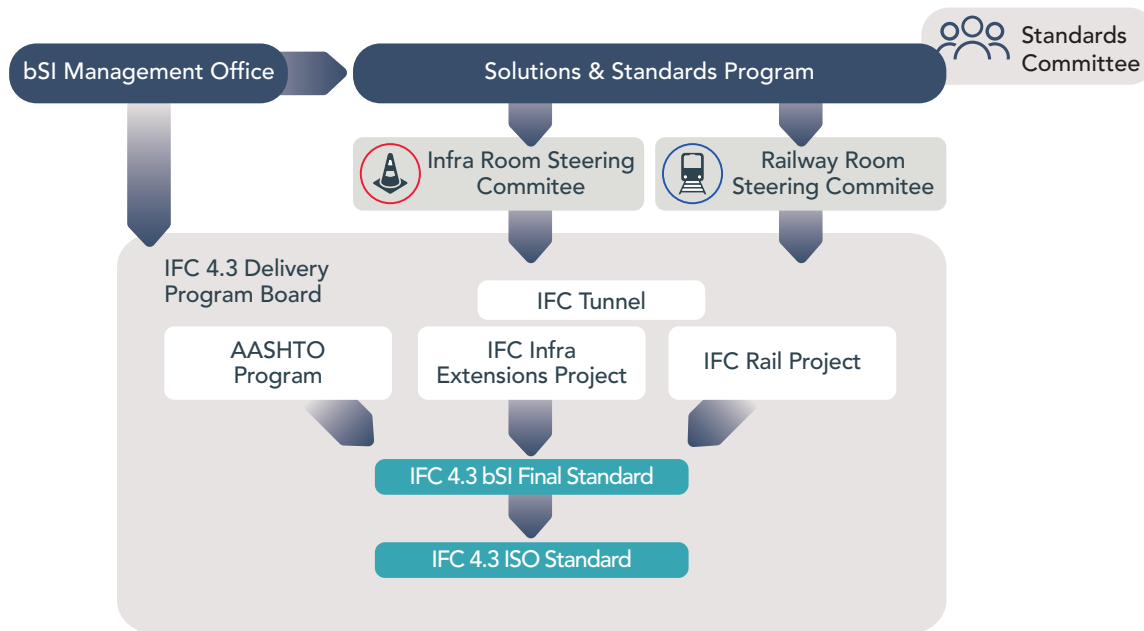
User Services

1) Use Case Management (UCM)

The new Use Case Management service was prepared for an early 2021 launch. This service improves the capture of exchange requirements.

IFC4.3 Delivery

Rooms and their projects are able to input specific exchange requirements and search for existing use cases to help with new Activity Proposals.

It also allows the Room Steering Committees to review user requirements to inform the Room Roadmap plans.

Chapters are also able to obtain a tenancy on the system, and in the near future all enterprises will be able to do so.

2) buildingSMART Data Dictionary (bSDD)

The bSDD has been revised and the new version is now available for use. The openBIM Standards, which are being created through the program, use the bSDD to input the user-defined properties and classifications.

3) Software certification

A program to improve the software certification process is in progress. This consists of two consecutive projects. The first is to determine user needs through a Voice of the Customer analysis. The out put of the subsequent gap analysis will determine whether an improvement to the existing service or a whole new model is required. Project 2 will be to deliver the working service.

Standards Committee Voting

The Standards Committee consists of representatives from every member and Chapter and is the senior body overseeing that the bSI Process has been correctly followed to ensure international consensus.

They were asked to vote on the following:

1) Published Reports
- IFC 4 Precast IDM
- IFC 4.3 final version for ISO

2) Activities Launched
- Facilities management openBIM
- Open CDE
- IFC JSON
- Occupant movement analysis
- Spatial zone requirements
- IDM / MVD for steel construction
- Regulatory Information Requirements
- Airport entities

Compliance Program

Professional Certification program

The Professional Certification Program has grown immensely through organic means. The program has been accelerated through Chapter Network which has provided the world with a common international framework to support the use of openBIM solutions and services.

bSI Program initiation: November 2015

First Chapter launch: **September 2018 (Germany)**

Number of participating Chapters: **19**

Number of active Chapter program: **13**

Number of Training Providers worldwide: **132**

Number of Qualified Individuals: **9,319**

Number of active development workgroups: **6**
(Practitioner, COBie, Building Performance, Owner/Operator, Contractor, Designer)

Number of volunteers at an international level: **120**
(SC + AP + Experts who reviewed the Question Database in 2018 + current workgroup participants)

Total sponsorship gained:
€142,000

Total development & operational costs:
€674,472

Other revenue:
€644.442

Program Balance:
€111,970

Total revenue:
€786,442

These figures are accurate as of 3 1st December 2021

Chapters are continuing to form working groups that align to international Rooms which helps develop new concepts and helps develop use cases.

In 2021, 3 further applications were in progress for IFC4 export certifications

Software Certification program

Software Certification Software certification services continues to be led and supported by the Institute of Applied Building Informatics (IABI), AEC3 and Apstex. The focus during 2021 was again the drive to move vendors to switch to IFC4 Software Certification as well as continued support of other standards. Demand for certifications of the established IFC 2x3 exchanges continued to be healthy with more software exchanges being certified during the year.

In 2021, 3 further applications were in progress for IFC4 export certifications. More software vendors are expected to follow shortly.

"The advantage of IFC4 certification for users, is the condition that the exchange requirements must be 100% supported by the software applications. This facilitates the application without having to compare certification reports."

Rasso Steinmann, Vice Chairman, buildingSMART International

Below is a table for the full list of IFC4 certifications:

Vendor	Application	Exchange Requirement	Certification Type	Status	Started	Finished	Schema
Vectorworks Incorporated	Vectorworks	Architectural Reference Exchange	Export	Finished	11/09/2017	17/04/2019	IFC4
GRAPHISOFT SE	ARCHICAD	Architectural Reference Exchange	Export	Finished	21/06/2018	05/06/2019	IFC4
Trimble Solutions Corporation	Tekla Structures ImportSDK (import)	Structural Reference Exchange	Export	Finished	02/10/2017	22/09/2019	IFC4
Autodesk	Autodesk Revit	Architectural Reference Exchange	Export	Finished	29/08/2017	19/10/2020	IFC4
DICAD Systeme GmbH	STRAKON	Structural Reference Exchange	Export	Finished	07/09/2018	02/11/2020	IFC4
Autodesk	Autodesk Revit	Structural Reference Exchange	Export	Finished	29/08/2017	09/11/2020	IFC4
Magicad Group	MagiCAD	MEP Reference Exchange	Export	Finished	04/03/2021	22/07/2021	IFC4
Autodesk	Autodesk Revit	MEP Reference Exchange	Export	Finished	12/08/2020	27/04/2022	IFC4
Allplan GmbH	Allplan	Architectural Reference Exchange	Export	Finished	13/03/2020	06/05/2022	IFC4

User Program

The buildingSMART user program facilitates understanding and implementation of bSI standards and solutions around the world. The program also enhances collaboration and communication among the buildingSMART community and the built asset industry at large to better make use of existing standards and solutions in use.

Chapters are continuing to form working groups that align to international Rooms which helps develop new concepts and use cases.

Use Case Management Service

The bSI Use Case Management (UCM) is a service to capture, specify and exchange industry best practice. It provides a guided process for developing and sharing use cases with a common language and understanding of BIM applications for the entire built asset industry.

The UCM is open to the entire buildingSMART community and is rolled out through the Chapter Network. With a tenancy, chapters are entitled to manage and adapt the UCM service for their local requirements. bSI rooms and activity teams have free access to the Co-Creation Space and are supported by bSI in their projects through the UCM Project Management Office (PMO).

bSI Service launch:
January 2020

Number of participating Chapters: 5

Number of Chapters Candidates: 5

Number of active bSI Rooms: 6

Number of Registered Users: > 2'000

Number of Co-Creation Space Users: > 500

Numbers of Publications: 75

The UCM not only empowers the entire bSI community but is also open for enterprises, institutions and other organisations. For instance, the EU Horizon project.

The service is aligned with the development of the Technical Roadmap. In the near future it will support the exchange with the buildingSMART Data Dictionary (bSDD). Exchange requirements will be available in the Information Delivery Specification (IDS) format.

The program is led by Thomas Glaettli, Head Use Case Management Service.

Awards Program

The bSI Awards program continues to generate more interest with a total of 111 projects submitted in 2020. There was a total of 7 category award winners, 3 additional excellence awards and 6 special mentions. There was also a 2020 Yearbook created with all winners and finalists featured. You can see the awards section in the annual report for more information.

The UCM is open to the entire buildingSMART community and is rolled out through the Chapter Network. The service is aligned with the development of the Technical Roadmap.

Technical Services

The Second-year of the Technical Roadmap: Integration

The Technical Roadmap turned one year old in April 2021. The second-year saw the launch of several new components like a new buildingSMART Data Dictionary (bSDD) and a new Use Case Management Service (UCMs). Most notably was the creation of a completely new IFC Management and maintenance system. The previous system to maintain IFC was a custom build tool that had lots of limitations and little focus on quality control.

IFC Management and Maintenance

The new IFC Management and maintenance system runs on Github combined with Travis. The management of IFCs is done in a UML class diagram. The three main parts (Classes, Psets and Concept templates) of IFC that have before been managed in separate systems, are now managed in one integrated data model. This UML model is published transparently on Github for everyone to study and access.

Every change refers to discussions that resulted in a consensus-based conclusion. This makes the development versioned, traceable, and transparent. In addition, on every change and update, quality control algorithms run automatically, resulting in a publicly available report. Quality assurance and quality control are the highest priority in the new IFC management system.

The documentation is published as a markdown in the same Github repository. This allows everyone to suggest changes and improvements to the documentation to allow acceleration of the readability and improvement of quality in general.

Every update of the UML also triggers scripts that automatically generate derivative publications. An updated express schema is published after every update and change, just like updated Pset definitions, HTML documentation, translation files, and XSD schema, etc. In the future, this functionality will be extended to other formats like ifcOWL and IfcJSON.

The IFC 4.3.x development was migrated to the new system mid-2021, and in 2022 the 4.4 version of IFC will also be using the same system setup.

A semi-automatic integration from the IFC maintenance system to the bSDD and a fully automatic integration to the IFC Translation service is now available.

New bSDD Launched

During the buildingSMART Fall summit, the new bSDD was officially launched. This milestone followed a year of thorough testing and quality assurance. The bSDD is considered a core component in the openBIM ecosystem, with strong integrations to the development of IFC, the new Information Delivery Specification (IDS), and the UCMs.

The bSDD is an effective way to publish standards and link them to each other. The internal structure of bSDD supports the new ISO 12006 part 3 and the ISO 23386. This positions the bSDD as a service to develop and publish Product Data Templates (PDTs) using a structured workflow that increases interoperability. In 2021 a lot of work was done to publish the data inside the bSDD in different formats. The bSDD API now supports HTML, XML, JSON and RDF through the URIs, which instantly bring the standards published in bSDD into the linked data ecosystem.

Integration of bSDD functionalities into tools that support IFC (authoring tools, editing tools, etc.) is a key success factor for the coming years.

The development of a bSDD Validation Service progressed as well in 2021 and will be accelerated in 2022.

In 2021 the bSDD development also took a setback. Product owner Frédéric Grand left the French chapter and had to give up his role as leader of the bSDD.

Quality assurance and quality control are the highest priority in the new IFC management system

buildingSMART owes him a lot of gratitude for his massive work to accelerate the development of bSDD for the good of the industry. Frédéric will still be involved as advisor to the development.

IFC translation service

The buildingSMART Translations service runs on translations.buildingsmart.org. It uses the Crowdin translation system that is made available for free to buildingSMART. Currently, IFC 4.3 is hosted in the translation service and is ready for translations into several languages. Everyone can help with translations ('crowdsourcing translations'), but representatives from the Chapters need to proofread and approve the translations. Guidelines for translators and proofreaders (Chapters) have been created and published on the buildingSMART knowledge base (user.buildingsmart.org).

Input into the translation system comes directly from the IFC management and maintenance system. New terms and descriptions in upcoming versions will therefore be available for translations even before a formal release of an update. Approved translations are automatically published as an open data format for translations behind the crowdin API, and are published in the bSDD.

UCMs launched

The UCMs was officially launched in 2021. The service was developed and is maintained by the Swiss chapter but is now formally part of the Technical Services department of buildingSMART International. It has a Steering Committee to drive the adoption and use of UCMs that assemble every 2 months.

The UCMs roadmap is created in 2021 that prioritized integration with bSDD and the new IDS standard.

Software Certification Market Analysis

The Strategic Advisory Council (SAC) had prioritized the redevelopment of IFC Software Certification in 2021. Gobar was hired as an external consultant to interview clients, software vendors and other stakeholders to generate a market analysis of requirements for Software Certification. First results of the analysis points in a direction where multiple levels of IFC software certification need to be available. This will be further outlined in 2022.

Besides the IFC Software Certification, there is a growing request for BIM Collaboration Format (BCF) (file and API) Certification and the validation of IDS files. In 2022 this will be further analyzed in collaboration with the community.
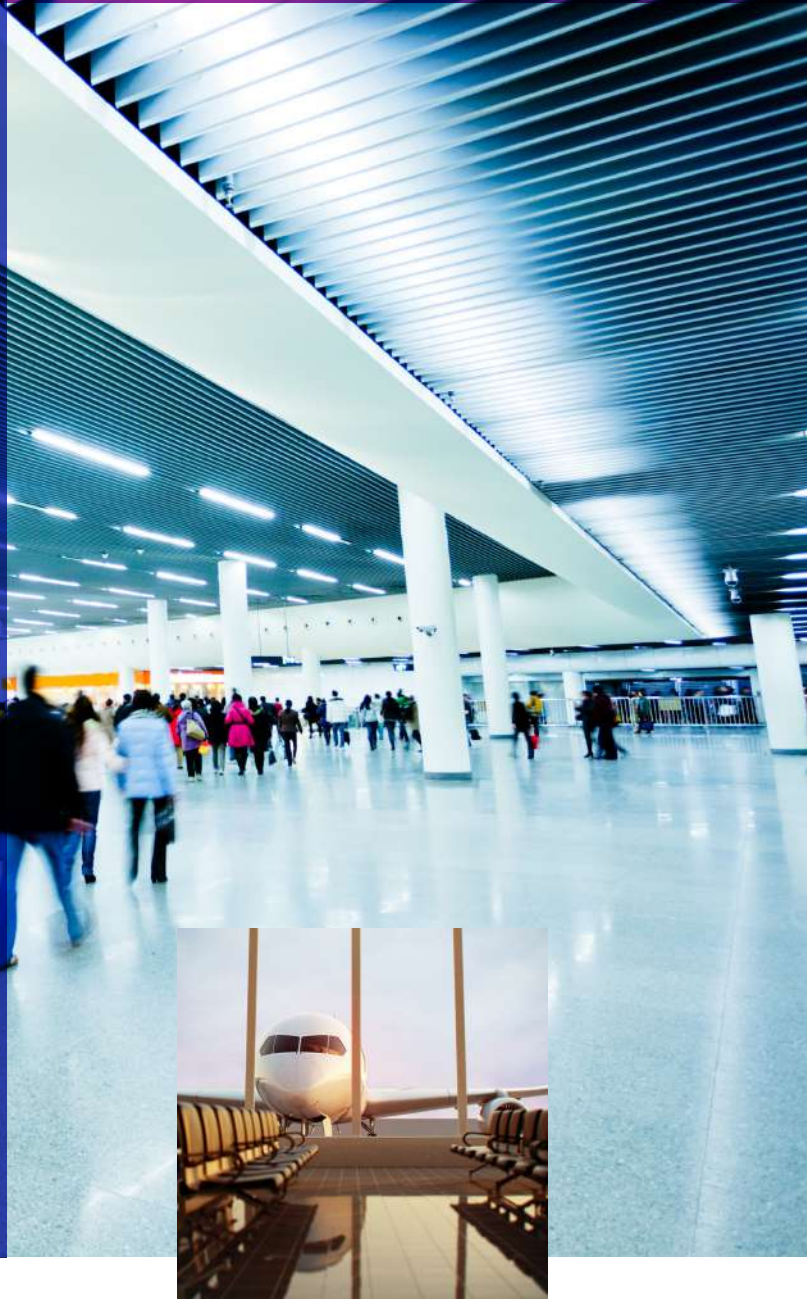
Airport **Room**

The mission of the Airport Room is to develop and deploy open digital standards for the airport environment. The unification of digital airport standards will enable more efficient working from the common supply chain and create a uniform approach for the industry.

The Airport Room continues to develop and now has representatives from airports in Asia, China, the GCC, Europe and the United States on its Steering Committee.

Some of the key objectives/challenges for the Room include:

- Creating a work plan for managing airport-specific assets

- Usage of rules for IFC models at airports

- Linked data/ontology regarding library exchange specifications

- Development of GIS-IFC interoperability

- Missing IFC entities

- Identification of the functional requirements of a digital twin

- Enabling economies of scale within the supply chain and with maintenance suppliers

- Completing the existing standards with airport-specific objects, data and processes

- Integrating these standards to align with the building, infrastructure and airport processes

- Enabling asset management decisions based on cost, risk and performance derived from openBIM for the entire lifecycle of airport facilities

- Innovative solution decisions designed to reduce disruption at airports

- Collaboration with the other buildingSMART Rooms

The primary activity in the Room at the moment is to uniquely define critical airport entities to create clear digital workflows for the whole airport community.

A series of surveys are underway to harmonize terminology as part of this initiative.

Building **Room**

The core mission of the Building Room is to create open digital standards and solutions by enabling intelligent data that either contributes to the planning, design and construction of buildings or the ongoing operations and maintenance.

This will enable process and data integration for buildings for their entire lifecycle. The Building Room is led by a Steering Committee comprised of representatives from international Members and buildingSMART Chapters that are focused on a variety of projects.

Great progress has continued to be made throughout 2021 and into 2022, with some project reaching their conclusion and new activities being proposed.

Some of the key objectives of the Building Room are:

• Open standard data exchange for whole life building management

• Asset management exchange of information

• Ensuring archives of asset information

• Digital project management

There is a range of initiatives in the Building Room portfolio. Some are close to conclusion, such as the Building Energy Modeling IDM and Quantity Take-Off IFC 4 MVD. Others in progress are Fire Safety and Occupant Movement Analysis, FM Handover – Equipment Maintenance, and Steel Construction

IFC 4 Precast has become a bSI Final Standard in the last year;

Facilities Management and openBIM has recently published five industry insight papers which are the basis of future openBIM® standards and these cover what Facility Managers require from BIM with respect to:

Cleaning airports

Public government workplaces

Space management at universities

Asset management for hospitals

Business catering

These are published in the Standards Library at www.buildingsmart.org

Construction **Room**

The Construction Room is focused on digital transformation and believe it will make construction site practices more efficient, safe and sustainable through the better flow of information, enabling innovative methods of construction and the incorporation of modern technologies.

Its remit is to enable the application of openBIM® standards to construction sites and communicate the benefits of openBIM to industry players in order to promote its further use.

The Construction Room is concerned with use cases where the application of openBIM will result in greater productivity, right first-time assembly, reduction in waste of materials and resources and improved safety.

Some of the key objectives of the Construction Room are:

- Advance the digitalization of construction
- Develop site environment best practices based on openBIM
- Integration of design, schedule and cost
- Capturing of use cases to make 4D and 5D (cost and scheduling) more commonly used
- Provide openBIM education to the construction industry
- Logistics, material management and barcoding/RFID integration

- Incorporate forward-looking Information and Communication technologies into the development of open construction solutions and standards
- Easier and streamlined flow of information through the supply chain, with appropriate levels of definition, final design sign off
- Opportunities for modern designs combining materials and components through DfMA analysis and off-site modular solutions, enabling efficient assembly flow
- Visual simulations of defined methods such as the placement of temporary works, assembly of components and modules
- Data linkage with non-BIM software and other standards

With a strong focus on new technologies, the Construction Room intends to focus efforts on new and emerging trends that will enhance on-site performance. Proposed initiatives include Construction Information Management, Integrated BIM Project Management, 4D/5D modelling, openBIM and the Internet of Things (IoT), and the design of autonomous vehicle control.

Infrastructure **Room**

The Infrastructure Room aims to combine, enhance and develop open standards for intelligent data, enable process and data integration for infrastructure projects and assets. The Infrastructure Room leads buildingSMART's efforts in several areas, including roads, bridges, tunnels, ports and waterways and alignment work.

Some of the key objectives of the Infrastructure Room are:

- Enable data exchange based on open standards for the planning, realization and maintenance of infrastructure works and ultimately all aspects of the built environment

- Improve the exchange of information and open data access between asset management databases

- Promote enduring archives of asset information based on open standards

- Enable lifecycle information management for infrastructure based on open standards

- Enable the merging of project related information e.g. requirements and risks, with asset information

The Infra Extensions deployment project took as its starting point the Candidate Standards for Road, Ports and Waterways and Bridge which published the requirements analysis, taxonomy report, an extended UML model report and an implementation report. IFC Bridge has been used for implementation in US, France and Italy already.

In conjunction with a project from the Railway Room to incorporate rail ecosystem entities, the output is the latest revision of IFC called IFC 4.3 Production Standard. The IFC 4.3 program board is managing the relationahsip with ISO for a revision to ISO 16739 standard that is expected to be published during 2023.

The buildingSMART collaboration with Open Geospatial Consortium continues following the publication of last year's report and focuses on the importance of BIM-GIS coordination as does the cooperation with CEN TC442

The Room Steering Committee is also focused on the roadmap which addresses the future needs of the infrastructure industry and addresses these in conjunction with other core themes such as the bSI Technical roadmap, partner liaisons, completion of current standard creation work and launching of the next activities. A series of Chapter Roadmap workshops are taking place to establish the international user requirements.

Product **Room**

The Product Room's core mission is to manage the development and provision of processes, templates, tools and functionality to enable the robust and efficient use of product data. This includes relevant third-party standards, classification systems and other forms of structured content for openBIM.

The Steering Committee are developing strategies that will bridge the information divide between those operating in the supply chain, where there are no international open standards, and the design and build domains, who are using IFC-based standards.

Some of the key objectives of the Product Room are:

- Enable the efficient use of product data in projects and subsequent asset management, including advances in digital supply chains

- Support the other Rooms to define the product data requirements needed as outcomes of their standards

- Develop and execute projects for product support to advance the development of openBIM

- Facilitate the translation and localization of IFC

The Room is also liaising with the consortium working group for advancing the supply chain needs in a proposal to connect bSI and GS1 standards, which will ultimately develop new standards for product manufacturers.

Initiatives in development include Construction Object Data (COD) as a proposal to develop classification for Products within IFC and Environmental Indicators for product manufacturers which have been added to the buildingSMART Data Dictionary (bSDD).

Railway **Room**

The core mission of the Railway Room is to accelerate and exploit new digital opportunities for railway systems and create a comprehensive and applicable digital representation of the entire railway ecosystem that will support all phases of the lifecycle. This provides the basis of interoperable support systems, reduced complexity, secure and safe solutions, and reduced costs for all stakeholders.

The Railway Room Steering Committee is led by representatives from ÖBB-Infrastruktur, SBB, Trafikverket, CRBIM, MINnD, SNCF, FTIA and RFI. The Steering Committee oversees the largest international project at bSI, called the IFC Rail Project. This project is developing an extension to the IFC schema to include railway entities. The resulting IFC4.3 Production Standard is on schedule to complete in autumn 2021.

Some of the key objectives of the Railway Room are:

• Develop interoperable support systems

• Reduce the complexity of the rail ecosystem

• Assure secure and safe solutions

• Reduce project costs and delays for all players

• Work with buildingSMART, rail owners and operators, and other stakeholders to:

  • Extend the IFC Infrastructure Schema for the rail domain, construction and maintenance

  • Contribute to the IFC Common Schema development

  • Build on international consensus

  • Take into account iterative works with complementary data and IFC deployments

  • Support early deployment and testing by making the deliverables publicly available and open

In conjunction with a project from the Infrastructure Room to incorporate road, bridge, ports and waterways entities, the output of the Rail project is the latest revision of IFC called IFC 4.3 Production Standard. The IFC 4.3 program board is managing the relationship with ISO for a revision to ISO 16739 standard that is expected to be published during 2023.

The IFC Rail Project was the focal point of this Room, specific activities of the project are divided into several initiatives supported by a Project Management Office and Technical Services team. The groups have developed use cases, Information Delivery Manuals (IDM), UML models and process maps. They have validated all the test cases in software and following the IFC4.3 deployment guidelines. The main domains of focus were Track, Power, Signaling, Telecommunications and the common elements for infrastructure domains. The Room has launched a new project in 2022 with the objective of deploying the IFC 4.3 standard into actual rail development projects and asset operations.

Regulatory **Room**

The core mission of the Regulatory Room is to help both facility owners and regulatory authorities benefit from the use of openBIM to meet expectations. The vision is an automated regulatory process, achieved by supporting gradual change in workflow from manual to fully automated whilst safeguarding the legal perspective.

The Regulatory Room continues to improve in the development and procedures needed to support activities across the community. The Regulatory Roadmap has developed with short, medium and long-term goals, based on its published charter and roadmap.

Some of the key objectives of the Regulatory Room are:

- Standardize processes, workflows and procedures for applicants and regulators based on openBIM and support them with tools, guidelines and manuals

- Support interoperability between Regulatory, Requirements and Recommendatory (RRR) content

- Provide an open discussion forum for each government's building regulators, researchers and implementers to promote openBIM-based processes and collaborative issues

- To be an arena for government regulatory bodies to share information, inspire and implement automated code checking using openBIM standards, including ISO 16739, in real-life situations

- Lead and manage projects and initiatives to facilitate and influence adoption by stakeholders.

The Room has published several bSI Technical Reports, including:

- e-submission: common guidelines to introduce BIM to the building approval process

- Application forms: common information requirements for automated compliance checking

A new project has commenced, based on the Application forms report called Regulatory Information Requirements which is focusing on achieving a coherent way of obtaining the critical data for building permits in Capital projects.

The Room has published a survey of Regulatory bodies which reached 160 participants in 38 countries. It concluded that awareness of BIM in Regulatory bodies was high, with the majority planning to use it in their processes, setting a good foundation for the Room's plans.

Sustainability Energy Management **Room**

This Room was formed at the end of 2021 and is still in development.

Currently the Steering Committee comprises of representatives from Schneider Electric and Siemens and other members will be invited in due course.

The Sustainability Energy Management Room (SEMR) was established at the end of 2021 and its mission is to ensure a more sustainable future for the built asset industry focussed on electrical networks in buildings. The new Room aims to develop and increase the use of open digital BIM standards for the optimum management of building energy requirements to address energy management, waste, and, to create innovation opportunities.

Note: The Room Charter which defines the mission and goals is being defined.

Some of the key objectives/ challenges for the Room include:

- Enabling energy consumption, understanding carbon footprint and evaluating circular economy aspects in the design of innovative solutions.

- Enabling users to make informed decisions in design, build and operation based on a comprehensive connected data model of their buildings incorporating a full electrical network, control network and the energy forecasted behaviour.

- To anticipate and specify digital ways of working at the earliest stage of an assets life whether it be new build or refurbishment

- Complementing the existing buildingSMART Industry Foundation Class (IFC) open standard, by integration of the Normalised Electrical Model (NEM) to enable more efficient working in the electrical design domain.

- Linking the electrical network and building management system to the building and mechanical and plumbing system model.

Technical **Room**

The Technical Room works with the global bSI community to foster advances in the core data architecture, tooling, and applications of open data standards to support built asset industry interoperability.

This objective is facilitated by:

- Surveying the information technology, data architecture, and data science advances happening across the broader technology industry for applicability to bSI initiatives

- Connecting innovators in industry and academia to encourage participation in buildingSMART technical programs and projects

- Facilitating bSI processes for maturing technology innovation from ideation through formalized projects and subsequent formalized standards

- Facilitating the development and promoting the distribution and use of workflow-enabling toolkits, tools, and technologies

The focus in 2021 was to support the work that was started in 2020 and then additionally begin to look to the future of IFC and related standards and services.

The project that have continued to make progress in 2021 include:

- **openCDE Documents API** – This has continued to make progress and begin implementations. Demos of the APIs were included in the program of the Spring 2022 bSI Standards Summit. The openCDE Documents API builds on the work that was started in the BCF standard and utilizes the Foundations API standard they both share. Final documentation and promotion to Candidate Standard status are expected in the second half of 2022.

- **Information Delivery Specification (IDS)** – IDS is moving forward in the standards process and is being demonstrated through test projects and some open-source development.

To determine where we should go in the future, the Technical Room used the bSI Standards Summits in 2021 to bring together developers and others working on aligned issues, inside and outside the buildingSMART community. The main goal being that we ensure that future work we do is driven by industry needs whether that be, end-user, software products or developers.

The Technical Room showcased technologies and platforms in the Summits to describe different approaches to the problems of data structures and exchanges bSI is looking to address. This included:

- **IFC.js** – IFC.js is a Three.js based open source IFC viewing technology. At this point it's a little over a year old but has started to gain massive traction in the industry.

- **BHOM** – The Buro Happold Object Model is a C# library that allows direct connections and interoperability between software applications.

- **iModel** – iModel is a project from Bentley Systems that looks to solve issues around model sharing, transactions and other change management topics.

- **Unreal Engine** – Unreal speak to their "File per Object" efforts in the new version of Unreal Engine to showcase a technology approach that leverages discreet datasets vs a monolithic one.

In the coming year, the Technical Room will continue to focus on how buildingSMART will update IFC to work with the new technologies that are developing as well as understand how to adapt to the growing number of use cases the community is asking to support.

Chapter Network

The buildingSMART Chapter network continues to see strong growth with the outlook looking very positive. There has been a lot of interest in new Chapter members as well as changes of statuses for existing Chapters. In 2021, Croatia was the only Chapter to move to Developing Chapter status with Spain and Italy moving from Developing to Full Chapter Status. This move from Spain and Italy really demonstrates the strength of these Chapters in moving to the top tier.

There has been new interest shown from North African countries such as Morocco and Algeria, as well as continued interest from Romania, Portugal and from the South American continent by way of Red BIM Gob LATAM, the LATAM Government Client Group.

There have been new supporting processes and materials added to help prospective Chapters in creating their submission and more information about what's expected from Chapters. There are also regular Chapter updates which can be found on the bSI website.

"Chapters are such an important part of the buildingSMART community as they provide an opportunity to connect with a global user program. As we continue to get closer to users, we need the Chapters to continue their efforts in making buildingSMART appealing and dynamic".

Aidan Mercer, Marketing Director, buildingSMART International

Chapters continue to lead the way on programs such as Professional Certification and regional events as well as leading the way on the Use Case Management Service (UCMS) and the bSDD.

Chapters provide an opportunity to connect with a global user program

Full Chapters

Benelux	Japan
Canada	Korea
China	Norway
Denmark	Russia
Finland	Spain
France	Sweden
Germany	Switzerland
Italy	UK and Ireland

Developing Chapters

Australasia	Singapore
Austria	Slovenia
Croatia	Turkey
Czech Republic	UAE
Hong Kong	USA
Poland	

Marketing

Overview

2021 was another successful year for marketing and communications as efforts to build the openBIM® message gained more traction. This is important because the swell of support is evident in the platforms and networks that comprises the buildingSMART community. This clearly demonstrates the value of open standards and digital services and represents further need to support end-users. There continued to be disruption to physical events, with virtual summits a continuing feature of the programs for the community. These events continue to provide the place for discussion, the development of standards and services and as a place to network. On average, attendees spent almost 17 hours online during these events with a feedback rating of 8.7 out of 10 (fall summit). All the videos and materials have been published online and are made publicly available.

The buildingSMART Awards Program continues to gain momentum with more record-breaking submissions than ever before. 2021 saw the introduction of a technical triage team that went through each submission to ensure it adhered to the recommended level of technical competence before the jury assessed each submission. There was new record of 133 submissions, with 74 passing technical triage. Finalists were invited to present at the virtual summit and with the second edition of awards brochure created from the finalists and winners.

News

The Digital Newsletter continues to be the main source of all information. There is an opportunity to subscribe and manage your preferences.

In 2021, bSI published a variety of important news stories for the community. Full stories can be found on the website. Some important highlights from the year included:

- Trimble and Schneider Electric join the Strategic Advisory Council

- The new bSDD is launched
- Infra and Railway teams publish IFC 4.3 publish implementation and validation report
- Croatia joins as a new Chapter
- Spain and Hong Kong become full Chapters
- The Summit in Italy postponed by 1 year
- bSI publishes two whitepapers

Platforms

The main communication mechanism is the CRM platform, **HubSpot**. Marketing further improved the overall usage by having a higher frequency of communications, but to a more targeted audience. An update to the communications preferences means the community can now opt-in to information most relevant to the subscriber.

Zoom continued to be the webinar/meeting platform of choice, with Hopin becoming the new platform for the virtual summits and dedicated sessions for members such as roundtables and webinars. This platform provided more stability, interactivity, and ease of use for these events.

Videos are managed on the **Vimeo** and **YouTube** accounts, giving options for on-demand content to be placed and then embedded in various websites as a result. This functionality is also being offered as a membership benefit, to host videos of projects and demonstrations.

The team is now enabled with **Camtasia** accounts and a lot of video production is being done to support the activities.

Award Force continued to be the platform for supporting the Awards Program, adding professionalism and ease of use for submitters and jurors. This has helped support the role Susan Keenliside plays in delivering this program.

GitHub helps to manage open-source code and documentation related to the standards and solutions.
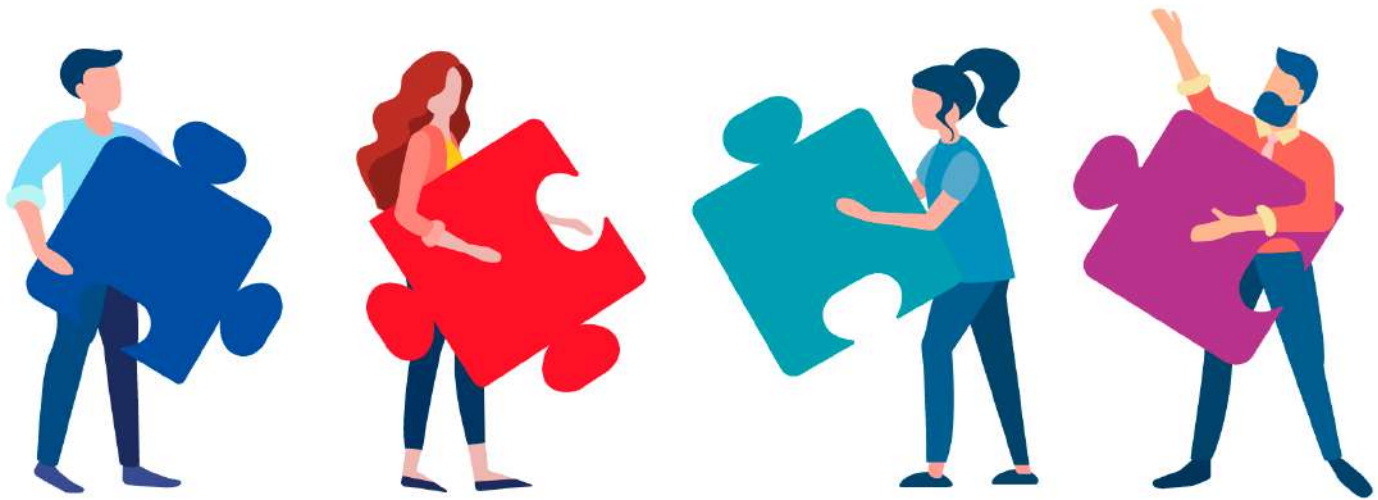
The buildingSMART page can be found at github.com/buildingSMART.

Monday.com is predominantly used for managing the solutions and standards program and is a tool for project managing the Rooms and the output. This includes working documents, tasks and deliverables, and roles and responsibilities.

Miro is a new tool used to help collaborate and brainstorm for strategic or working meetings by capturing notes and ideas.

Buzzsprout is the platform for the buildingSMART Digital Twins Podcast and provides a base for all the episodes.

The buildingSMART **Forum** continues to provide users a variety of ways of getting involved and engaging with the community.

There is also a new **User** website for knowledge-based learning that is designed to house user guides and tutorials. This is in its infancy but provides an opportunity for end-users to learn more about openBIM.

Social Media

Social media platforms are fast becoming a critical function for buildingSMART's outbound communications. Growth in LinkedIn for example has been high. A break-down of the channels and the growth can be seen below:

The LinkedIn page has grown from 25,607 followers in 2020 to 31,511 in 2021. This channel sees the highest amount of engagement.

- Twitter grew from followers 7,130 to 7,568
- Facebook grew from 2,430 to 2,720
- YouTube has grown from 1,470 to 1,860. There have also been over 70,000 views on the channel.
- Vimeo now has 336 followers with over 80,000 views on the channel

31,511
LINKEDIN

2,720
FACEBOOK

1,860
70,000 views
YOUTUBE

7,568
TWITTER

366
80,000 views
VIMEO

The buildingSMART Awards Program continues to gain momentum with more record-breaking submissions than ever before

Membership

Membership remains the main source of financial income that supports the operation of buildingSMART International. The COVID-19 pandemic has no doubt had an impact on the industry and drive for new members and 2020 and 2021 saw a slowdown in new membership. However, bSI was pleased with the retention of the majority in addition to some new arrivals. This strength of commitment to remain with bSI has helped continue the development of programs and activities and is the reason bSI can operate as it does. bSI is hopeful 2022 will see another upturn in membership as previously experienced in other years.

The new "Principal" membership category which is closely aligned to work being done on the Technical Roadmap, still does not have any members having been launched in 2020. bSI is hopeful that organizations will come forward to be part of this level. Other levels include Strategic, Multinational and Standard. Strategic membership is the most influential level, with members contributing to the strategic direction of buildingSMART through a variety of benefits. These include the Strategic Advisory Council meetings, hosted twice yearly and in 2022 we plan on meeting in-person again. Multinational members are entitled to be members of up to five local Chapters in addition to membership of bSI. Standard members are also given membership of a local Chapter of choice plus membership to bSI.

As of early 2022, there are nine strategic members: Arup, Autodesk, China Communications Construction Company (CCCC), China Railway BIM Alliance (CRBIM), Nemetschek Group, Oracle Construction and Engineering, Schneider Electric, Siemens and Trimble. There are nineteen multinational members and thirty-eight standard members. Members sit on the Standards Committee, which endorses the creation of standards, and can work in Room Committees and on projects. Members benefit from the collective local and international activities of other members. They play an active role, not only in identifying issues, but also in developing solutions.

New members during the year were Schneider Electric (strategic); Think Project!, Bosch Refinemysite, and ACCA (upgraded from Standard) as multinational and MTR, Georg Fischer, IES, and Pragoprojekt all as standard members.

9
STRATEGIC MEMBERS

38
STANDARD MEMBERS

19
MULTINATIONAL MEMBERS

8
NEW MEMBERS

Awards Program

The 2021 Awards Finals took place during the second week of the buildingSMART International Virtual Summit Autumn 2021, concluding with an Awards Ceremony on Thursday 7th October. All finalists presented their projects during the Summit and a small finalist jury (from an original Jury of 154) deliberated following the presentations to select a winner from each category.

2021 saw an astonishing 133 submissions across the 8 categories, 86 of which passed the triage stage. A total of 9 winners were announced at the Awards Ceremony, alongside recognition of the other 12 finalists and 7 special mentions.

The second publication of the annual openBIM Awards Yearbook for 2021 was published in March 2022. The yearbook outlines the overall process and statistics, and features all Winners and, Finalists. The brochure can be found at:

https://publications.buildingsmart.org/the-buildingsmart-awards-yearbook-2021.html

Award Winners

Category of Asset Management

Winner: MKP GmbH, Germany

Project Name: smartBRIDGE Hamburg -
The openBIM-based Digital Twin for Bridge Maintenance

Category of Community Contribution

Winner: Mostostal Warszawa S.A, Poland

Project Name: Make it Easier with openBIM: Primary School in Warsaw's Wilanów District

Category of Construction

Winner: China Academy of Railway Sciences Corporation Ltd, China

Project Name: Beijing-Zhangjiakou High-Speed Railway

Category of Design

Winner: Sichuan Highway Planning, Survey, Design and Research Institute Ltd., China

Project Name: Yan-Jiang Expressway G4216

Category of Facilities Management

Winner: Siemens Schweiz AG, Switzerland

Project Name: Grosspeter Tower: Performance GAP Analysis with Simulation

Category of Handover

Winner: Auckland International Airport Ltd, New Zealand

Project Name: Foodstuffs North Island Headquarters & Distribution Centre at Auckland Airport

Category of Professional Research

Winner: The University of Hong Kong, Hong Kong

Project Name: openBIM: Opening the Gate for BIM and Blockchain Integration (OBBi)

Category of Student Research

Winner: The Technical University of Munich (TUM), Germany

Project Name: The IfcInfraToolKit

Category of Technology

Winner: VCE Vienna Consulting Engineers ZT GmbH, Austria

Project Name: From Pixel to Pset: The Digital Structural Inspection

Governance and Finance

buildingSMART International is incorporated in the UK as a company limited by guarantee while the self-governing Chapters are set up according to the legal framework in their country. The International Council (IC) consists of representatives from the Chapters in their governance capacity and holds an annual general meeting. Each Chapter sends two representatives to the IC meetings. A Board is elected at the annual International Council meeting.

The Board met online on 6 occasions in 2021. Its work includes setting key priorities, reviewing and signing off of accounts, receiving and deciding upon new Chapter applications, setting and updating Company Byelaws and oversight of key strategies.

The Strategic Advisory Council (SAC) also advises bSI, and during the year SAC members met with the Board on two occasions. Six full-time and two part-time officers were employed by bSI in 2021: a Chief Executive, an Operations Director, a Marketing Director, a Finance Manager, a Business Administrator, an Events Manager who joined in January 2021 and 2 International Project Coordinators, one of whom joined in April 2021. The Chief Executive was also the company Secretary.

Other services are procured on a fee basis and include a Technical Director, technical support for solutions & standards development, an International Project Coordinator, US representation and support, communications support and website management.

The principal source of income for bSI is membership dues which in 2021 contributed €1,725,000, a 22% growth on 2020 (compared with 7% growth the year before). Income from Chapter membership stood at €399,000. €263,000 was returned to the Chapters under the rebate scheme. Income from services was €435,000. Of this total, €282,000 was Professional Certification income and €113,000 was software certification income, but most of the latter passes through with payments to the service provider. Agent license fees for the old bSDD generated €13,000 of service income and the Use Case Management Service launched in 2021 generated 20,000 of service income, but again most of this is passed on to the service provider.

Other income in 2021 comprises grants, €52,000, and bSI charges for non-member project sponsors, €118,000.

The two bSI Virtual Summits in 2021 generated income through sponsorship and ticket sales and this income was utilized for hosting platform costs and core operational costs consumed in the organization of the two summits.

Total core operational and program costs in 2021 were €2,149,000. The principal outgoing was bSI management (€1,504,000). Management costs increased by 32% compared with 2020 due to the new Events Manager and International Project Coordinator and recruitment costs for the Compliance Director who is due to start in 2022. Legal costs were significantly lower in 2021 and travel costs were only €21,000 due to ongoing restrictions imposed by the pandemic. Due to Program expansion, spend on marketing and IT increased by 48% compared with 2020. Program engagement and activity also increased further in 2021 as did technical activity due to the impending release of IFC 4.0 and the development of the new Data Dictionary. This led to a 63% increase in technical costs compared with 2020 and an increase in other program support costs of 12% which included additional operational support for IFC development.

Projects are funded separately, with total funding and expenditure balancing out on project completion. Project funding in 2021 stood at €1,682,000, over one million of which was funding for phase two of the IFC Rail project.

Currency exchange rate movements between the Euro and GBP in 2021 were to the detriment of the overall result, but despite this foreign exchange loss in excess of €100,000, the year ended at a break even position. Total equity remained stable at €506,000. Increasing revenue, chiefly through membership, remains a priority. The accounts are published at the end of this report.

2021 Full Year

INCOME TOTAL
4,323

399
1,726
-263
435
1,682
118
175
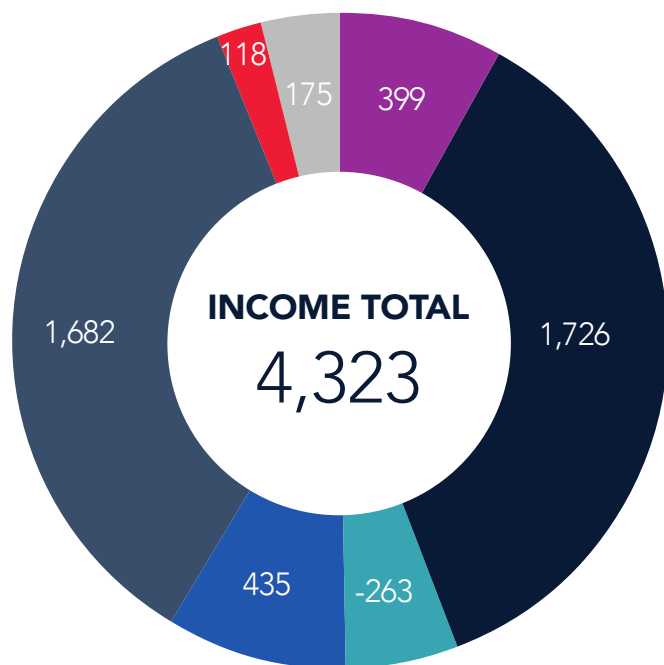
Income	2020 Actual	2021 Budget	2021 Actual
● Chapters	359	360	399
● Membership	1,410	1,857	1,726
● Chapter rebate	-260	-350	-263
● Services	303	396	435
● Projects	1,489	1,385	1,682
● Summits	130	109	118
● Other Income	67	210	175
Income Total	**3,498**	**3,967**	**4,323**

EXPENSES TOTAL
4,321

49
164
1,782
1,682
277
367
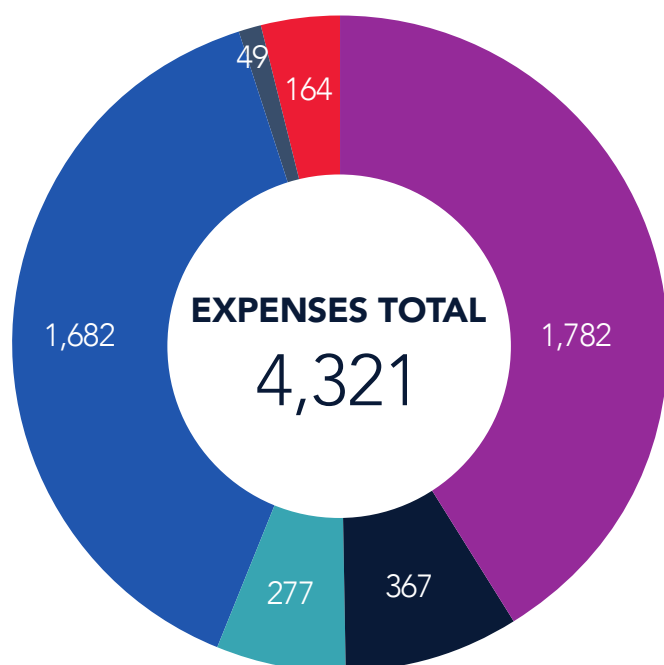
Expenses	2020 Actual	2021 Budget	2021 Actual
● bSI Core	1,431	1,814	1,782
● Programs	266	384	367
● Services	215	244	277
● Projects	1,516	1,385	1,682
● Summits	78	110	49
● Exchange & bad debts	-54	0	164
Expenses Total	**3,453**	**3,938**	**4,321**

Surplus	**45**	**29**	**1**
GBP to Euro rates	1.12	1.15	1.19
(€000's)			

Annual Report Priorities for 2022

Priorities for 2022 continue to reflect the growing requirements for openBIM standards and services to support digital workflows and the long-term need for open data strategies. The importance of the successful development, adoption and implementation of standards continues to be high priorities as well as the support for services as part of the Technical Roadmap. Priorities for 2022 are listed below.

Delivery of Standards

In addition to continuing to refine and improve the bSI Process, bSI aims to complete the harmonization of infrastructure extensions to the IFC Schema including:

- Publication of IFC 4.3 Production Standard
- Submission of IFC 4.3 to ISO for approval
- Endorsement of IFC 4.3 by CEN
- Publish updates to the BIM Collaboration Format (BCF) v3
- Further develop the openCDE API

Creation of Services

In accordance with the buildingSMART Technical Roadmap, bSI aims to deliver scalable online services that enhance and support the use of IFC including:

- Launch the buildingSMART Data Dictionary (bSDD) as an online service
- Work with vendors to provide bSDD plug-in functionality
- Publish and host an online Use Case Management Tool

Reach new markets

buildingSMART desires to expand its community by attracting Chapters in additional countries and engage with emerging markets investing in major building and infrastructure projects including:

- Respond to future Chapter inquiries from Morocco
- Respond to future Chapter inquiries from Romania
- Respond to future Chapter inquiries from Portugal
- Support for potential LATAM engagement
- Support for potential India engagement

Serve new domains

buildingSMART desires to extend the IFC schema and support services to include new domains including:

- Continue to support the IFC Tunnel project to develop additional IFC extensions Convene an Airports Industry Committee to validate requirements and priorities
- Co-author whitepapers discussing the role of openBIM to facilitate lifecycle Asset Management
- Further define the role of open standards to support Digital Twin ecosystems
- Explore new domains like Oil & Gas

Quality assurance

Provide a comprehensive Compliance Program including:

- Updated multi-level software certification program for IFC 4.3
- Continue to develop the Professional Certification program including:
  - Support for Chapters deploying Foundation training and certification
  - Create Practitioner training and certification courseware and examinations
- Recruit and appoint a Compliance Director as an additional member of the bSI Management Team
- Evaluate the use of Information Delivery Specifications (IDS) for model/project validation

Explore new business models

There is a continued focus on developing new business models and opportunities to support the growth of the community. This includes for bSI and the Chapter network.

buildingSMART International Ltd
Unaudited Financial Statements
for the year ended 31 December 2021

Statement of Financial Position

	Notes	2021 £	£	2020 £	£
Non-current assets					
Intangible assets	4		120,520		137,737
Property, plant and equipment	5		10,787		10,936
			131,307		148,673
Current assets					
Inventories		4,091		620	
Trade and other receivables	6	504,199		222,240	
Cash and cash equivalents		1,976,654		1,939,761	
		2,484,944		2,162,621	
Current liabilities	7	(2,106,833)		(1,345,730)	
Net current assets			378,111		369,715
Total assets less current liabilities			509,418		518,388
Non-current liabilities	8		(83,848)		(93,819)
Net assets			425,570		424,569
Reserves					
Capital contribution reserve			52,431		52,431
Income and expenditure account			373,139		372,138
Members' funds			425,570		424,569

The directors of the company have elected not to include a copy of the income and expenditure account within the financial statements.

For the financial year ended 31 December 2021 the company was entitled to exemption from audit under section 477 of the Companies Act 2006 relating to small companies.

The directors acknowledge their responsibilities for complying with the requirements of the Companies Act 2006 with respect to accounting records and the preparation of financial statements.

T he members have not required the company to obtain an audit of its financial statements for the year in question in accordance with section 476.

These financial statements have been prepared and delivered in accordance with the provisions applicable to companies subject to the small companies regime.

Notes to the Financial Statements

1 Accounting policies

Company information
buildingSMART International Limited is a private company limited by guarantee incorporated in England and Wales. The registered office is 9 Quy Court, Colliers Lane, Stow-cum-Quy, Cambridge, CB25 9AU.

1.1 Accounting convention
These financial statements have been prepared in accordance with FRS 102 "The Financial Reporting Standard applicable in the UK and Republic of Ireland" ("FRS 102") and the requirements of the Companies Act 2006 as applicable to companies subject to the small companies regime. The disclosure requirements of section 1A of FRS 102 have been applied other than where additional disclosure is required to show a true and fair view.

The financial statements are prepared in sterling, which is the functional currency of the company. Monetary a mounts in these financial statements are rounded to the nearest £.

The financial statements have been prepared under the historical cost convention. The principal accounting policies adopted are set out below.

1.2 Income and expenditure
Turnover comprises the fair value of the consideration received or receivable for the provision of services in the ordinary course of the company's activities and membership subscription income. Turnover is shown net of sales/value added tax, returns, rebates and discounts.

The company recognises revenue when:
The amount of revenue can be reliably measured;
it is probable that future economic benefits will flow to the entity; and specific criteria have been met for each of the company's activities.

Income is recognised over the period to which it relates and any amounts received during the year that relate to future periods are carried forward at the balance sheet date as deferred income.

1.3 Intangible fixed assets other than goodwill
Intangible assets acquired separately from a business are recognised at cost and are subsequently measured at cost less accumulated amortisation and accumulated impairment losses.

Intangible assets acquired on business combinations are recognised separately from goodwill at the acquisition date where it is probable that the expected future economic benefits that are attributable to the asset will flow to the entity and the f air value of the asset can be measured reliably; the intangible asset arises from contractual or other legal rights; and the intangible asset is separable from the entity.

Amortisation is recognised so as to write off the cost or valuation of assets less their residual values over their useful lives on the following bases:

bSI DD   Straight line over 10 years

1.4 Property, plant and equipment
Property, plant and equipment are initially measured at cost and subsequently measured at cost or valuation, net of depreciation and any impairment losses.

Depreciation is recognised so as to write off the cost or valuation of assets less their residual values over their useful lives on the following bases:

Office equipment   25% straight line basis

The gain or loss arising on the disposal of an asset is determined as the difference between the sale proceeds and the carrying value of the asset, and is credited or charged to surplus or deficit.

1.5 Impairment of non-current assets
At each reporting period end date, the company reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). Where it is not possible to estimate the recoverable amount of an individual asset, the company estimates the recoverable amount of the cash-generating unit to which the asset belongs.

Recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset for which the estimates of future cash flows have not been adjusted.

If the recoverable amount of an asset (or cash-generating unit) is estimated to be less than its carrying amount, the carrying amount of the asset (or cash-generating unit) is reduced to its recoverable amount. An impairment loss is recognised immediately in surplus or deficit, unless the relevant asset is carried at a revalued amount, in which case the impairment loss is treated as a revaluation decrease.

Recognised impairment losses are reversed if, and only if, the reasons for the impairment loss have ceased to apply. Where an impairment loss subsequently reverses, the carrying amount of the asset (or cash-generating unit) is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset (or cash-generating unit) in prior years. A reversal of an impairment loss is recognised immediately in surplus or deficit, unless the relevant asset is carried at a revalued amount, in which case the reversal of the impairment loss is treated as a revaluation increase.

1.6 Inventories
Inventories are stated at the lower of cost and estimated selling price less costs to complete and sell. Cost comprises direct materials and, where applicable, direct labour costs and those overheads that have been incurred in bringing the inventories to their present location and condition.
Inventories held for distribution at no or nominal consideration

Notes to the Financial Statements

are measured at the lower of cost and replacement cost, adjusted where applicable for any loss of service potential.

At each reporting date, an assessment is made for impairment. Any excess of the carrying amount of inventories over its estimated selling price less costs to complete and sell is recognised as an impairment loss in profit or loss. Reversals of impairment losses are also recognised in profit or loss.

1.7 Cash and cash equivalents

Cash and cash equivalents are basic financial assets and include cash in hand, deposits held at call with banks, other short-term liquid investments with original maturities of three months or less, and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities.

1.8 Financial instruments

The company has elected to apply the provisions of Section 11 'Basic Financial Instruments' to all of its financial instruments.

Financial instruments are recognised in the company's statement of financial position when the company becomes party to the contractual provisions of the instrument.

Financial assets and liabilities are offset, with the net amounts presented in the financial statements, when there is a legally enforceable right to set off the recognised amounts and there is an intention to settle on a net basis or to realise the asset and settle the liability simultaneously.

Basic financial assets

Basic financial assets, which include trade and other receivables and cash and bank balances, are initially measured at transaction price including transaction costs and are subsequently carried at amortised cost using the effective interest method unless the arrangement constitutes a financing transaction, where the transaction is measured at the present value of the future receipts discounted at a market rate of interest. Financial assets classified as receivable within one year are not amortised.

Classification of financial liabilities

Financial liabilities and equity instruments are classified according to the substance of the contractual arrangements entered into. An equity instrument is any contract that evidences a residual interest in the assets of the company after deducting all of its liabilities.

Basic financial liabilities

Basic financial liabilities, including trade and other payables, bank loans, loans from fellow group companies and preference shares that are classified as debt, are initially recognised at transaction price unless the arrangement constitutes a financing transaction, where the debt instrument is measured at the present value of t he future payment s discounted at a market rate of interest. Financial liabilities classified as payable within one year are not amortised.

Debt instruments are subsequently carried at amortised cost, using the effective interest rate method.

Trade payables are obligations to pay for goods or services that have been acquired in the ordinary course of business from suppliers. Amounts payable are classified as current liabilities if payment is due within one year or less. If not, they are presented as non-current liabilities. Trade payables are recognised initially at transaction price and subsequently measured at amortised cost using the effective interest method.

1.9 Taxation

The company is primarily a mutual company and as such is exempt from corporation tax on surpluses generated from mutual activities.

1.10 Employee benefits

The costs of short-term employee benefits are recognised as a liability and an expense, unless those costs are required to be recognised as part of the cost of stock or non-current assets.

The cost of any unused holiday entitlement is recognised in the period in which the employee's services are received.

Termination benefits are recognised immediately as an expense when the company is demonstrably committed to terminate the employment of an employee or to provide termination benefits.

1.11 Leases

Rentals payable under operating leases, including any lease incentives received, are charged to profit or loss on a straight line basis over the term of the relevant lease except where another more systematic basis is more representative of the time pattern in which economic benefits from the lease s asset are consumed.

1.12 Foreign exchange

Transactions in currencies other than pounds sterling are recorded at the rates of exchange prevailing at the dates of the transactions. At each reporting end date, monetary assets and liabilities that are denominated in foreign currencies are retranslated at the rates prevailing on the reporting end date. Gains and losses arising on translation in the period are included in profit or loss.

2 Judgements and key sources of estimation uncertainty

In the application of the company's accounting policies, the directors are required to make judgements, estimates and assumptions about the carrying amount of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised where the revision affects only that period, or in the period of the revision and future periods where the revision affects both current and future periods.

3 Employees

The average monthly number of persons (including directors) employed by the company during the year was:

	2021	2020
Total	8	5

4 Intangible fixed assets

Cost	bSI DD £
At 1 January 2021 and 31 December 2021	172,171

Amortisation and impairment	
At 1 January 2021	34,434
Amortisation charged for the year	17,217
At 31 December 2021	51,651

Carrying amount	
At 31 December 2021	120,520
At 31 December 2020	137,737

5 Property, plant and equipment

Cost	Plant and machinery etc £
At 1 January 2021	24,116
Additions	5,117
At 31 December 2021	29,233

Depreciation and impairment	
At 1 January 2021	13,180
Depreciation charged in the year	5,266
At 31 December 2021	18,446

Carrying amount	
At 31 December 2021	10,787
At 31 December 2020	10,936

6 Trade and other receivables

Amounts falling due within one year:	2021 £	2020 £
Trade receivables	459,300	145,351
Other receivables	44,899	76,889
	504,199	222,240

7 Current liabilities

	2021 £	2020 £
Trade payables	70,039	91,171
Other payables	2,036,794	1,701,735
	2,106,833	1,792,906

8 Non-current liabilities

	2021 £	2020 £
Other payables	83,848	93,819

9 Members' liability

The company is limited by guarantee, not having a share capital and consequently the liability of members is limited, subject to an undertaking by each member to contribute to the net assets or liabilities of the company on winding up such amounts as may be required not exceeding £500.

10 Operating lease commitments

Lessee

At the reporting end date the company had outstanding commitments for future minimum lease payments under non-cancellable operating leases, as follows:

	2021 £	2020 £
	6,438	6,438

11 Related party transactions

P Macleamy
(director)
Included in other operating income are donations the director made via CAF America.

Other member organisations
The directors W H Moore, Professor R T Steinman n, K V Anderson, D Schaper, K Yajima, C Castaing and J Makwana are connected with member organisations, which each pay annual membership subscriptions to buildingSMART International Limited in the normal course of their business.

In the course of normal business, some member organisations also receive payments for services provided to the company. Such services are provided on an arms length basis.

Strategic Members

Multinational Members

Officers, Board Members and Leaders

buildingSMART International Management Office

Richard Petrie
Chief Executive in 2021, current interim CEO

Ian Howell

Richard Kelly
Operations Director

Léon van Berlo
Technical Director

Aidan Mercer
Marketing Director

Board Members

Patrick MacLeamy
Chairman

Rasso Steinmann
Deputy Chair

Jan Saar
Treasurer

Karin Anderson

Christophe Castaing

Dirk Schaper

Kazumi Yajima

Kjell Inge

Jugal Makwana

Company Secretary

Richard Petrie in 2021, current interim Company Secretary Richard Kelly

Certification

Mark Baldwin

Rasso Steinmann

Léon van Berlo

Infrastructure Room

Tiina Perttula

Phil Jackson

Jürgen Litsch

Tristan McDonnell

Roland Moser

Anna Neidenström

Jim Plume

Marion Schenkwein

Marek Suchocki

Nobuyoshi Yabuki

Construction Room

Ken Endo

Rory Doak

Adolfo Gutierrez

Veljko Janjic

Konstantinos Kessoudis

Giovanni Volpatti

Railway Room

Winfried Stix

Kristian Fevejle Andersen

Peter Axelsson

Christophe Castaing

Modestino Ferraro

Xenia Fiorentina

Pierre-Etienne Gautier

Vincent Keller

Joakim Fenigsen Lockert

Suo Ning

Patrick Offroy

Tysnes Eivind Pagander

Franz Josef Peer

Tarmo Savolainen

Liming Sheng

Adrian Wildenauer

Building Room

David Ivey

Rob Roef

Kjell Ivar Bakkmoen

Mirbek Bekboliev

Benjamin Gonzalez

Inés Azpeitia González

Jan-Anders Jönsson

Francis Leung

Geraldine Rayner

Airport Room

Adam Rendek
Miika Kostamo
Xuan Dai
Arisca Droog
Christoph Carl Eichler
Basak Keskin
Fumiaki Kishida
Mohammed Salem
Birgitta Schock
Maya Tryfona
Gerard van der Veer
Lai Wei

Product Room

Michel Bohren
Umberto Alesi
Radboud Baayen
Michel Bohren
Frédéric Grand
Hans-Christoph Gruler
Robert Heinze
Hansueli Schmid
Espen Schulze
Lai Wei

Regulatory Room

Nick Nisbet
Franco Coin
Tamer El-Diraby
Tomi Henttinen
Kirill Mikhalkin
Masaki Muto

Technical Room

Greg Schleusner
Dennis Shelden
Robert Anderson
Jakob Beetz
Christophe Castaing
Christian Frey
Thomas Liebich
Bjørn Stangeland
Angel Velez

Sustainable Energy Management Room

Trinidad Chardin-Segui
Christian Frey
Bertrand Lack
Oliver Lebherz

Standards Committee Executive (SCE)

Birgitta Foster
Kjell Ivar Bakkmoen
Leif Granholm
Rasso Steinmann
Richard Petrie
Richard Kelly

Standards Committee Technical Executive (SCTE)

Håvard Bell
Mirbek Bekboliev
André Borrmann
Christophe Castaing
John Dickinson
Benjamin Gonzalez
Leif Granholm
Jan Karlshøj
Haijiang Li
Thomas Liebich
Nick Nisbet
Greg Schleusner
Dennis Shelden
Souheil Soubra
Bjørn Stangeland
Rasso Steinmann
Maya Tryfona
Léon van Berlo
Sergey Vishnevetsky
Chi Zhang
Richard Kelly

Implementers Support Group

Jeffrey Ouellette
Angel Velez

Model Support Group

Thomas Liebich
Jon Mirtschin
Thomas Krijnen
Nicholas Nisbet