International bodies

INTRODUCTION
SAICE’s networking on an international level took off in 1994 during the ASCE (American Society of Civil Engineers) convention in Atlanta when a SAICE delegation was invited to attend the annual ASCE International Round Table. During that visit SAICE’s President and Executive Director at the time, Brian Bruce and Dawie Botha respectively, not only had the opportunity to network with engineering institutions from across the world, but for the first time ever they met African colleagues.

They returned inspired and eager to start an African Round Table, similar to the ASCE model. From this idea sprung the Africa Engineers Forum, which was eventually incorporated into the Federation of African Engineering Organisations (see p 63). Relationships with other international engineering bodies followed, to the extent that SAICE is today not only contributing meaningfully to the world engineering scene, but receiving international visitors on a regular basis, all to the benefit of SAICE’s members.

WFEO (World Federation of Engineering Organisations)
This multi-disciplinary engineering organisation was established in 1968 and was formed under the auspices of the United Nations Educational, Scientific and Cultural Organisation (UNESCO). A close relationship still exists. It represents engineering organisations from approximately 90 nations, and as such around 15 million engineers. Over the past ten years or so the WFEO has gained considerable acceptance and status, thereby facilitating a strong and united voice for engineering. It promotes communication and cooperation, develops internationally agreed policies, and promotes interaction with the United Nations. It plays a major role in issues concerning sustainability and anti-corruption, and a series of committees have been addressing issues such as education and training, the environment, information technology, energy, capacity building and technology.

The WFEO membership includes National Members, in terms of which ECSA (Engineering Council of South Africa) represents the South African engineering profession, International Members (like the Federation of African Engineering Organisations) that represent regional engineering groups, and Associate Members, who have no voting rights. SAICE is an Associate Member of WFEO.

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UNESCO (United Nations Educational, Scientific and Cultural Organisation)
UNESCO was founded on 16 November 1945 and, in addition to dealing with the issues described in its name, sees itself as striving towards a higher purpose, namely “building peace in the minds of men”. After World War II this goal was obviously of great importance. UNESCO promotes cooperation among its 190-odd member nations by mainly focusing on respect, values and the dignity of each civilisation and culture. The organisation is actively pursuing the Millennium Development Goals by means of its strategic activities.

SAICE has been contracted several times by UNESCO to execute programmes in the form of workshops aimed at issues like “Engineers and the Alleviation of Poverty”. A further initiative concerns a feasibility study to ascertain whether a mini ‘Numbers and Needs’ study would be appropriate for selected African countries, following the example of the SAICE Numbers and Needs publications by Allyson Lawless and her team.

Rovani Sigamoney, Programme Specialist: UNESCO Engineering Initiative, has played a major role in facilitating interaction with SAICE. Prof Brian Figaji, also from South Africa, played an important and valuable role as South Africa’s representative on the Executive Board of UNESCO until 2015 when Rapu Molekane was elected to serve for the period 2015–2019.

The UNESCO Engineering Initiative was established to promote engineering education at secondary and tertiary education levels, and to highlight the roles and accomplishments of women and the youth in engineering. It also emphasises the importance of renewable and alternative energies for sustainable engineering practices. By showcasing how the youth are taking on contemporary engineering challenges and how professional engineers are shattering gender-based stereotypes, the UNESCO Engineering Initiative hopes to inspire the next generation of engineers. As one of the oldest professions in the world, engineering is vital in addressing basic human needs, in alleviating poverty, in promoting secure and sustainable development, in responding to emergency situations, in reconstructing infrastructure, in bridging the knowledge divide and in promoting intercultural cooperation. Despite the social and economic importance of engineers, there is increasing concern that declining enrolment in engineering studies will have consequences for future development. The UNESCO Engineering Initiative is addressing this concern through its partnerships with various professional engineering (and education) bodies, as well as with industry.

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FIDIC (International Federation of Consulting Engineers)
The members of FIDIC comprise consulting engineering organisations from various countries. FIDIC plays a leading role in addressing sustainability, organising anti-corruption campaigns, setting standards in consulting engineering, and interacting with the World Bank and other funding organisations and structures regarding procurement issues.

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ICE (Institution of Civil Engineers)
ICE, the UK-based equivalent of SAICE, was established in 1818, thereby setting the norm for learned societies in engineering. It has more than 80 000 members around the world. Since the early nineties ICE and SAICE have been cooperating on many issues.

The most important achievement to date has been that ICE facilitated international reciprocity agreements between itself, ECSA and SAICE, in terms of which South African civil engineering qualifications and professional status are recognised. ICE also facilitated the entry of ECSA into various international accords, including the Washington Accord and the Engineers Mobility Forum. Learned society activities between ICE and SAICE are currently managed by means of an agreement of cooperation. Regular meetings between the two institutions, facilitated by the ICE-SA Division (Joint SAICE-ICE Division), form part of their annual activities, and on several occasions the Brunel Lecture has been presented in South Africa.

Alain Jacquet is the current ICE representative for South Africa.

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IStructE (Institution of Structural Engineers)
IStructE was originally established in 1908 as the Concrete Institute. Its focus is primarily on structural engineering and public safety within the built environment. It has more than 27 000 members in various countries around the world. SAICE and IStructE cooperate by means of an agreement, and courtesy visits to the IStructE management in London by the SAICE Executive take place from time to time.

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ASCE (American Society of Civil Engineers)
ASCE was founded in 1852 and currently has a membership of more than 150 000 worldwide. It is a typical learned society for civil engineering professionals. In 1994 ASCE was the first international organisation to offer SAICE an agreement of cooperation. Its International Round Table (IRT) on a number of occasions provided SAICE with a valuable platform for communication and networking, where SAICE participated in several initiatives, including the ASCE Vision 2025 strategic planning exercise, where SAICE’s input was mainly in terms of sustainability and providing a developing-world perspective.

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FAEO (Federation of African Engineering Organisations) and SAFEO (Southern African Federation of Engineering Organisations)
In order to achieve engineering excellence and to create a better quality of life for all in Africa, leaders and representatives of engineering institutions in Africa held a General Assembly on 8 May 2012 at the Kenyatta International Conference Centre, Nairobi, Kenya, and unanimously agreed to establish a central united home for African engineering organisations in solidarity under the name Federation of African Engineering Organisations (FAEO). The organisational model of FAEO comprises:

- Central African Federation of Engineering Organisations (CAFEO)
- Eastern African Federation of Engineering Organisations (EAFEO)
- North African Federation of Engineering Organisations (NAFEO)
- Southern African Federation of Engineering Organisations (SAFEO)
- West African Federation of Engineering Organisations (WAFEIO).

These various regional groups work under the FAEO, which represents Africa at the WFEO, AU (African Union) and any other relevant international organisations. SAFEO represents southern Africa in COMESA (Common Market for Eastern and Southern Africa), SADC (Southern African Development Community), NEPAD (New Partnership for Africa’s Development) and other regional bodies with engineering and sustainable development interests in southern Africa.

FAEO is therefore a young organisation which still faces many challenges, but its members’ commitment and will to succeed are sure to let it grow into a strong and unifying organisation for all engineering practitioners in Africa.

Africa has huge economic potential, but it needs the necessary infrastructure to develop and sustain this potential. Infrastructure development should not only be inward-looking, but should be done on a regional basis, and eventually on a continental basis. In unity is strength, and it is engineering practitioners who must make sure that an integrated road network, rail network, power network and telecommunications network are developed for the continent. One requirement for such integrated networks is that there should be compatible standards and design codes. This will not be easy to achieve, as the countries in Africa have a legacy from many different countries in Europe, and it will be a challenging task to align these codes and standards with one another.

The FAEO has an African vision and its intention is to facilitate the establishment of an engineering corps that can truly serve the peoples of Africa.

SAFEO strives to promote and extend the exchange of technical, scientific and professional knowledge to better service the interests and welfare of engineering practitioners in member countries, as well as to encourage and support members to uphold and advance the integrity, honour and dignity of engineering in order to achieve the following outcomes:
Excellence in engineering technology in Africa.

Informed and intelligent decision-making about built environment infrastructure by all government structures and private sector entities, by utilising human capacity building orientation programmes and projects.

A sufficient pool of competent professionals by and through:
- offering and pursuing awareness and orientation programmes, projects and activities regarding the role of engineering and technology
- promotion of interest in mathematics and science at higher grades in primary and secondary schools
- offering career guidance programmes and activities
- promoting consistent investment mechanisms for infrastructure, and promoting fair and reasonable remuneration for all engineering practitioners
- facilitating mentorship
- offering continued professional development opportunities.

Sustainable professional frameworks and organisational structures in Africa by creating permanent facilities and administrative mechanisms to support the built environment professionals’ activities and programmes.

An awareness relating to SAFEIO activities in order to prepare the countries, their people and their decision-makers for the challenges of the future by utilising the opportunities offered to enhance the image and raise the public awareness about the role and value of engineering and industry in particular, and engineering and the built environment in general.

Support the development of entrepreneurship in the engineering environment.

The FAEO has now been firmly established and is fully functional in sub-Saharan Africa. The FAEO has become visible as an active organisation and is accepted as the organisation representing the engineering profession in Africa.

The FAEO Executive has ongoing discussions with the AU Commission for Human Resources, Science and Technology. For the first time the engineering practitioners in Africa now have a direct voice at the African Union.

The FAEO is recognised by UNESCO as the representative body for engineering practitioners in Africa, and has become part of the African Engineering Initiative. (Please also see the Appendix on page 66.)

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EAP (Engineers Against Poverty)
EAP is a specialist NGO working in the field of engineering and development. SAICE signed a cooperation agreement with the EAP. Interaction therefore takes place between SAICE and EAP, and EAP takes part in a number of joint ventures where SAICE is represented.

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RedR International
RedR was established in the UK in 1980 and its name refers to its mission, which essentially is to maintain a Register of Engineers for Disaster Relief and to provide training in this field.

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RAE (Royal Academy of Engineering)
The Royal Academy of Engineering was established in 1976. On their website the RAE states that, “As Britain’s national academy for engineering, we bring together the country’s most eminent engineers from all disciplines to promote excellence in the science, art and practice of engineering. Our strategic priorities are to enhance the UK’s engineering
capabilities, to celebrate excellence and inspire the next generation, and to lead debate by guiding informed thinking and influencing public policy.*

The RAe has strong links with the organised professions, including ICE and SAICE. Its links with SAICE enhance the RAe’s initiatives to facilitate the growth of professional engineering societies in Africa. SAICE’s president of 2000, Allyson Lawless, is an International Fellow of the RAe.

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IEI (Institution of Engineers India)
The IEI offers Life Institutional Membership to engineering-related organisations and individuals throughout India. Any public or local body, registered company or individual may therefore become a member of the IEI. In September 2012, while attending the congress of the World Federation of Engineering Organisations in Slovenia, SAICE and the IEI signed a Memorandum of Understanding, whereby both institutions confirmed their willingness to work together on international issues whenever deemed appropriate.

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CIB (International Council for Research and Innovation in Building and Construction)
The CIB was established in 1953 with the support of the United Nations as an association to stimulate and facilitate international cooperation and information exchange between governmental research institutes in the building and construction industries, with an emphasis on those institutes engaged in technical fields of research. The CIB has since developed into a global network of over 5 000 experts from about 500 member organisations active in the research community, industry or education, who cooperate and exchange information in more than 50 CIB Commissions and Task Groups covering all fields in building and construction-related research and innovation.

CIB members are universities, institutes, companies and organisations involved in building and construction research or in the transfer or application of the results of research. Member organisations usually appoint experts from their ranks to participate in CIB Commissions and Task Groups. An individual may also be a member and participate in a Commission or Task Group.

Members have immediate access to the world’s leading experts and expertise, and are facilitated to present and validate their own knowledge and technology. They are also offered opportunities for collaboration in international projects. In these, leading experts bring state-of-the-art technologies together in support of ongoing improvements of building and construction systems, processes and technologies all over the world.

Currently, CIB member organisations include most of the major national building research institutes in the world, as well as many other types of organisations in the building and construction industry. While considerable attention is still given to technical topics, there are now also activities focused on topics such as organisation and management, economics of building, legal and procurement practices, architecture, urban planning and human aspects.

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ISSMGE (International Society for Soil Mechanics and Geotechnical Engineering)
The ISSMGE is the pre-eminent professional body representing the interests and activities of engineers, academics and contractors all over the world who actively participate in geotechnical engineering. The aim of the ISSMGE is the promotion of international cooperation amongst engineers and scientists for the advancement and dissemination of knowledge in the field of geotechnics, and its engineering and environmental applications.

The ISSMGE has some 90 member societies worldwide representing approximately 20 000 individual members. These include practising engineers, teachers, researchers, and equipment designers and manufacturers. The Society also has around 30 corporate associates from industry.

The International Society is an affiliated member of the International Union of Geological Sciences (IUGS), which is itself a member of the International Council for Science.

Close relationships are maintained with ISSMGE sister societies, the International Society for Rock Mechanics (ISRM) and the International Association for Engineering Geology and the Environment (IAEG), via the Federation of International Geo-engineering Societies (FedIGS).

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CIOB (Chartered Institute of Building)
The CIOB is the world’s largest professional body for construction management and leadership. It has a Royal Charter to promote the science and practice of building and construction for the benefit of society, and has been doing that since 1834.

The CIOB accredits university degrees, educational courses and training, providing professional and vocational qualifications that are a mark of the highest levels of competence and professionalism, providing assurance to clients and other professionals who procure built environment assets.

CIOB members work worldwide in the development, conservation and improvement of the built environment.

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CREDITS
We acknowledge with appreciation that some of the information in this article was taken from the websites of the various bodies discussed. Please see the contact details underneath each body for the relevant website address.
BACKGROUND
The necessity to address infrastructure backlogs urgently, as described in the SAICE 2017 Infrastructure Report Card for South Africa, was the inspiration for preparing a draft guide that could be used to address infrastructure backlogs in the developing world.

Starting on our own continent, through my involvement with the Federation of African Engineering Organisations (FAEO), the idea of a universal guide quickly took root. FAEO supported the concept and, with the draft Guide which had been prepared by SAICE in hand, started the process of escalating the idea to the level of the World Federation of Engineering Organisations (WFEO), with the eventual aim of producing a report on the state of global infrastructure to be submitted to the United Nations.

The long-term aim, once condoned by the United Nations, is to enable various engineering organisations in the developing world to use the practical Guide to produce their own infrastructure report cards based on the conditions peculiar to their countries.

FAEO WORKING GROUP
Infrastructure report cards have over the years been used in various (mostly developed) countries to report on the state of infrastructure. As long as this is done objectively and based on solid data, it serves the purpose of informing society whether or not they have the necessary infrastructure to achieve their aspirations. Engineering organisations are in a perfect position to produce such infrastructure report cards, as they have access to a vast pool of relevant knowledge and expertise, and can play the role of an honest broker between civil society and government. Hence FAEO is extremely well placed to initiate this project.

FAEO submitted a proposal (for the development of a format for regional-specific report cards) to WFEO, and this was accepted by the WFEO Executive Council on 24 October 2018 at a meeting in London. A Global Infrastructure Report Working Group (GIRWG) was subsequently formed, which is recognised as a committee of the WFEO Executive Council.

The project, via the GIRWG, is the full responsibility of FAEO, and is also funded entirely by FAEO. The current GIRWG term of office is from October 2018 until the close of the General Assembly in October 2021, when a review of its continuation will be made.

FAEO asked me to chair the Working Group, with assistance from the FAEO President, President-Elect, Immediate Past President, Capacity Building Official, and representatives from three of the FAEO regional branches. To benefit from international participation, representatives from India, the United States, Canada, China, the United Kingdom and Singapore were also added to the team.

The purpose of the GIRWG is to provide guidance for the development of national infrastructure report cards, with the longer-term aim of producing a Global Infrastructure Report Card to be submitted to the United Nations. The scope of this work broadly includes:

- Finalising the Infrastructure Report Card Guide to produce a starter report that could be used to introduce the concept (also to potential funders).

UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

| GOAL 1 | No poverty |
| GOAL 2 | Zero hunger |
| GOAL 3 | Good health and well-being |
| GOAL 4 | Quality education |
| GOAL 5 | Gender equality |
| GOAL 6 | Clean water and sanitation |
| GOAL 7 | Affordable and clean energy |
| GOAL 8 | Decent work and economic growth |
| GOAL 9 | Industry, innovation and infrastructure |
| GOAL 10 | Reduced inequality |
| GOAL 11 | Sustainable cities and communities |
| GOAL 12 | Responsible consumption and production |
| GOAL 13 | Climate action |
| GOAL 14 | Life below water |
| GOAL 15 | Life on land |
| GOAL 16 | Peace and justice-strong institutions |
| GOAL 17 | Partnerships to achieve the Goal |
Providing training in the form of work sessions on a regional basis. Merely making the Guide available will not be enough to trigger member organisations to produce infrastructure report cards. The intention is to hold ‘train the trainer’ work sessions, starting at central locations in Africa.

Providing support to first-time report card teams. This support can vary from long-distance advice to more hands-on involvement. In some cases the organisation producing the report card may require some form of sponsorship or funding.

Translating the Guide into other languages (there has already been requests for translation into Chinese, Arabic, French and Spanish).

Developing the format for the report that will be submitted to the United Nations. This would include:

- Determining which SDGs (United Nations Sustainable Development Goals) to use as key indicators against which to measure progress.
- Determining the format for reporting, which should be uncomplicated enough for a lay person to understand.
- Developing a web-based repository for report cards so that the integration of information is automated as far as possible.

Producing the Global Infrastructure Report, perhaps biennially if practical. It is expected that it will take some years for member countries to produce their first infrastructure report cards, with full implementation probably only possible in five years’ time.

The draft Infrastructure Report Card Guide is not intended to be prescriptive, but suggests minimum requirements which, if adhered to, could lead to combining individual score cards into a regional, continental and even global score card that could be submitted to the United Nations General Assembly. In this way engineering organisations could make a real contribution to achieving the United Nations SDGs by focusing attention on where infrastructure is lacking or dysfunctional.

Based on the SDGs a preliminary draft format for reporting would consider most of Africa and Asia, Latin America, the Caribbean, Oceania and Caucasus.

IN CONCLUSION
Achieving the 17 SDGs is almost entirely dependent on the presence of effective and fully operational infrastructure. Infrastructure comprises the assets that society develops, owns and utilises in order to improve the standard of living and the quality of life. It enables economic development and keeps society healthy. However, infrastructure can only be an asset if it is maintained in optimum working condition. Governments have to report to what degree they achieve their set goals in terms of the SDGs, but they seldom report on the state of the infrastructure that is required to achieve these goals. The envisaged development of regional (and eventually global) infrastructure report cards should therefore be pursued in all earnest for the good of everyone living on our planet.

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