



UKQI

Trading with confidence

Introducing the UK Quality Infrastructure
and how it can benefit developing and
transition economies

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The value of a National Quality Infrastructure

International trading relationships are built on trust and always have been. Today trust is often built via a structure of standards, agreements, codes and regulations designed to ensure that when we buy something – as businesses or consumers – we get exactly what we expect.

For these standards, agreements and codes to carry weight, they must be written and implemented rigorously and consistently in ways that give everyone involved a high level of confidence in the outcome. It is to enable that consistent rigour that the concept of National Quality Infrastructures has emerged.

A National Quality Infrastructure can be understood as having five core components: standardization, testing, measurement, certification and accreditation.

Standardization – creates the national and international standards that specify how things should be made and done in a way that is mutually acceptable.

Testing and measurement – implementation of specifications and standards to ensure validity and consistency.

Certification – ensures that those who use standards and codes are applying them in the right way.

Accreditation – ensures that those who carry out testing, certification and inspection are competent to do so.

Trading nations with a well-regarded and trusted National Quality Infrastructure enjoy a host of benefits:

- Using standards creates better, safer, more sustainable products
- The knowledge from standards and measurement techniques enable more innovation and product development
- Domestic commercial activity increases
- Consumer protection is enhanced

Meanwhile:

- Technical barriers to international trade are reduced
- There are fewer duplicated or competing standards, tests, regulations and accreditations, so the costs of international trade are reduced
- Products and services become internationally competitive
- The country can represent its views more effectively in international fora and shape the development of international rules

The net result is greater participation in global trade and a stronger balance of payments.

For developing and transition economies, a National Quality Infrastructure forms the foundation for economic development and greater prosperity.



Developing Egypt's quality infrastructure

BSI, UKAS and the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) partnered with the Egyptian Accreditation Council (EGAC) to develop Egypt's quality infrastructure further.

Over three years the partners proposed reforms to the regulatory and legislative framework in line with EU best practice. They also helped build EGAC's institutional and technical capacity through a range of training programmes and study visits for assessors and experts. This component focused on obtaining international recognition for formal multilateral agreements with ILAC and IAF, as well as establishing relations with European Cooperation for Accreditation (EA).

The project succeeded in raising international awareness of EGAC and enhancing its capacity. As a result Egypt is now a signatory to ILAC¹ and IAF² and is part of an EA cooperation agreement under the auspices of the regional accreditation body, Arab Accreditation.

In a follow on project BSI, NMRO and NPL, along with the German and Czech National Metrology Institutes, are partnering with the Egyptian National Institute of Standards (NIS) to strengthen its institutional and technical capability.

¹ International Laboratory Accreditation Cooperation

² International Accreditation Forum



Meet the UK National Quality Infrastructure

The UK Quality Infrastructure (UKQI) comprises four long-established and exceptionally strong institutions which oversee standardization, testing and measurement, and certification and accreditation in the UK.

BSI – The British Standards Institution is the UK's National Standards Body (NSB) responsible for producing national and international standards. Founded in 1901, BSI remains among the world's largest and most active NSBs, publishing around 2,500 new standards every year.

BSI operates in more than 150 countries and has been instrumental in shaping the majority of the world's most widely used and implemented international standards, such as the quality management systems standard, ISO 9001. It was a founder member of ISO and maintains a highly influential voice in international and European standardization. BSI has held a Royal Charter since 1929.

NMRO – The National Measurement and Regulation Office has origins dating back to the 19th century. It has operated as an Executive Agency¹ since 1989. NMRO is responsible, among other things, for providing the legal metrology infrastructure necessary to make markets function more effectively, underpinning trade measurement and providing confidence in the market. Its focus is on simplifying technical regulation wherever possible. It also offers a range of certification services that enable businesses to export their products globally.

NMRO is a leading voice in WELMEC² and provides a major influence on the implementation and future design of EU legislation via membership of the Commission's Measuring Instruments Working Group. NMRO is also a highly influential participating member of OIML³.

NPL – The National Physical Laboratory was established in 1900 and is the UK's National Measurement Institute. NPL is responsible for maintaining the UK's primary measurement standards that ensure the accuracy and consistency of measurement.

NPL is a world leader in scientific metrology* (measurement science) carrying out research to develop the next-generation of measurement techniques and playing a key role in helping develop international measurement standards. NPL is influential in the work of both the international and European scientific metrology organizations – BIPM and EURAMET respectively – and is currently represented on more than 400 international committees or professional bodies. NPL also contributes to the Mutual Recognition Arrangements whereby institutes worldwide recognize the validity of each other's calibration and measurement certificates.

UKAS – The United Kingdom Accreditation Service was formed in 1995 and is the UK's National Accreditation Body. UKAS accreditation assures the competence, impartiality and integrity of certification and conformity assessment bodies. This reduces the need for suppliers to be assessed by each of their customers.

UKAS is a world-leading innovator in accreditation services. Its development projects range from physiological diagnostic services to nuclear new build, energy management and retail banking products. UKAS is also highly active and influential internationally, holding positions on both the ILAC and IAF Executives. UKAS' involvement in international groups provides for mutual recognition, further reducing the need for multiple supplier assessments and as a consequence helping reduce barriers to trade.



¹ A semi-independent organization set up by the UK Government to carry out some of its responsibilities

² European Cooperation in Legal Metrology

³ The International Organization of Legal Metrology



Building the UAE's capacity in legal metrology

NMRO, NPL, UKAS, LGC (formerly the Laboratory of the Government Chemist) and NEL (formerly the National Engineering Laboratory) are partnering with the Government of the United Arab Emirates to help UAE closely replicate the UK's well-established national measurement and quality infrastructure model.

The training comprises core legal metrology modules from NMRO. UAE delegates also access the vast knowledge of partner organizations including that of UKAS for quality in measurement overviews, LGC for chemical and medical legal metrology measurement and research, NEL for flow measurement and NPL for temperature measurement. The programme enables the UAE Government to source all its quality infrastructure needs from one point of contact.

As a result of the help and training received from the UKQI partners, UAE's infrastructure is quickly developing into a primary authority for measurement in the region.



What the partners in the UK Quality Infrastructure deliver – **case studies**

UKQI partners have a strong track record of project delivery. Here, and on other pages, is a selection of recent case studies demonstrating their capacity, diversity and competence.



Sharing knowledge of legal metrology

Over four successive years, NMRO has partnered with BSI and NPL to share their unique knowledge and experience in measurement with delegations from a variety of emerging economies including Bangladesh, Zambia, Liberia, Lesotho and the Democratic Republic of Congo. This work is funded by UNIDO and has been repeatedly awarded to the UK despite strong competition from several other countries.

The training package in legal metrology comprises a two-week programme hosted by NMRO in London. It includes site visits to manufacturers to witness advanced processes and procedures.

Delegates visit NPL's state-of-the-art facility for tailored training in temperature measurement techniques, followed by a special tour of the Mass Standards laboratory. They also spend a day with BSI to talk about the role of standards and quality systems in measurement. The value of this programme is underlined by the extremely positive feedback the partners receive.



Providing Brazil with the skills to accredit climate change schemes

UKAS has partnered with the UK Foreign and Commonwealth Office to deliver a series of workshops in support of the implementation of greenhouse gas emissions trading in Brazil. Inmetro (the Brazilian National Institute of Metrology, Quality and Technology) was in the process of implementing certification schemes that support emissions trading and regarded UK expertise as world-class in this arena.

The training involved building up their competence levels in ISO 14064 (on how greenhouse gas emissions can be measured and reported) and ISO 14065 (on the requirements for greenhouse gas verification bodies).

The certification of environmental activities has been vital in giving confidence to all the parties in Brazil who rely upon greenhouse gas emissions assertions or claims.



Gaining international recognition for Ukraine's accreditation services

NPL, UKAS, BSI and the EU Border Assistance Mission (EUBAM) partnered with the National Accreditation Agency of Ukraine (NAAU) to gain international recognition for NAAU accreditation services.

Over two years the partners provided a Resident Twinning Advisor to work at NAAU, analysed Ukraine's accreditation framework and created a development plan for NAAU. They delivered training and mentoring, shared their EU accreditation body experience and improved work procedures for the accreditation of calibration laboratories.

As a result the accreditation function of NAAU is aligned with the relevant international standards and NAAU has gained ILAC and European Cooperation for Accreditation (EA) recognition. The efficiency of NAAU's operations has been strengthened as has the capacity of its personnel to accredit conformity assessment bodies and calibration laboratories.



Removing technical barriers to trade between Turkey and the EU

BSI, UKAS, the UK Department of Trade and Industry, the German Federal Enterprise for International Cooperation (GIZ), the Association Française de Normalisation (AFNOR), Ankon Consulting and NORM Consulting partnered with the Turkish Ministry of Economy and KalDer (the Turkish Society for Quality) to help remove technical barriers to trade between Turkey and the EU.

This two-year project analysed the current quality infrastructure and identified technical assistance needs. The partners organized and delivered training to build institutional capacity. They conducted inter-laboratory comparisons and proficiency testing, updated legislation and enabled knowledge transfer to both the public and the private sectors.

As a result the Turkish conformity assessment and metrology sectors have become better organized. Certification and assessment bodies know more about EU directives and accreditation. More SMEs are participating in standardization and the quality of Turkish laboratory services has increased. Consumer awareness of product safety and standardization has improved.



Creating a national measurement infrastructure in Lebanon

BSI and NMRO partnered to help Lebanon create an entire measurement infrastructure. This two-year knowledge transfer project aimed to develop Lebanon's expertise and enable it to gain the information required to set up an infrastructure capable of supporting successful trade with Europe, in a recognized way.

Activity included building laboratories, buying equipment and training staff to use it. The partners also helped establish quality systems to verify the effectiveness of the laboratories and their suitability for trade purposes in due course as they develop and mature.

The project has brought the joint expertise of the UKQI to bear, making a substantive contribution to Lebanon's future economic progress.



Improving China's microwave antenna measurement facilities

NPL partnered with the National Institute of Metrology (NIM) in China to install an antenna extrapolation range in Changping. NIM wanted to improve its microwave antenna measurement facilities – which provide the high accuracy essential for applications such as satellite communication and Earth remote sensing – and turned to NPL for expertise in range design, construction, installation, validation and training.

The extrapolation range is a chamber lined with radiation absorbing material. Its measurement system comprises a computer-controlled carriage on a precision rail guidance system. Over two years NPL made multiple site visits, produced over 300 design drawings, manufactured and tested hundreds of parts, and provided software, procedures, validation and training.

The completed range is now producing excellent results with very low measurement uncertainties. NIM believes it has greatly improved China's national microwave measurement standards and represents a new highpoint in NIM infrastructure construction.



Helping strengthen Rwanda's quality infrastructure and export capacity

BSI has partnered with the Rwanda Standards Board (RSB) to support a major reform of Rwanda's quality infrastructure.

During the first three-year phase (2012-2014), BSI provided strategic assistance and capacity building training courses. BSI also conducted countrywide standards awareness workshops for Rwanda's private sector and ran training on food safety management systems and HACCP. RSB's organizational structure was upgraded and its scope of services considerably extended, and the private sector gained a greater understanding of the role and importance of standards.

BSI is now engaged in a second phase (2015-2017) with RSB consolidating the achievements of phase 1. This second phase is creating awareness and delivering capacity building to the private sector in areas like quality and food safety as well as building capacity in the use of testing equipment, upgrading RSB's staff capacity to conduct quality and safety tests of Rwandan products.



Services offered by UK Quality Infrastructure partners

UKQI partners provide a comprehensive range of consultancy services to overseas governments wanting to build the capacity of their own National Quality Infrastructure.

A customized programme is built each time to meet the specific needs of the host nation, delivered by one or more of the partner institutions.

Few other providers can match the UKQI partners' breadth of expertise. They can provide everything necessary to build a robust National Quality Infrastructure capacity. This includes:

Capacity building services

- Needs analysis in order to target the intervention in the most efficient and effective way
- Legislative review and advice on how the regulatory framework can be improved
- Consultancy and training on:
 - institutional governance
 - growing the commercial independence of institutions
 - improving or building a National Quality Infrastructure
 - embedding the economic benefits of a National Quality Infrastructure
- Technical assistance covering standards, accreditation*, metrology and conformity assessment

Specialist services

- The full range of UKAS accreditations*
- Advanced accreditation services* such as of medical laboratories, diagnostic imaging services and other healthcare activities
- Training and development to help organizations reach ILAC and IAF signatory status
- Assistance with standards' development
- Research to identify published or in-development standards in a specific area of interest
- Support with developing a standards and metrology strategy in an innovative area or emerging technology
- Standards' implementation training
- Consultancy in defining, setting up and commissioning testing facilities
- Measurement training needs analysis
- Measurement skills training
- Training for legal/regulatory metrology personnel
- Type approval services to companies manufacturing measuring instruments
- Consultancy on which measurement equipment to buy
- Measurement facility design, build, implementation and commissioning

*Note that the provision of UKAS services will be subject to European Union Regulations and the principles of ILAC and IAF policy.





Why choose to work with UK Quality Infrastructure partners?

The UKQI comprises four institutions with a truly global reputation for the integrity and quality of their work. The UKQI partners have the capacity, knowledge, approach and experience to deliver excellent results.

Expertise

- All UKQI partner institutions are EU-mandated bodies so are able to take on the full range of projects
- All projects carry the weight of being led by a nationally-recognized institution
- UKQI partners offer an unrivalled breadth of specialized expertise across all National Quality Infrastructure areas
- UKQI partners provide personnel of a universally high quality – often fielding experts who are international committee members and who can therefore rightly be considered as world-leaders in their field

Seamless delivery

- UKQI partners offer a 'one-stop-shop' model, so you will only deal with one key contact
- The partners have built a track record of successfully delivering projects in all corners of the globe
- They have the experience and flexibility to deliver programmes at all levels
- Because of the shared heritage of UKQI institutions and their long experience of collaborative working, they provide highly integrated services

Added value

- Because of their close working relationship with the UK Government, UKQI partners understand the government perspective and work well with governmental bodies
- At the same time, all UKQI partner institutions are required to be commercial and bring that commercial acumen to their work with clients
- In particular UKQI partners focus on helping clients get the best long-term value from their investment in building infrastructure capacity. They recognize that it is the private sector that will generate economic activity, so work to ensure that commercial businesses and organizations also benefit
- UKQI partner institutions are all involved in shaping international developments in their respective fields, so the knowledge they share is leading-edge
- Because the partners often write key standards and legislation, no one is better-placed to accurately interpret and oversee the implementation of international codes and standards
- Because of the many senior roles that UKQI partner members play in international fora, they are also well-placed to provide clients with better access to the international quality infrastructure community
- The high international reputation of UKQI partner institutions helps bring international recognition to those with whom they work



Abbreviations and acronyms used in this publication:

- BIPM** – Bureau International des Poids et Mesures
- BSI** – British Standards Institution
- CEN** – European Committee for Standardization
- CENELEC** – European Committee for Electrotechnical Standardization
- EA** – European Cooperation for Accreditation
- EU** – European Union
- EURAMET** – European Association of National Metrology Institutes
- HAACP** – Hazard Analysis and Critical Control Point
- IAF** – International Accreditation Forum
- IEC** – International Electrotechnical Commission
- ILAC** – International Laboratory Accreditation Cooperation
- ISO** – International Organization for Standardization
- NMRO** – National Measurement and Regulation Office
- NPL** – National Physical Laboratory
- NSB** – National Standards Body
- OIML** – The International Organization of Legal Metrology
- UKAS** – United Kingdom Accreditation Service
- UKQI** – The United Kingdom Quality Infrastructure
- UNIDO** – The United Nations Industrial Development Organization
- WELMEC** – European Cooperation in Legal Metrology

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To find out more about what the UKQI can offer you, please go to ukqi.org, email info@ukqi.org or contact one of the partners direct:

BSI Group

International Projects
389 Chiswick High Road
London W4 4AL
United Kingdom

T: +44 845 086 9001
E: projects@bsigroup.com
bsigroup.com/ukqi

NMRO

Stanton Avenue
Teddington
Middlesex TW11 0JZ
United Kingdom

T: +44 20 8943 7272
E: training@nmro.gov.uk
gov.uk/nmro/ukqi

NPL

Hampton Road
Teddington
Middlesex TW11 0LW
United Kingdom

T: +44 20 8977 3222
E: international-enquiries@npl.co.uk
npl.co.uk/ukqi

UKAS

21-47 High Street
Feltham
Middlesex TW13 4UN
United Kingdom

T: +44 20 8917 8400
E: info@ukas.com
ukas.com/ukqi

