



Relating International qualifications to the EQF – the Welding case
RAINBOW January 2017

STATE OF THE ART REPORT

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1. INTRODUCTION

The present State of the Art report is being developed under the framework of the RAINBOW project, and intends to document and to describe the latest accomplishments regarding the alignment of International Sectoral Qualifications (ISQ) to the European Qualifications Framework for lifelong learning (EQF, 2008).

Over the past five years there has been an increasing number of research activities across Europe looking to understand the range of sector-recognised certificates and qualifications awarded outside of national systems and processes. The EQF Advisory Group, namely the sub-group for International Qualification (triggered by the “Welding case” which refers to the European Federation for Welding, Joining and Cutting (EWF) case) has been paying attention to the challenge of recognising International qualifications within both the EQF and National Qualifications Frameworks (NQFs).

The present report gives an overview of the general ISQ landscape across Europe and includes a comprehensive approach about the EWF International Qualification System as well.

The methodology used for conducting the research and capture the sectoral qualification data is summarised in the table 1:

Table 1 - Methodology used in the state of the art report

Methodology	Aims
Desk review	Baseline of existing available data Mapping organisations and initiatives active in ISQs Mapping of national procedures to relate ISQ to the NQF Listing of existing documents on International Sectoral Qualifications (<i>in the REFERENCES section 8 of State of the Art Report</i>)
Case study	Presenting the Welding International Qualifications Collection of EWF Qualifications data Mapping EWF relationship with NQF and EQF
Survey *	Gathering detailed information about the Welding qualifications implementation at national and European level * if necessary (at mid-term stage of the project)

To set the scene, the background and context section of this report highlights the need and importance to link International Sectoral Qualifications to the EQF. Some fundamental concepts are addressed for setting a common awareness about the EQF alignment and the critical issues related to it.

Throughout the report, several references to previous studies and documents on International sectoral qualifications are provided. Both, [Cedefop publications about International Qualifications \(2012\)](#) and the [European Commission study on International Sectoral Qualifications and Frameworks](#)



[and systems \(2016\)](#) are key documents for a comprehensive understanding about International Qualifications. A brief overview regarding these studies is provided, including the mapping of international qualifications and sum up of major findings.

Finally, the EWF International Qualification and Certification System is presented as a case study for relating international qualification to the EQF. A detailed description about the system is provided, namely its coverage, governance, training system and the relationship with the NQF and EQF.



2. BACKGROUND AND CONTEXT

The growing internationalization of products and services has triggered an increasing number of qualifications – certificates and diplomas – awarded at international (sectoral) level, outside the jurisdiction of national authorities. These ‘non-State’ qualifications have been developed and are awarded by a wide range of bodies, organisations and companies addressing various purposes, mainly giving access to some occupations or professions, perform specific task and /or technologies.

The International (sectoral) qualifications are defined as:

International Qualification (IQ) is “a certificate, diploma, degree or title awarded by an international body (or a national body accredited by an international body) and used in more than one country, which includes learning outcomes (based on standards developed by an international body, organisation or company)”

Source: Proposal for a Council Recommendation on the European Qualifications Framework for lifelong learning (2016)

International Sectoral Qualification (ISQ) corresponds to an international qualification which is “relevant” to a sector of economic activity developed by an international sectorial organisation or an international company.

Source: Proposal for a Council Recommendation on the European Qualifications Framework for lifelong learning (2016)

International sectoral qualifications, such as the EWF European/International Qualifications, are of great importance, as they are driven by the industry/market needs and based, in most cases, on standards issued by ISO and CEN. These qualifications set standards to perform welding tasks according to stakeholders’ needs, ensuring the new technologies are embraced, as well as, the health and safety assurance requirements are met. Finally, they enable mobility and recognition of workers within the membership network.

The EQF is a relevant tool to translate and compare a given level of a qualification comprised in a given NQF of a country for mobility purposes.

In the scope of the International Sectoral Qualifications, the EQF is intended to prevent that qualifications are referenced to different levels according to the NQF of the country where it is being delivered. That would weaken the quality assurance mechanisms and make mobility of the working force more complicated.

European Qualification Framework for lifelong learning (EQF) is a “translation grid”, organised into eight common European Levels of learning to which each national framework can relate. Each level is defined in terms of knowledge, skills and competences, known as Learning Outcomes, that need to be acquired to reach each level.

Source: EQF Recommendation 2008



Referencing process to the EQF is the “establishment of a relationship between the EQF levels and national qualifications frameworks or systems.”

Source: Revision of the European Qualifications Framework (Roadmap, 2016)

The EQF Recommendation (2008) stipulates that international sectoral organisations should be able to relate their qualifications systems to a common European reference point and, thus, show the relationship between international sectoral qualifications and the national qualification systems.

For this purpose, Member States through the National Authorities responsible for qualifications systems, in cooperation with stakeholders responsible for developing and using qualifications, were invited to define the correspondence between the national qualification system and the 8th level of the EQF by 2010, which are also referred as “referencing” levels, and to indicate the EQF levels on newly issued certificates/diplomas and or/certificate/diploma supplements by 2012.

According to Cedefop data, in 2016 a total of 39 Countries were participating and cooperating on the European Qualifications Framework. 33 countries had officially established or formally adopted their national qualifications frameworks (NQFs) and 6 countries were still working on the design and the formal adoption of their NQFs.

In this context, the EQF Advisory group developed a quality assurance mechanism for the referencing process based on **10 criteria** aiming to ensure trust and the involvement of all relevant stakeholders in the referencing process, being a base of dialogue between countries.

Currently, all qualifications are firstly included in the National Qualifications Frameworks (NQFs) of each country and then, through comparability of each NQF, their levels are compared to the EQF, meaning to the EU level.

For instance, today’s awarding bodies wishing to assign a European level to international (sectoral) qualifications ensure these qualifications are a part of national qualifications frameworks and comply with diverse national quality assurance practices and procedures first.

This process, entails 28 different procedures for awarding body to comply with, keeping a high risk of inconsistencies to arise between countries, namely:

- risk that the same qualification is given a different EQF level
- and fragmentation in case a qualification is part of some NQFs and not others.

Additionally, this process generates a high administrative burden for the international (sectoral) organisation to sign up with all national quality assurance procedures and requirements.



The Revision to the EQF Recommendation, in 2016, points out several specific problems related to the EQF, including the lack of transparency and comparability of international sectoral qualifications, as no formal procedure is in place for referencing directly the ISQ to the EQF.

Since its creation, the EQF has become widely accepted as a reference point and source of inspiration for developing qualifications frameworks, not only within Europe, but also globally.

Despite the important progress achieved by the EQF in the comparability of national qualification systems, evaluations of the EQF Recommendation carried out on behalf of the European Parliament and the COM in 2013, demonstrate that the role of the EQF concerning international sectoral qualifications should be clarified.

3. STUDIES AND FINDINGS ABOUT INTERNATIONAL SECTORAL QUALIFICATIONS

3.1 Cedefop research on International Qualifications (2012)

The Cedefop (2012) publication [1 - **REFERENCES available in section 8**] describes the main typologies of International Qualifications and its features. They may differ according to:

- a) purpose – what is the qualification for;
- b) type – how complete and which is the duration of the qualification;
- c) coverage – where is the qualification used (geographical dimension);
- d) competent body – which body awards the qualification;
- e) currency – what can the qualification be exchanged into.

As mentioned before, an international qualification has become increasingly important in most of the cases to enable access to some occupations or professions, following the same standards, perform specific tasks and/or technologies. According to the study, international qualifications are usually 'non-state' awarded, awarded by sectoral organisations of the labour market, they reflect its market needs, have tight link with it and, more than that, are recognised by companies, employers and other stakeholders, having a need for such a qualification.

Some sectors in the labour market make use of them, such as: administration and management, education and training sector, financial services, ICT, sports, transport and welding. The latter one, was highlighted by Cedefop on the harmonisation and quality assurance of training, qualification and certification, which will be analysed in depth in section 2 of this State of the Art Report.

Table 2 - Mapping of International Qualifications

Cedefop research on International Qualifications – main findings	
Sector	Awarding Body
Administration and management	Project Management Institute (PMI)
Education and training	University of Cambridge ESOL, Association Montessori International, Pearson
Financial services	European Bank Training Network, Association of Chartered Certified Accountants; International Association of Book-keepers
Information and Communication Technologies	European Computer Driving License Foundation; Microsoft, Cisco
Personal services	European sectoral social dialogue
Hairdressing	UNI Europa hair and beauty – Coiffure EU
Sports	International Volleyball Federation (FIVB); Royal Yachting Association, Europe Active, International Council for Coaching Excellence, European Confederation of Outdoor Employees;

Transport	International Maritime Organisation, International Civil Aviation Organisation; European Aviation Safety Agency, International Civil Aviation Organisation/Eurocontrol Airbus, European Commission; European Railway Agency.
Human Resources	Chartered Institute of Personnel and Development
Engineering	International Council on Systems Engineering
Health	European Federation of Radiographer
Welding	European Federation for Joining and Cutting

Source: *International Qualifications, 2012, Cedefop; Study on International Sectoral Qualifications Frameworks and Systems, 2016, European Commission*

3.2 European Commission study on International Sectoral Qualifications, Frameworks and Systems (2016)

The European Commission commissioned a report (published by November 2016) [2 - **REFERENCES available in section 8**] on the characteristics of international sectoral qualifications, frameworks and standards. The results were based on the data collected from desk research, two survey's targeted at international sectoral/professional organisations and EQF National Contact Points, interviews with representatives from the sectoral organisations and from the discussions led during an expert workshop.

The aim was to clarify the nature of international sectoral qualifications and related initiatives, their ambition to link with the EQF and the possibilities for establishing such linkages.

The mapping of the qualifications (labelled as *initiatives* in the report) was analysed in terms of type, maturity, governance, use of learning outcomes, quality assurance systems and their relationship to NQFs and the EQF. A detailed description of the results achieved is given in the table below:

Table 3 - Main findings about International Sectoral Qualifications

International Sectoral Qualifications – main findings	
1. Types of initiatives and common aspects	<ul style="list-style-type: none"> • 254 organisations are managing international sectoral qualifications, frameworks or standards • The overall number of initiatives could be higher (private initiative was not identified in the research) • Most of the identified initiatives correspond to international sectoral qualifications, suites of qualifications, or standards • No international sectoral qualifications system was identified, according to the definition used by Cedefop • The identified initiatives are related to 17 sectors

	<ul style="list-style-type: none"> • The most common activities are related to: human health and social services, arts, entertainment and recreation, business administration, ICT and finance, insurance and real estate • The majority of the identified organisations provide initiatives targeting highly skilled professionals • Most of the initiatives have labour market value but are not a formal entry requirement for an occupation/profession • Purpose of the initiatives was to facilitate mobility of professionals across countries and securing and or raising professional standards.
2. Maturity of the initiatives identified	<p>Majority of the initiatives:</p> <ul style="list-style-type: none"> • Have high numbers of people (2/3 of initiatives reviewed had over 5,000 'users' and only 11 initiatives had less than 1,000 users) • Are in place for over a decade "well established" • Have a growing interest in using the EQF and its underlying principles as a reference • Operate worldwide and do not focus specifically on the European market
3. Management and Governance	<ul style="list-style-type: none"> • Many initiatives are led by organisations representing either national professional bodies or directly professionals themselves • A small number of initiatives are governed by private for-profit companies • Most of the initiatives identified had in place processes for ensuring the continued relevance • Majority of initiatives are managed by member organisations • The most common management arrangements are set by a specialised group meeting regularly (e.g. committee, a group of experts, or an advisory board) • Some initiatives do not (yet) have a system in place for updating • Updating is only done informally by the former project partners, in the best case through a follow-up project

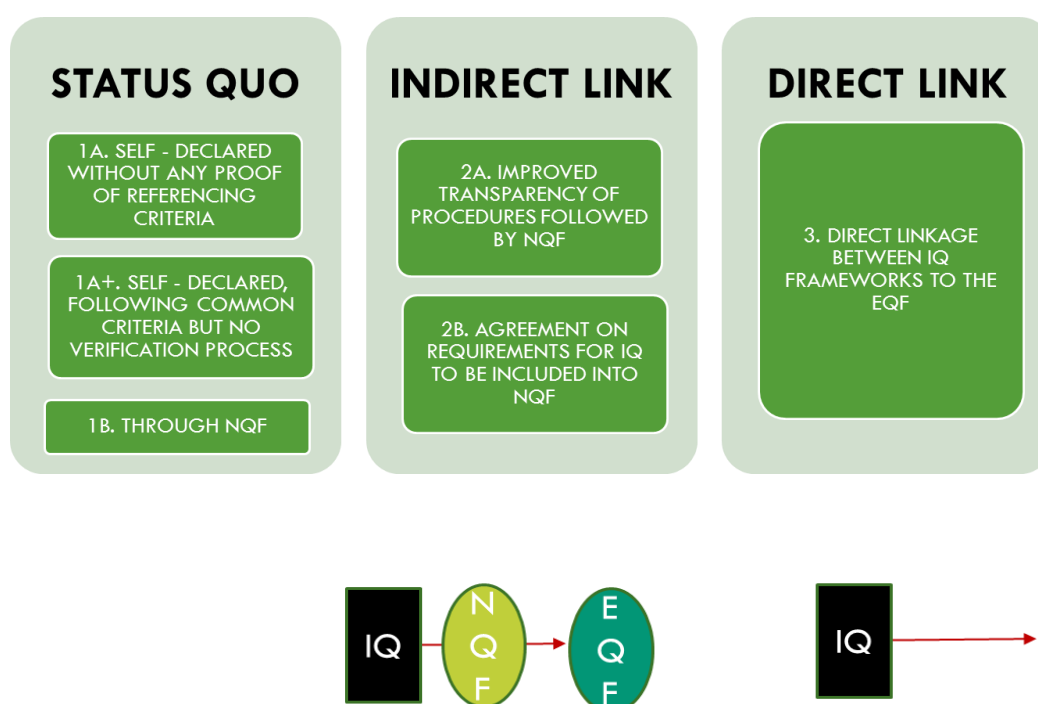
	<ul style="list-style-type: none"> The most common funding source are assessment or certification fees and membership fees
4. Relationship with NQFs and EQF	<ul style="list-style-type: none"> 9 countries have procedures in place for including ISQ in their National Qualification Framework, namely BG, BIH, FR, LT, NL, PT, SI, SK, UK-EWNI, UK-SC Organisations chose to link their initiatives to NQFs to improve national recognition A total of 26 organisations have linked their initiatives to an NQF Two types of linkage were identified: a direct link to NQFs and an indirect link Reasons for not linking the initiatives to an NQF are: deterioration of quality and it doesn't benefit the European or international dimension of the initiative National referencing process is perceived as time-consuming. The negotiation process is slow and regulations and criteria are different between countries 39 organisations/initiatives displayed EQF levels. In 13 cases, such a link is being displayed without any existing linkage with an NQF. Organisations chose to link their initiatives to the EQF to improve recognition (recognition of professions; recognition at European Level; recognition outside Europe; recognition in the labour market; and recognition in education and training systems) A few did organisations didn't consider the EQF as well known or mature enough to provide significant benefits
5. Use of learning Outcomes and quality assurance	<ul style="list-style-type: none"> Learning outcomes are commonly used to define international sectoral qualifications and standards. The majority of the organisations have explicit quality assurance processes in place for the delivery of training and for the assessment/certification process The majority of the organisation have approved provider process that training providers must meet to deliver the initiative Common quality assurance procedures included: reviewing training materials; requiring teachers or examiners to meet certain criteria and audits

	<ul style="list-style-type: none"> The majority of the organisation have clear assessment and certification criteria
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- 1- All activities related to the recognition of learning outcomes and other mechanisms that link education and training to the labour market and civil society. These activities include: • definition of qualification policy, training design and implementation, institutional arrangements, funding, quality assurance; • assessment and certification of learning outcomes. Comment: a national qualifications system may be composed of several subsystems and may include a national qualifications framework. *Source: Cedefop (2014) Terminology of European education and training policy*

The above-mentioned findings set some implications for the EQF, namely regarding the International sectoral qualifications and frameworks referencing process to the EQF. Potential linkages options are presented in Fig.1.

Figure 1 - Trends in linking International Sectoral Qualifications to the EQF



Source: International Sectoral Qualifications and Frameworks and systems (EU publication, 2016)

The different linking trends are clearly detailed in the next section.

STATUS QUO / ENHANCED STATUS QUO

What is it? Means that organisations can either directly link to the EQF informally or link through NQFs, but neither of these options are ideal since they compromise the harmonisation of the levels.



What are the critical aspects? In the informal linkage to the EQF, there is no validation process for decisions. So, there is no control over whether these initiatives meet EQF principles of learning outcomes and quality assurance procedures.

What are the implications? Trust in the EQF could be compromised, meaning it could turn out to be a less effective mobility tool.

INDIRECT LINK

What is it? Strengthening an indirect linkage to the EQF means that the process of referencing international sectoral initiatives to NQFs could be improved by creating agreements on the requirements and by adding more transparency on the national procedures and requirements.

What are the critical aspects? To arrive to the harmonisation of procedures and requirements for 28 countries. This approach could undermine International Sectoral qualifications.

What are the implications? National divergences could compromise the procedure and the reputation of the EQF.

DIRECT LINK

What is it? This means that a common EU approach to link standards or frameworks directly to the EQF should be adopted, through a consistent process (possibly based on EQF referencing requirements)

What are the critical aspects? Requires the buy-in from national authorities and the European Commission, when it is understanding that some national authorities have reservations on recognising qualifications outside the formal education system.

What are the implications? It would require a clear statutory basis at European level, meaning a structure responsible for assessing the quality assurance processes. Better recognition of International Sectoral Qualifications at national level, once they have a formal relation with the EQF.

The report concludes that International sectoral initiatives in the field of qualifications are a reality that cannot be neglected, as they refer, in most cases to mature and well-established initiatives. The study highlights that participating organisations have awareness of the EQF, and the majority of them are willing to establish a link with EQF levels.

The study also highlights several options for International Sectoral Qualifications and System to move forward in linking to the EQF. Nevertheless, none of them is ideal when looking at the combination of benefits versus costs, feasibility and quality, particularly due to political resistance.

Four recommendations for improving the referencing process are given on both scopes, through NQF and EQF, thus considering possible benefits, costs, unintended consequences and feasibility.

Through the NQF:

- 1) Creating an agreement on requirements for International Sectoral Qualifications to be included into a NQF;



2) Improving transparency on the national procedures and requirements being used to International Sectoral Qualifications to the NQF.

Through the direct linkage to EQF:

- 1) Direct linkage of International Sectoral Qualifications to the EQF based on EQF referencing requirements;
- 2) Direct linkage of International Sectoral Qualifications to the EQF having a common EU process.

4. NATIONAL PROCEDURES FOR RELATING INTERNATIONAL SECTORAL QUALIFICATIONS TO THE EQF

In 2014, experts from France, Scotland, Ireland and the Netherlands were consulted by the EQF Advisory sub-group for ISQ to present the existing procedures for aligning ISQ to the NQFs [3 - **REFERENCES available in section 8]]**:

The conclusions and “lessons learnt” (Boomgaert, W., 2014) about the 4 national procedures were the following:

- Procedures were strongly embedded and linked with national procedures for aligning national qualifications to the EQF;
- ISQ were a part of the category of “non-formal” qualifications, consequently no specific procedures were dedicated to ISQ in those countries;
- The NQF were specifically designed to be “open” to qualifications awarded outside education;
- The importance of considering and understanding the national culture and purpose of the NQF;
- Specific procedures at national level were still “in progress”;
- Levelling the international Sectoral qualifications was not always wanted or needed;
- A national register could be enough to give the ISQ visibility to the wider public without having an NQF.

In 2015 the European Commission commissioned a survey in order to gather national procedures for aligning the ISQ to NQFs. The results were afterwards complemented and updated by email and specific interviews.

The conclusion from this “new” mapping of national procedures for aligning ISQ to the NQF revealed:

- A very low level of activity concerning both the linking of ISQs to NQFs;
- A relatively small number of countries reporting any specific activity;
- Most countries declared not been approached by organisations wishing to link this type of qualifications or frameworks to their NQF;
- Only Ireland, Malta, the Netherlands and Lithuania were able to name specific organisations, which have approached them for a possible linking of their qualifications to their NQF;
- That 9 countries (BG, BIH, FR, LT, NL, PT, SI, SK, UK-EWNI, UKSC) had currently national procedure in place (or under development) for including ISQ in their NQFs;
- That 22 countries (AT, BE-fr, BE-nl, CZ, DE, DK, EE, ES, FI, HR, HU, IT, LI, LU, LV, ME, MT, NO, PL, RO, SE, TR) confirmed not having any national procedure in place or under development for the inclusion of ISQs.
- A total of 26 organisations had reported to have linked their initiatives to an NQF;
- 14 initiatives stated as being directly linked to an NQF;



- 14 stated as being indirectly related to an NQF. This was the case of Malta, where no formal process for linking ISQs to NQFs were identified. For these initiatives, it may be that the initiative is well-established in the country and consequently has been classified as a national professional qualification.

“A peer learning activity about International Sectoral Qualifications” held in Bulgaria (2015) also revealed interesting perspectives regarding ISQ and its alignment with NQFs and with the EQF. The experience from Ireland and from the “French case of integration of Maritime Qualifications” is the described below:

Ireland has a National Framework for qualifications instead of a national qualifications framework, thus highlighting that it is not restricted to Irish qualifications. Microsoft Certificates are one of ISQ which have been included in the Irish NFQ. The procedure applied for inclusion was an approach in which part nationalises private qualifications (through an Academic accreditation approach). This procedure is now suspended and a new one is being developed.

Finally, regarding the integration of maritime qualifications to the NQF, four requirements were identified for a qualification to be included upon demand in the NQF:

- Relevance of the qualification (related to the skills need of a specific sector)
- Graduate's opportunities for labour market insertion;
- Quality of the certification;
- Arrangements for the validation of non-formal and informal learning

An important conclusion coming from this peer learning activity was that in several countries ISQ are incorporated in national education and training systems as a part of a national qualifications.



5. FRONTEX – THE BORDER GUARDING HARMONISATION EXAMPLE

FRONTEX is the EU agency that coordinates the operational cooperation of the Member States at the external borders of the European Union. Among the diversity of activities for which FRONTEX is responsible for, we highlight the support to training and education of national border guards through the establishment of common training standards at the European level. In this context, FRONTEX developed a ‘common curricula’ for border guard training and education that were adopted by the Member States and implemented at the national level, according to FRONTEX common training principles and philosophy.

5.1 Features of the FRONTEX common training standards

- aims to reach as many border guards as possible and all staff categories (from basic to middle- and high-level officers, from operational staff to trainers and border guard instructors and from specialists to border guard managers);
- aims to address the training needs of stakeholders at all levels and in all areas (from the harmonisation of the border guards’ career path education to the development and delivery of specialised training courses);
- requires a close contact and direct involvement of the stakeholders through a formal network of nominated national experts — National Training Coordinators (NTCs);
- training tools and standards are developed in close cooperation with experts from the Member States and Schengen associated countries’ border agencies and partner organisations;
- training tools and products are tailored to the training and professional development needs of the various categories of border guard officers.

5.2 The Sectoral Qualifications Framework

The concept of the European Sectoral Qualifications Framework for Border Guarding (SQF) is a result of the FRONTEX project to develop a common comprehensive training platform that supports the Member States/ Schengen associated countries in integrating the common core curricula developed by FRONTEX.

The SQF is a framework of high-level learning outcomes that encompasses all levels of qualifications acquired in vocational and academic education and training in the border guard field.



The SQF has at its core, the concept of ‘professional learning’ which describes the knowledge, skills and competences transferable to a workplace, the learning that is relevant for the job (required to perform border guard tasks).

The SQF enables harmonisation and benchmarking of border guard learning regardless of national organisational structures or national training and education systems. It acts as a ‘translation tool’ for national qualifications, ensuring the comparability of qualifications and the compatibility of training programmes.

The SQF serves the same function as the EQF, but is written to specifically capture learning related to a particular sector, in this case border guarding.

5.3 Alignment with the NQF and EQF

The SQF was designed to align with levels 4, 5, 6 and 7 of the EQF and it is consistent with the Bologna and Copenhagen processes.

The SQF for Border Guarding describes four levels of learning outcomes (related to the complexity of learning): levels 4 and 5 (principally reflecting the curriculum level of the Common Core Curriculum (CCC) for basic border guard education), level 6 (common core learning standards for border guard mid-level education/CMC updated, bachelor’s level) and level 7 (master’s level — the basis for the European joint master’s dedicated to high-level border guard officers and for all other courses that Frontex will further develop at level 7).

To understand the level of complexity in each level of the SQF the following guide is provided:

- **Level 4:** A complexity of learning similar to end of school examinations at age 18
- **Level 5:** The complexity of post-school vocational training, or a foundation year of a bachelor’s degree
- **Level 6:** The complexity of the final year of a bachelor’s degree
- **Level 7:** The complexity of the final year of a master’s degree

The integration of the SQF at the national level is a process supported by FRONTEX through a harmonised translation and training in course design in line with the SQF and Bologna/Copenhagen principles and quality assurance processes.

The SQF does not dictate national training requirements; it includes all national requirements and is, therefore, considered “inclusive and not prescriptive”.

As the SQF is essentially a translation device, the differences that have emerged during a national reviewing process undertaken by the Member states were only identified and communicated (e.g. the basic border guard training learning outcomes is at level 4 in the SQF, but that is accredited as a level 3 course in some Members States)



Nonetheless, the discrepancies it did not affect in any way the usage of the SQF at the national level, as the Member State referred to previously decided to review and develop its occupational standards for a number of profiles, using the SQF Competence Profiles as a reference methodology and standard. This demonstrates and reinforces the idea of the SQF being a supporting tool, developed based on a flexible paradigm that remains inclusive and not prescriptive of the Member States' national specifics.

Source: FRONTEX, Sectoral Qualifications Framework for Border Guarding “setting Standards for training excellence” Vol. I, 2013



6. EWF QUALIFICATION AND TRAINING SYSTEM - THE WELDING CASE

6.1 Relevance of the Welding Sector

Increasing the EU competitiveness in Manufacturing is one of the objectives defined for the period 2014-2020, which is expected to boost employment and turnover of European companies. Within the manufacturing sector, welding is, eventually, the most used technology with recognized importance in terms of both employment and added value.

A comprehensive study conducted in Germany in 2013 based on data collected in European organisations through statistical analysis and modelling, led to results that show that the total added value generated by European joining industry is around 66 Billion Euros per year and estimates that over 1.2 million people work in welding and related technologies. Welding technology is involved in most manufactured products or components, from transport industry, to energy production, from macro- to microscale components.

If a weld is not properly performed, catastrophic failure of the welded construction may occur with serious damage to people and significant economic losses. It has been estimated that the cost of repairing an unacceptable weld can cost 5 to 6 times the cost of welding if correctly in the first time. Safety and profit depend then on a good technical control of welding operations where personnel knowledge, competence and skills play an important role.

Sources Moos, W, Janssen Timmen Macroeconomic an sectoral value added by production and application of Joining technology in Germany and Europe (2013); Baur, C., Wee, D., Manufacturing's next act. (2015)

6.2 International Qualification and Certification System

The International Education, Training, Qualification and Certification System, managed by EWF, is a harmonised scheme for the education, training and examination of personnel involved in welding, joining and related technologies, used in 30 European countries, covering all EU members, and has a worldwide recognition as International qualification system.

The EWF Qualification and Certification system is an open system that ensures that any person, anywhere in the world, has unrestricted access to education, training, qualification and certification in welding and related technologies, in accordance with international standards, (e.g. ISO, CEN, etc).

Certification of welding personnel started to be addressed by the European Welding Federation (EWF) about 15 years ago due to the requirement of industry in having staff not only qualified but also certified for the job. With the European enlargement other country members were associated to this group.

At the moment, 46 countries (Fig. 2), European and non European, are using the EWF qualifications and certifications, in a total with 44 ANBs (Authorized Nominated Bodies) 683 ATBs (Authorized Training Bodies). The network includes VET schools using the EWF system.

Figure 2 - Geographical distribution of countries using the international harmonized System for Qualification of Welding Personnel



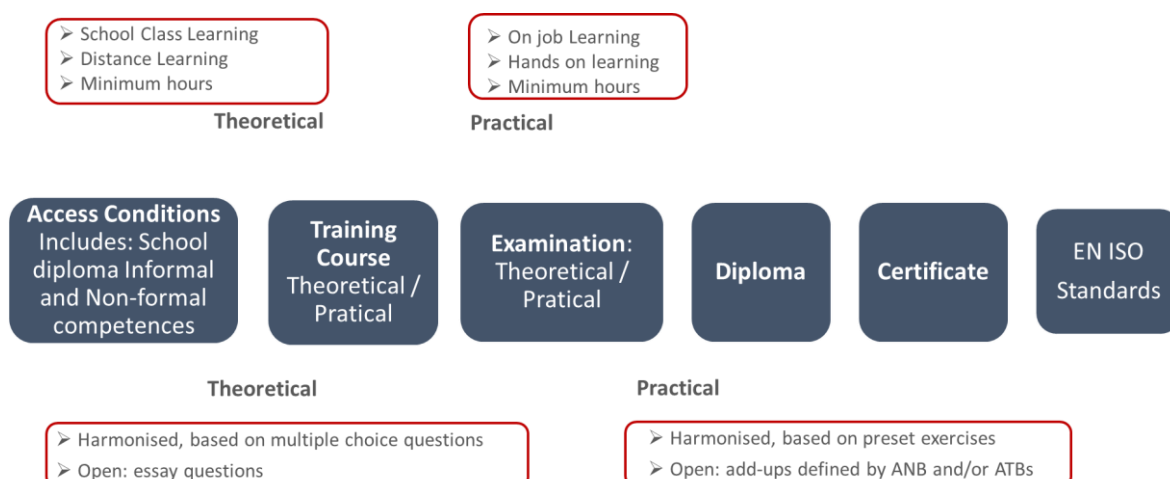
Source: L. Quintino, E. Assunção, R. M. Miranda, *A successful experience of international training and education in manufacturing* (2017)

The EWF system started in 1992 with the development of Guidelines for the higher level (International Welding Engineer Qualification) and has since then been developed to encompass all professional levels of welding.

The EWF System assures harmonised knowledge, skills and competence for any holder of a diploma in any region of the world, and comprises Education, Examination and Qualification Guidelines for different professional levels.

A comprehensive understanding about the EWF qualification system is given below (Fig.3):

Figure 3 - EWF Qualification System



The key supporting areas of the EWF Qualification system are the harmonisation of the Qualifications Guidelines and the Quality Assurance System.

The EWF committee for education and training is responsible for preparing the guidelines for courses, giving the contents in terms of themes and keywords with minimum teaching times assigned to them. Access to harmonised courses is only for those with appropriate general education, different in each country.

6.3 Qualification

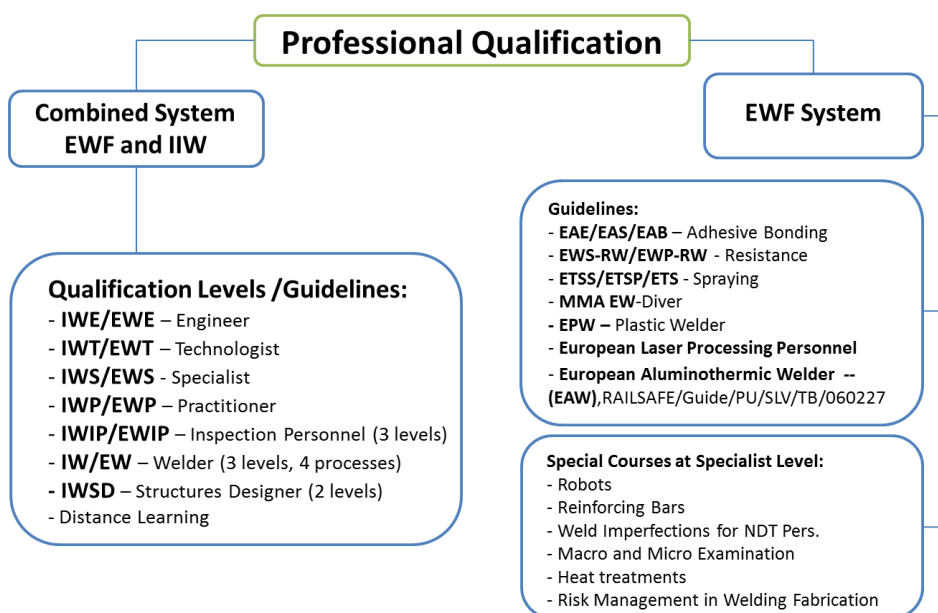
In the EWF qualification System, the implementation of International Qualification courses is provided by approved ATBs, under ANBs supervision, which combine both supporting knowledge and application experience, in a close relation with industry and their needs.

Qualification of Welding Personnel is in accordance with the Guidelines and rules, involving an examination of the knowledge and skill related to specified criteria". Success in this examination leads to the issue of the related EWF diploma gained. Such diplomas remain valid for the lifetime of the holder.

Source: Rules for the Implementation of EWF Guidelines for the Education, Examination, Qualification and Certification of Welding Personnel. Approved: November 2016

The EWF Qualification system comprises the following professional qualifications:

Figure 4 - EWF Professional Qualification structure*



* IIW – International Institute of Welding

The Professional Qualification structure (Fig. 4), show the EWF courses' guidelines covering all professional levels in welding technology and related areas, such as thermal spraying, adhesive bonding, plastics welding and underwater welding.

Special courses were also developed providing a specific education on emerging technologies, as for instances in laser welding or adhesive bonding.

Blended learning options are admitted facilitating education in different countries, mobility and lifelong learning.

6.4 Certification of personnel

Qualification itself, does not indicate that the diploma holder is competent to do a particular job.

This means, that companies manufacturers must ensure that engineers, designers and technicians who deal with welding issues at all levels possess relevant competences. Thus, the certification of Welding Personnel is the "procedure leading to a written testimony of an individual's competence demonstrated by examination and assessment of experience and subsequent surveillance to confirm that the competence has been retained." This process leads to the issue of a Certificate with a validity period.

Source: Rules for the Implementation of EWF Guidelines for the Education, Examination, Qualification and Certification of Welding Personnel. Approved: November 2016

Requirements for certification are for instance inscribed in the standard EN ISO 14731 "Welding Coordination – Tasks and Responsibilities" which specifies that people with welding related responsibilities must be able to demonstrate that they are competent to carry out those

responsibilities. Furthermore, in order to comply with EN ISO 3834 “Quality requirements for fusion welding of metallic materials”, it is necessary also to comply with EN ISO 14731.

6.5 Management and Governance

EFW manages the International System for Training, Qualification and Certification of both welding personnel and companies using welding, in Quality, Environment, Health and Safety.

EFW is a membership system of 28 European member countries and 2 Observer Members from outside Europe, represented by their national welding societies/institutes.

Members pay an annual fee to participate in EWF’s activities and gain access to EWF products and services.

A General Assembly takes place every six months, in May and November, bring together the EWF members with the aim of discussing, planning and reviewing future actions and activities as a response to the market needs, as identified by each member.

6.6 Relationship with NQFs and EQF and the use of learning outcomes

Regarding the Welding International Qualifications referencing process to the NQFs, some EWF members actively started the integration of the EWF qualifications into their national system, mainly the welder qualifications (European Welder for Tube – I/ETW; European Welder for Plate – I/EPW European Welder for Fillet – I/EFW), as presented in the table 4.

In 2013, EWF conducted a survey to its national members, in order to identify the NQF level of the EWF qualifications. The results are presented below and show the divergence and poor agreement regarding the EQF levels in the different countries:

Table 4 - NQF level of the EWF Qualifications

EFW/IIW	UK	PT	BG	NL	FI	CZ	DE
I/EWE	-		-	6		-	-
I/EWT	-		-	4		-	6
I/EWS	-		-	2/3	5	-	6
I/EWP			-	1		-	
I/ETW	4	2	4	1	4	-	

I/EPW	3	2	4	1	4	-
I/EFW	3	2	3	1	4	-

Source: EWF Internal Survey

The information received at that time from the EWF members correspond, in most cases, to a self-declared referencing process, according to European Commission, 2016 [2 - **REFERENCES available in section 8**] since we assume the National authorities were not consulted during the referencing process, neither involved in the EWF survey.

Currently, there are national evidences of an indirect linkage between EWF Qualifications in Portugal, Finland and UK (Annex 1).

Indirect link to an NQF – means that “qualifications are based on international sectoral standards or frameworks or that integrate international sectoral qualifications are included in some NQF in some countries.

Source: European Commission study on International Sectoral Qualifications and Frameworks and systems (2016)

The Portuguese and Finish realities reveal that the qualifications are fully recognised in their NQF's enabling the trainees to be awarded with a national diploma, and if its the case of the training center being an ATB, the trainee is awarded with a Double “degree” or joint diploma 2 diplomas (one national and one international - EWF). Although, the qualifications assume different shapes from country to country.

Some of the differences can be found in the National implementation of the Welder Qualifications, as the table 5 illustrates.

Table 5 - Design and structures of the European Welder Qualification in Finland vs Portugal, according to the EWF/IIW Guidelines

Finland	Portugal
Qualification name: Vocational Upper secondary education and training	Qualification name: Dual Education
General Education: - 20 Credits <ul style="list-style-type: none"> Compulsory core subjects (e.g mother tongue, second national language, mathematics, physics and chemistry, health education, arts and culture, etc.) Optional core subjects (e.g environment studies, information and communication, ethics, psychology, etc.) 	General Education - 900 hours: <ul style="list-style-type: none"> Citizenship and Employability Language and Communication Mathematics for life ICT's
Free-choice Modules – 10 Credits including students counselling	Learn with Autonomy (transversal component) – 40 hours
Vocational Modules – 90 credits: <ul style="list-style-type: none"> Compulsory modules for all 	Technical Training Component - 1000 hours:

<ul style="list-style-type: none"> • Study programme in manufacturing technology (some of them according to EWF Guidelines) • Study programme in automation technology and maintenance • Study programme in casting technology • Optional modules for all (some of them according to EWF Guidelines) <p><u>On job learning</u> – 20 credits <u>Entrepreneurship and final project</u> – 2 credits</p>	<p>Compulsory technical programme, according to the EWF Guidelines - 800 hours</p> <p>Optional technical programme, according to the EWF Guidelines- 200 hours</p>
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Common aspects Divergent aspects

Sources: *Requirements for Vocational Education, Finish National Board of Education, 2010, Vocational Qualification in Metalwork and machinery; Referencial de Qualificação Metalurgia e Metalomecânica (2017)*

According to the EWF experience in referencing the international sectoral qualifications to the NQF, two distinct approaches can be identified:

1) For low levels 2 to 4 (e.g for European Welder Qualification in Portugal and Finland, there is an attempt to integrate the Welding Qualifications in the National VET education system, adopting the necessary requirements to be recognised at national level)

Figure 5 - Integration of the EWF qualification in National



2) For high levels 5 to 7 (e.g. for the European Welding Engineer in the UK, the integration is done in the Higher Education System as a joint degree)

Figure 6 - Integration of the EWF qualification in National Higher Education System



PROFESSIONAL RECOGNITION

There are some comprehensive national reports on International Sectoral Qualifications developed namely by Latvia (2014) [4 - **REFERENCES available in section 8]** and UK (2015) [5 - **REFERENCES available in section 8]** both making reference to the Welding case.

The first one demonstrated that the European Welder Qualification is one of the majors ISQs awarded, being monitored and reviewed by a professional association (DVSPersZert). In the latter one, the Welding ISQs are monitored and reviewed also by a professional association, The Welding Institute, and recognised by the Engineering Council (entity which sets and maintains the internationally recognised standards of professional competence and ethics that govern the award and retention in Engineering roles).

Regarding the alignment of the Welding Qualifications directly to the EQF, in 2013, EWF made a first attempt to map the EWF Harmonised Training and Qualification System to the levels of the European/International Qualification Framework. This self-declared referencing process is described in the table 6. An updated version of this matrix is available in the document “Guideline of EWF methodology for writing learning outcomes” (RAINBOW result R2.1)



Table 6 - EWF self-declared referencing process from 2013

Mapping the IIW/EWF Harmonized Training and Qualification System to the levels of the European/International Qualification Framework				
IIW/EWF harmonised training programme, including entry requirement for each where applicable	EQF descriptors			Target recognition (EQF level after awarding IIW/EWF Diploma)
	Described as theoretical or factual (Note 1)	Described as cognitive and practical (Note 1)	Described in terms of responsibility and autonomy (Note 1)	
European/International Welding Engineer (entry requirement: EHEA ('Bologna') 1st cycle, EQF Level 6)	364 learning outcomes (Note 2) from 438 hours postgraduate training after achieving EQF Level 6 – see generic descriptors and examples below:			EQF Level 6 or 7 (Note 3)
	Carry out a critical assessment of theory, principals and applicability of welding and related technologies Explain fully the principles of fracture mechanics.	Deduce the best technical and economical solution in complex and unpredictable problems related to welding. Predict correctly the choice of welding process and consumables for each type of stainless steel.	Detail the requirements for writing quality control procedures and quality plans for welded fabrication. Detail tasks and responsibilities of the welding coordination personnel.	
European/International Welding Technologist (entry requirement: EHEA Short Cycle, EQF Level 5)	351 learning outcomes (Note 4) from 338 hours of training after achieving EQF Level 5 – see generic descriptors and examples below:			EQF Level 5 or 6
	Explain the elements of cost associated with welding. Explain metallurgical and weldability aspects involved when joining dissimilar materials.	Interpret procedures for the calibration, validation and monitoring of welding operations. Predict contraction and distortion in joints and structures induced by welding.	Define tasks and responsibilities of the different inspection personnel Define the qualification of Non Destructive Testing personnel.	
European/International Welding Specialist (entry requirement: EQF Level 4)	288 learning outcomes (Note 5) from 227 hours of training after achieving EQF Level 4 – see generic descriptors and examples below:			EQF Level 5
	Describe the design of welded joints in accordance with given details. Recognise the effects of imperfection size, morphology and position on structural integrity.	Identify and use appropriate weld symbols. Use of diagrams in the design of welded joints subject to fatigue loading.	Identify procedural and operator qualifications to be applied to repair welds. To understand and be able to handle welding related tasks in respect of the manufacture of specific welded products.	



European/International Welding Practitioner (entry requirement: EQF Level 3)	180 learning outcomes (Note 6) from 140 hours of training after achieving EWF Level 3 – see generic descriptors and examples below:			EQF Level 4
	Outline the relationship between the welding procedure and mechanical properties. Recognise the advantages and disadvantages of different types of welds in relation to static loading.	Be able to use and care for the equipment and accessories for different welding processes. Outline the effects of heat treatment after welding and deduce the conditions of such treatment.	Show competence in carrying out testing to a given schedule. Identify appropriate methods to reduce each type of welding risk factors.	
European/International Pipe Welder one material, using one welding process.	101-116 learning outcomes, from 50-52 hours of theoretical training and 440 hours of practical training, outlined below:			EQF Level 4
	Outline common problems when using welding to join pipes, tubes and/or plates in a variety of combinations, geometries and positions and when dealing with related activities (e.g. fit up, cutting, tack welding, basic visual inspection)	Be able to produce welds to join pipes, tubes and/or plates in a variety of combinations, geometries and positions to the required quality and of specified dimensional accuracy	Take personal responsibility for your own actions and for the quality and accuracy of the work produced. Deal promptly and effectively with problems within your control. Be able to supervise routine welding work of others	
European/International Plate Welder in more than one welding process and/or base material	122-138 learning outcomes, from 56-60 hours of theoretical training and 580 hours of practical training, outlined below:			EQF Level 4
	Understand the differences between the processes and materials chosen. Identify the necessary measures to achieve sound butt and fillet welds in plate using the chosen welding processes and materials including related activities (e.g. fit up, cutting, tack welding, basic visual inspection)	Be able to check the information on the welding procedure specification, and to produce fillet and butt welds in plate using the chosen processes and materials in a variety of geometries and positions to the required quality and of specified dimensional accuracy	Take personal responsibility for your own actions and for the quality and accuracy of the work produced. Deal promptly and effectively with problems within your control Be able to supervise routine welding work of others	
European/International Plate Welder in one material, using one welding process.	87-92 learning outcomes, from 43-45 hours of theoretical training and 290 hours of practical training, outlined below:			EQF Level 3
	Identify the welding process and understand the difference in base and filler materials and related necessary activities (e.g. fit up, cutting, tack welding, basic visual inspection)	Be able to check the information on the welding procedure specification, and to produce welds in butt and fillet welds in plates in a variety of geometries and positions to the required quality and of specified dimensional accuracy	Take personal responsibility for your own actions and for the quality and accuracy of the work produced. Deal promptly and effectively with problems within your control	
	81-97 learning outcomes, from 38-42 hours of theoretical training and 280 hours of practical training, outlined below:			EQF Level 3



<i>European/International Fillet Welder in two materials and/or two welding processes.</i>	Understand the differences between the processes and materials chosen. Identify the necessary measures to achieve sound fillet welds using the chosen welding processes and materials including related activities (e.g. fit up, cutting, tack welding, basic visual inspection)	Be able to check the information on the welding procedure specification, and to produce fillet welds using the chosen processes and materials in a variety of geometries and positions to the required quality and of specified dimensional accuracy	Take personal responsibility for your own actions and for the quality and accuracy of the work produced. Deal promptly and effectively with problems within your control	
<i>European/International Fillet Welder in one material, using one welding process.</i>	<i>53-38 learning outcomes, from 25-27</i> Know the basic principles of the welding process; the difference in base and filler materials and related activities (e.g. fit up, cutting, tack welding, and basic visual inspection)	<i>hours of theoretical training and 140 hours of practical training, outlined below:</i> Able to check the information on the welding procedure specification, and to produce fillet welds in a variety of geometries and positions to the required quality and of specified dimensional accuracy	Work under supervision. Deal promptly and effectively with problems within your control	<i>EQF Level 2</i>
Notes				
1. Text taken directly from the table of EQF descriptors in http://ec.europa.eu/eqf/compare/eqf_en.htm#comparison				
2. Examples taken from a total of 364 learning outcomes (129 on welding processes, 115 on materials, 58 on design and 62 on applications)				
3. In some EU countries the I/EWE post-graduation course is included in MSc programmes				
4. Examples taken from a total of 351 learning outcomes (129 on welding processes, 111 on materials, 49 on design and 62 on applications)				
5. Examples taken from a total of 288 learning outcomes (111 on welding processes, 88 on materials, 34 on design and 55 on applications)				
6. Examples taken from total of 180 learning outcomes (80 on welding processes, 49 on materials, 8 on design and 43 on applications)				



The EWF International Qualifications are offered in the market, since 1992 and were based in traditional training courses which content, methodology, assess conditions, examinations are detailed in Guidelines that all the recognised VET training schools (more than 600 ATB's) implement.

With the support of the Erasmus+ funded projects, these Guidelines are being aligned with the most recent EU tools, in particular the LOs approach proposed by the RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (2008) on the establishment of the European Qualifications Framework for lifelong learning.



7.CONCLUSION

International sectoral initiatives in the field of qualifications are a reality that cannot be neglected. They are, in most cases, mature and well-established initiatives with a tight link to the market needs, and recognised by companies, employers and other stakeholders, having a need for such a qualification.

Currently, all qualifications are firstly included in the national qualifications frameworks (NQFs) and then, through comparability of the NQF, their levels are compared at EU level. Nevertheless, the mapping of common national procedures and criteria for aligning ISQ to NQF is still missing, which leads to misunderstandings in the EQF levels.

Majority of the organisation managing International sectoral initiatives are aware about the EQF and are willing to establish a link with EQF levels to improve recognition of professions; recognition at European Level; recognition outside Europe; recognition in the labour market; and recognition in education and training systems.

Organization that wish to have their ISQ linked to the EQF should be offered the solution to do so. Those who do not carry this wish, should not be pressured.

Despite the efforts, there is a lack of transparency and comparability of international sectoral qualifications, as no formal procedure are in place for referencing International sectoral Qualifications to the EQF.

There are several options for International Sectoral Qualifications and System to move forward in linking to the EQF. Despite the fact, none of them is ideal when looking at the combination of benefits versus costs, feasibility and quality, particularly due to political resistance.

Recommendations for improving the referencing process are given on both scopes, through NQF and EQF. These two options are at sate and both should be considered:

- 1) **Indirect link** is the Member States' sovereignty to integrate international sectoral qualifications in the national framework and to assign a NQF level, other Member states should be consulted to harmonise the level. The reasoning behind this approach could be to one National Qualification Agency (NQA) to accept the IQS and refer it to National level, and another NQA could be consulted to gain more consistency.
- 2) **Direct link** is the possibility of developing EU criteria to make the direct link with the EQF, which is the aim of the RAINBOW project.

Due to its consolidated experience as a harmonised training and certification system, EWF aims at setting up a methodology for linking International sectoral initiatives to the EQF, namely by designing possible criteria and procedures for levelling and by sharing its Quality Assurance procedures for awarding the qualifications. By doing so, EWF methodology intend to serve for benchmarking to other International Sectoral Qualifications.



The EWF Qualification System has room for improvement on its methodologies, especially on transparency and feedback mechanisms, but it is also clear that the EWF System can be used for improving ISQ to the EQF referencing. A possibility is to involve all relevant stakeholders into all stages of the referencing process, thus by covering national authorities, trade unions, etc.



8. REFERENCES

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<http://ec.europa.eu/social/BlobServlet?docId=15699&langId=en>

10. ANNEX

Annex 1 - EWF international qualifications linked to the NQF

Country	Evidence	Link
Portugal	ANQEP – National Qualification Catalogue (for the EW and EWP Qualifications)	http://www.catalogo.anqep.gov.pt/Qualificacoes?Page=2&CurrentPerPage=10&Designacao=&AreasFormacaoId=63&CodigoArea=&Nivel=2&NivelQEQ=&RVCC=false&Parciais=false http://www.catalogo.anqep.gov.pt/Qualificacoes/PDFQualificacaoReferencial/1469/EFA/duplacertificacao/521050_RefEFA
Finland	OPH FI – Curricula and Qualifications (for the EW and EWS qualifications)	http://oph.fi/download/183822_Welders_Specialist_Qualification_.pdf http://oph.fi/download/183697_Welders_Further_Qualification_.pdf http://oph.fi/download/183802_platers_specialist_qualification_.pdf http://oph.fi/download/183692_plate_and_sheet_metal_technology_further_qualification_.pdf
UK	For the EW and EWE Qualifications	http://ccea.org.uk/sites/default/files/docs/accr/education/european/eqf/isq_report_nov2016.pdf
Latvia	For the EW Qualifications	http://www.nki-latvija.lv/content/files/International_Qualifications_Latvia_2014.pdf https://www.latvijaskvalifikacijas.lv/qualificacion/atestats-par-arodizglitiba-ar-profesionalo-kvalifikaciju-rokas-lokmetinatajs-mma-lokmetinatajs-metinasana-ar-mehanizetotiekartu-aktivas-gazes-vide-mag/