

ETF POSITION PAPER

**Anticipating and matching demand
and supply of skills in ETF partner
countries**

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Introduction

This paper aimed at a readership that includes stakeholders in European Training Foundation (ETF) partner countries and ETF specialists, all of whom are jointly striving to exchange and improve knowledge and practices in skills anticipation and matching.

The ETF supports policy-makers and practitioners in ETF partner countries to enhance the relevance of their education and training systems so as to improve the match between skills supply and demand. Since its inception, the ETF has worked toward this end through the implementation of a range of projects to guide partner countries toward better understanding of the present and future skills demand and to encourage exploration of the relevance of the skills developed by young people through education and training to the labour market. A number of projects have been implemented over the years, including: enterprise surveys in Western Balkan countries in the early 2000s; the identification of new occupations in Central Asia (in 1998-1999); studies of the transition from education to work for young people (from 2000 in Serbia, Syria, Tajikistan and Ukraine), and; sector specific studies on skill needs (2011 in Ukraine). Skills anticipation and matching has gained momentum as a policy issue in ETF partner countries and the European Union (EU) in recent years, partly as a result of rapid changes in the labour markets, rising and persistent unemployment rates - in particular among youth, and national efforts to improve competitiveness. The country analyses produced within the Torino process (2010) demonstrated the preoccupation of partner countries with achieving better understanding of the skills demand in order to develop more effective education and training policies and reduce skill mismatch. The EU places great emphasis on better matching through the EU 2020 strategy and, in particular, the New Skills for New Jobs Agenda. Anticipation and matching approaches and methods are widely encouraged with a view to developing a skilled workforce with the 'right mix of skills' in response to labour market needs, in a way that promotes job quality and lifelong learning. The EU Skills Panorama initiative launched in 2011 pools various policy initiatives in the field of skills anticipation and matching.

In response to these developments the ETF launched 'Anticipating and matching demand and supply of skills in ETF partner countries,' a 3-year innovation and learning project, in 2011 with the aim of further supporting the specific needs of partner countries in integrating new knowledge developed at the EU and international level. The present document is the outcome of the first year of work in this project and it draws upon deskwork, country analyses and methodological papers developed during this period. It also draws upon the rich discussions arising from two meetings of groups of experts from EU and partner countries that produced analysis of current issues and practices in the field and discussion of the pros and cons of various skills anticipation and matching approaches and methodologies in view of on the needs and conditions in transition and developing countries.

This paper will describe the ETF position and approach for skills anticipation and matching, it will provide a strategic and conceptual framework for the ETF's activities in this field and will contribute to shared understanding as a basis for future work. ETF partner countries are heterogeneous and the challenges and possibilities in each differ from those in the highly developed countries. This means that, no one-size-fits-all solution can be proposed for the issue across the board. The aim of this paper is to inspire debate and contribute to the production of tailor-made approaches and best-fit solutions.

Chapter 1 gives a conceptual clarification of the main issues and provides definitions of key terms. Chapter 2 highlights specific framework conditions and needs in transition and developing countries. Chapter 3 provides a brief overview of international approaches and practices, demonstrating that while much can be learned from the rich experiences in EU member states and other developed countries, transition and developing countries must develop individual policy mixes to fit their specific needs. Chapter 4 presents the ETF approach to supporting partner countries in the development of their anticipation and matching approaches and Chapter 5 gives an overview of ETF action for 2012-2013. A bibliography and a glossary of terms complete this position paper.

1. Skills and the labour market: a conceptual framework

Skills are a key factor in the prosperity of nations and in improving the lives of individuals and many countries have therefore invested heavily in skills training in recent decades. For workers, skills equate with employability, access to income from work and social rights and mobility; for businesses, skills are a major component in productivity, competitiveness and innovative capacity, and; for society at large, the added value of skills and education in general can be seen in higher living standards, better public services and more active and open societies. Overall, the development and application of skills is a factor that is crucial in ensuring that people find gainful employment and for boosting job creation and competitiveness.

The education and training system has a key role to play in ensuring that opportunities are provided for all individuals to continually develop their skills in a lifelong learning perspective, thus enabling them to adapt to rapidly changing labour market requirements and conditions. Two vital elements will help achieve this: (i) better information for all actors (learners and their families, training providers and policy-makers) on the skills required by the labour market – both current and in the foreseeable future, and: (ii) better transformation capacity, putting this information into action in shaping education and training provision.

Although the responsibility for developing skills relevant to present and future labour market needs primarily lies with the education and training system and the policies that shape these, it is also important to stress that improved matching of skills demand and supply is determined equally by appropriate labour market functionality. Rigidities in labour market functionality can create impediments to the adequate mobilisation and application of the skills available. For example, rigid wage-setting mechanisms send erroneous messages on relative skills supply and demand to labour market actors; this leads to distortion of incentives for the application of skills and becomes an important factor that can impede adequate matching. Other factors that similarly impede good matching include: (i) discriminatory recruitment practices by employers on the basis of sex, age, ethnic, linguistic or religious background; (ii) underdeveloped labour exchange systems, and; (iii) the lack of support measures to overcome issues of geographical mobility.

The conceptual framework presented below focuses primarily on the role of education and training provision within the skills matching process.

Conceptual clarifications

ETF work with partner countries builds on the basis of the following shared definitions and understanding of key terms (see Annex A2 for a full glossary of terms).

SKILLS: this term is widely used in various forms of discourse with a variety of meanings, and the connotations of the term change when translated into some languages. In this context, the ETF defines a 'skill' as: the ability to apply knowledge and experience to complete tasks and solve work-related problems. The term therefore refers to cognitive, practical and social dimensions and may also refer to innate talents. In this paper, the term 'skills' is used in the most open way possible, covering a different and broader category of elements than mere 'qualifications'.

QUALIFICATION: refers to the formal outcome of education or training. 'Qualification' generally signifies an official record of achievement such as a certificate or diploma recognising the successful completion of education or training, a test or examination; a qualification may also designate a legal entitlement to practice a trade.

MATCHING: covers all approaches and actions aimed at reducing the gap between skills supply and demand in the labour market, increasing the employability of the workforce and reducing skill shortages. Matching requires information about the labour market, derived from monitoring, anticipation and forecasting of skill demands and supplies, and transfers this information into effective policies and activities to reduce labour market imbalances. Thus, matching covers various mechanisms, instruments and policies that are in place in a country and its regions or sectors in order

to improve the coordination of the supply and demand of skills, from demand-oriented education and training, to placement and referral systems.

Matching can also be described as a form of mediation and coordination between the demand and supply side of skills, undertaken by mediators such as career guidance officers and counsellors or employment services. Coordination operates on various levels: the fit between individual workers and their tasks; the fit between education and training supply (both initial and continuing) and requirements for qualifications, and; the overall fit between supply and demand within the labour market.

MISMATCH: skill needs on the labour market and the supply of skills from educational institutions are often said to be poorly matched and this is termed ‘mismatch’. This ‘mismatch’ is a popular explanation for high youth unemployment rates, low competitiveness and poor economic growth. A ‘skill mismatch’ situation occurs when people cannot find jobs to match their skills and where, at the same time, employers cannot find the workforce necessary to meet their skills requirements. Mismatch can be reduced but not entirely avoided. There are, of course, factors other than skills that can impact on the imbalance between qualitative and quantitative supply and demand, and these include elements such as: wage levels, gender or age discrimination, poor working conditions, the lack of geographical mobility and, last but not least, migration.

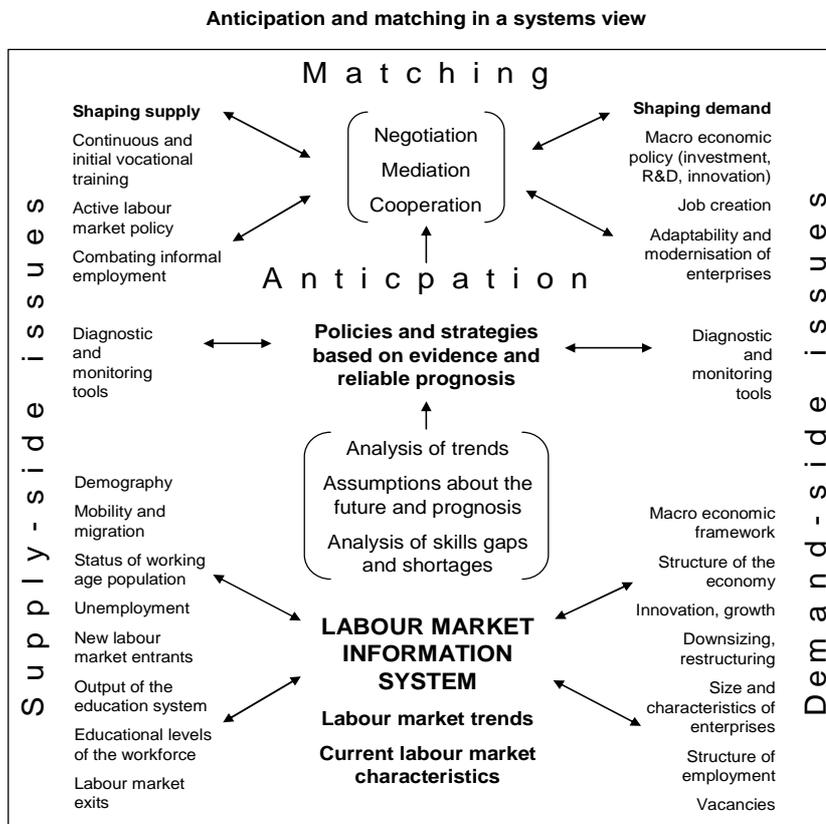
SKILLS GAPS, SKILLS SHORTAGES: various forms of skill mismatch can be distinguished, encompassing various types of skill gaps and imbalances such as: over-education, under-education, over-qualification, under-qualification, over-skilling, skill shortages and surpluses, skill obsolescence and so forth. The skill mismatch can be vertical (with imbalance between educational levels) or horizontal (imbalance between specialisations or occupations). Skill mismatch can be identified at various levels: the individual, the employer, the sector, or the economy. One frequently encountered and seemingly paradoxical skill mismatch situation sees higher education graduates unemployed or forced to work in jobs with lower skills requirements while employers report a shortage of workers with appropriate technical vocational skills. A shortage of education/qualification/skills may contribute to low productivity in businesses, whereas a surplus may render low returns to education. Mismatches are often discussed at the macro level, but such discussion obscures the fact that there may in fact be shortages in one sector or region concurrently to oversupply in another (Gatelli and Johansen, 2011). Labour market shocks, such as the impact of the post-2008 economic crisis, industrial restructuring and technical innovations also have a strong impact on skill mismatch.

ANTICIPATION: denotes all attempts to capture and envisage possible aspects of future relationships between skills supply and demand, with a particular emphasis on upcoming requirements in any particular country, sector or region, as well as changing skills requirements due to new technologies. ‘Anticipation’ denotes the procedures in place to understand future requirements and includes various methods and instruments of information and knowledge acquisition, both quantitative and qualitative, formal and informal (from formal quantitative forecasting based on projections or surveys, through qualitative prediction methods, to informal projects based on information and knowledge exchange between players within the same part of the system). Any reliable anticipation must be based on data monitoring, as future developments are rooted in the present and cannot be understood without adequate understanding of the present situation. ‘Monitoring’ is a term that includes all the procedures in place to observe current and ongoing relationships between skills supply and demand in all of the various aspects.

Understanding the matching process

The relation between monitoring, anticipation and matching and the dimensions of supply and demand are depicted in Figure 1 on the basis of the concepts described above. Matching skills supply and demand involves cooperation, mediation and negotiation between the education systems and the business sector, while adjusting supply and demand. Effective matching requires the implementation of coherent and regular anticipation procedures, with policies based on reliable data, diagnosis and monitoring tools. A robust labour market information system forms the cornerstone in the process of assessing mismatch problems and developing a sound prognosis for future trends.

Figure 1: Anticipation and matching

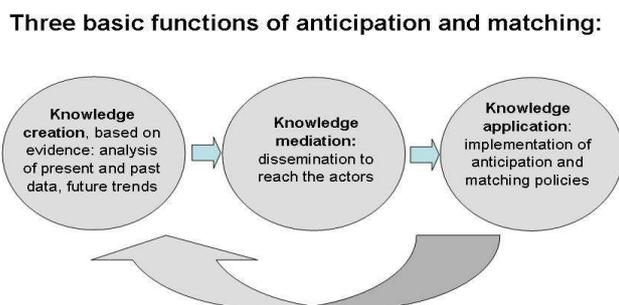


Creating knowledge and transferring knowledge into action: how anticipation and matching are linked

The education system and the labour market function at different speeds. While the education system is made to build on long-term policies and strategies, the business sector must adapt quickly to changing market demands and technological innovation if it is to stay competitive in global, national or local markets. There are variable, but often lengthy, lags between the decisions made on investment in skills and the time when these skills finally become available, and training of various sorts therefore forms an important complement to education in the context of lifelong learning. A functional training system facilitates the adaptation of the workforce to changing skills demands and has a shorter reaction time than any system for initial education. This type of training fulfils two key functions: it keeps the skills of individual workers up to date with new developments and the changing skills requirements of the workplace, and; it provides re-training that can increase occupational mobility. Retraining can offer a solution in the event of structural change, especially where restructuring results in mass redundancy.

Anticipation and matching are reliant on the outcomes of the three basic functions of the knowledge continuum: i) knowledge creation, based on evidence and forecasting, ii) knowledge mediation and dissemination, and finally iii) knowledge application, e.g. policy implementation (European Commission, 2007). Any effective application of these functions will, in turn, have an impact on the evidence, and this means that the system of anticipation and matching is a dynamic entity and that ultimate success depends on the systemic quality of the interaction and interplay between these components.

Figure 2: The interplay between knowledge creation, mediation and application



The first step of ‘knowledge creation’ aims to gain information about current skill demands and supply. Relevant and reliable information on the quality and quantity of skills demands, currently known as ‘nowcasting,’ for immediate and short-term action, forms the basis for forecasting future skills needs. Information about future trends in both demand and supply helps improve matching systems. It is therefore important to identify the data and information relevant for matching purposes and to ensure that this data is reliable and representative, that the forecasts are robust and that they are based on tried and tested methodologies.

The following matrix provides a framework for the classification of approaches for anticipation and matching. This matrix has two dimensions: level of intervention and time. The ‘level’ category covers the scope or extent of outreach of the approaches, ranging from one-to-one contact with individual people or enterprises (micro-level), through contact with whole economic sectors or regions (meso-level), to impacts on the national economy and systems or supra-national level (macro-level). The time dimension covers periods differentiated as short-term, mid-term and long-term.

Figure 3: Anticipation of skills demands

Anticipation: exploring current and future demands (examples)

Time horizon ▶ Levels ▼	Short-term (0-1 year)	Mid-term (1-5 years)	Long-term (>5 years)
Micro-level (people, enterprises)		Tracer studies, qualification needs assessment at company level Surveys about labour market transitions	
Meso-level (sectors, regions)	Employer surveys, vacancy monitor	Sector specific skill needs analysis Qualitative (sector specific) forecasts	
Macro-level (macro economic, national level)			Formal, national or regional quantitative projections

Policy-makers and stakeholders must be informed of the knowledge gained in a timely, up-to-date and transparent manner. The mere publication of research results may be insufficient; the findings must be

disseminated in order to reach the actors involved in the processes. Information for policy-makers should be based on a mix of approaches, in an attempt to maximise the validity of the data.

Application of the knowledge gained is the final objective and the information must be transferred into effective action by: making education and training curricula more demand-oriented; guiding young people in careers decisions on what to study and how and where to find gainful employment, and; advising and supporting adult job changers, people facing redundancy, or those wanting to re-enter the labour market to improve their employability.

Figure 4: Matching skills supply and demand

Matching: transferring the findings into policies (examples)

Time horizon ▶	Short-term (0-1 year)	Mid-term (1-5 years)	Long-term (>5 years)
Levels ▼			
Micro-level (people, enterprises)	Placement and referral systems (PES) Personal development plans (PES) Workplace training (biz)	Labour market training (unemployed, preventive measures) Socially responsible restructuring	
Meso-level (sectors, regions)	Demand-oriented training provision	Career counselling and guidance Sector and regional (local/spatial) policies and strategies	VET reform NQF systems
Macro-level (macro economic, national level)		Active labour market policy National HRD strategies	National employment strategy, Lifelong learning strategy

Methods used to anticipate skills demand and supply can also be classified according the methodology applied (EEO, 2008):

- Quantitative, formal, model-based projections (mainly based on research at macro level, with a long- or mid-term time horizon)
- Sector specific, occupational or local studies (typically combining quantitative and qualitative methods)
- Surveys of employers or groups within the workforce (mainly relevant for the micro level, short term actions)

2. Specific challenges and framework conditions in transition and developing countries

During recent years, ETF partner countries (and, indeed, most countries in the world) have experienced extensive changes in their labour markets that have raised serious impediments to identification of the demand for skills and the creation of better matching mechanisms. Today, all of the partner countries are simultaneously confronted with: (i) high and persistent unemployment (in particular among youth), and; (ii) skill shortages or gaps - particularly in dynamic sectors, regions and/or enterprises.

The reasons behind this common scenario vary according to the country although they are all linked to recent and on-going labour market developments. Transition countries have experienced severe labour market shocks, due in large part to turbulence caused when entire state-owned or subsidised

industries were privatised or disappeared. The transition from state-planned to market economies, with the ensuing privatization and industrial restructuring, has generated large-scale redundancy and has rendered obsolete the skills of the older workforce. Guaranteed lifetime employment was the predominant form of employment in the previously centralised economies, but this has substantially reduced (with the exception of Belarus and, to some extent, Kazakhstan) with labour market flexibilisation and the appearance of new and more precarious forms of employment - in particular in terms of the growing informal sector. Most of the new jobs are created in the service sector and in Small and Medium-sized Enterprises (SMEs), but net job creation has not been sufficient to provide employment for all the adults made redundant and labour market newcomers. These new forms of employment also demand completely different skills to those required by the previous big industrial companies.

Emigration has also been a common phenomenon for all partner countries and some of them (Kyrgyzstan, Moldova and Tajikistan) have primarily become labour exporters with aging populations (with the exception of Azerbaijan and Albania). Also, the deteriorating educational attainment levels of the post-transition years are now improving and are generally better than those of other countries with similar per capita GDP, but they are not yet on a par with those of EU member states.

Developing countries are traditionally characterised as having: a large informal economy associated with low labour productivity; on-going structural change from agriculture to services, and; internal migration from rural to urban areas. In these countries, most employment is found in agriculture and non-agricultural informal activities in petty-trade and personal services - sectors that provide a wide range of precarious, low-skilled and vulnerable jobs. The business sector in such countries is predominantly made up of micro and small enterprises where 'production chains' (linking a lead enterprise with small contract manufacturers or homeworkers) are also common, providing informal work in low quality jobs. Another characteristic of developing countries is labour market segregation, where there is a strong division between the workers employed in vulnerable conditions in the traditional sector and those employed decently and securely in the public sector or sections of the modern economy (mainly banking and export-oriented industries). The modern business sector typically encounters difficulties in filling jobs that require skilled workers, even where there is high unemployment. The national working-age populations are generally young, which creates extra pressure for the labour markets in these developing countries in such a way that they have traditionally been open to migration. As with the Transition countries, the educational levels here have been improving over the years, but they are far below of those of developed countries.

Despite the diversity of economic, labour market and demographic developments in the ETF partner countries, some common challenges can be identified in the efforts they are making to improve matching of skills demand and supply.

The first of these can be described as a **serious uncertainty over future skills demand in the medium and longer term**: at the moment, aggregate demand for skills in the ETF partner countries is biased towards lower skills levels that will be unable to support the future economic and social development of these countries. The current structure is also unable to provide meaningful messages for the design of education and training systems. Most countries still lack a broader vision of their future economic development and the role and position of human capital development within plans to make such a vision reality. At the same time, partner countries face severe impediments in the identification of short- and medium-term skills needs and in adapting their education and training provision. Chief among these are: the dominance of the informal sector; the reliance on micro-, small- and medium-sized enterprises (entities that rarely formulate any present or future skill demands), and; delayed industrial restructuring and modernisation of industries - in particular in the transition countries.

The second challenge relates to **weak labour market monitoring systems**. These are unable to capture changes in skills demand or to provide useful information on gradual adaptation of education and training provision. Although serious considerations and concerns have been expressed about skill

mismatches in ETF partner countries, the actual degree of the phenomenon and its implications for individuals and economies are not yet known. All partner countries have information and data collection mechanisms and practices that can provide baseline information on skills demand and supply, but these are either not used at all, or not fully used, for planning or decision-making purposes. Many countries also have a range of specialised (often donor-financed) surveys at their disposal that provide valuable insights on qualitative aspects of skill demands. However, these tend to be ad hoc surveys that are rarely followed up or that are not sufficiently embedded in the decision-making processes.

The third concerns the **low degree of cooperation among education and economic actors** at all levels. Despite efforts to improve communication between the worlds of education and work in recent years (initiatives to create qualification frameworks and sector-based councils, committees and associations to improve skills availability in various economic sectors) the two worlds continue to function in parallel to a large extent. Inert and introverted education supply systems continue to produce graduates with skills of limited relevance to current and future demands on the labour market, while employers complain about the inadequate output of the education system without making any genuine attempts to contribute to new training design and delivery. However, it must be recognised that some countries, particularly those with improving economic prospects, are seeing employers participate more proactively in skills development processes and the upgrading of training and skills.

The fourth relates to the **low capacity of intermediary institutions**, such as public employment services and vocational guidance systems, in taking a proactive role in skills matching. The scope of their work is under-developed and under-utilised despite the efforts made to support them as intermediaries over recent years.

The fifth challenge concerns the **underdevelopment of continuing vocational training** to ensure the provision of flexible training and quick fixes in terms of the delivery of new skills input targeted either at adults or young people who have already left the formal education system. The vast majority of work undertaken in the ETF partner countries has focused on the provision of initial vocational education and training (VET), while any strategic approach to supporting continuing vocational training still remains firmly in its infancy.

The sixth, and final, challenge is the development of appropriate strategies to deal with the impact of **demographic change** in a range of countries with very diverse situations. Countries with high population growth may experience over-supply of educated school leavers, whereas countries with aging populations may experience under-supply of both skilled and unskilled workers (Bartlett, 2011). Migration and the 'brain-drain' phenomenon are further conditioning factors. Countries with positive population growth (Albania, Turkey and the countries of the Southern Mediterranean) are experiencing substantial pressure on their labour markets and education systems, whereas countries with aging populations (most Eastern Partnership and Western Balkan countries) are facing significant gaps in human resources.

3. Learning from international experience

There has been a proliferation of research into the early identification and anticipation of skills in Europe and across the world, and rich experience and research is available from EU member states and other OECD countries - mainly USA and Australia. Some EU countries, in particular the Nordic states, France and Italy, have a long tradition of forecasting labour market and skills needs, whereas the newer member states have only recently started to develop and regularly apply such methods and tools following the transition from centrally-planned to market economies. The variety of possible approaches is huge, but a carefully selected mixture of tools can cater for different needs and obtain the best solution in terms of reliable information.

At the European Union level, the EU 2020 strategy and the 'New Skills for New Jobs' initiative (European Commission, 2008a) aim to create the conditions necessary for the modernisation of labour

markets and the promotion of an enhanced mix of policy instruments and targeted actions to ensure better matching. The 2010 employment guidelines aim for “developing a skilled workforce responding to labour market needs, promoting job quality and lifelong learning”¹ and the European Centre for the Development of Vocational Training (Cedefop) has created a network of European experts and regularly conducts research in the field of skills forecasting².

In 2011, the European Commission launched the EU Skills Panorama as a single umbrella to cover all policy initiatives in the field of skills anticipation and matching.

The main methods and tools used to anticipate skills demands at EU level are³:

a) Quantitative, model-based projections:

Longer term perspectives are explored by formal, national-level, quantitative, model-based forecasts that generally provide comprehensive, consistent and transparent projections. Depending on the information and data available, these may be based on a simple extrapolation of past trends, more complex time series methods, or may have introduced behavioural content. A range of medium- and long-term forecasting activities of different types are being carried out across Europe on medium-term (five years ahead) and long-term (10 years ahead) bases.

At EU level, formal and model-based demand and supply side projections were made by Cedefop in 2008 and later updated in 2010. A sophisticated approach was used to forecast Europe’s future skill needs and supply, and this research, published as Cedefop Future skills supply and demand in Europe (Cedefop, 2010d), shows the broad trends for skills demand and supply towards 2020.

National projections are also undertaken in most EU countries. They vary in methodology and time horizon and are often implemented by research institutes. Most countries also produce short-term profiles showing expected evolution of the situation year on year. Some examples of approaches are given in Box 1.

Box 1: Examples of model-based approaches in EU countries.

In **Denmark**, a number of actors are involved in national and regional quantitative forecasting, including the Ministry of Education, the Economic Council of the Labour Movement, the Danish Institute of Governmental Research, and the Ministry of Finance.

France has long-standing and robust forecasting tools at all levels, based on a network of observatories. Quantitative projections are used in regional and sector forecasts of labour market and skills requirements.

Several models are used in **Germany**. The Federal Employment Agency (IAB) research institute bases its projections on a disaggregated macro model and links them with international models, including input–output and macro models for the OECD countries and the other important trading partners of Germany. The forecasts and analysis conducted by the IAB can be accessed at:
<http://www.iab.de/839/section.aspx/Bereichsnummer/7>

In the **UK**, the multi-sector dynamic model of the UK economy forms the basis for the ‘Working Futures’ data, which provides medium-term forecasts of labour market and skills requirements. The research is carried out by the UK Commission for

¹ Council decision of 21 Oct 2010 on guidelines for the employment policies of the Member States, (2010/707/EU).

² Cedefop skillsnet, <http://www.cedefop.europa.eu/EN/about-cedefop/networks/skillsnet/index.aspx>

³ The 2008 Autumn review of the European Employment Observatory (EEO) provides a comprehensive overview of tools and methods used in EU countries. <http://www.eu-employment-observatory.net/resources/reviews/EEORReviewAutumn2008-EN.pdf>

Employment and Skills and can be accessed at:

<http://www.ukces.org.uk/ourwork/working-futures>

In **Norway**, forecasting studies based on multi-sector growth models for the economy have been performed since the late 1970s. Statistics Norway started work on an updated picture of future labour supply and demand by type of education, and this led on to studies of future labour supply and demand matching by types of education at the national level.

Source: European Employment Observatory, 2008:12

b) **Sector studies**, combining qualitative and quantitative methods:

Oxford Research undertook sector specific studies at EU level on behalf of the European Commission in an effort to analyse the future skill demands of 19 economic sectors, using a scenario technique (see also point d.) below).

Sector forecasts are carried out at national level by sector skills councils where these exist (the Netherlands, the United Kingdom), or within the framework of educational standards for national qualification frameworks or apprenticeship regulations. Sector studies are often linked with development plans for strategic sectors such as information and communication technologies.

c) **Employer surveys**

A pilot employer survey on skills needs in the EU is being implemented by Cedefop. National and local employer surveys are a frequently used tool and vary greatly in their scope, method and timings, ranging from internet-based surveys to in-depth face-to-face interviews. The surveys are often carried out by Public Employment Services (PES) to create data on short-term personnel demands (recruitment plans) and skills needs, and they are also used to design labour market training in accordance with employer demands. Another consideration to bear in mind is that employers themselves are not always competent at anticipating future skills needs, either due to ignorance of macro-economic trends or to the fact that many SMEs may find it difficult to accurately formulate their skills needs.

Other types of survey are conducted among workers, students or graduates to gather information on skills use, job changes, the transition from school to work or the labour market outcomes of educational curricula or training measures. Most of these surveys are implemented by education and training institutions.

d) **Qualitative foresight**

Macro-level foresight exercises, a scenario-based approach, cover the general economy and education and training systems, using qualitative methods (expert panels, Delphi forecasting methods, scenarios) as well as formal quantitative projections and forecasts with a longer-term perspective. The aim of this approach is usually to identify the main drivers of change, propose scenarios for plausible evolution, outline strategic choices and make recommendations for the different stakeholders. Panels may be organised to ensure support from all actors, including representatives from large enterprises, social partners, academics and education and training experts.

At the EU level, sector projects were commissioned and undertaken by the European Commission to forecast the future of jobs and skills. The European cross-sector foresight methodology that underpins these studies consists of the following steps:

- mapping of a sector, including analysis of the main economic and employment trends, importance of the value chain and outsourced services, and SWOT analysis;

- identification of the main drivers of change and the main emerging or changing skills and competences in the sector; sketching the main scenarios for plausible evolution and their implications for employment trends over a period up to 2020;
- identification of implications for competences and occupation profiles in terms of jobs expanding, transforming or declining;
- outlining strategic choices to meet the sector's skills needs;
- identification of specific implications of the sector's skills needs for education and training;
- recommendations addressing the different stakeholders (social partners, public authorities at all levels, education and training institutions).

To date, 19 sectors have been subject to this style of analysis (Oxford Research, 2010).

There is evidence of a holistic approach to skills anticipation skills needs emerging in EU Member States, using quantitative and qualitative methods to achieve robust and reliable results (European Commission, 2008a). In some countries, forecasts have been used in conjunction with many other pieces of information to contribute to a more detailed, consistent and plausible picture of future skill needs. European countries generally present either variations of a 'decentralized system' type, where anticipation is developed mostly at trade, sector or local level and systematic anticipation of skill needs at national level is not pronounced (Denmark, Hungary, Latvia, Lithuania, Portugal, Slovakia and Spain), or variations of the 'coordinated holistic system' type, with a well-developed and long-established system based on medium- and short-term macro-level forecasts, a system of sector studies, regular questionnaire-based skills surveys among employers and regular regional surveys on employment (Austria, France, Germany, Netherlands and the UK). Other EU member states also use a combination of the two types.

Outside the EU, changing skills demand has been a core concern. In the USA, the Bureau of Labour Statistics (BLS) applies a coherent and comprehensive forecasting system, based on a single forecasting model integrating a range of information sources. They produce biennial outlooks that provide medium- and long-term perspectives for the USA as a whole and a selection of geographical sub-areas, with detailed projections of employment by sector and occupation to guide decision-making by policy-makers and others. These projections are freely distributed and used to develop other products and services. The work of the BLS is designed to provide policy-makers, jobseekers and all other information users with regular information on labour market trends, career opportunities and possible future developments. The results are not intended for mechanistic planning purposes and are complemented by other activities, including the Occupational Employment Statistics survey and the US Occupational Information Network (<http://www.onetonline.org/>) system for monitoring changing skill needs within occupations.

One of the major limitations on reliable skills anticipation is the relatively complex and expensive data collection process required. As a result, specific approaches are often selected on a more pragmatic basis, dependent on already available statistical data, resources and research capacities. **It should, however, be stressed unreservedly that a comprehensive labour market information system forms the backbone of any education and employment strategy.**

Forecasts with longer time horizons are subject to the risk of unexpected economic shocks, unpredicted changes in factor prices and the vagaries of wage relations, rapid advances in technology, and other similar elements that can have a significant impact on the precision of anticipation efforts.

Use of a mixture of methods is probably the best route to valid and reliable results, as the various methods available have different strengths and weaknesses. These techniques should be continuously developed and improved in order to provide practical value added for information users.

Main approaches and examples of skills matching

A wide range of skills matching approaches are implemented by the various actors (see Figure 3.) and specialised agencies, PES and social partners play a key role in mediating between supply and demand. The main options available are described here and some examples are given:

a) Vocational information and guidance systems

Career guidance covers a range of services and activities designed to help individuals manage their careers, make educational, vocational or personal decisions and implement these both before and after entering the labour market (Cedefop, 2008). The target groups may be individuals of any age, at any point throughout their working lives.

The aim of a career guidance system is to guarantee that citizens have everything they need to make an informed decision when choosing training and vocational pathways. While career guidance is indispensable in any situation, it plays an especially critical and strategic role in the context of transition and developing countries and in times of economic crisis. One fundamental line of action in response to situations such as these lies in strengthening support mechanisms to increase opportunities for access to VET and onwards to jobs via this route. This can be achieved through career guidance targeted both on short-term reintegration into the workplace and on medium- and longer-term goals as well (Vuorinen, 2010).

Career guidance can be implemented either by specialised agencies, PES or the education system. Effective career guidance systems must be coordinated at national level on the basis of a robust policy framework with defined short-, mid- and long-term priorities. These must be couched in an operational action plan with realistic resource allocation and a wide communication plan in order to ensure a participatory approach to include all of the interest groups related to career guidance (Zelloth et al, 2003).

b) The role of Public Employment Services (PES) in matching

PES are playing an increasingly important role in the adaptation and further development of workforce skills, mainly for unemployed people but also for those employees who must adapt their current skills to the changing skills demand in their workplace in order to retain their jobs. Matching the skills of the workforce with jobs has traditionally been a core task of the PES, but coping effectively with this task indispensably requires cooperation with other stakeholders. Cooperation with employers is a common practice, but the forms of this cooperation vary widely, although most include regular dialogue with employers on the availability of vacancies and good practice dictates that these vacancies should be actively and systematically canvassed. Cooperation with employers' organisations is less common (DTI et al, 2010) whereas cooperation with training providers is a relatively common practice. Training and retraining courses are regularly contracted out by most PES.

Employer surveys and quantitative forecasts are the most common forms of anticipation data used by PES in the EU member states, whereas surveys of students and graduates are less favoured. This data is then used by the PES at many different levels, from drawing up national strategic plans and local action plans (active labour market measures and labour market training) to service delivery for individual clients (counselling, personal development plans, guidance and referral to training measures or jobs).

The following illustrative examples show the wide range of activities performed by PES in their efforts to improve matching:

Job fairs in Slovenia are organised by the local employment offices and coordinated by the central office of the Employment Service of Slovenia (ESS) to include specific added value as a wide range of local partners are actively involved. These partners include: employers, social partners, municipalities, education and training providers, private employment agencies and regional development agencies. Job fairs are open to the wider public (inactive, job changers, students and parents), but individuals who are registered as unemployed receive personal invitations from the local employment office by mail and SMS. (<http://www.ess.gov.si/>)

The **Austrian Qualification Barometer** is a self-help tool for information on jobs and occupational trends. This device regularly incorporates data from various qualitative and quantitative surveys including company surveys, expert discussions and labour market data. It is a pragmatic tool that is popular with jobseekers and advisors. (<http://www.ams-forschungsnetzwerk.at/deutsch/qualibarometer/qualibarometer.asp?sid=6865764&lng=1>)

In **Denmark**, the PES provides a six-monthly '**Labour Market Balance**' forecast based on various sources of skills demand and supply data. It is posted on a public internet site used by PES staff, jobseekers and other labour market participants. It provides short-term information which is used to identify bottleneck areas that require extra funding for training, rule on the provision of work permits for immigrants and counsel and advise jobseekers (DTI et al, 2010, p. 120).

In the **United Kingdom** (UK), the '**Train to Gain**' programme addresses employers. It is implemented by the Learning and Skills Councils in cooperation with Jobcentre Plus (the UK PES). Skills brokers offer skills advice to employers and match business needs with further education and training providers. They also help identify funding or grants and provide funding for basic literacy and numeracy training (DTI et al, 2010).

A similar programme, the '**Qualification Counselling for Enterprises**', is implemented by the **Austrian PES**. Certified consultants help small enterprises (of up to 50 employees) to assess skills gaps, set up training plans and find suitable training providers. Training for specific target groups (women, unskilled or older workers) can be subsidised. (http://www.ams.at/sfu/14091_18668.html)

c) **Skill sector councils**

The establishment of skill sector councils represents an important approach to skills anticipation and matching at the level of industrial sectors. It is estimated that over 2,500 different councils of various kinds exist across the EU (Lempinen, 2012) with membership usually involving employers, trade unions, training providers and any ministries responsible for VET. Skills councils usually focus on a specific industrial sector, but they may also be organised at local, mainly regional, level. Sector skills councils are common in the UK and they are also a long-standing tradition in the Netherlands and Denmark, while sector-based skills councils are also increasingly common in transition and developing countries. Croatia established a system of VET Sector Councils in 2009, developing national qualification standards for 13 different sectors, Moldova established councils for its vital construction and agricultural sectors and Ukraine is on the way to establishing sector councils (Lempinen, 2012).

d) **Multi-level local governance approaches**

The Austrian example shown here aims to promote the knowledge society at the local, or provincial, level, ensuring the competitive edge of the province by enhancing research and innovation. A wide platform of stakeholders is involved, although overall coordination is undertaken by a local government agency.

Lower Austria Network for Education and Qualification Needs (Netzwerkstatt Bildungs- und Qualifikationsbedarf Niederösterreich, www.noe-bildung.at). This network was established in 2003 by an agency of the provincial government of Lower Austria responsible for the promotion and coordination of research and education at the local level. The network unites research and education institutes, local government, employers and social partners in working for its main goal of anticipating future skills demands and the implications for higher education and continuous training. Two large network events are organised each year for decision-makers from the business, education and science sectors, focussing on qualitative anticipation and the design of specific lines of action and implementation.

4. The ETF approach to addressing anticipation and matching in the context of transition and developing countries

In a context of dynamic and complex labour markets, improved matching of skills and jobs is of paramount importance for all countries. Skills matching has become a high profile policy agenda for many countries due to an international context of rapid technological change and globalised competition as well as concern over building a better life for individuals by raising employability, social mobility and inclusion.

However, **skills matching** is a **complex process** that involves a web of decisions made by various stakeholders from different levels and within different time horizons: individuals and their families decide on the training they will undertake; training institutions decide on the type of the training courses they will provide and the content of these; education, training and labour market policy-makers decide on the configuration of the education and training system and the level of investment made in the various parts of the system at national, regional and sector level, and; employers decide on how they will deploy skills through their recruitment and personnel management practices.

Skills matching is also a **dynamic process** as the jobs available and the skills involved are changing rapidly over time while individuals are also changing their skill sets through training and the experiences accrued at work or in their wider life.

Given the complexity and dynamics of the matching process **perfect matching between skills demand and supply is not always feasible or necessary**. It is particularly unfeasible in rapidly changing labour markets and economies, and it is not necessary in the cases of the many people capable of undertaking a wide variety of different jobs, or the many jobs that can be done by people with different skill sets (Lorenz, 2012). What is important, however, is for policy makers to avoid the creation of a skills mismatch so large that it undermines individual employability and hampers competitiveness and growth in enterprises.

In the context of transition and developing countries in particular, skills anticipation and matching is an even more complex task due to factors such as: (i) the higher degree of economic uncertainty generated by delayed enterprise restructuring and modernisation - where the extensive SME sector finds the present and future skills needs difficult to articulate and where there is little clarity on the future path of national economic development; (ii) weak institutions, capacities and governance systems unable to ensure adequate cooperation between educational and economic actors, and; (iii) limited resources.

Deliberate action by policy-makers is necessary to address the above challenges and ensure:

1. A better understanding of present and future skill needs (knowledge creation)

Including the development of an **early warning system** based on:

(i) labour market monitoring of trends in skills demand and supply to identify eventual skill gaps, shortages or surpluses, and detect the extent and direction of skills mismatch, and;

(ii) anticipation of future skill needs through the mobilisation of various instruments to inform potential developments at national, regional and sector level, and to develop a better understanding of quantitative and qualitative needs.

The importance of the various kinds of information and data collection instruments and their concomitant use cannot be overemphasized in view of the wide range of actors and decisions essential in ensuring a better match between skills demand and supply.

2. A better interaction between actors (knowledge mediation)

Knowledge creation on present and future skills demand and supply and any eventual skill gaps or shortages is necessary but alone will not be sufficient to support improved matching in the short, medium and long term. All countries need to ensure that knowledge creation is embedded in decision-making processes and that appropriate mechanisms are established for this knowledge to reach actors in the education and training system (policy-makers at all levels, training institutions and learners). Examples of such mechanisms include: national VET and/or skills councils, sector councils or committees, regional bodies with competences on regional skills policies, cooperation initiatives between training providers and businesses, and adequate vocational guidance systems.

3. Transformation of labour market intelligence into appropriate action in the education and training system (knowledge application)

This involves the capacity of education and training policy-makers, professional institutions and training providers to translate labour market intelligence into appropriate qualifications (also including competences), curricula and adequate training provision/places.

4. Strengthened institutional capacities of PES

PES that work directly with the unemployed and employers must improve both their capacities and outreach. These entities play a key role in generating labour market information and in transferring the findings into action through active labour market policies, job placement and referral systems.

5. Development of continuing vocational training systems

Continuing training is vital for skills upgrading in view of continuous structural and technological changes in the economy and the challenges presented by an aging population. The development of a proper training market, with flexible and demand-led training provision, must be developed to provide life-long learning opportunities.

Any coherent policy approach should also take into account contextual factors that may influence the success of better labour market matching, such as appropriate wage-setting mechanisms, improved working conditions, countering of gender and age discrimination and facilitated geographical mobility.

5. ETF action to support partner countries in improving their skills matching mechanisms

In view of the above, **ETF action for 2012-2013** will focus on:

1. Through the innovation and learning project on matching and anticipation, the ETF will work towards:
 - creating an improved understanding and analysis of the extent, direction and nature of skill mismatch in the context of our partner countries, producing a methodological paper on

different approaches to measure skill mismatch and a paper analysing skill mismatch in 10 partner countries;

- identifying anticipation methodologies (foresight, forecasting at national, regional and sector level) that can provide meaningful information and direction for strategic planning in education and training in the context of uncertainty, linking skills development strategies to the broader developmental needs of the countries;
- awareness-raising about the usefulness, preconditions of application and complementarities of different methodological instruments in creating information for various actors and decision-making processes. A series of methodological guidance materials on different approaches to anticipation and matching are being prepared for use in partner countries. The topics covered include: macro forecasting, sector-based analyses, regional demand analyses, enterprise surveys, transition from school to work and tracer studies, skills supply analyses, and the role of intermediary institutions.

2. Through its country work, the ETF will work towards:

- enhancing the institutional capacities of partner country organisations to analyse existing information and to generate new knowledge for better monitoring of trends in skills supply and demand through the introduction and implementation of tools and by improving and creating evidence available for use in analysis and policy-making. Examples of this include the transition from school to work surveys in Central Asia and an occupational structure analysis undertaken through a representative enterprise survey in Ukraine;
- facilitating dialogue among various actors from the skills demand and supply sides, encouraging the sharing of information to develop well-informed actions;
- raising awareness about the roles and function of intermediary institutions such as PES and other bodies in matching (training or skills development funds and vocational guidance institutions) to maximise their potential.
- promoting sector-based and sub-national (regional and local) pilot activities to inspire, leverage and scale-up nation-wide policy actions. Examples include the sector committees in Moldova and Ukraine and the regional demand analyses in Tunisia and Ukraine.

Annexes

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A2 Glossary of terms

ANTICIPATION	The term 'anticipation' denotes all procedures and activities with the aim of identifying future skills requirements in a country, sector or region.
CAREER GUIDANCE AND COUNSELLING SYSTEMS	A range of activities designed to help individuals make educational, vocational or personal decisions and implement these before and after they enter the labour market (Cedefop, 2008).
COMPETENCE	A 'competence' is the proven ability to actually apply knowledge, skills, and personal, social and/or methodological abilities in a work or education situation including changing situations (European Commission, 2008b).
CONTINUOUS VOCATIONAL EDUCATION AND TRAINING (CVET)	CVET refers to education and training after initial education and training or after entry into working life. The purpose of CVET is to help individuals improve or update knowledge, skills or competences, acquire new skills for a career move (including transition from unemployment or inactivity to employment) or retraining, and undertake continuing personal or professional development (Cedefop 2008d).
DROP-OUT RATE	The number of students that withdraw from an education or training programme before its completion (Cedefop, 2008d).
EMPLOYABILITY	A combination of factors that enables individuals to progress towards or enter employment, to remain in employment and to progress during their career (Cedefop, 2008d).
EMPLOYER SURVEYS	Employer surveys are surveys among employers (private or public) regarding skill needs, competence vacancies, and training. The surveys may be quantitative or qualitative, using questionnaires or interviews. One example of an employer survey is the National Employer Skills Survey in the UK (European Commission, 2008a).
FORECASTING	Quantitative forecasts produce information on quantitative aspects of future labour markets using relatively advanced methods. Quantitative forecasts use data about the present and past to estimate future developments. The results of forecasts are always numbers, often presented in graphic form as curves showing a trend (DTI et al, 2010)
FORESIGHT STUDIES	Foresight studies are typically multi-disciplinary qualitative and quantitative analyses which assume that alternative futures are possible. Foresight studies may include alternative scenarios. Foresight activities may also consider the actions that should be taken to shape the future (DTI et al, 2010)
INFORMAL LEARNING	Informal learning results from daily activities related to work, family life or leisure. It is not structured and usually does not lead to certification. In most cases, it is unintentional on the part of the learner (European Parliament, 2008)
HORIZONTAL SKILL MISMATCH	Horizontal skill mismatch is the situation where a person might have the required level of qualification for a job, but the person does not have the right type of knowledge or skills required for the job (Cedefop, 2009a).

KSC (KNOWLEDGE, SKILLS AND COMPETENCIES)	KSC is a new term developed in the context of qualifications frameworks, where skills denote a specific technical aspect of the capabilities, as separate from knowledge (declarative) and competences (social, personal).
LABOUR MARKET INFORMATION SYSTEM (LMIS)	Any information concerning the size and composition of the labour market or any part of the labour market, the way it or any part of it functions, the problems it faces and the opportunities available, and the employment-related intentions or aspirations of those who form part of it (Thuy et al,2001, p. 57).
LABOUR MARKET MONITORING	Regularly conducted observation of statistical indicators of Labour Market Policies input/output and performance (outcome) to be used in improving programme implementation and, on occasion, programme design.
LABOUR MARKET INTELLIGENCE	Interpretation and analysis of labour market information
LIFELONG LEARNING	Lifelong learning is all learning activity undertaken throughout life with the aim of improving knowledge, skills, competences and/or qualifications for personal, social and/or professional reasons (Cedefop, 2008d).
MATCHING	The various mechanisms, instruments and policies in place in a country and its regions to improve the coordination of supply and demand in the labour market.
NON-FORMAL LEARNING	Is learning not provided by an education or training institution and that typically does not lead to certification. However, it is intentional on the part of the learner and has structured objectives, times and support (European Parliament, 2008).
OCCUPATION	Occupation is a term for a set of tasks and duties characterised by a high degree of similarity. Occupations are mainly identified via the International Standard Classification of Occupations, ISCO (DTI et al, 2010).
OVER-EDUCATION	A situation in where an individual has a level of education higher than that required by their current job (Cedefop, 2010b).
OVER-QUALIFICATION	A situation in which an individual has a level of qualification higher than that required by their current job (Cedefop, 2010b).
OVERSKILLING	A situation in which an individual is not able to fully utilise his or her skills and abilities in their current job (Cedefop, 2010b).
PUBLIC EMPLOYMENT SERVICES (PES)	PES are public or governmental bodies responsible for the implementation of labour market policies. PES can provide a range of services to jobseekers, unemployed or inactive individuals, and employers such as job-broking, job-search assistance, guidance and counselling, collecting and applying LMI, restructuring programmes. PES can sub-contract services to Private Employment Agencies/Services (PRES) or other organisations and/or deliver services in cooperation with other organisations such as Social Partners (Thuy et Al, 2001; European Commission, 2009d).
PRIVATE EMPLOYMENT AGENCIES/SERVICES (PRES)	PRES are legal non-governmental entities supplying employment services. PRES normally work under contract to the PES, or specialise in highly-skilled or managerial staff recruitment support. Temporary work agencies could also be considered within the PRES category. In most countries, PRES need to obtain a license issued by the Ministry of Labour or the PES.

QUALIFICATION	<p>The term qualification can refer to two different things:</p> <p>a) An official record of achievement such as a certificate or diploma recognising the successful completion of education, training, a test or examination and a qualification can also be a legal entitlement to practice a trade.</p> <p>b) The requirements for an individual to enter or progress within an occupation (DTI et al, 2010).</p>
SKILL	<p>The term 'skill' is widely used with a variety of different meanings. In our context, 'skill' is defined as the ability to apply knowledge and knowhow to complete tasks and solve work-related problems. According the EQF, skills may be cognitive or practical (Cedefop, 2008d).</p>
SKILL GAP	<p>A situation in which the level of skills of the employee or a group of employees is lower than that required to perform the job adequately, or where the type of skill does not match the requirements of the job (Cedefop 2010b).</p>
SKILL MISMATCH	<p>Skill mismatch is a broad term that encompasses various types of skill gaps and imbalances such as over-education, under-education, over-qualification, under-qualification, over-skilling, skill shortages and surpluses, skills obsolescence and so forth. Hence, skill mismatch can be both qualitative and quantitative, thus referring to both situations where a person does not meet the job requirements and where there is a shortage or surplus of persons with a specific skill. Skill mismatch can be identified at the various levels of the individual, the employer, the sector or the economy. Several different types of skill mismatch can coincide (DTI et al, 2010).</p>
SKILL NEEDS	<p>Skill needs is a term used to describe the needs of employers, sectors, or the economy for specific skills in order for the economy to perform adequately. Skill needs can arise as a result of manpower needs or skill gaps. But in addition to these situations, skill needs can arise where new sectors or industries emerge, where new technologies are introduced, or where new jobs are created as a result of convergence between existing sectors or industries (DTI et al, 2010).</p>
SKILL OBSOLESCENCE	<p>Skill obsolescence refers to the situation in which skills are no longer demanded or useful in the labour market (economic skill obsolescence) or the decay of skills resulting from lack of use (technical skill obsolescence) (DTI et al, 2010).</p>
SKILL SHORTAGE	<p>A situation in which the demand for a particular type of skill exceeds the supply of available people with that skill (Cedefop 2010b).</p>
SKILL SURPLUS	<p>Skill surplus occurs when the supply of a particular type of skill exceeds the demand for people with that skill (DTI et al, 2010).</p>
TEMPORARY WORK AGENCIES	<p>A temporary work agency is a company (profit or not-for profit) that recruits and deploys workers for temporary work assignments in other companies. Temporary work agencies are regulated by law and need a license in most countries.</p>
TRACER STUDIES	<p>Tracer studies are systematic approaches to monitor labour market outcomes implemented for an education institute or curricular area, tracing the career steps and labour market status of graduates over an extended time period.</p>

TRAINING NEEDS ASSESSMENT (ALSO SKILLS NEEDS ASSESSMENT OR ANALYSIS)	A systematic analysis of present and future skills needs against the skills available to an individual employee or group of employees, generally for the purpose of implementing relevant training measures.
LEARNING OUTCOMES	Statements of what a learner knows, understands and is able to do on completion of a learning process (European Parliament, 2008).
VERTICAL MISMATCH	A situation in which the level of education or skills is less or more than the required level of education or skills (Cedefop 2010a).
OCCUPATION	Occupation is defined as a 'set of jobs whose main tasks and duties are characterised by a high degree of similarity'. Occupations are mainly identified via the International Standard Classification of Occupations, ISCO (ILO, 2009).
UNDER-EDUCATION	A situation in which an individual has a lower educational level than that required by their current job (Cedefop, 2010b).
UNDER-QUALIFICATION	A situation in which an individual has a lower qualification level than that required by their current job (Cedefop, 2010b).
UNDER-SKILLING	A situation in which an individual lacks the skills and abilities necessary to perform to acceptable standards in their current job (Cedefop, 2010b).
VALIDATION OF INFORMAL AND NON-FORMAL LEARNING	The confirmation of learning outcomes of an individual acquired from non-formal and/or informal learning. The validation is performed by a competent body and the learning outcomes are assessed against a predefined set of criteria. Validation typically leads to certification (European Parliament, 2008).

Definitions from various sources are used, where no source is explicitly mentioned the definition is that used by the ETF.