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Forecasting skill demand and supply in Europe: Reflections on the Cedefop Approach

***Skillsnet Technical Workshop: Building on the skills
forecasts: Comparing methods and applications***

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Overview

Context:

- History; Rationale; What forecasts can and cannot achieve

Methods:

- Alternative approaches to Anticipation
- The Cedefop Approach
- Technical alternatives - econometrics, theory & judgment

Lessons learned over the past 5 years:

- Technical lessons
- Data gaps - need for better data - using country specific data
- Lessons from other countries - less reliance on econometrics

What next?

- Plans for 2011 & Possible Longer-term developments

History

Early attempts at pan-European skills forecasting

Cedefop Pilot studies based around E3ME

New Framework Programme 2008/09-2011/12

- Initial results - 2009
- Quick update and model development work - 2010
- Full update - 2011
- Final assessment and analysis - 2012

Why Forecast ? - The Rationale for Forecasting in a Market Economy

A rapidly changing & uncertain world

Long lead times on investment decisions such as education and training choices

Evidence of market failure

Need for a cool, logical and systematic assessment of future prospects

Need for a counterfactual to assess policy or different choices

Anticipation at the centre of the ***New Skills for New Jobs*** agenda

Why Not?

Forecasting is *impossible*

Forecasting is *unnecessary*

Forecasts are *inaccurate* and based on *invalid assumptions*

(They are *illegal* (at least in the UK!))

ACT AGAINST CONJURATION, WITCHCRAFT AND DEALING WITH EVIL SPIRITS

First enacted during the reign of James I, partially repealed in 1736, but nevertheless:

“prediction of the future is illegal as are any pretence to such arts and powers whereby ignorant people are frequently deluded and defrauded”

However, practitioners were no longer condemned to death:

“shall for every such offence suffer imprisonment for the space of one whole year without bail, and once every quarter of the said year shall stand openly in the pillory for the space of one hour”

However.....

Fortunately for UK forecasters this was further amended more recently in:

the **Fraudulent Mediums Act, 1951**

in which such activities are excused if:

“done solely for the purposes of entertainment”

Is forecasting possible?

The Future cannot be predicted by anybody with precision or certainty – “All forecasts are wrong!”

Can make useful projections, based on explicit assumptions

A comprehensive, systematic, consistent and transparent set of projections provides useful information for all labour market participants, helping to inform all those making choices & decisions

Is it necessary?

Market prices & signal are insufficient in a complex & uncertain world – considerable evidence of market failure

The Cedefop Approach

Conceptual Framework & Modular Approach

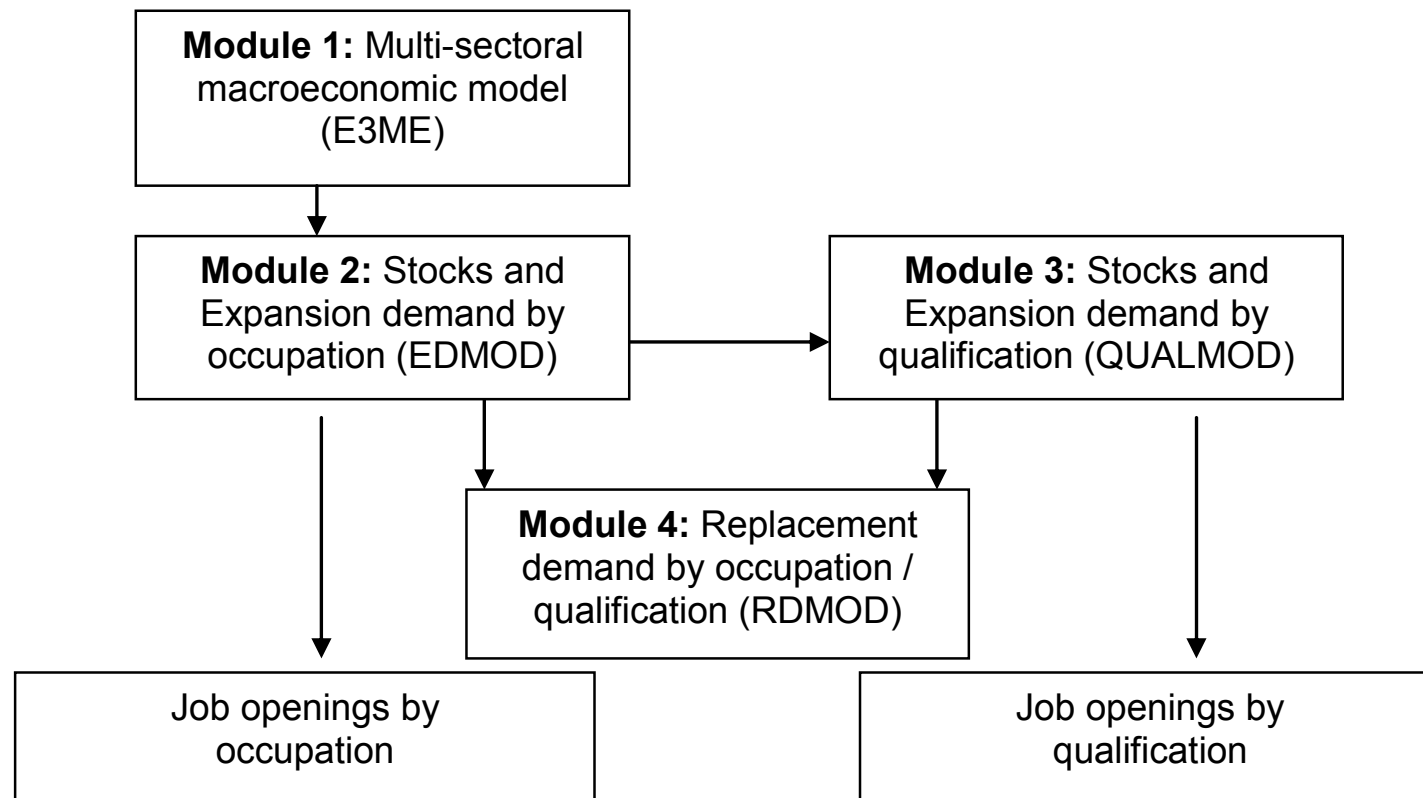
Quantitative methods, Econometric models based on E3ME - But not purely econometric (could make more use of judgement and also theoretical considerations (Computable General Equilibrium (**CGE**) model methods))

Common data sources (National Accounts; ELFS) and common models - But lowest common denominator (a Country Specific Data (**CSD**) approach might be advantageous for some modules)

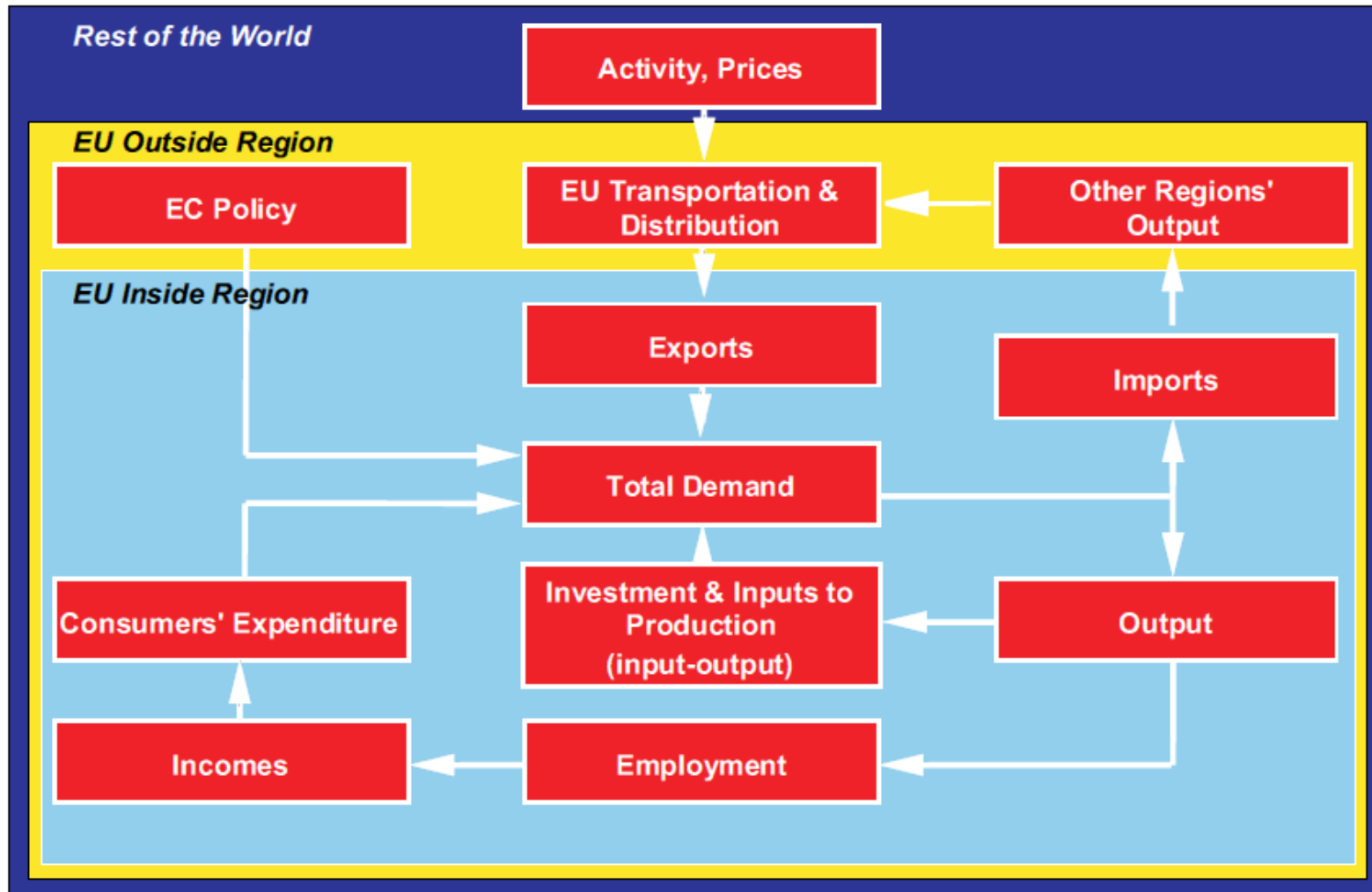
Peer review process (including this event)

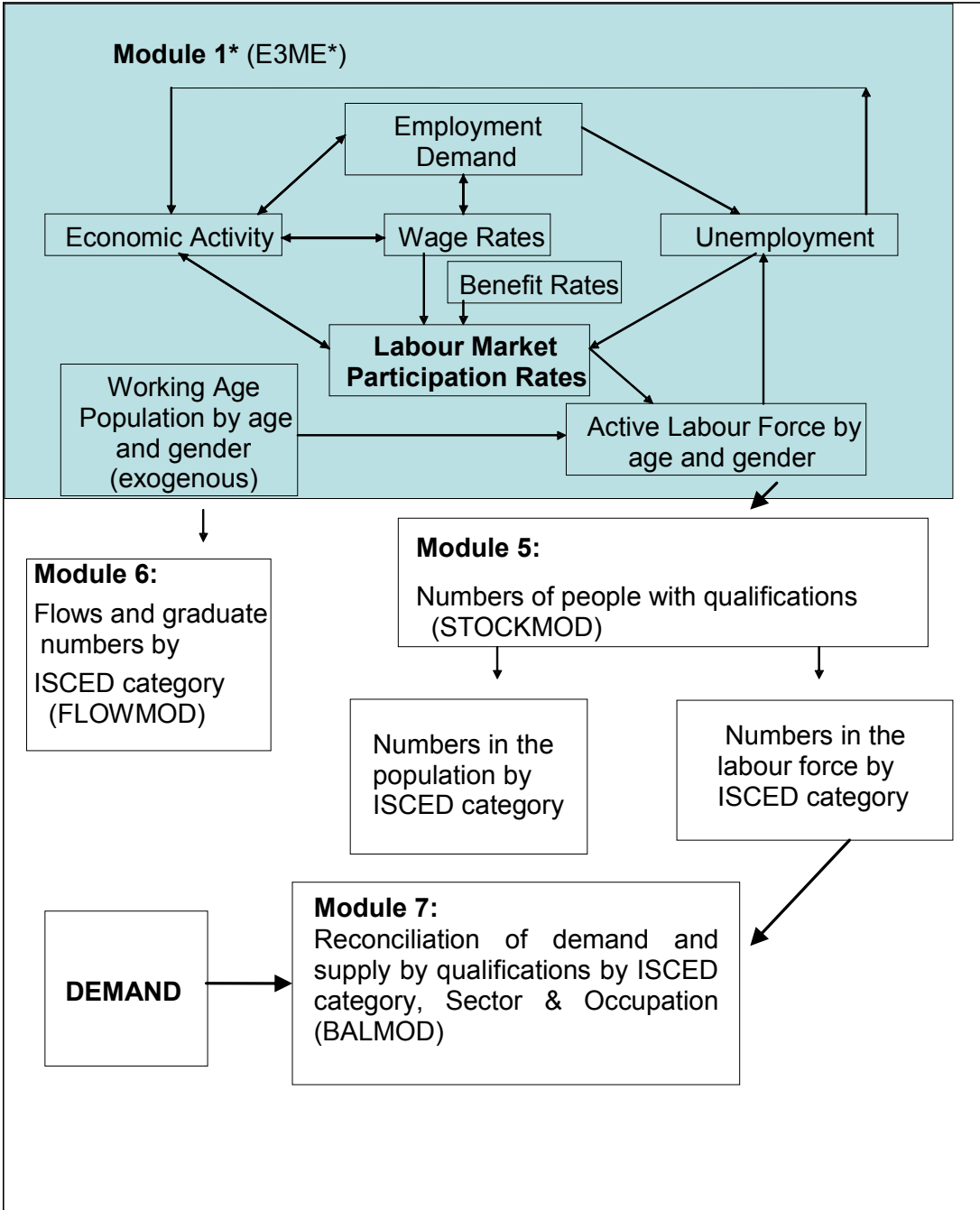
Forecasting as a **Process** & the importance of **Dialogue**

Modular Approach to Skills Forecasting: Overview of the Framework - Demand



E3ME as a Regional Econometric Input-output Model





Technical alternatives

Econometric models

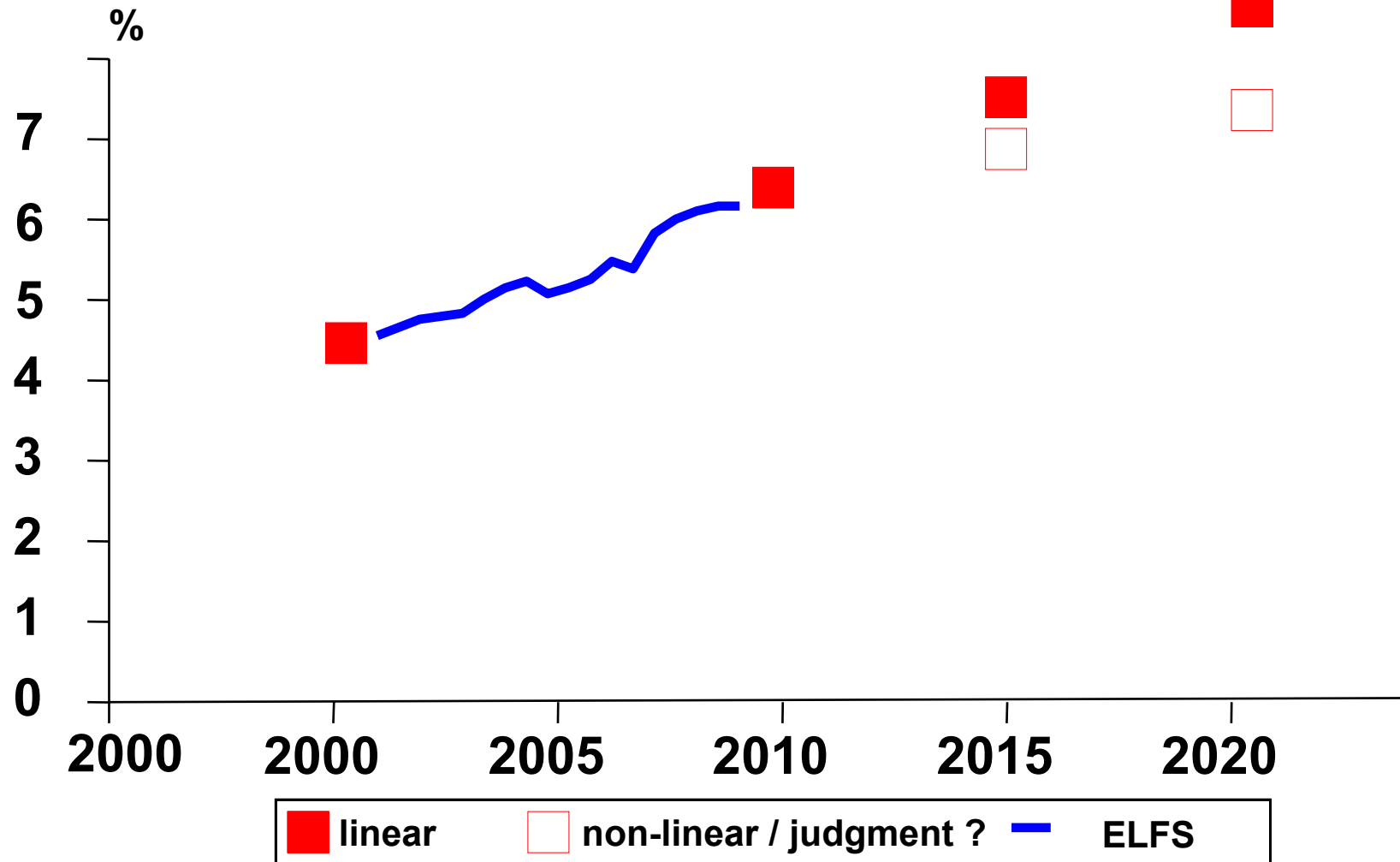
Simple time series models

Judgement & fixed shares

Computable general equilibrium (**CGE**)
methods, imposing theoretical constraints

Common data or Country Specific Data
(**CSD**)

Techniques & methods for projecting Occupational & Qualification Shares



Lessons to date

- General feasibility established
- E3ME provides a sound foundation
- Econometrics & other analysis of:
 - Supply & demand (- limitations of econometrics)
 - RDs (- the cohort component method is OK)
 - Migration (- mixed messages)
- The quest for greater detail:
 - Recurring data problems & constraints
 - Occupational Skills Profiles (- some promise)

ELFS Data - strengths & weaknesses

Strengths:

- Availability & Consistency (in principle)

Weaknesses:

- Fitness for purpose: data not designed for modelling
- Inconsistency (in practice, over time & cross country)
- Short time series, limited degrees of freedom
- Sample sizes: pushing data to the limits - not enough detail by skill (occupation; qualification (by level & discipline/field) & key / generic skills)

Pushing the data to its limits demonstrates feasibility of providing some detailed breakdowns:

- but this remains problematic

ELFS limitations & possible solutions

Projections based on such data may need to be limited to very simple models (fixed shares; broad rates of change)

Or possibly generated by **CGE** approaches (imposing theoretical relationships) which can provide some useful insights

There may also be potential for a **CSD** approach (using country specific data in certain modules (e.g. detailed data by occupation & qualification by sector), making use of country expert knowledge and expertise)

May be advantages in linking this with expert judgment, including sectoral expertise

Econometrics & related modelling of skill demand & supply

Supply:

- *Stock flow approach* shows some promise (addresses the cohort inconsistency problem), but may be problematic for small countries
- *General Econometrics modelling* less promising (data gaps & other limitations (e.g. short time series) are crucial)

Demand

- *General econometric modelling* of the demand for skills, using panel methods - some progress, but not a substitute for simpler models
- *Skills Upgrading* tells a broadly consistent story, but again not a substitute for simpler models & difficult to generalise and apply within the full, detailed, disaggregated model framework

Need to explore theoretical (**CGE**) approaches & greater use of **expert judgement** (e.g. link to sectoral studies & proposed SSCs)

Replacement demands

Cohort component method (well established but open to criticism)

Exploration of panel data (allows identification of individual decisions and the different causes of replacement demand)

This alternative approach could easily be implemented where data are available (for certain countries)- but

- the estimates are very similar to those from the cohort-component approach;
- such data are currently NOT generally available within the EU LFS

Therefore replacement demand will continue to be estimated using the cohort-component methodology

- Need to lobby Eurostat for better data
- A **CSD** approach could offer some potential advantages

Imbalances & mismatches

Results suggest that governments may need to stimulate demand from employers and to find ways to increase the utilization of skills

Geographical dimension - some structural problems across Europe (with Eastern Europe facing particular problems of potential oversupply).

The indicators developed link occupational demand to educational supply:

- Qualification employment shares in occupations;
- RAS based indicators of constraint & change

These will be further refined in the next forecasting round (distinction by field & additional detail by level of qualification to be added (data permitting))

Other possible approaches might include developing a **CGE** module, including both demand and supply

Migration & demography

Migration has a significant impact on the future size of the population, with implications for forecasting supply & demand for skills.

- Eurostat demographic projections - net migration is **endogenous** (calculated to deliver convergence to zero net migration at EU level by 2150)
- Alternative: net migration as an **exogenous** variable, which influences demographic change

The latter results in quite different projections of labour and skill supply - to be explored further in 2011

Other migration related issues include implications for **Replacement demands** - emigration has the potential to increase replacement demand significantly – this will also be considered further in 2011

Occupational skills profiles

Qualification Requirements (8 categories, based on EQF)

Field of Study (14 categories, e.g. Economics, commerce, business administration, Technical & engineering, etc)

Knowledge (8 main areas, e.g. Health and social care, Humanities and art, etc, distinguishing level and importance)

Skills (7 categories, e.g. learning to learn, ICT/digital skills, various communication skills and “practical skills”). The latter is projected to decline in terms of both level and importance.

Competence (3 categories - personal, social and methodical capabilities, distinguishing level & importance)

Occupational Interests (6 categories - artistic, conventional, enterprising, investigative, realistic & social)

Working Values (6 categories - achievement, independence, recognition, relationships, support & working conditions)

Lessons from Abroad

- Methodology & Data - link between data available & methods used – importance of statistical infrastructure
- Key requirements for quantitative modelling:
 - National accounts (macro/sectoral models) - OK
 - Time series on employment by sectors - OK
 - occupational & qualification structure within sectors (SIC & SOC)
- problematic at a pan-European level
- Modelling of skill demand - pros and cons of econometrics
- The demand for detail - and ways to meet it - **CSD** or **CGE**
- Treatment of imbalances and mismatches - **CGE**
- Generic and other aspects of skills - further work on **OSPs**
- Dissemination of the results to a wider audience is highly desirable - Cedefop plans to make greater use of the internet

Work plans for this year and beyond

- Further review & ***refinement of data*** and (where possible) ***additional detail*** for skill demand and supply
- Full update of main ***Skill Demand*** forecast
- Full update of main ***Skill Supply*** forecast
- Analysis of implications for ***Mismatches & Imbalances*** -
- ***Four extra countries*** (Iceland, Croatia, Turkey, & the former Yugoslavian Republic of Macedonia)
- Expert scrutiny by Individual Country Experts (ICEs) based on country groups & led by Country Group Experts (CGEs)

Other Key Tasks in 2011

- Development of more ***qualitative scenarios*** and ***interpretation*** of results for policy makers
- Developments of ***models & scenarios*** to explore impact of ***climate change*** and related mitigation measures
- Exploration of implications for ***Productivity & Growth***
- Further analysis of ***sensitivity*** of the results to assumptions about ***Migration***
- Validation and further refinement of ***Occupational Skills Profiles***

In combination these elements should ensure that we can provide even better information to policy makers and others about the prospects for skill demand & supply in Europe