Investing in the Future of Jobs and Skills

Scenarios, implications and options in anticipation of future skills and knowledge needs

Executive Summary
Post

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Overview

This executive summary highlights the main results of the final report *Investing in the Future of Jobs and Skills. Scenarios, implications and options in anticipation of future skills and knowledge needs in the Post and Telecommunications Sector*. It specifically addresses the Post Sector. Apart from analysing sector trends and developments, the study explores four plausible and distinctly different futures and their implications for jobs, skills and knowledge in the year 2020. The study is scenario-based, and is both forward- and backward-looking. It presents a variety of options and recommendations to address future skills and knowledge needs, aimed at the sector (firms, industry at large, sectoral partners), education and training institutes, policy-makers and other stakeholders.

The study should be placed against the background of the EU's renewed Lisbon Strategy for Growth and Jobs and the recently launched New Skills for New Jobs initiative. Investing in people and modernising labour markets is one of the four priority areas of the Lisbon Strategy. The New Skills for New Jobs initiative (European Commission, 2008; see http://ec.europa.eu/social/) presents a very first assessment of the EU's future skills and jobs requirements up to 2020. The initiative aims to help ensure a better match between the supply of skills and labour market demand and to improve the Member States' capacity to assess and anticipate the skills needs of its citizens and companies.

This study appears in a series of 16 sector studies which are all based on the same common foresight methodology and uniform step-wise approach (see table). The study combines desk research and expert knowledge, and brought together various internal (project team) and external sector experts. The methodological framework that was initially developed by Maria Joao Rodrigues (2007) was further developed, operationalised and applied by a consortium consisting of TNO (lead), SEOR and ZSI.

Methodological framework – the study explained in ten steps
Step 1. Identification of economic activities (sector selection)
Step 2. Main economic and employment trends and structures
Step 3. Main drivers of change
Step 4. Main scenarios
Step 5. Main implications for employment – changes by job function
Step 6. Main implications for skills – emerging needs by job function
Step 7. Main strategic choices to meet future skills and knowledge needs
Step 8. Main implications for education and training
Step 9. Main recommendations
Step 10. Final workshop (validating, complementing, finalising)

The post sector – main characterisation

The post sector comprises postal services ('national post activities') and courier activities. It includes activities such as pickup, transport and delivery of letters and parcels as well as the use of the universal service infrastructure (including retail locations, sorting and processing facilities) and carrier routes to deliver the mail. An important difference exists between companies with a universal service obligation for specific mail items such as letters and other companies with no such obligation. Universal Service Providers (USPs), have to provide

services nationwide for all customers. The 'other' companies deliver primarily express parcels, a service not related to universal mail service.

The post sector is characterized by strong change and dynamics. The huge increase in IT-based ways of communication (e-mail, Internet) and doing business (B2B; B2C; e-billing, e-banking) have importantly altered the sector, and have led to new products and new demand, most importantly for express parcels. Post services have gradually shifted from an industry based on two-way communication (mail and parcels) to an industry rendering transportation (parcels, packages, freight) and advertising services. Liberalisation and IT developments have stimulated competition, have enabled the entry of new competitors (express companies) and have increased overall efficiency in the sector. USPs and traditional mail and parcel services have faced decreases but new services (e.g. hybrid mail; advertising/direct mail) and express companies have shown strong growth.

Main economic and employment trends

Value added of the post and telecoms sectors combined amounted to €307 bn for the EU-27 in 2006, with the bulk of value added being generated by the telecoms sector. Value added in post amounted to €59.6 bn in 2004, of which almost two thirds were generated by national post activities (USPs) and one third by courier activities (Eurostat, 2008). USPs in the EU showed below world average growth in the period 1995-2000, but much higher growth in 2000-2006. The express industry, the main competitor of USPs after liberalisation, is one of Europe's fastest growing sectors, with a yearly turnover growth of 12% in 1998-2003. Although still small compared to its 'old' EU-15 counterpart, the express industry has risen fivefold in the new Member States (NMS) during the same period. Value added annual growth of the post and telecoms sector together was - with 5.6% - more than twice the growth of the EU economy (2.3%) as a whole during the period 1995-2006. Most of this growth, again, was observed in telecoms. The NMS almost showed double digit annual growth of 9.6%, three times as much as overall GDP growth.

About 40,000 enterprises were active in the post sector, of which 37,000 in courier activities. Altogether, they employed 1.94 million people or 0.89% of overall EU employment in 2006. Almost 81% of all jobs in the sector were based in the EU-15. Two thirds of total sector employment was in national postal activities. Employment in post in the EU grew with 1.7% annually during the period 2000-2006, and in the New Member States even with 2.7%. Most of this growth was in courier services, with the express sector showing an employment growth of 13% per year during the period 1998-2003.

Employment, state-of-play 2006 and changes 2000-2006

Post and courier activities	Level 2006 (times 1,000)	Annual growth	Share in EU	Change in share
EU	1 944	1.7	100	0
EU 15	1 718	1.6	88	-1
NMS	225	2.7	12	1

Source: Eurostat/TNO. Post and courier services: NACE 64.1.

The majority of firms (97.2%) in the post and telecoms sector together is small firms employing less than 50 employees. 1.9% are medium-sized firms and only 0.9% are large firms with more than 250 employees. However, small firms and medium-sized firms account for only 7.7%, respectively 4.8% of all employment, even though their share has been increasing with 2.5 and 2.3% points during the period 1995-2006. Large firms account for 87.5% of employment, however with a decreasing share.

Employment trends by job function: shares (2006) and changes in shares (in%), 2000-2006						
Post and telecommunications	Shares, 2006			Changes in shares, 2000-2006		
	EU15	NMS	EU	EU15	NMS	EU
Managers	9	9	9	-2	1	-2
Engineers	8	9	8	1	4	1
Other professionals	17	18	17	-8	4	-6
Clerks	40	47	41	1	2	1
Service workers	2	3	2	-2	-4	-2
Electronic equipment mechanics	5	5	5	2	-5	1
Craft workers. plant operators. drivers	7	5	7	7	-3	6
Elementary occupations	12	4	11	1	2	1

Source: Eurostat Labour Force Survey/TNO

The impact of IT on substitution (postal mail by Internet, by e-mail and by mobile messages), on e-business (parcels) and on advertising obviously affects the skills mix. Most jobs in post are in the categories 'clerks' (administrative and sales personnel in, for example, post offices and back-offices of express companies), other professionals (i.e. sales & marketing), engineers and IT professionals, and sorting staff and mail carriers (see Table above: both drivers and elementary occupations). The share of women in overall employment of post and telecoms combined is 36% in the EU-15 and 53% in the NMS. Almost half of all employees is younger than 40 years. Low educated workers in post and telecoms are almost all found in post. By 2000 the percentage of employees in USPs without qualification was 57%. For other operators this share is with 43% also substantial even though it decreased strongly, down from 55% in 1995. Improved and new technologies have allowed companies to increase efficiency of their logistics processes dramatically. Most efficiency gains were achieved in the decrease of the number of employees needed to staff the sorting centres as a much larger share of letters and parcels are sorted mechanically nowadays. Other changes apply to sales & marketing professionals (decreasing in EU-15 and increasing in NMS), technicians (increasing in EU-15, strong decrease in NMS) and engineers and IT professionals (a gradual upward change in the EU as a whole).

Employment by gender, age and education: post and telecoms, 2000-2006						
	EU		EU 15		NMS	
	Level	Change	Level	Change	Level	Change
Women	39	1	36	0	53	-4
Age < 40	48	-4	48	-4	54	3
Age 40 – 50	30	0	30	0	27	-4
Age > 50	22	4	22	4	19	1
Low education	21	-4	25	-2	4	-4
Mid education	57	2	52	-1	71	-5
High education	22	2	23	3	25	9
Entrepreneurs	3	n.a.	2	n.a.	4	n.a.
Definition	Level % 2006	Total change % 2000-2006	Level % 2006	Total change % 2000-2006	Level % 2006	Total change % 2000-2006

Source: TNO/Alphametrics based on Eurostat Labour Force Survey

Liberalisation and technological progress have resulted in a reduction in the number of staff employed in traditional postal services and a change in the composition of the labour force, with more part-time jobs and less full-time jobs. The shift in job and skills structure reflects a change in technologies (automated sorting, automation, Internet, IT), markets (packages and freight, new services) and business models (competition from new competitors but also from

ICT and new media companies). With the shift to more-IT intensive production and newer services the nature of the business has changed to more consultancy-type and technology-driven services, requiring more high skilled labour. Basic IT skills have become more important for operators and postmen; advanced IT skills have become more important for technical and professional operators. However, IT skills are not even the most important skills to be acquired, as will be shown in the section on scenario implications.

SWOT Analysis and Identification of Main Drivers

The Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis and the expert-based search for main drivers of change both yield important building bricks for the design and further elaboration of the scenarios (see Table SWOT and Table Main Drivers). A further differentiation was made between exogenous drivers (drivers that form a "given" at sector level)[1] and endogenous drivers (drivers that can be influenced at the sector level, for instance by national or European policy-making, or by collective effort from within the sector).

SWOT Post Sector	
Strengths	**Weaknesses**
○ Stable demand (might go down in future) ○ New companies act as initiators ○ Dense network ○ New IT technologies ○ Diversification of job profiles ○ Trusted brands ○ Universal service provision	○ Old culture incumbents ○ Universal service provision ○ Oligopoly (potent players drive the sector) ○ License obligations (entry barrier) ○ Enhanced automation leads to lower-quality-lower-paid jobs
Opportunities	**Threats**
○ Liberalisation ○ IT ○ New products and services ○ Diversification of products and services ○ Growth new EU members and global growth ○ Transparent, long term and foreseeable regulation ○ New forms of cooperation between public/private and private/private ○ High skilled job opportunities, need for up-skilling ○ Adaptation to new needs	○ Security problems ○ Less interesting jobs due to insecurity ○ Relocation of enterprises ○ Increasing regulation – acting as a barrier to growth if unclear

Source: TNO/SEOR.

Scenarios and implications for employment

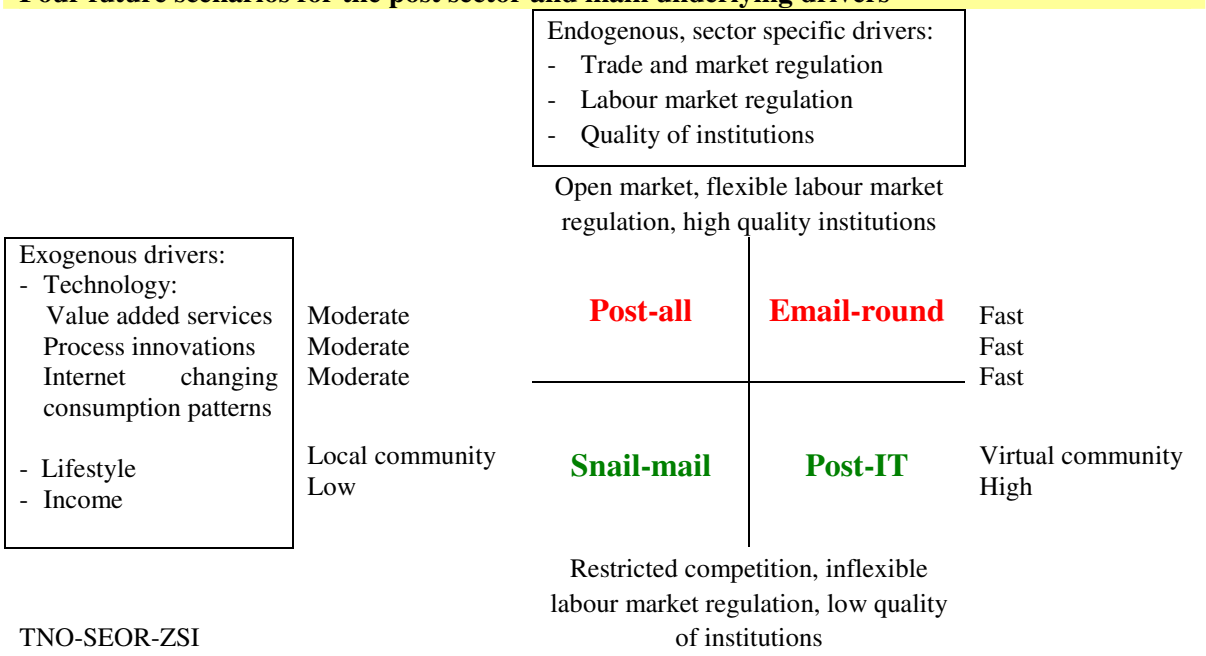
Four future scenarios have been explored: 1) *Snail-mail, 2) Post-all,* 3) *Post-IT,* and 4) *Email-round* (see Figure). The scenarios depict plausible and credible futures for the post sector in Europe by 2020. Rather than wishful pictures ('dreams', 'crystal ball gazing') of the future, scenarios are founded on drivers and trends observed and are derived in a logical and deductive way, hence making inferences about plausible future developments. Rather than

[1] With the exception here of Technology, parts of which which can be influenced at firm level. For reasons of internal consistency of the scenarios, this driver is nevertheless categorised as exogenous.

Main drivers of change: Post sector													Source: ©TNO-SEOR-ZSI.
Category	Driver	Is this driver relevant for the sector? Y / N	How relevant is this driver for the sector? Scale 0-10	How uncertain is this driver for the sector? Scale 0-10	Are substantial impacts expected on the volume of employment? Y/N	Are substantial impact expected on employment composition? Y/N	Are substantial impacts expected on new skills? Y/N	Short, medium or long run impact? S	M	L	Substantial differences expected between (groups of) countries? Y / N	Substantial differences expected between subsectors ? Y / N
Economic	Income per capita and household	Y	8	5	Y	N	N	Y	Y	Y	Y	N
	Increasing global competition	Y	5	3	Y	N	N	Y	Y	Y	N	Y
	Emerging economies driving global growth (new market demand, especially BRICs)	Y	3	3	N	N	Y	N	N	Y	N	N
Technology, R&D and product and process innovation	Advances in IT impacting on organizational structures & new business models	Y	5	6	N	N	Y	N	Y	Y	N	N
	Internet changing production and consumption patterns (e-business; etc.)	Y	10	0	Y	Y	Y	Y	Y	Y	N	N
	New types of work organization (teams-based, sociotechnique, etc.)	Y	5	0	N	Y	Y	Y	Y	Y	Y	N
	New/additional value-added services	Y	10	0	Y	Y	Y	Y	Y	Y	N	N
Institutional / Political	Trade and market liberalisation (national level)	Y	10	0	Y	Y	Y	Y	Y	Y	Y	N
	EU integration – broadening (bigger domestic market)	Y	5	5	Y	Y	Y	N	N	Y	Y	N
	Quality of institutions (judiciary, transparency, corruption, business climate, structural rigidities)	Y	10	0	Y	N	N	Y	Y	Y	Y	Y
	Labour market regulation	Y	10	3	Y	N	N	Y	Y	Y	N	N
	Environmental regulation	Y	5	3	Y	Y	Y	Y	Y	Y	N	N
	Security and safety regulation	Y	7	5	N	N	Y	Y	Y	Y	N	N

predictions or forecasts based on a model, the scenario outcomes in this study are based on expert opinion. The bandwidth between the most extreme scenarios can be interpreted as indicative for the degree of uncertainty indicating possible paths for flexible anticipation. In constructing the scenarios, those drivers have been selected that scored high on the criteria relevance, impact and uncertainty. The relevance criterion was used to focus and tailor the scenarios to the aim at hand, i.e. drawing inferences on the future of jobs and skills and knowledge needs by 2020. Impact and uncertainty were used to define distinct directions in the four scenarios which have been depicted in the figure below, with the exogenous drivers on the horizontal axis and the endogenous drivers on the vertical axis.

Four future scenarios for the post sector and main underlying drivers



Note that the demographics – ageing (less young, more retirees) – and its effects on labour supply have not explicitly been identified in selecting the drivers, as demographics in the time frame of 2009-2020 are relatively certain (i.e. predictable) and play a role across all scenarios. Education and training, which stricto sensu could be perceived as endogenous factors, have been excluded. They form - together with a number of other strategies and/or policies - the solutions and hence a possible response to the impact of the scenario on skills, knowledge and jobs. The key features of the four scenarios can be described as follows:

Scenario I: ***Snail-mail***

Snail-mail depicts a world characterised by a low level of change. Income growth levels are low, which result in small increases in demand. The local community is important and technology does not change very fast. This stimulates 'old' patterns of postal services to survive. Change is also not stimulated by competition, with large incumbents not being challenged but rather becoming less market-driven and inward-looking. The intended next steps in postal market liberalisation are not carried through and the quality of regulatory bodies is low. The demand for traditional and 'new' (IT-based) services is supposed to be stable over time.

Scenario II: ***Post-all***

Post-all depicts a world characterised - like in *Snail-mail* - by moderate technological progress, low income growth and a community focus. Main difference is that competitive market regulation and high quality institutions are present, with liberalization ensuring a high level of

competition. The larger corporations face increasing competition from smaller niche players, both in the traditional postal and in the express markets. Communities and local presence are major drivers; the search for further cost efficiency as a result of low income growth and moderate technological progress lead to restructuring by incumbents, lay-offs and wage decreases.

Scenario III: *Post-IT*

Post-IT depicts a world characterised by fast technological progress and virtual communities becoming more important than personal contacts. The express segment is growing as a result of rising incomes and more Internet shopping, while traditional postal activities are lagging behind. Incumbents are not very efficient, as competition is restricted and the quality of institutions is low. Also companies have consolidated in order to cope with diminishing market demands and to try to increase efficiency, but at a prize: making them inflexible and unable to change quickly to changing market conditions. Often, new entrants are absorbed by the incumbents. Consumers turn to other sectors to provide them with the services they require, leaving companies overstaffed in various departments and forcing them to reorganise.

Scenario IV: *Email-round*

In *Email-round* technological progress is fast, communities are going virtual and income develops favourably. Competition is further stimulated by liberalisation and deregulation. Traditional mail is on the way back, with the number of deliveries going down, offices closed down and remuneration of low educated workers going down. However, companies grow and develop many new value added services, creating new chances for workers but requiring news skills and knowledge. Incumbents and new entrants compete heavily. Express companies are diversifying into other mail segments, with their ability to service items quickly giving them significant advantage. Flexible labour markets and ditto regulation facilitate this process.

Implications of scenarios for jobs, skills and knowledge by job function

Job volume changes. All scenarios lead to substantial change in the structure of employment and skills requirements, with the overall job volume change being negative in all scenarios, and with more dynamics in *Post-IT* and *Email-round* (see Table). *Post-all* and *Snail-mail* are the scenarios where technology has least impact. In *Post-IT* and *Email-round* the impact of technological change is large, but with very different different institutional settings, most importantly the continuation of market liberalisation and deregulation (*Email-round*) or a halt (*Post-IT*). Although job numbers will go down, the main differences between the scenarios is in skills and knowledge changes. Substantial differences will continue to exist between new companies and 'old' incumbents.

Implications of scenarios: job volume changes by function, 2009-2020

	Snail-mail	Post-all	Post-IT	Email-round
Managers	M	D	M	M
Business professionals	D	M	I	I
Operations professionals	M	D	M	I
Sorting staff and mail carriers	M	D	D	D
Cashiers	M	M	D	D
Administrative staff	M	D	D	D
Technicians	M	D	M	M
Transportation workers	D	D	D	D

Source: TNO-SEOR-ZSI. Note: D = decrease, I = increase, M = maintain.

In all scenarios except *Post-all* the number of ***managers*** is expected to stabilise, however, for different reasons. With little competition managers use their power to remain in position, with not much external pressure to reduce management layers. Under high competition such pressure does exist, leading in *Post-all* to a decrease in the number of managers. In *Email-round*, the decrease evens out as frequent changes, with high levels of diversification, decentralisation, new start-ups and concentration, need to be managed. The number of ***business professionals*** is expected to increase in the scenarios with fast changing market conditions and technological change. In *Post-IT* and Email-round, more business professional are needed, both to generate and execute new high value added products and ideas. In *Snail-mail* and *Post-all*, there is not much need for business professionals. The reason for this is that competition is little and technological change slow. Only in *Post-all* involving important restructuring, business professionals are more in demand. Demand for ***operations professionals*** which includes ICT and other engineering professionals but also logistics specialists, is for most part driven by technological development and supply of new high value added services. In *Email-round*, their number increases. A similar trend is observed in *Post-IT*; however, with the number of companies reducing, overall demand maintains. In *Snail-mail* their number is stable: as the number of companies is more stable and since infrastructure and operations are focal, demand for their services can be expected to be stable.

Sorting staff and mail carriers represent the bulk of employment in the postal sector. Their number is mostly dependent on demand for postal services, but also fed by efficiency measures, i.e. cost reduction (sorting: automation; carriers: part-time and flex workers). In high competition/fast technological change scenarios, the position of the sorting and mail carriers is under pressure, resulting in further job losses. This is also because of high substitution effects from other (technology-induced) services. *Snail-mail* is the only scenario in which sorting staff and mail carriers maintain their position, at least in numbers, with local communities playing an important role and competition and technological change being low. A notable divide in wage pay and conditions exists between old and younger mail carriers. New companies are hiring a new type of distribution worker Active redeployment is one of the main challenges for the coming years. The number of ***sales personnel*** stabilizes in *Snail-mail* and *Post–all* in which local communities play a role, with companies showing local presence. In *Post-all* incumbents are under pressure to cut costs, losing market share in niche markets, but winning also market share because of local presence. In fast paced technological growth scenarios where communities become even more virtually oriented, local presence is not required anymore, providing the incentive to companies to cutting back on costs. Expected changes for ***administrative personnel*** are similar as those for sorting staff and mail carriers; regarded mostly by management as overhead, this category is subject to job cuts when profits are falling behind. Also competition and technological change forces companies to cut costs. Only in *Snail-mail* their number is expected to maintain.

The expected growth of the number of ***technical staff*** is expected to maintain in high paced *Email-round* and *Post-IT*, with more value added services being offered (requiring new equipment and maintenance), but decreasing demand for letter mail. In *Post-all* reduction of overhead costs is important, stimulating companies to reorganise sorting and other technical facilities as well as to cut costs by economising on maintenance. The demand for ***transportation workers*** under fast paced technological growth decreases as part is replaced by digital items (*Post-IT* and *Email-round*). In *Snail-mail* local presence requires local delivery and transport to local offices, although transportation workers remain vulnerable to efficiency gains and hence outsourcing (viz. *Post-all*). USPs try to reduce the number of transport workers but new start-up companies require transport workers. However, the latter

is not expected to offset the decrease in demand. Active redeployment of this category of workers is one of the main challenges for the coming years.

Identification of emerging competences, skills and knowledge needs

By taking the scenarios and drivers as a starting point, logical inferences ('guestimates') of skills and knowledge needs were made for each of the identified job functions. *Skills* refer to the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualification Framework (EQF), skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments). *Knowledge* refers to the outcome of the accumulation of information through learning. It is the body of facts, principles, theories and practices that is related to a field of work or study. In EQF context, knowledge is described as theoretical and/or factual. *Competences* refer to the proven ability to use knowledge, skills and personal, social and/ or methodological abilities, in work or study situations and in professional and personal development. Competences thus defined come actually close to what is generally understood nowadays as 'soft skills'. In EQF context, competences are described in terms of responsibility and autonomy. In the practical elaboration of future skills and knowledge needs for the purpose of this study, both have been further 'disentangled' to result into six clusters of similar and related skills and knowledge needs (see Box).

Overview of skills and knowledge needs identified for each job function and scenario
Knowledge ('hard skills')
• Legislative / regulatory knowledge (environmental / safety / labour / contracting); Language*; e-skills; Marketing skills; Technical knowledge; Product knowledge; Product development
Social Skills
• Team working skills; Social perceptiveness (listening / understanding); Communication; Networking; Language*; Intercultural
Problem-solving Skills
• Analytical skills; Interdisciplinary; Initiative, Multi-skilling; Creativity
Self-management Skills
• Planning; Stress and time management; Flexibility; Multi-tasking
Management skills
• Strategic & visionary; Coaching and team building; Change management; Project management; Process optimizing; Quality management; People skills crucial for collegial management style
Entrepreneurial skills
• Supplier and customer relationship / understanding; Business understanding / development; Trend setting / trend spotting
Source: TNO-SEOR-ZSI

Future skills and knowledge needs by job function

Across all job functions soft skills will become increasingly important, especially so for high skilled professional job functions. The general trend of up-skilling across job functions is bound to continue in the coming years. Due to the changing nature of jobs, predefined technical knowledge capabilities will become somewhat less important while skills to adapt and learn new competences and life-long learning will be put at a premium. Certain

knowledge – notably e-skills – will become more important. Emerging competences of higher skilled jobs mostly refer to *how* to learn, communicate, interact and adapt to changing environments in addition to a high quality education. Emerging competences in medium-educated job functions that mostly execute defined tasks and processes refer mostly to specific knowledge sets that can be taught through learning.We illustrate the key emerging skills and knowledge needs for two of the eight distinguished job functions, notably managers, and operations professionals.[2]

Managers. Developments in the postal sector, even in scenarios with strong technological change, are not as fast as in the telecoms and other sectors. Skills and knowledge changes are therefore less dramatic overall, but still have a substantial impact for managers. For managers *Email-round*, with strong technological change and competition, has the largest skills impact as it drastically changes the business. *Snail-mail* with slow technological change and little competition departs from current practices in that the local community plays a more decisive role in competition and managing a company with a community focus requires different techniques than the more traditional management skills. Knowledge is a major asset for managers. In *Post-IT* and *Post-all* regulatory knowledge is vital in successfully acquiring other companies. In scenarios with strong technological change technical knowledge and e-skills will become more influential, as managers need to keep up with developments. In all scenarios social skills are needed, but with different emphasis. Most important is social perceptiveness. In the local community scenarios social perceptiveness is important in identifying what the community wants, and align the company accordingly. In scenarios where efficiency and technological development are important, social perceptiveness is directed also internally, towards employees, as many organisational changes will affect them. Managers need to be able to communicate and explain. In scenarios with strong technological change it is important to understand customers in order to foresee developments and to identify new opportunities. New opportunities require (more) problem solving skills, most notably analytical skills and creativity. These skills are needed in order to understand technologies and to be able to combine them into business opportunities. Analytic skills are also important in restructuring. In scenarios with forced reorganizations (*Post-all* and *Post-IT*), coaching, team building and change management skills are in high demand. In fast paced scenarios flexibility is key; planning skills are more important in scenarios of slow paced technological growth. Marketing, business development and trend spotting skills are most relevant in scenarios with strong technological change. In all scenarios it is crucial that managers understand their suppliers and customers.Most diversity occurs in management skills, with strategic skills in scenarios with strong technological growth. In *Email-round* with bottom-up change, managers need to be approachable and have a more collegial management style. In all scenarios leadership emerges as critical skill, especially leadership for guiding changes that are under way.

Operations professionals. Logistical efficiency is the prime concern of operations professionals who are involved in everything related to planning and distribution systems, including ICT and web related services. In *Post-all* and *Post-IT*, where companies focus on reducing costs to cope with competition, operations professionals play an important role in streamlining the organisation: improving the efficiency of processes and systems, and integrating new services. In *Email-round* the focus is on integrating new value added services. In *Snail-mail* characterised by little change and little competition, companies focus on process reliability and coherence of business operations with local communities.

[2] For a summary of future skills and knowledge needs for these and other job categories, see the tables at the end of this summary. More extensive and detailed accounts on skills and knowledge needs can be found in the main report, with further differentiations made by scenario.

E-skills, operational and logistical technical knowledge as well as management knowledge are important for operational professionals, especially in scenarios with strong technological change. In scenarios with slow technological progress, social perceptiveness is an increasingly required and challenging skill, with the role of local communities being vital for the organisation. Networking skills, communication skills and team working skills are especially key in scenarios of strong technological change, in convincing managers and business professionals of the need to allocate more means to new technologies. Strong technological change also requires more problem-solving skills, including signalling changes and to acting accordingly, as well as analytical skills. Interdisciplinary skills are important, as new value added services are dependent on many different technologies. Changes in the business environment require the operational professionals to adjust themselves to new circumstances. The most obvious related self management skills are flexibility in *Email-round* (fast changing technologies) and better planning skills in *Email-round*, *Post-IT* and *Post-all* (improving organisational efficiency). Business development and understanding consumers and suppliers skills are key in all scenarios. Trend setting and spotting are very important in *Email-round*. All scenarios require some form of new management skills. Strategic and visionary skills are especially relevant in *Email-round* and *Post-IT*. As companies economise on overhead, quality management becomes an issue. In dynamic scenarios change management and project management skills are required, either to deal with forced changes or to develop new possibilities. Moreover in all scenarios process optimising skill are highly relevant.

These examples show that there will not only be a continuous trend of up-skilling in the coming years, but also that skills and knowledge needs – and related gaps and shortages – need to be addressed flexibly, taking in mind the trajectory of strategic change of both the firm and the sector.

Main strategic choices to meet skill and knowledge needs

In order to meet future skills and knowledge needs, apt and timely solutions – referred to here as strategic choices - are required (see table below). Strategic choices refer and relate to the medium- and longer term, even though emerging skills and knowledge needs in practice may also apply to the now and tomorrow. Essential in seeking appropriate solutions is to keep this longer time perspective in mind. Rather than focusing on one single solution, a set of linked strategic choices will in most cases be the best strategy to follow. Prioritising both in time (what first, where to follow up) and in allocation of resources (including budgetary focus) followed by further fine-tuning is a clear necessity to guarantee that skills needs are targeted and solved. Skill needs can be identified at various levels, ranging from assessments at the national or even European sector level to more precise assessments at the regional and company level. Increasingly the identification of skills and knowledge needs but also the search for adequate solutions will have to become an integral part of an overall longer-term business strategy, also for SMEs. Some solutions will be found within the company itself, e.g. through reorganising functions within or between plants, by offering (re)training trajectories or by active global sourcing of personnel. For SMEs and especially for micro-enterprises such longer-term, more strategic human resource management often will be more difficult to organise and operationalise.

In order to address the identified future skills and knowledge needs in an encompassing and timely manner, appropriate joint action is needed by all stakeholders, including the industry (firms, sector organisations and social partners), training and education institutes, intermediary organisations and, last but not least, government at all levels (EU, national, regional and local). Collaboration is needed in order to agree on and implement a package of

feasible solutions. Timely, targeted and reliable information to make decisions – i.e. adequate monitoring and analysis - is an essential prerequisite.

Conclusions

Implications, conclusions and recommendations refer to two distinct levels: the individual job function (micro) level focusing on available options by job function and the more aggregate generic 'meso-level' level. They are aimed at sectoral stakeholders (firms, social partner, education and training institutes and others) and policy-makers. The preceding table summarises the micro-level options and highlights the main findings by category. At the meso-level a further distinction is made between education and training on the one hand and 'other' main conclusions and recommendations on the other, as follows:

Conclusions and recommendations on education and training

1) Adapt and modernise vocational education and training (VET) and general education systems, but do this nationally rather than at the EU level;

2) Modernise VET by enhancing flexibility and addressing emerging training needs by modularisation;

3) Work towards closer collaboration between companies and (higher) education;

4) Increase flexibility by promoting e-learning and blended learning;

5) Pro-actively re-train and up-skill employees and those made redundant;

6) Train the trainers – keep vocational training up-to-date;

7) Improve the provision of information on future skills and training needs to both students and trainers;

8) Provide career guidance for labour market entrants and employees;

9) Actively promote multi-skilling;

10) Provide special training and support to self-employed and part-time employees;

11) Take special courses and support for older workers seriously;

Main other conclusions and recommendations

1) Improve the image and attractiveness of the sector in view of attracting high-skilled and technical staff;

2) Collaborate with all relevant stakeholders and intensify co-operation: Partnerships for Innovation and Job creation and Social Dialogue;

3) Recognise prior learning, promote skills assessments and their validation and stimulate the international and intersectoral acknowledgement of qualification certificates;

4) Invest strongly in human capital and and enhance the possibilities to engage in life-long learning.

Summary of job volumes, skills changes, strategic choices and main players in anticipatory action by scenario					
		Snail-mail	**Post-all**	**Post-IT**	**Email-round**
Managers	1. Employment volume change	M	D	M	M
	2. Skills changes counted	3	9	15	19
	3. Emerging skills needs	Self-management, Social, Entrepreneurship	Management, Social, Entrepreneurship, Self-management	Entrepreneurship, Management, Knowledge, Social, Self-management, Problem-solving	Entrepreneurship, Management, Social, Entrepreneurship, Self-management, Problem-solving
	4. Most important solutions	In-house development; recruiting from other sectors	In-house development; recruiting from other sectors	In-house development; recruiting from other sectors	In-house development; recruiting from other sectors
	5. Most important actors	C	C	C	C
Business professionals	1. Employment volume change	D	M	I	I
	2. Skills changes counted	2	9	12	22
	3. Emerging skills needs	Social, Entrepreneurship	Social, Management, Entrepreneurship, Knowledge, Problem-solving	Social, Knowledge, Management, Entrepreneurship, Problem-solving	Entrepreneurship, Management, Self-management, Problem-solving, Social, Knowledge
	4. Most important solutions	Recruit	Recruit, (Re)train	Recruit, (Re)train	Recruit, (Re)train
	5. Most important actors	C	C	C	C
Operations professionals	1. Employment volume change	M	D	M	I
	2. Skills changes counted	4	9	16	18
	3. Emerging skills needs	Entrepreneurship, Management, Social	Management, Entrepreneurship, Social, Self-management	Problem solving, Management, Knowledge, Entrepreneurship, Social, Self-management	Problem solving, Management, Knowledge,Entrepreneurship, Social, Self-management
	4. Most important solutions	Recruit	Recruit, (Re)train	Recruit, (Re)train	Recruit, (Re)train
	5. Most important actors	C, E	C, E	C, E	C, E
Sorting staff and mail carriers	1. Employment volume change	M	D	D	D
	2. Skills changes counted	2	7	6	8
	3. Emerging skills needs	Social	Self-management **(stress)**, Social, Problem-solving	Self-management **(stress)**, Problem-solving, Knowledge	Self-management **(stress)**, Social, Knowledge
	4. Most important solutions	Retrain, Information	Retrain, Recruit, Information	Retrain, Recruit, Information	Retrain, Recruit, Information
	5. Most important actors	C, E, S, U	C, E, S, U	C, E, S, U	C, E, S, U

		Snail-mail	Post-all	Post-IT	Email-round
Sales personnel	1. Employment volume change	M	M	D	D
	2. Skills changes counted	3	9	8	8
	3. Emerging skills needs	Social	Social, Problem solving	Knowledge **(regulatory)**, Self-	Knowledge **(regulatory)**, Self-
	4. Most important solutions	(Re)train, Information	(Re)train, Information	(Re)train, Information	(Re)train, Information
	5. Most important actors	C, E, S, U	C, E, S, U	C, E, S, U	C, E, S, U
Administrative staff	1. Employment volume change	M	D	D	D
	2. Skills changes counted	2	6	8	13
	3. Emerging skills needs	Management, Entrepreneurship	Problem solving, Management,	Problem solving, Management,	Problem solving, Self-
	4. Most important solutions	(Re)train, Information	(Re)train, Information	(Re)train, Information	(Re)train, Information
	5. Most important actors	C, E	C, E	C, E	C, E
Technicians	1. Employment volume change	M	D	M	M
	2. Skills changes counted	3	2	9	9
	3. Emerging skills needs	Self-management, Social,	Self-management,	Problem solving, Self-	Problem solving, Self-
	4. Most important solutions	(Re)train, Information	(Re)train, Information	(Re)train, Information, New	(Re)train, Information, New
	5. Most important actors	C, E	C, E	C, E	C, E
Transportation workers	1. Employment volume change	D	D	D	D
	2. Skills changes counted	1	2	2	2
	3. Emerging skills needs	Self-management	Self-management	Self-management	Self-management
	4. Most important solutions	(Re)train, Information	(Re)train, Information	(Re)train, Information	(Re)train, Information
	5. Most important actors	C, E, U	C, E, U	C, E, U	C, E, U

C=Companies; S=Sectoral organisations, U=trade Unions; E=Education and training institutes; G=Government (EU, Member State, regional, local). Notes: 1) The term 'skills' includes knowledge (needs). 2) The second row 'skills changes counted' refers to the number of skills categories in the most extreme scenario that are up to change. 3) Indicated in bold: skills or knowledge sub-categories up for the strongest upgrade need.