

*RE-IMAGINING  
WORK*

# GREEN PAPER

*WORK 4.0*

2015

# PRELIMINARY REMARKS

With “Work 4.0”, we are taking a look at the working world of today, tomorrow and beyond. We wish to launch a broad dialogue about how we want to work and what opportunities exist for companies, workers, the social partners and policy-makers to shape developments. As we embark on this dialogue, we set out descriptions, analyses and a large number of questions, but we do not have fully developed answers at this stage. This document summarises the starting point for the Federal Ministry of Labour and Social Affairs at the launch of the “Work 4.0” dialogue.

As a first step, we describe important overarching trends and scenarios affecting our working society (Chapter 1). Then we set out what we understand by Work 4.0 and outline the position of the Federal Ministry of Labour and Social Affairs as we embark on this dialogue (Chapter 2). We go on to offer an overview of key areas for action and formulate concrete questions (Chapter 3). While our reflections in Chapter 3 are based on these individual action areas, Chapter 4 focuses on the concrete institutions of the social state. Chapter 5 sets out how the **WORK 4.0** dialogue process is structured and what it aims to achieve.

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# FOREWORD BY FEDERAL MINISTER ANDREA NAHLES

## WORK 4.0 – NEW P R O S P E C T S F O R O U R WORKING SOCIETY

Gazing into the future is once more in vogue in the media. Will taxis, buses and HGVs soon no longer need drivers? Are robots the better surgeons? Will cash become obsolete as we pay for everything using mobile phones? Will houses and estates be built using 3D printers? These kinds of questions are driving a discussion of future scenarios for a “digital revolution”. The foundations of this revolution are more and more powerful IT systems, highly developed robotics and sensor technology, 3D printers, clouds, and vast collections of data, which, thanks to Big Data, can be combined to make astounding predictions possible.

The German business community is also debating urgent questions: will the car of the future come from Stuttgart, Wolfsburg or Silicon Valley? How can tools be linked with construction sites, crates with containers, heating and ventilation systems with the weather? Will German companies succeed in “digitalising” the things they do particularly well, such as machines and high-quality services? There are important issues involved: ensuring that Germany and Europe remain attractive locations for business, changes in market distribution, considerable potential for economic growth, and the dream of a digital “economic miracle”.

Digitalisation is fuelling our imaginations and innovation, and surprising us with a never-ending stream of new products and business models. At the same time, we are now gradually beginning to grasp the extent to which it has already transformed our reality forever, and the speed with which it is permeating and reshaping our media, the economy and popular culture.

Work is proving to be a key locus of this transformation. When we talk about Work 4.0, we not only mean the new technological developments

of Industry 4.0. We are talking about the work of the future, in all its breadth and diversity. The changes made possible by technology are just one important factor in this. A silent revolution is being driven by people: we are currently experiencing a fundamental cultural shift, with new preferences emerging as regards the way in which work is organised. Individualisation is not just a buzzword in product development and marketing, but a historic trend which extends far



beyond consumption. We want to lead individual lives. And that means: we want to look after our loved ones, especially when they need us most. We want a private life worthy of the name, and decent work which suits our situation in life. It should leave us the freedom and sovereignty to lead our lives, while at the same time giving us the level of security we need.

In my capacity as Labour Minister, I want to ensure that our debate about the future is a progressive one, with people and their needs at its heart. In concrete terms: what place do drivers, doctors, postal delivery workers, checkout workers and construction workers have in the digital world (and beyond)? Will today's HGV driver, instead of sitting behind a steering wheel, find himself monitoring electronic instruments in his cab tomorrow? Even further in the future, will he be sitting in a logistics centre, controlling several driverless HGVs remotely?

# FOREWORD

Or will he perhaps be able to do so from home? Will he have more leisure time than before, will he be able to lead a healthier life, see his family more often and share responsibilities with his wife? Will he still feel a connection with his company? Will he have opportunities for involvement and co-determination? Will his co-workers feel solidarity with him? Or will our driver feel surplus to requirements and be unable to find work? Will he perhaps have seized the opportunity to do something else entirely? Will our institutions have supported him in doing so?

The digital revolution means that a careful evolution in social affairs is necessary. What is important to me in this context? Decent, secure and healthy work. Finding new ways to combine a high level of employment with participation in work. Taking seriously workers' changed individual preferences regarding their work, and developing policies which enshrine a life-phase approach. Ensuring that fair wages and social security in our social market economy also apply to new forms of work. Finding good solutions regarding initial and continuing training which enable us to shape technological change and to help workers cope in a world of work characterised by greater diversity, discontinuity and uncertainty. Ensuring that companies find the skilled workers they need and embrace good corporate governance because of the many advantages it brings them. We want to carry the high standards for which we fought so hard in the past forward with us into the Working World 4.0. Achieving this requires regulation of the highest possible quality, rather than the highest possible quantity.



With Work 4.0, we want to launch an important debate, pose questions and identify joint answers. I invite academics, practitioners, the social partners and civil society to participate in this process. We need the perspectives of women and men, of young people and older people, with their wealth of experience in terms of both life and work. This Green Paper makes a start: it outlines our current position and sets out questions from various perspectives. While we won't be able to answer all of them definitively, at the end of the process we will have a better idea of how we want to work in future and what we need to do to achieve this.

My aim is for us to develop a new social compromise which benefits employers and workers alike. For example, by working with the social partners to identify ways in which workers can fulfil their individual preferences regarding their working hours. By striking a balance between companies' flexibility requirements and workers' needs. Or by making life-long learning our first and most important response to a world of work that is constantly changing. This can only be achieved if we work together to ensure that workers receive the education they need throughout their working lives. Let's talk about it!

There are many reasons why people work. For most people, earning a living for themselves and their family is paramount. Work is a source of dignity and identity. In addition, it is a gateway to participation, advancement, prestige and success. Many people work in order to make use of their talents, to realise their potential, or to find contact, recognition and validation in a community. Whether it is a necessity, a calling or a pleasure – work is and remains vital for every individual and for society as a whole. We are a working society. To be more precise: we are a **WORKING SOCIETY IN EVOLUTION.**

This is opening up new options for action and opportunities for us to shape developments. If we are to make use of them, we must identify answers to the following questions: what are the most important factors driving this evolution today? Where is our working society heading, and the institutions which underpin it? How do we want to, and how will we, work in the future?





# 1.1 TECHNICAL POTENTIAL:

## THE DIGITAL AND GLOBAL ECONOMY

### Big Data

*Big Data refers to the collection and analysis of ever larger volumes of data, made possible by technical progress in terms of processors and sensor technology, but also by advances in analysis methods.*

We are moving towards a digital economy. Increasingly powerful IT systems with falling production costs, rising worldwide internet usage both at home and on the go, highly developed robotics and sensor technology, cyber-physical systems which link the virtual world with the world of things, 3D printing as a new production method, intelligent software systems, Big Data, and, not least, shifts in consumer preferences – the digital transformation is revolutionising traditional businesses models, turning entire sectors upside down, and leading to new production and logistics chains, products and services. The resulting productivity gains and the high level of price transparency in e-commerce benefit consumers, who, as “prosumers”, are also more and more involved in the innovation and production process.

### Digital transformation

*The digital transformation is the sum of the changes which may result from rapid and widespread adoption of new information and communication technologies in the economy and in society. They all individually, and especially in combination, have a significant potential to transform the way in which we work and do business.*

The digital transformation is unfolding at global level and bringing even distant regions and people into close contact with each other. Global competition and the international division of labour are intensifying. Broadly speaking, we are seeing an **INNOVATION MODEL** that is widespread in Germany, designed to ensure the continual improvement of products and processes, come up against a disruptive innovation model from Silicon Valley that aims to produce radical changes.

For companies in high-tech Germany, this transformation offers many **OPPORTUNITIES**, but also holds a number of risks. Productivity gains, greater closeness to the customer and export opportunities – Industry 4.0 and its new production systems open up all of these

opportunities for Germany's traditional leading industries, such as mechanical engineering or car manufacturing. They could face new competition for technological and brand dominance from large-cap IT companies which are moving into industrial production. The "Makers" movement<sup>1</sup>, at the intersection of IT programming, 3D printing, low-volume production and crafts, could provide new impetus for domestic production. In the services sector, an "on-demand economy" is emerging, with online platforms offering a simple, rapid and low-cost means for companies and private households to obtain services.

According to the Monitoring Report Digital Economy 2014<sup>2</sup>, there is still considerable variation in the level of digitalisation in **INDIVIDUAL SECTORS**. Digitalisation is furthest advanced in telecommunications and publishing, the media and broadcasting. There is also a high level of digitalisation for IT, information, financial and insurance service-providers, as well as manufacturers of computer, electronic and optical products, and vehicles. Commerce, manufacturing of electrical equipment, and mechanical engineering rank in the middle of the sector index. Looking to the future, those sectors which have invested comparatively little in their information and communication technology in the past are likely to make up more ground in the coming years; these include the transport and logistics sector, and energy and water supply.

### Industry 4.0

*Industry 4.0 describes a revolution in the manufacturing sector. At the heart of Industry 4.0 is a highly automated and interconnected industrial production and logistics chain. Virtual and real processes merge on the basis of what are known as cyber-physical systems. This permits highly efficient and highly flexible production, with customer wishes being taken into account in real time, and allows a large number of product variations to be produced.*

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<sup>1</sup> Anderson (2012): Makers: The New Industrial Revolution.

<sup>2</sup> Federal Ministry for Economic Affairs and Energy (BMWi) (2014): Monitoring Report Digital Economy 2014.

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As far as job-rich sectors are concerned, the level of digitalisation in the services sector, in particular, can be expected to rise. Retail, for example, faces the challenge of developing omni-channel offers for customers in order to link online sites with bricks-and-mortar stores.

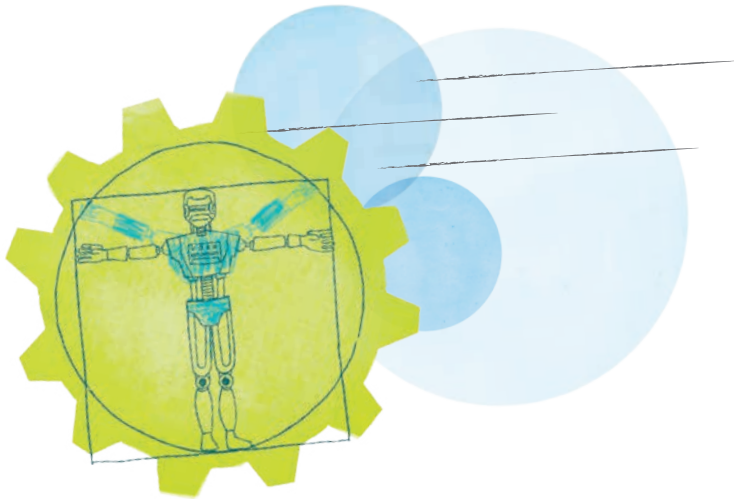
How is **WORK** changing in the digital economy? According to the Federal Statistical Office, 54% of workers in Germany used a computer with an internet connection in their work in 2014. It is not just in offices that digital work is becoming the norm; in factories, too, the use of computerised, interconnected machines is widespread. Almost a quarter of production is already fully or highly automated in Germany today.<sup>3</sup> Digital work also makes possible a wider range of working arrangements, such as telework, and new forms of work, such as crowdworking.

### Crowdworking

*Crowdworking is the process of distributing work, generally broken down into smaller tasks, to crowdworkers via digital platforms. The work can be given either to a company's own employees (internal crowdworking) or to third parties (external crowdworking), who are often solo self-employed individuals working for many customers worldwide.*

It remains to be seen what the digital economy's **NET EFFECT ON EMPLOYMENT** will be. New occupations are emerging. New jobs are being created, for example in the 7000 ICT start-ups in Germany each year. More than a million people already work in the ICT sector in Germany today.<sup>4</sup> On the other hand, the degree of automation is continuing to rise due to software solutions which run complex algorithms, and interconnected manufacturing equipment with powerful computer technology.

Labour-market researchers believe that, in recent years, **AUTOMATION** has resulted in the loss of middle-skilled, routine-intensive occupations, in particular.<sup>5</sup> In many countries, this led to a polarisation of employment, in the form of a relative increase in low-skilled and high-skilled employment, a trend to which changes in consumer preferences and



shifting sectoral structures also contributed. Wage polarisation can also be observed in the United States. So far, Germany has experienced employment polarisation, but no wage polarisation comparable to that in the US.<sup>6</sup>

Although technological innovations have repeatedly resulted in the short-term loss of many occupations in the past, over the long term they have also created new employment opportunities. However, some experts question whether these positive effects on employment will be present in future.<sup>7</sup>

### Polarisation

*When demand for mid-level qualifications declines relative to both higher-level and lower-level qualifications, e.g. as a result of technological progress, this can result in wage or employment polarisation. This can lead to a rise in wages at the top and bottom of the wage distribution relative to those in the middle, for example.*

<sup>3</sup> Fraunhofer-Institut für Arbeitswirtschaft und Organisation (2013): Produktionsarbeit der Zukunft – Industrie 4.0.

<sup>4</sup> Federal Ministry for Economic Affairs and Energy (BMWi) (2014): Monitoring Report Digital Economy 2014.

<sup>5</sup> For example, Autor/Dorn (2013): The Growth of Low-Skill Service Jobs and the Polarization of the U.S. Labor Market, American Economic Review 103.

<sup>6</sup> Cf. Dustmann/Ludsteck/Schönberg (2009): Revisiting the German Wage Structure, The Quarterly Journal of Economics 124; Antoniczyk/DeLeire/Fitzenberger (2010): Polarization and Rising Wage Inequality, IZA Discussion Paper No. 4842.

<sup>7</sup> Cf. Osborne/Frey (2013): The Future of Employment: How susceptible are jobs to computerisation? and Brynjolfsson/McAfee (2014): The Second Machine Age.

## 1.2 SOCIAL VALUES:

### CHANGED PREFERENCES REGARDING WORK

Technology is not alone in transforming our reality: **CHANGED SOCIAL PREFERENCES AND VALUES** are doing so as well. People's life plans have become more individual and diverse. Traditional role stereotypes have long since become less influential. Many women and men want to work on a more equal basis and share family commitments to a greater extent. All of this is changing the importance people attach to work compared to their private lives, what they want from work and jobs, and, not least, what action they want the state to take. This development is also reflected in the rise in labour-force participation, especially among women, and it is creating new gainful employment in the sectors of child care, long-term care, household services, household appliances, the food industry, and other services. In other words, not only is the labour supply changing, so is the structure of the demand for labour.

#### Generation Y

*Generation Y refers to the demographic cohort born between 1985 and 2000.*

*Members of Generation Y are believed to place much more value than older generations on the meaningfulness of their work and on a work-life balance.*

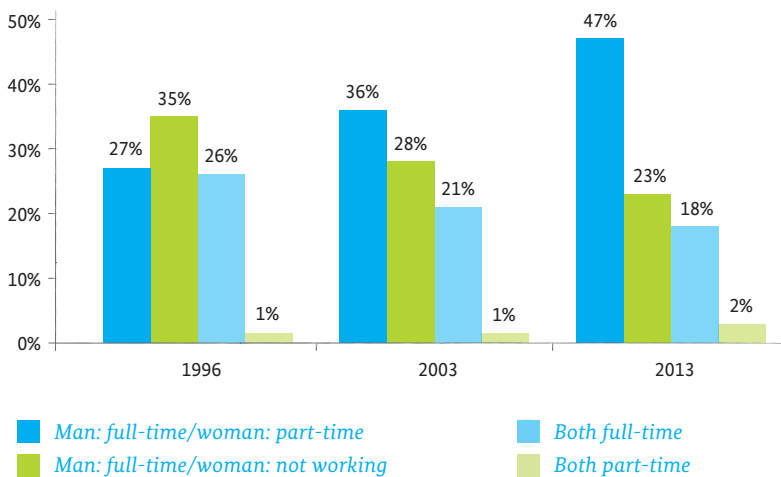
The desire for a better **WORK-LIFE BALANCE** is increasing – both among the younger Generation Y, who are in the process of entering the world of work, and among 30- to 50-year-olds, who want to combine professional success, an active private life, and spending time with their families in their role as parents. There is strong demand among the gainfully active for greater working time sovereignty.<sup>8</sup> Workers would like more flexibility and personal control over their time in certain life phases – particularly when starting a family, but also when caring for family members, or undertaking initial or continuing training.

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<sup>8</sup> Cf. IG Metall Vorstand, publisher (2014): Arbeit: sicher und fair! Ergebnisse der Beschäftigtenbefragung.

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## Distribution of employment status in couple families



Source: Microcensus

## Time sovereignty

*In general, time sovereignty means that an individual has control over how to use his or her own time. In the narrower sense, it refers to workers having a say in the number and pattern of hours they work.*

## Rush hour of life

*The rush hour of life refers to a life phase with a particularly high concentration of demands and decisions that are of vital significance for an individual's future (e.g. the phase between the ages of 25 and 45). Completing education and training, entering the world of work and starting a career, choosing a partner and starting a family: all of these events fall within this phase and have to be dealt with simultaneously within a short space of time.*

The intensification of private and work demands and the **TIME CRUNCH** are felt particularly strongly during the “rush hour of life”. Higher levels of educational attainment and a rise in the proportion of young people going on to higher education have led to an increase in the average age of those entering the world of work, especially for graduates. As a result, people are frequently starting families later in life. It is increasingly common for workers to have to simultaneously negotiate entering the world of work, career advancement and starting a family within a short space of time, in the same life phase. Caring responsibilities may also have to be taken on.

A majority of the population finds combining all of this a major challenge. Two thirds believe that balancing work and family commitments in Germany is, overall, “not very easy”.<sup>9</sup> 41% of those in dependent employment say that they themselves experience problems in doing so.<sup>10</sup> Between the demands of work, social expectations and their own wishes, this “stressed middle” in particular feels under a great deal of pressure. This may also be an important reason for the increase in mental stress.

With Generation Y, more and more young people are entering the world of work who place greater value on the balance between work and private life. In their eyes, “decent work” also includes employers offering opportunities for personal development and continuing education and training, working time flexibility, working time accounts, parental leave or sabbaticals.<sup>11</sup> Many employers seeking young skilled workers are already adapting accordingly.

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<sup>9</sup> Cf. Institut für Demoskopie Allensbach (2013): Monitor Familienleben 2013.

<sup>10</sup> Federal Institute for Occupational Safety and Health (BAuA) (2012): Stress-Report Deutschland 2012.

<sup>11</sup> Vgl. Hurrelmann & Albrecht (2014): Die heimlichen Revolutionäre. Wie die Generation Y unsere Welt verändert.

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# 1.3 NEW UNCERTAINTIES AND CHANGES IN THE STANDARD EMPLOYMENT RELATIONSHIP:

## THE DECLINE OF STANDARD EMPLOYMENT RELATIONSHIPS & DIVERGENCE

### Standard employment relationship

*In the 1980s, a number of academics defined the empirically most widespread form of gainful activity in West Germany as the standard employment relationship, with the following characteristics: permanent, open-ended, full-time employment with compulsory social insurance coverage and regulated working hours, outside the agency work sector. Frequently, it was implicitly assumed that the employee in question was a sole male breadwinner with a family.*

In the eyes of employees, “**DECENT WORK**” still means, above all, having a secure and adequate income, having a permanent position, developing social connections, and being able to make use of and develop their own skills in their work – including as a result of a good leadership culture in the workplace.<sup>12</sup> Academics define the “standard employment relationship” in similar terms, although their requirements are not equally high.<sup>13</sup> Due to the widespread public acceptance of this type of employment relationship, it is regarded as the **STANDARD FOR FORMAL EMPLOYMENT**. If policy-makers are to continue to take it as their yardstick in shaping the social insurance systems in future, a new standard employment relationship must be developed.

While it is essential to look at divergences from the standard employment relationship, it is equally important to begin by noting that most workers in Germany are still in stable and secure employment. The strength of our world of work is, above all, the capacity for **INTERNAL FLEXIBILITY** agreed in negotiations between the social partners. Many companies have highly flexible working time options agreed by the social partners. That is one reason why our economy has weathered the severe economic crisis in the past decade so well.

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<sup>12</sup> New Quality of Work Initiative (forthcoming): Monitor Gewünschte und erlebte Arbeitsqualität; New Quality of Work Initiative (2006): Was ist gute Arbeit? Anforderungen aus Sicht von Erwerbstätigen.

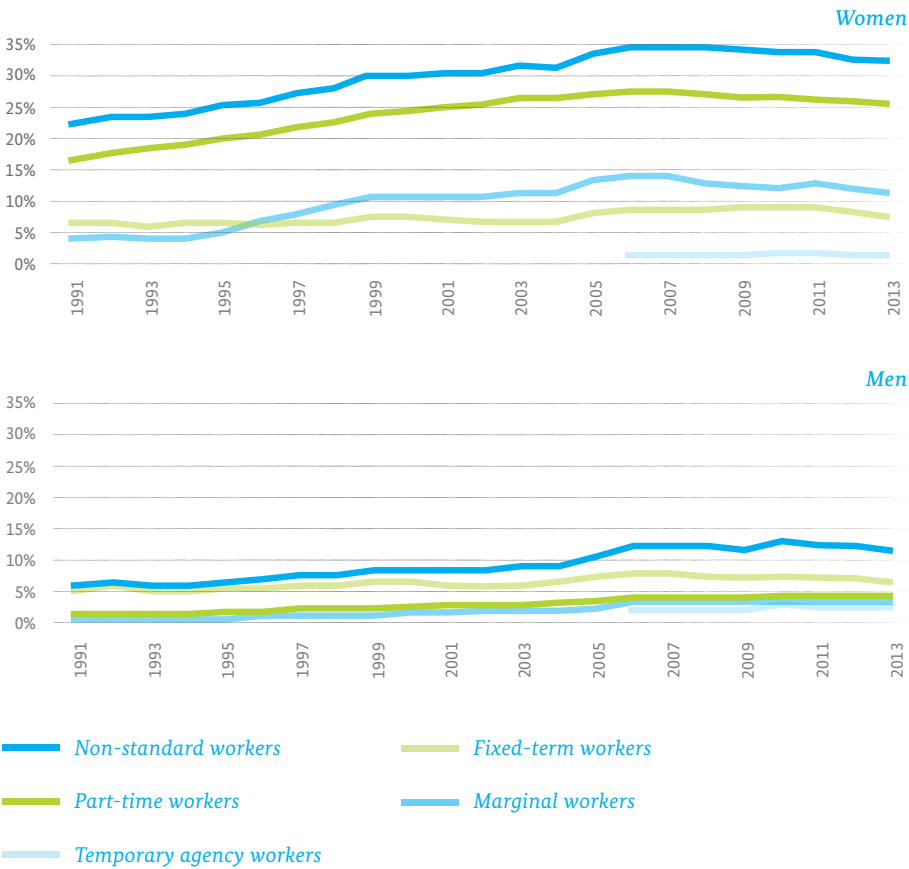
<sup>13</sup> Cf. for instance Mückenberger (1985): Die Krise des Normalarbeitsverhältnisses – hat das Arbeitsrecht noch Zukunft?, in: Zeitschrift für Sozialreform, 7–8/1985..

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# IN THE LABOUR MARKET

Non-standard workers as a share of all gainfully active persons



Source: Federal Statistical Office, Microcensus. Analyses of non-standard forms of employment among the core labour force; break in the time series in 2011.

### Non-standard employment relationships

*Non-standard forms of employment include part-time work (under 20 hours per week), marginal employment, fixed-term employment and temporary work.*

However, if we compare the world of work in Germany today with that of 25 years ago, much has changed. The working world has become more diverse and more female, but it has also become more **UNSTABLE**. Overall, more people are economically active, especially older people and women. And although the standard employment relationship was never universal – even in the heyday of full employment, there were still a significant number of non-standard employment relationships – today it seems much less standard than it once did. The boundaries between “standard” and “non-standard” are becoming increasingly blurred. That said, the transformation of the world of work is also visible in quantifiable trends: in particular, the decline in collective bargaining coverage, the growth of the low-wage sector, the rise in what is known as non-standard employment (part-time work below 20 hours per week, temporary work, fixed-term contracts), the increase in more unstable work histories and, recently, the growing shift to contract work.<sup>14</sup>

### Dualisation

*In view of a growing and increasingly entrenched low-wage sector and the spread of non-standard forms of employment, even as the number of standard employment relationships remains high, academics have introduced the concept of the dualisation of the German labour market.*

Taken together, these trends – accompanied by a high level of employment by international standards – lead to a diagnosis of labour market dualisation.<sup>15</sup> At the bottom end of the wage distribution, a segment of partly insecure and precarious employment has developed. At the same time, the long-term unemployed are currently benefiting very little from the significant growth in employment.

The labour market has been segmented in the past as well, generally by skill level, and the more flexible segments of the labour market are what enable many people to enter the labour market in the first place. Problems arise if these segments offer no or very limited opportunities to move into secure and better paid employment. Research shows that mini-jobs and temporary work, at least, do not serve as a bridge in this way, or do so only to a limited extent.<sup>16</sup>

The relative **DECLINE IN STANDARD EMPLOYMENT RELATIONSHIPS** need not go hand in hand with the loss of their influence in setting standards. Many employees still want a permanent, well-paid, full-time job (usually protected by a collective agreement) outside the agency work sector. But not all workers share this desire for full-time employment – particularly not throughout their entire lives.

As the world of work has changed, and in the context of a wider shift in values, the public's understanding of “standard” work has also been transformed. In some life phases, the standard employment relationship does not match the individual's own wishes and plans. Gender-specific role stereotypes and the resultant division of labour have changed – at least as far as social expectations are concerned.

If people's life plans are increasingly to contain different individual labour-market transitions in future, and potentially also include phases without work, then additional, interspersed periods of education will be necessary. Furthermore, an ageing society will involve phases when people face greater caring responsibilities and will require more flexible transitions to retirement. The opportunity of **INDIVIDUAL FLEXIBILITY IN DEVELOPING LIFE PLANS** goes hand in hand with challenges regarding **SOCIAL PROTECTION**.

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<sup>14</sup> Cf. Institute for Employment Research (IAB) (2015): Zentrale Befunde zu aktuellen Arbeitsmarktthemen, Aktuelle Berichte 7/2015; Ellguth/Kohaut (2014): Tarifbindung und betriebliche Interessenvertretung: Ergebnisse aus dem IAB-Betriebspanel 2013, in: WSI Mitteilungen 4/2014.

<sup>15</sup> Eichhorst/Kuhn/Thode/Zenker (2010): Traditionelle Beschäftigungsverhältnisse im Wandel \* Benchmarking Deutschland: Normalarbeitsverhältnis auf dem Rückzug.

<sup>16</sup> Institute for Employment Research (IAB) – Brief Report 13/2010 (2010); Federal Employment Agency (2014): Der Arbeitsmarkt in Deutschland – Zeitarbeit – aktuelle Entwicklungen; Lehmer (2012): Dient die Arbeitnehmerüberlassung als Brücke in nachhaltige Beschäftigung, Sozialer Fortschritt 8/2012; Caliendo/Künn/Uhlendorff (2012): Marginal Employment, Unemployment and Job Match Quality, IZA Discussion Paper No. 6499.

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## 1.4 THE CONTINUING IMPACT OF OTHER MEGATRENDS:

### DEMOGRAPHIC CHANGE, GLOBALISATION & THE KNOWLEDGE SOCIETY

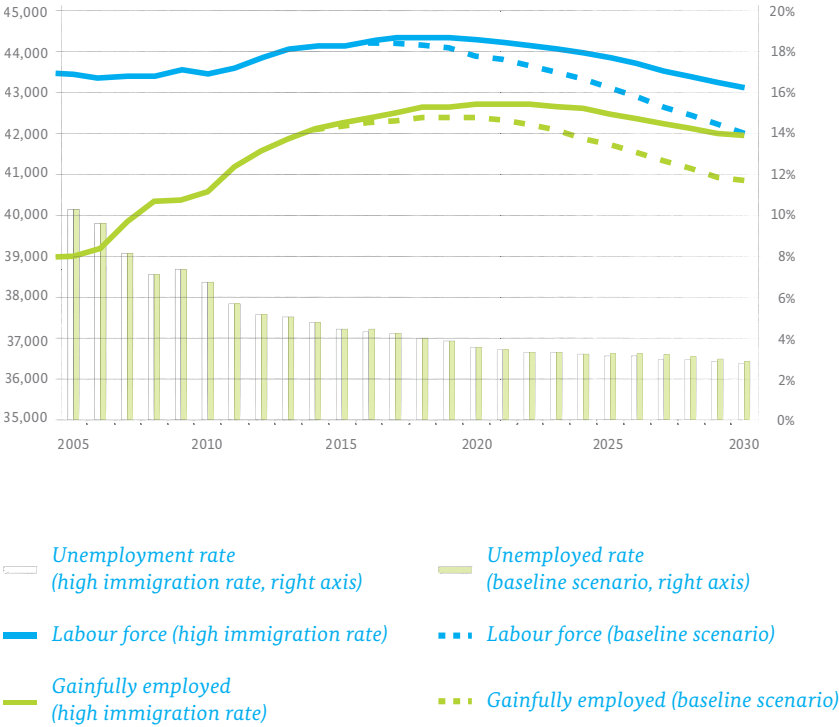
In addition to the developments described above, other well-known trends are continuing to have an impact. **DEMOGRAPHIC CHANGE** will result in a significant shift in the size and structure of the population in the coming years: in Germany, there will be many more elderly people, while the population as a whole will shrink. This trend will be most visible in the working-age population. The baby boom generation, who make up a large part of today's workforce, will be retiring in the coming years and decades. At the same time, there are fewer new entrants to the labour market to take their place.

#### Skilled workers

*Individuals who have completed a vocational training programme lasting a minimum of two years are considered skilled workers. These are people who have completed an apprenticeship or hold a technical college certificate, a degree from a university or university of applied sciences, or an equivalent qualification.*

Meeting the **NEED FOR SKILLED LABOUR** remains a central political challenge. Against the backdrop of a falling labour supply overall, it is necessary to harness all available potential in the long term in order to secure growth, prosperity and cohesion for the entire country. As the workforce ages, it becomes increasingly important to preserve people's ability to work and employability. The central aims for age/ageing-appropriate work are the design of good and motivating working conditions, a stronger culture of continuing education and training, and the protection and promotion of employee health. Growing needs for skilled labour cannot be met solely by recruiting young skilled workers; it is particularly important to preserve employees' creative and physical capabilities, and to open up the labour market further to women, older people, people with disabilities, and people with a migrant background.

# Labour supply and demand trends



Source: Economix 2015. Left axis: absolute numbers in thousands. Right axis: in percent.

In addition to demographic change, other trends will also have a lasting influence on the working society of the future. The global interdependence of economic blocs will increase further. Technical progress, e.g. in the field of communication technologies, will, as set out above, drive forward this trend. In this context, it is important to seize the economic opportunities of **GLOBALISATION** and tap into new sales markets, while at the same time preventing potential negative consequences, such as the loss of jobs due to offshoring.

We have long since passed the point where the “work of the future” could be considered from a purely national perspective. We are integrated into the global division of labour. Some see a conflict between our model of prosperity and ecological risks such as global warming. It is beyond the thematic scope of this Green Paper to examine this challenge in detail. However, at the intersection of Work 4.0 and global issues is the need to move to an ecologically sustainable growth path via technological and social innovation. Likewise, we share responsibility for ensuring compliance with fair working conditions across global production and supply chains. It is also becoming more and more apparent that economic success is not just a question of GDP; the distribution of wealth and equality of opportunity also play an important part in maintaining the capacity for growth and potential for innovation, and in securing future opportunities for greater prosperity.<sup>17</sup>

### *Knowledge society*

*In a knowledge society, knowledge and its organisation are the foundation of society and a vital economic resource which determines the competitiveness of economies to a large degree. Work increasingly takes the form of knowledge work and mental tasks. Access to and sharing in knowledge via education is a central social issue.*

The long-term trend towards the knowledge society will continue, including as a result of digitalisation. In industry and services, increasing use will be made of more sophisticated technologies; value creation and jobs are shifting from production to the services sector. Over 73% of gainfully active persons already work in the services sector today.<sup>18</sup>



The future demands of the world of work require better educated and trained workers. As the OECD's PIACC (Programme for the International Assessment of Adult Competencies) study showed, this involves, on the one hand, higher levels of qualification so that workers can keep up with the technological developments. On the other hand, alongside subject-specific knowledge, there is growing demand for social and personal skills such as problem-solving skills, creativity, communication skills or the capacity for holistic and integrative thinking – skills which equip people for many different sectors. The results of the PIAAC study also show that education not only improves an individual's employment opportunities, but also leads to a significant return – i.e. higher wages – in the German labour market, compared to other European countries. In addition to these financial benefits for workers, higher levels of qualification also lead to productivity gains for companies.

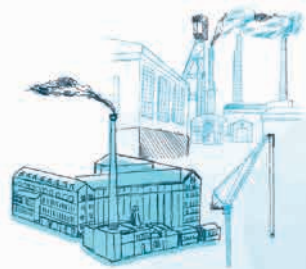
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<sup>17</sup> Cf. OECD (2014): Trends in income inequality and its impact on economic growth.

<sup>18</sup> Institute for Employment Research (IAB) (2013): Daten zur kurzfristigen Entwicklung von Wirtschaft und Arbeitsmarkt 4/2013.

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In view of the current technological trends, social developments and changes in the labour market, do we need a **NEW VISION OF WORK?** What should it look like? Work 4.0 does not describe today's normality in the workplace. Instead, Work 4.0 highlights new prospects and opportunities for shaping developments in the future. The title "Work 4.0" picks up on the current discussion about the fourth industrial revolution (Industry 4.0), but puts forms of work and employment relationships centre stage – not just in the industrial sector, but in the entire world of work. Work 4.0 refers in essence to gainful employment in this context, even if a broad definition of work also has to include other forms of work (such as work carried out in the family). Broadly speaking, the following historical phases can be associated with the stages of the industrial revolution.

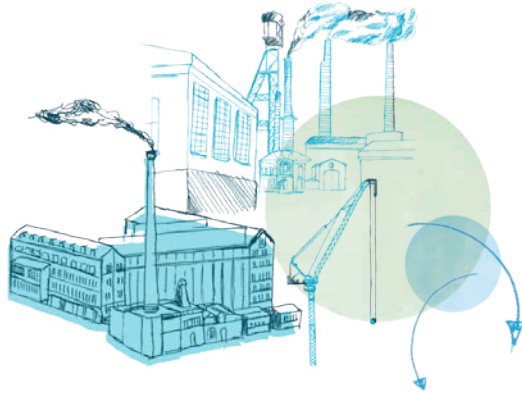


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<sup>19</sup> Cf. Brynjolfsson/McAfee (2014).

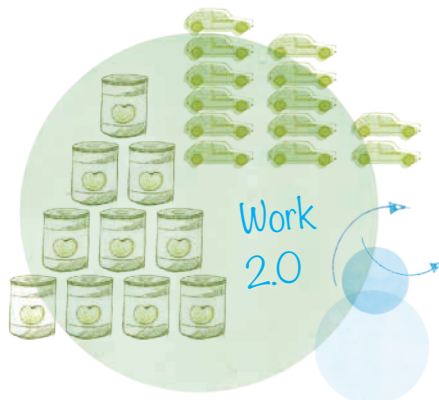
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**WORK 1.0** refers to the birth of the industrial society and the first workers' organisations. The introduction of the steam engine and mechanical production systems led, in the late 18th century, to changes not only in production methods, but also in the organisation of work, social structures and the self-image of the emerging classes.

**WORK 2.0** was the beginning of mass production and the birth of the welfare state in the late 19th century. Industrialisation led to new social problems and raised fundamental social questions. Worsening social problems and growing pressure from organised labour were an important factor in the introduction of the first forms of social insurance in the German Empire.





**WORK 3.0** covers the period in which the welfare state and workers' rights were consolidated on the basis of the social market economy. Employers and employees negotiated with each other on an equal footing, as social partners. The need for representation of common interests was unquestioned in companies and among workers. Later, some social rights were revoked, partly as a result of growing competitive pressures. Since the 1980s, production has been further automated through the use of information technology and electronics, the share of the economy accounted for by services has been rising sharply, and national markets have been opening up as a result of Europeanisation and globalisation.

**WORK 4.0** will be more interconnected, digital and flexible. The specifics of what the future world of work will look like are still unclear. Since the beginning of the 21st century, we have been facing another fundamental transformation of production methods. The growing interconnectedness and rise in cooperation between man and machine is not only changing the way we produce things, but also leading to entirely new products and services. As a result of cultural and social shifts, new preferences are emerging with regard to work, and demand for products and services is also changing. What effects these developments will have on the organisation of work and social security is uncertain, but they can be shaped by society and policy-makers – just as they could in the previous phases. We are at the beginning of new negotiation processes between individuals, the social partners and the state.



In future, it will not be enough to respond to unwelcome developments at the **MARGINS OF THE LABOUR MARKET**, although this will continue to be necessary. But far more needs to be done to shape Work 4.0.

**SOLUTIONS AGREED BY THE SOCIAL PARTNERS** remain of central importance in shaping decent work. However, changes in the world of work, e.g. greater internationalisation and the trend towards anytime, anyplace working, make it more difficult to recognise shared problems and to articulate and then enforce collective interests. At the same time, the individual's ability to enforce his or her own interests is still limited. Policy-makers have a duty to establish a useful framework for the social partners to act at national and European level.

### *Shift in cultural values*

*The change in societal and individual values and standards is called a shift in cultural values.*

The shift in cultural values (new diversity in terms of people's life plans, a partnership-based conception of people's roles, individuals' desire for more time sovereignty and a better work-life balance) goes hand in hand with **NEW EXPECTATIONS OF THE STATE**. The public expects to receive support, whether in the form of money, time or benefits in kind, for the tasks which society has an interest in them performing over the course of their lives (bringing up children, caring for parents, continuing education and training, social engagement).



When we talk about a fourth industrial revolution today, it often comes across as if new technical possibilities and trends will inevitably revolutionise our lives and our world of work in line with their requirements. Yet this is not the case at all. Technology merely creates new possibilities. It is still up to us to decide which of these possibilities to accept, and to shape our lives and the world of work – this is the mandate for society and policy-makers to take action!

The **POLITICAL TASK** of shaping our working society, today and tomorrow, is not so very different from what it has been in recent decades. The aim is to secure participation in work, allow gainful employment to be combined with individual schedules and priorities, ensure fair wages for all and preserve social security, develop capabilities and skills continuously via education and initial and continuing training, preserve decent work amidst ongoing changes, and promote a sustainable corporate culture. These aims have not changed. But new preferences regarding work, technological and social changes, and the transformation of the labour market mean that new responses are required if we are to achieve these aims.

## 3.1 WORK FOR ALL?

### SECURING PARTICIPATION IN WORK

#### Social market economy

*This term describes an economic system which combines free participation for all in a competitive economy, with social equity and socially compatible progress in society.*

Not everyone wants or is able to work full-time for the same employer throughout their entire lives. But **PARTICIPATION IN WORK**, the chance to be active in the labour market, to have a work history as well as a life history, is important for our personal identity and our social relationships. That is one reason why there is a broad consensus in society that every citizen of working age should have access to paid work. Work preferences and the structures of the labour market are changing, but the central expectation of the social market economy remains: those who want to work should be able to find work.

The conditions for this in Germany are good: over the past ten years, the number of people in jobs with compulsory social insurance coverage rose by more than 3.5 million. The number of unemployed declined by around 1.5 million. Overall, people's chances of finding a job have improved significantly. In some regions of Germany, the aim of full employment is almost within reach. But not all sections of the population are benefiting from this positive trend: for example, the level of unemployment among people with disabilities or among people with a migrant background has not declined significantly in recent years. **WORK FOR ALL** therefore remains a key aim of employment and labour-market policy.



In spite of the positive overall employment trend, many people are still **AFRAID OF LOSING THEIR JOB**, and potentially their livelihood with it. In recent decades, the insecurity which people feel has been exacerbated by globalisation, in particular, and the associated increase in pressure on costs, by automation and rationalisation in companies, a growing pressure to perform, and changes in the return on investment expected by international investors.

Today, new questions are arising not just for workers in low-skilled occupations, but increasingly also for highly qualified skilled workers and for entire companies and sectors. Will a given business model still be successful in a digital economy? What will happen to workers if HGVs drive themselves and computers make medical diagnoses or provide legal advice? Where will new jobs be created?

## End of work

*There have been predictions of the end of work due to productivity gains from technological progress for over a century. Although entire sectors and occupations have repeatedly vanished in the past, new business models and occupational profiles emerged at the same time. It is therefore more a question of change, upheaval and new equilibriums in the labour market..*

At the moment, the public debate is split between the argument that we are facing the “end of work” and fears of a shortage of workers and skilled labour. The “end of work” has been repeatedly predicted in the past, and in all probability it will not happen this time either. Reality has always proved such predictions wrong so far. The digital economy is creating diverse **NEW EMPLOYMENT OPPORTUNITIES**. And it offers new chances of an improvement, with the help of technology and new working arrangements, in the **LABOUR-FORCE PARTICIPATION OF CERTAIN GROUPS**, such as people with disabilities or people who have to juggle work and family commitments in difficult life phases.

Where automation in industry and services results in people being replaced by machines and software, the main question is how the resulting productivity gains are distributed.

In the past, technical progress has always led to changes in occupations and job profiles, and allowed new jobs to be created. But there have been losers as well, namely **LOW-SKILLED WORKERS** in routine-intensive occupations. Their unemployment rate has risen sharply in recent decades and has now reached 19%. In other words, it is around four times higher than the rate for people who have completed a vocational training programme (5%); those with a higher-education degree have an unemployment rate of just 2.5%. In western Germany, these rates are even lower (3.9% for people with a mid-level qualification and



2% for people with a higher-education degree). The challenge facing labour-market policy, including as a result of digitalisation, will be how people with low-level qualifications, and in particular the long-term unemployed, can be helped to gain a vocational qualification and how they can find their place in the world of work.

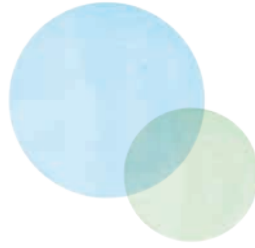
In the coming decades, digitalisation will also transform higher-skilled occupations and affect further sectors. New, more flexible forms of work will probably come to play a greater role.

We can mitigate the feared shortage of skilled labour by improving the labour-market integration of low-skilled individuals, **WOMEN, OLDER PEOPLE AND MIGRANTS**, in particular, and by ensuring, via healthy work and training and skills development, that as many people as possible are and remain employable. Companies can also contribute by fostering diversity. At the same time, our labour market will be more dependent on the immigration of skilled workers.

It is also important to ensure a better match between job requirements and qualifications. According to the PIAAC study, almost a quarter of workers in Germany say they have the necessary qualifications to perform more demanding tasks than are required in their job. We must find a way of making better use of this potential.

Making it possible for **PEOPLE WITH DISABILITIES** to participate in working life is an important task for policy-makers. The use of special technologies is a key element in improving the participation of people with disabilities in working life. Modern information and communication technologies play a vital role in a large number of occupations. The active measures taken under labour-market policy in Germany therefore place a particular focus on ensuring that workstations are properly equipped in line with individual needs, potentially including the use of technical aids and accessible hardware and software, tailored in particular to the needs of blind and partially sighted people. The resulting increase in independence for individuals has effects which go far beyond the labour market. This is becoming more and more important in ageing societies, in particular, partly because working lives are becoming longer.

People with disabilities are often well-qualified skilled workers. They frequently have above-average training and qualifications. An increasingly accessible world of work could open up new employment opportunities for them in fields and occupations which currently remain mostly closed to them. In addition, an accessible world of work is beneficial for people with and without disabilities alike.



Against this background, the following key questions must be posed:

- ④ How can we safeguard and further improve on the current high level of employment? What additional measures are necessary in the medium term to meet the need for skilled labour?
- In what areas of public need and sectors could new jobs be created in future? What state support (infrastructure, research, measures to boost demand, financing, etc.) may be needed?
- What impact will the expected digital structural change have on employment? Which occupations and sectors will be affected in what way and over what period of time? What qualifications will be needed?
- How can new opportunities be developed for low-skilled individuals, the long-term unemployed, people with disabilities, migrants, disadvantaged young people and single parents?
- ④ What opportunities, but also what risks, do the technological advances in tomorrow's digitalised world of work ("Industry 4.0") hold for workers with severe disabilities?

## 3.2 GAINFUL EMPLOYMENT OR INDIVIDUAL SCHEDULES AND PRIORITIES – WHO IS IN CONTROL?

### A LIFE-PHASE APPROACH IN LABOUR AND SOCIAL POLICY

Work retains its strong influence over the structure of our lives. Yet **WORKING HOURS** have become more flexible and diverse over the past two decades. Half of all employees now organise their working hours using working time accounts and similar instruments<sup>20</sup>, giving them leeway to better integrate other priorities in their lives.

In addition, technical innovations such as mobile devices and broadband internet offer employees the opportunity to better coordinate family commitments and individual needs with their working lives. Many employees therefore associate the digital transformation above all with **NEW FREEDOMS**. Telework in various forms is now an established arrangement in many companies. Nonetheless, for many employees, particularly those in occupations where their physical presence is required (e.g. in the care and education sectors, but also in many production occupations), mobile working is impossible or only possible to a limited extent. Unlike in other European countries, the proportion of employees who work from home at least occasionally has been stagnating for years, or even declining slightly.<sup>21</sup>

#### Mobile working

*Mobile working refers to work outside the workplace. It includes working from home (telework, alternating telework), working at customer locations (e.g. services or sales), working on the go (e.g. in planes and hotel rooms) and working during business trips (e.g. trade fairs, conferences).*

At the same time, there has been a **CHANGE IN COMPANIES' TIME REQUIREMENTS**. Just-in-time production and globalisation are increasing the pressure on businesses to make more flexible use of labour. In many companies, employees are now expected to think and act in an entrepreneurial manner. Performance is often now judged by results, rather than the work involved. This can result in work intensification and time-related stress. There has been an increase in people working in the



evening, at night and at the weekend.<sup>22</sup> For many employees, more flexible working does not mean that they gain more freedom, but rather that it is harder for them to plan their working hours and leisure time, and that they have to be reachable even outside their standard working hours.

To some extent, companies' flexibility requirements clash with employees' individual needs for flexibility in different life phases. In particular, the demands and flexibility needs of family life are often difficult to reconcile with those of the world of work. Since both parents work in many families these days, **TIME CONFLICTS IN FAMILIES' DAILY LIVES** are on the rise.

The model of "both parents working full-time" rarely works, however. Many couples with children opt for the "traditional" solution of the mother working part-time: in 47% of all couples with minor children, the father works full-time while the mother works part-time.<sup>23</sup> This is also reflected in the fact that the rise in women's labour-force participation in recent years can largely be explained by the growth in part-time jobs. The number of women working part-time has risen from 1.7 million to 8.3 million over the past ten years.<sup>24</sup>

<sup>20</sup> Cf. Seifert, Hartmut (2014): Renaissance der Arbeitszeitpolitik: selbstbestimmt, variabel und differenziert. WISO Diskurs, November 2014.

<sup>21</sup> Cf. Brenke (2014): Heimarbeit: Immer weniger Menschen in Deutschland gehen ihrem Beruf von zu Hause aus nach; in: DIW Wochenbericht 8/2014.

<sup>22</sup> Institute for Employment Research (IAB) Brief Report No. 21, November 2013: 58% of all workers now work at night, at the weekend, or work shifts, at least from time to time.

<sup>23</sup> Cf. graph in Section 1.3; Federal Statistical Office: Microcensus 2013.

<sup>24</sup> Cf. Federal Statistical Office: Microcensus 2013. Working women aged between 20 and 64 who work fewer than 32 hours per week.



These days, more and more couples would like to divide employment and family commitments between them on a **MORE EQUAL BASIS**. Many men want to spend more time with their families, while many women would like to increase their working hours, with 11.5% of all working women expressing this preference.<sup>25</sup> Policy-makers are already responding: for example, the new “partnership bonus” in the Parental Allowance Plus encourages both parents to work part-time in the range of 25 to 32 hours per week. This enables both partners to make a substantial contribution to securing their income and to divide work and family commitments between them in a spirit of partnership.

### Full-time lite

*The terms “near full-time employment”, “full-time lite” or “part-time plus” refer to working-time models below the full-time level of 40 hours per week, but above the level of part-time employment, defined as 20 hours. Such models enable employees to better balance their personal and work commitments.*

As yet, however, the option of near full-time employment (“full-time lite”) is very rarely used. Apart from the reduction in income, one reason for this could be that part-time work can lead to a professional dead-end. In many cases, part-time employees face difficulties in increasing their working hours again at a later point in time. Advancement is also usually rarer for part-time employees than those working full-time.

But finding a work-life balance is not only a central challenge in families’ daily lives; it also affects people in other life phases. Combining work with initial or continuing training can also cause time conflicts, as can volunteer work.

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<sup>25</sup> According to the Microcensus 2013; cf. also the Progress Report 2014 on the Federal Government’s Skilled Labour Concept. However, 2.1% of working women would prefer to work fewer hours.

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New options are necessary in order to defuse these conflicts. We need a new definition of what constitutes a standard employment relationship. To this end, the social partners and policy-makers should strive for a **NEW FLEXIBILITY COMPROMISE** which enables workers to use working-time models based on a life-phase approach. One possible option is a proposal raised in the current debate, namely that of a family working-time model which gives parents the chance to work less when their children are young by partly offsetting the reduction in their wages. Another option is allowing employees to work part-time for a fixed period of time in future, with the right to subsequently return to their previous hours.

The question of how we can ensure the availability of working time models designed for specific life phases remains open. Corporate mechanisms and collective agreements offer scope for tailor-made solutions, but they are not universally applicable. The life-phase approach is therefore also a central issue for labour and social policy.

Against this background, the following key questions must be posed:

- What might solutions look like which take into account the interests of both businesses and employees when it comes to flexibility? What social or technological innovations could support this?

### *Life-phase approach*

*A life-phase approach to working time enables employees to reduce their hours in certain life phases, e.g. when starting a family or undertaking continuing training, so they can better balance the various demands on their time.*

### *Family working-time model*

*The family working-time model is designed to allow couples to share work and family commitments in a spirit of partnership. Both engage in paid employment with a significant number of weekly working hours (e.g. around 80% of a full-time position) and share family commitments. The possibility of a wage compensation benefit is under discussion, which would partly offset the difference in income compared to working full-time.*

- How can we design a new standard employment relationship? What might working-time models designed for specific life phases look like in practice, and how can their wider availability be ensured, particularly in smaller companies? Can part of the digital economy's productivity gains be used to facilitate shorter working hours in certain life phases?
- With regard to the changes caused by flexibility requirements, is an adequate level of protection still ensured? In a flexible working world, how can we ensure that individuals can still secure their own livelihoods? Do employees need additional rights to enable them to adjust their employment as they move from one life phase to another, or can we rely on tailored solutions?
- How can families be supported in sharing work and family commitments in a spirit of partnership? What would a targeted mix of money, time and infrastructure look like, and what further contribution can policy-makers make in this context?
- As flexibility and individualisation increase, how can we continue to preserve the shared spaces and timeframes which are the fundamental conditions for recognising common interests and asserting them in society and the world of work?
- How can we learn more about the causes of mental stress and illness, so that we can use this knowledge to take preventive action?



### 3.3 THE SOCIAL MARKET ECONOMY RELOADED?

#### *F A I R W A G E S & S O C I A L S E C U R I T Y*

The social market economy's influence extends to the whole of society. Its guiding principle is the achievement of social equity, prosperity and a good quality of life for the general public. Everyone benefits if the economy does not lose sight of the social dimension, because widespread prosperity and social harmony create a climate in which demand, business investment and technical progress can flourish. There is no shortage of examples of the **POSITIVE ECONOMIC IMPACT OF SOCIAL POLICY**: for example, social security systems act as automatic stabilisers in economic crises; investment in education and training, including and especially in the case of people who have had a more difficult start in life, lays the foundation for ensuring the availability of the skilled labour needed by companies. The social state strengthens confidence in the market and its institutions.

Striking a balance between economic and social concerns is a perpetual task. In Germany, **EMPLOYERS AND EMPLOYEES** work together in many institutions on an **EQUAL FOOTING**. Free collective bargaining, social partnership, staff representation, and the self-governing social insurance systems which are primarily funded by employers and employees on an equal basis, are therefore central pillars of our social market economy.

The **STATE** intervenes to take **CORRECTIVE** action when special interests and market failures produce results which run counter to the common good and the aims of social policy. Via its social security systems



and other measures of social policy, the state offers protection from life's major risks, improves opportunities for economic and social participation and promotes social equity. The social market economy continues to evolve as new challenges emerge and new answers are developed to the question of how it can fulfil its promise of stability, security, freedom and prosperity for all.

The original **PROMISE OF PROSPERITY FOR ALL** has become **LESS COMPREHENSIVE**: compared to the situation in 2000, the labour share of national income has declined significantly and the distribution of wealth has become less equitable. Since then, wages have lagged behind corporate profits and property income. Real wages have stagnated, even if recent pay settlements and the current low level of inflation suggest that this picture is beginning to change. The proportion of low-paid workers has risen significantly over the past 15 years. In 2012, almost a quarter of workers were employed in the low-wage sector (women: 31%, men: 18%).<sup>26</sup> Women are still paid more than 20% less than men, on average. The disadvantages which women face in working life must be dismantled, in particular those relating to pay and professional advancement.

### *Low-wage sector*

*The low-wage sector is defined in terms of the relative low-wage threshold. This is generally defined as two thirds of the median hourly wage. In 2012, the national low-wage threshold was 9.30 euros per hour, and 24% of all workers were active in the low-wage sector.*

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<sup>26</sup> Cf. IAQ Report 2014-2.



This income distribution trend also has negative **MACROECONOMIC EFFECTS**. According to an OECD study, Germany's economic growth between 1990 and 2010 would have been around six percentage points higher if income distribution had remained constant.<sup>27</sup> One important reason for the widening income gap is likely to be decline in collective bargaining coverage.<sup>28</sup>

If the social partnership system is weakened because **COLLECTIVE BARGAINING COVERAGE IS IN DECLINE**, state action can be necessary to either ensure that the system of free collective bargaining remains functional, or to offset the differences in market incomes via the minimum wage, the tax system, the systems of basic income support, or other measures.

It is problematic if **NON-STANDARD FORMS OF EMPLOYMENT** become entrenched without offering an adequate income over the long term. Tax-funded benefits may then be needed to make up the shortfall. The introduction of a general minimum wage is an important step in tackling this problem. Further challenges are posed by what is known as pseudo self-employment, and by other abusive situations, such as some contract work arrangements.

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<sup>27</sup> OECD (2011): *Divided We Stand: Why Inequality Keeps Rising*.

<sup>28</sup> Bertelsmann Stiftung (2015): *Increasing Wage Inequality in Germany*.

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**WORK HISTORIES** are becoming **MORE DYNAMIC AND DIVERSE** at all qualification levels. Less stable work histories pose a challenge for our social insurance systems. Gaps in people's work histories can put them at risk of not having an adequate income in retirement. The way in which we manage transitions will therefore become more important, particularly the entry into employment, changes between different forms of employment, the return to work after a period of unemployment, and a flexible transition to retirement.

In the context of the growing digitalisation of the economy and the world of work, many people are predicting a further rise in solo self-employment, which has already increased significantly in recent decades. The first step should therefore be to determine what new forms of work have emerged or are emerging, and on what scale. The second step should be to examine how existing social insurance law applies to these forms of work, and what new responses to this transformation should be developed. This applies both to **SOCIAL PROTECTION FOR GAINFULLY ACTIVE PERSONS** and the financial viability of the individual social-security systems.

### *Solo self-employed persons*

*Self-employed individuals  
who do not employ any staff  
are generally known as solo  
self-employed persons.*

We must determine how businesses which operate internationally can be required to pay their fair share of (national) **TAXES AND CHARGES** in future. It is necessary to create the legal framework for this, conclude European and international treaties and agreements, and develop mechanisms to monitor compliance with these agreements and to sanction non-compliance where appropriate.

Against this background, the following key questions must be posed:

- 9 How can we ensure that workers benefit to a fair extent from economic success in all sectors, even in times of dynamic change? How can trade unions and employers' associations be strengthened in their roles and the social partnership be preserved in a changing world of work?
- 6 How can we succeed in closing the gender gaps with regard to pay, working time, wealth accumulation, old-age provision and career opportunities?
- How can labour-market policy better protect people from the risks posed by non-standard forms of employment and labour-market transitions? How can the financing of these tasks reflect the fact that it is in the interests of society as a whole to provide a safety net for labour-market transitions, e.g. after periods devoted to bringing up children? How can we improve transitions from marginal employment ("mini-jobs") to jobs with compulsory social insurance coverage, and from temporary work to long-term employment?



- What might long-term strategies to secure the income base of the statutory pension system and the social insurance system as a whole look like? In view of a changed working world, new forms of work and the population's changed age structure, how can the contributions base be kept at a sufficient level to finance an adequate level of social security?
- How can we achieve economic stability, maintain employability and preserve social security in the European framework? Is the proposal of a European unemployment insurance scheme, currently under discussion, a sensible option?
- What effects are new business models outside the framework of dependent employment having on social security? How can fair incomes and social security for the (solo) self-employed be facilitated?

### 3.4 ONCE A SKILLED WORKER, ALWAYS A SKILLED WORKER?

#### *T R A I N I N G & SKILLS DEVELOPMENT FOR THE WORK OF TODAY & T O M O R R O W*

Technological and structural change is transforming occupational profiles, requirements and standards. At the same time, occupational flexibility, changing jobs, retraining, and leaving and re-entering the workforce are all part of a new normal. The transformation of the working world and lifestyles is shaping work histories at all levels of qualification: they are becoming more dynamic, diverse and individual. To ensure that changes do not lead to unwelcome disadvantages, individual and needs-based **OPPORTUNITIES FOR CONTINUING TRAINING AND SKILLS DEVELOPMENT** must be available throughout people's **ENTIRE WORKING LIVES**.

While education and training are highly regulated, the **STRUCTURES IN FURTHER AND CONTINUING TRAINING** are widely regarded as something of a mishmash. Critics point to the confusing complexity of the structures and of the wide variety of options for financial support on offer, the lack of transparency with regard to continuing training provision, the shortage of guidance services, and uncertainty over people's legal entitlements vis-à-vis their employers and regarding the possibility of state financial support for continuing training and skills development schemes.

This is consistent with the picture of an **UNEVEN** distribution of **CONTINUING TRAINING OPPORTUNITIES** and **READINESS TO UNDERTAKE CONTINUING TRAINING**. The rate of participation in continuing vocational education and training is below average for employees of smaller companies, older employees and low-skilled workers.



In 2012, the participation rate for those with a high level of educational attainment (subject-restricted higher-education entrance qualification – Fachabitur – and above) was 64%, and 68% for those with a higher-education degree. Among those with a low level of educational attainment (secondary general school – Hauptschule – and below), the participation rate dropped to 32%. The participation rate in continuing training for people without a vocational qualification was 37%. Company size also played an important role: in companies with up to ten employees, the participation rate was under 50%, while it rose to around 67% for companies with 1000 or more employees.<sup>29</sup> In addition, the rise in non-standard employment has apparently led to less long-term investment by companies in their staff.<sup>30</sup> Inadequate training and skills development poses risks both for individuals (loss of income) and for businesses (skilled labour shortages).

An expansion in continuing education and training is urgently needed, including as a result of digital structural change. Just like reading, writing and arithmetic, the ability to use computers is today one of the basic skills which boys and girls need to be taught in schools. The OECD's PIAAC study confirms how essential this is. Almost all German jobs already require these expanded basic skills today: just 8% of respondents stated that they never work at a computer.

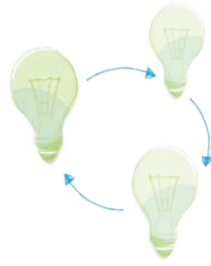
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<sup>29</sup> Federal Ministry of Education and Research (BMBF) (2013): Weiterbildungsverhalten in Deutschland – AES 2012 Trendbericht.

<sup>30</sup> Bellmann/Grunau/Leber/Noack (2013): Weiterbildung atypisch Beschäftigter.

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## Digital literacy

*Digital literacy refers to the knowledge and skills required in the use of new technical devices and the associated information and communication networks.*

This digital literacy ranges from a basic theoretical knowledge of how computers and communication devices are designed and work, to a fundamental knowledge of how to use them, to the ability to navigate and express oneself in online communities. It is flanked by information literacy, i.e. the ability to deal with information in a targeted, autonomous, responsible and efficient manner.

How extensive this knowledge must be and what in-depth knowledge and skills are necessary varies depending on the level of education and the job specification. However, all workers will find that their need for this knowledge and these skills will continue to increase as a result of technological change and ever **SHORTER INNOVATION CYCLES**. According to an OECD study<sup>31</sup>, around 60% of workers in Germany have basic ICT skills, but around 25% do not. For a growing number of gainfully active persons, it will be essential to combine subject-specific knowledge with practical ICT skills and to update them at regular intervals. This applies in particular to those from an educationally disadvantaged background and those at a disadvantage in the labour market.

Education must **EQUIP WORKERS** to collaborate across company and organisational boundaries, as these forms of work will increase in importance. The growing irrelevance of where and when work is carried out and the specialisation of the knowledge economy will mean that production processes do not stop at the factory gates. This places new demands on employees and on management-level staff. Creative and social skills, together with the capacity for integrative thinking and interconnected working, are becoming essential to companies' success and a gateway to social mobility for workers.

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<sup>31</sup> OECD (2014): Skills and Jobs in the Internet Economy; OECD Digital Economy Papers, No. 242.

Against this background, the following key questions must be posed:

- How can we ensure that the mechanisms established by companies and in collective agreements are systematically integrated with general state support for continuing education and training, with the aim of establishing a new culture of continuing education and training in Germany?
- ④ Are new financing options and a “fair” financing mix necessary in order to further develop and strengthen continuing vocational education and training in Germany, taking a needs-based and lifelong approach?
- ④ How can the preventive approach of labour-market policy arrange for the provision of educational guidance services nationwide – with the involvement of chambers of industry and commerce, chambers of crafts, trade unions, professional associations and the Federal Employment Agency? How can the Federal Employment Agency respond adequately in the long term to the growing importance of continuing education and training during employment?
- What forms of support and incentives will help to increase the take-up of continuing education and training, particularly in SMEs and among low-skilled workers, in order to ensure that people with weaker basic skills also become skilled workers?
- ④ How can continuing education at institutions of higher education, including for people with vocational qualifications, be made more accessible, and be better organised and supported?

## 3.5 HOW WILL WE WORK IN THE FUTURE WORKING WORLD?

### *P R E S E R V I N G D E C E N T W O R K A M I D S T T H E D I G I T A L T R A N S F O R M A T I O N*

So far, the debate about Industry 4.0 has focused on visions of what is feasible, technical norms and standards, and complex process architectures. The key issue of **SHAPING GOOD WORKING CONDITIONS** has been neglected. Yet anyone who believes that higher productivity can only be achieved through better cooperation between man and machine needs to take a different perspective: **INDUSTRY 4.0** can only be a success if work is aligned with the **NEEDS OF WORKERS**. As we tackle the major challenge of the technological modernisation of our economy, we must not allow one group's vision to become another's fears, with the result that our society blocks its own progress.

While factory work usually has to take place at a certain time and place, many services and administrative activities can, using digital tools, potentially be performed from any location at any time. This opens up **NEW SCOPE** for a more self-directed way of working, and makes it easier to balance work, family and leisure more flexibly in line with individual needs. However, it is also leading to a breakdown in the boundaries on work, in terms of when and where it takes place. In a survey commissioned by the Federal Ministry of Labour and Social Affairs into quality of work and economic success, 30% of white-collar workers said that they work from home at least occasionally (manual workers: 2%). 12% of white-collar workers deal with work matters in their leisure time several times a week (manual workers: 4%).<sup>32</sup>

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<sup>32</sup> Federal Ministry of Labour and Social Affairs (BMAS) (2013): Arbeitsqualität und wirtschaftlicher Erfolg: Längsschnittstudie in deutschen Betrieben.

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Anytime, anyplace working offers opportunities to develop **WORKER-FRIENDLY FORMS OF FLEXIBILITY**, e.g. in the framework of various telework models. That said, it is also confronting companies with new questions regarding the organisation of work, such as how they can succeed in developing viable alternatives to the 9-to-5 culture. New issues relating to **HEALTH PROTECTION** also emerge if the boundaries between work and private life become blurred to the point where people are expected to be reachable at all times, with potential negative effects on their mental health. The opportunity of “anytime – anyplace” must not turn into an “always and everywhere” obligation for workers.

While there may be a breakdown of the boundaries on work in terms of when and where it takes place, as far as work processes are concerned it is important to take a closer look at the issue of work **INTENSIFICATION**. It is necessary to determine the extent to which multitasking and information overload, or the precise measurement, timing and monitoring of individual tasks, are resulting in work becoming highly intensive, and to examine what options there are to organise work, define requirements and channel information flows in such a way that they can be dealt with well, while also preserving the necessary scope for innovation.

### *Breakdown of boundaries*

*The use of modern information and communication technologies is breaking down the boundaries on work, with a new openness replacing the structures previously imposed by the company in terms of location, time and organisation, in the form of fixed working hours and workplaces and the staff's long-term attachment to the company.*

### Services on demand

*Increasingly, services for private consumers and corporate customers are being offered via online platforms, which charge a fee for putting service users and providers in touch with each other. Observers believe a new and highly flexible “on-demand economy” is emerging, with new technical possibilities facilitating the direct provision of personalised services.*

The established protective mechanisms of the law should also apply in full to digital work. The **LEGAL FRAMEWORK** should therefore be examined to determine whether it needs to be updated in specific areas in order to maintain worker protection amidst the changes taking place, and to adequately cover new forms of work as well. In the era of Big Data, new responses also need to be developed regarding staff data protection and data security.

As far as the emergence of new forms of work is concerned, there is a need for fundamental empirical research in Germany into the life situation, working conditions and pay of crowdworkers and other service-providers who offer services on demand via online platforms. The question is what support is possible and would be welcomed, with the aim of ensuring that these groups can organise themselves and assert their interests. There is considerable need for a debate about fair standards regarding services provided via online platforms.

We have effective mechanisms for **BALANCING THE INTERESTS** of employers and employees in the social market economy. In the digital economy, however, new conflicts of interest could emerge, often without being recognisable as such at first glance, between members of the public in their various roles as consumers, workers or citizens, as we are already seeing in the first discussions about e-commerce, bricks-and-mortar retail, online platforms, etc. In the necessary debate about our digital future, we also need to reach an understanding about the connection between “good products and services” and “decent work”.

Against this background, the following key questions must be posed:

- How can the “humanisation of work” be achieved in the 21st century? What will the factory, the office, the production model of the future look like, and what are the implications for workers? How can socially responsible technology design ensure workers stay healthy, reduce mental stress and make work safe? How can the same level of occupational safety and health be guaranteed in the case of mobile working?
- Are the basic concepts of labour law (such as “employee” or “establishment”) still applicable in the digital world of work? How do the rules concerning staff data protection need to be designed in order to adequately protect employees’ interests?
- Are gainfully active persons who offer their services via online platforms on the basis of contracts for work or services genuinely self-employed, or are there arrangements where pseudo self-employment can be assumed?
- How can we better link labour and social policy with consumer policy in the digital economy? What opportunities do new technologies offer consumers to better inform themselves about the working conditions under which products and services are produced?

### *Humanisation of work*

*This term means that the world of work should, as far as possible, be adapted to the worker. It encompasses all measures intended to enhance work content and working conditions.*

## 3.6 HOW WILL SUCCESSFUL COMPANIES OPERATE IN THE FUTURE?

### *GOOD CORPORATE CULTURE & DEMOCRATIC PARTICIPATION*

The future of sectors and companies hinges on their innovative potential and their ability to manage change successfully – that is just as true in the Oderbruch and the Rhine Valley as it is in Silicon Valley. Involvement, participation and co-determination are the central principles of good corporate culture – for they provide a foundation for creativity, openness and engagement. A **SMART PERSONNEL POLICY** therefore focuses on “the whole person” in dialogue with employees: it considers issues such as the work-life balance, opportunities for advancement and personal development, education and continuing training, health and good leadership, age/ageing-appropriate organisation of work, and a good transition to retirement.

**CO-DETERMINATION AND ECONOMIC SUCCESS** are closely connected in Germany: where a works council exists, productivity is generally higher,<sup>33</sup> innovation is more common,<sup>34</sup> the gender wage gap is narrower<sup>35</sup> and the sickness absence rate is lower.<sup>36</sup> Companies which are subject to co-determination are thus “healthy enterprises”, in both senses of the word. In companies focused on the short-term interests of investors and the capital markets, it is often the works councils which call for sustainable investment and act as advocates for the long-term business perspective. Many companies are conscious of these advantages and practise a lively culture of co-determination. A practice which has proved its worth in times of crisis – for example, in the implementation of short-time work.



Co-determination also enjoys a **HIGH LEVEL OF ACCEPTANCE** among employees. This is shown in particular by the extremely high turnout in works council elections, which consistently hovers at around 80%, and is thus far higher than the turnout for Bundestag and other political elections. It must be noted, however, that co-determination coverage is in decline: in the western Länder (federal states), around 43% of all employees are represented by a works council, while the figure for the eastern Länder is 35%. Significant differences exist depending on the size of the establishment (5 – 50 employees: 9% in the west and 10% in the east; establishments with more than 500 employees: 91% in the west and 90% in the east). There is also variation between different sectors (energy/water/waste management/mining: 83% in the west, 66% in the east; hospitality sector/other services: 14% in the west, 17% in the east).<sup>37</sup>

As the boundaries on when and where work takes place increasingly break down (e.g. through mobile working or telework), active co-determination can become more difficult for the employees concerned, even if they have the formal rights. The rules on co-determination do not apply to self-employed contract workers.

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<sup>33</sup> Jirjahn (2010): Ökonomische Wirkungen der Mitbestimmung in Deutschland: ein Update, Hans Böckler Foundation, Working Paper 186.

<sup>34</sup> Askildsen/Jirjahn/Smith (2006): Works Councils and Environmental Investment: Theory and Evidence from German Panel Data, in: Journal of Economic Behavior and Organization.

<sup>35</sup> Gartner/Stephan (2004): How Collective Contracts and Works Councils Reduce the Gender Wage Gap, Institute for Employment Research (IAB) Discussion Paper, No. 07.

<sup>36</sup> Pfeifer (2014): Absenteeism in Apprenticeships: What Role Do Works Councils Play?, Leading House Working Paper No. 98.

<sup>37</sup> Institute for Employment Research (IAB) Establishment Panel, data for 2013.

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## New Quality of Work Initiative (INQA)

*A joint initiative of the Federation, the Länder (federal states), the social partners, chambers, the Federal Employment Agency, academia and businesses, the New Quality of Work Initiative seeks to promote an employee-centred corporate culture and develops incentives for work arrangements which foster motivation, health and innovation, above the statutory minimum standards. It offers advisory services, information, opportunities for exchange and an assistance programme to develop new practical aids for employees and enterprises.*

On the other hand, there are a great many companies which go beyond the legal co-determination requirements to cultivate a **CULTURE OF PARTICIPATION** – in some cases taking a cross-hierarchical approach – in order to be an attractive employer and to make it easier to recruit skilled workers. Many successful examples of good working conditions designed by the social partners, going beyond the legal minimum standards, can be found in the New Quality of Work Initiative (INQA), for example. These approaches range from cooperative ownership structures, to SMEs where the employees elect management-level staff for a fixed term and have a say in salaries and bonuses. Other companies are experimenting with decentralised organisational structures and opening up new ways for employees to have their say by translating the opportunities offered by social networks to the company level. These forms of democratic participation for employees can help to balance the interests of companies and workers in a new flexibility compromise.

In practice, however, the opportunities for participation vary considerably between different **OCCUPATIONS, SECTORS AND SIZES OF COMPANY**<sup>38</sup> and do not always match the changed preferences of employees, particularly those from **GENERATION Y**. The current Employment Survey conducted by the Federal Institute for Vocational Education and Training (BIBB) and the Federal Institute for Occupational Safety and Health (BAuA) indicates that there is a high degree of development potential regarding employees' scope for action. A study by the Federal Ministry of Labour and Social Affairs<sup>39</sup> concludes that a majority of management-level staff in Germany also consider today's management practices to be outdated.



Against this background, the following key questions must be posed:

- In a modern working world, how can the involvement and participation of employees be designed in such a way as to take equally into account employees' expectations and capabilities and the challenges facing companies?
- What challenges are emerging in the changed world of work for co-determination, which is an important institution in democratic participation and in striking a balance between different interests?
- What might concrete flexibility compromises look like which recognise business imperatives at a time when there is a growing breakdown in the boundaries on where and when work takes place, but which also ensure that employees' entitlement to and need for time away from work, training and skills development, and a work-life balance are respected? How can companies recognise and maximise the potential of their employees, irrespective of age, gender and cultural background? What working conditions create an innovation-friendly atmosphere in companies?
- We are seeing a new interest in cooperatives, social enterprises and similar types of enterprise. Can they help to strengthen a sustainable economic culture and decent work?

### Democratic participation

*The terms "democratic participation" or the "democratic enterprise" refer to staff involvement, e.g. in strategic developments or the organisation of work, going beyond co-determination.*

<sup>38</sup> Wittig/Nöllenheidt/Brenscheidt (2013): Grundausswertung der BIBB/BAuA-Erwerbstätigenbefragung 2012 mit den Schwerpunkten Arbeitsbedingungen, Arbeitsbelastungen und gesundheitliche Beschwerden.

<sup>39</sup> New Quality of Work Initiative (INQA) (2014): Monitor „Führungskultur im Wandel“.

The strength of our social market economy lies in its special combination of a lively free market and a social state which has developed in close collaboration with the social partners. Despite occasional differences over specifics, we can build on a broad consensus in this context: there is widespread support in society for key institutions of the social state, such as labour law, free collective bargaining, staff representation, occupational safety and health, and the self-governing social insurance systems. They offer a **RELIABLE FRAMEWORK** for the free and fair development of Germany's market economy.

The transformative potential of digitalisation, the major opportunities – but also risks – it offers, require a positive vision of the future and the long-term political will to shape developments. Although this primarily takes place at **NATIONAL LEVEL**, the **EUROPEAN DIMENSION** must also be adequately taken into account. This dimension is important with regard to matters which transcend national borders, such as the safeguarding of pension portability, European works councils, or even occupational safety and health, which is regulated at European level to a large degree. Against this background, the Federal Ministry of Labour and Social Affairs will initially frame the forthcoming debate in broad terms, and this is reflected in the descriptions and analyses of the preceding chapters. But the future debate on reform will also be about taking a closer look at the institutions which can help us to take concrete action to shape change.



### *Labour law*

Labour law will continue in future to play a key role in shaping the legal relations between gainfully active persons and those who enter into contracts with them. It is built on the core principle of compensating for the imbalance of power between employers and employees. To this end, a variety of protective mechanisms have historically been incorporated into and added to the civil-law structures of the employment contract. In a future digitalised world of work, ensuring that this **PRINCIPLE OF PROTECTION** remains **EFFECTIVE** will continue to be key.

### *Staff representation*

People want to be involved in shaping the conditions in which they spend a significant proportion of their life working. A collective approach is the only effective way for them to do so. Co-determination enables employees to participate collectively in the decisions which directly affect them in their workplace. The possibility enshrined in the Works Constitution Act (Betriebsverfassungsgesetz) for institutions for the collective representation of workers' interests, with legal participatory rights, to be set up in establishments with five employees or more, is an essential pillar of our social market economy. The primary aim remains valid even in the era of digitalisation, namely to facilitate a **"DEMOCRATIC ENTERPRISE"** in which those affected can, on the basis of guaranteed participatory rights, assert their legitimate interests in a way that they cannot do effectively as individuals. Safeguarding this will continue to be a responsibility for the social state. It is up to those affected to actually make use of the opportunities which exist. Trade unions and employees are already carrying out important work in this area with campaigns to eliminate co-determination-free zones.

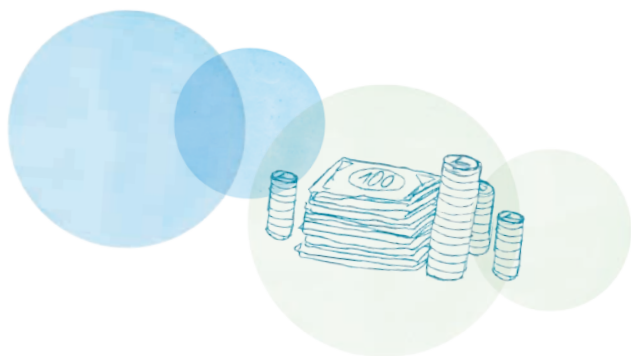


### *Collective bargaining law*

In our pluralistic society, Article 9 of the Basic Law, the German constitution, guarantees that working and economic conditions are shaped by associations of the social partners. The collective bargaining system is the main embodiment of this right to collective self-determination. It also reflects the knowledge that individual employees can only assert legitimate interests vis-à-vis companies at a collective level – going beyond the individual establishment, even. The social partners thus have a common interest in the state generally respecting civil society's power in this area and restraining itself accordingly. The **SOCIAL PARTNERSHIP** has proved its worth in Germany, even in difficult times. It is a vital locational advantage, and we want this to remain the case. In tomorrow's world, or even beyond, the social partners' power to shape conditions will continue to be needed.

### *Occupational safety and health and working time legislation*

Value creation will increasingly shift to new forms of production in which new technologies play a major role. Automation, interconnectedness and cooperation between man and machine will increase. The main responsibility we want to take up is shaping these developments in a way which is compatible with workers' interests. On the one hand, physical burdens and monotony may decline, which would be an important step towards the humanisation of the world of work. On the other hand, change processes and anytime working can constitute pressures which have to be managed. The legislation on occupational safety and health in Germany – and in Europe – has to be equal to these challenges. It is important to ensure that the transformation in value creation is not defined as a purely technical problem. The “internet of things” must be designed as an “internet of people and things”.



### *Employment promotion*

The legislation relating to employment promotion, which includes unemployment insurance, is a core element of social security in Germany. It is supplemented by basic income support for jobseekers. In addition to this **FINANCIAL SAFETY NET** in the event of unemployment, employment promotion aims to **PREVENT AND REDUCE UNEMPLOYMENT**, in particular by enhancing individuals' employability, and to contribute to a high level of employment and the **IMPROVEMENT OF THE EMPLOYMENT STRUCTURE**. Job centres – in the form of joint institutions and licensed local authority agencies – already handle many responsibilities relating to employment promotion today: three quarters of the unemployed are supported by the basic income support agencies. This fine-tuning of the balance between an insurance system and a welfare system, and the different structures and tasks, must be kept in mind as we adapt employment promotion to deal with future challenges. Employment promotion is already facing the challenge of giving greater weight to the insurance principle.

The **PREVENTION PRINCIPLE** already plays a major role. As we move to the value creation and production of tomorrow, occupations and qualifications are changing. More and more, preventive support is likely to be necessary not just when the risk of unemployment looms, but also at a far earlier stage, with regard to professional flexibility and continuing vocational education and training. These challenges will not only affect the institutions responsible for employment promotion and basic income support for jobseekers; they will also – indeed, they will first and foremost – have an impact on education and training structures in Germany, for example. This must be taken into consideration in the funding of new tasks.

### *Comprehensive pension insurance scheme*

*To date, the statutory pension insurance system has first and foremost – although not exclusively – covered people in dependent employment (employees). By contrast, this concept would include all gainfully active persons, including the self-employed, in a statutory pension scheme.*

### *Statutory pension and accident insurance*

The various components of the social insurance system provide protection from life's typical risks for the majority of the population. The key challenge will be to examine whether a **CHANGE IN FORMS OF WORK** causes new gaps in protection. The main analysis will be whether new forms of economic activity should be classified as "employment", the basic concept which largely determines whether social insurance coverage is compulsory. In addition, it will also be important to examine whether the protection provided needs to be extended. This debate has already begun with regard to the statutory pension insurance system, with discussion of the possibility of a "comprehensive pension insurance scheme" covering all gainfully active persons. The protection provided by accident insurance is already very extensive, so adjustments in this area appear less necessary at first glance. But in any event, it is essential to consider how to implement compulsory insurance coverage effectively, and ensure sustainable financing, in future value creation in the digital world.

### *Outlook*

Tomorrow's economy requires a society which is capable of innovation and which constantly reinvents itself in response to change. In the face of global competition, it will be even more important to set up companies, develop new business ideas and bring them to commercial maturity.

This is where the institutions of the social state could offer positive support. Creativity thrives on security – and vice versa. Can the instruments of the social state provide support for factors which stimulate innovation and growth? An example of where this might be possible is the issue

of business start-ups: they have declined significantly over the past 15 years. One of the reasons for this is that the 30 to 45 age group, whose members are most likely to start a business, is shrinking markedly due to demographic change. At the same time, the younger generation clearly feels a strong need for security.

Trying something, even if it might end in failure – this is an area where we in Germany can learn from Silicon Valley, but in our own way. Creativity and a willingness to take risks require not only intellectual freedom, but also material security and confidence that, even in the event of failure, a safety net will be there to keep people from losing everything. The question is whether the process of starting a business – like starting a family – potentially requires support and protection by the social state. And this brings us full circle: we need a dialogue and a new compromise about who, in what circumstances, requires protection and support from the social state, taking the subsidiarity principle into account, and about how this can be organised – for all our sakes.





## LAUNCH CONFERENCE

22nd APRIL, 2015



GREEN PAPER

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- EXISTING PLATFORMS
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### PUBLIC DIALOGUE

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SOCIAL MEDIA
- PUBLIC SURVEY
- FILM FESTIVAL

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LATE 2016



WHITE PAPER

How do we want to work in future? Workers, the public, the social partners, companies, associations, educational institutions, the institutions of our social state and, not least, policy-makers – they all have legitimate interests and aims, and no one has a monopoly on shaping future developments in this area. A compromise is therefore the only possible outcome. We will seek to ensure that it is a good compromise, a socially compatible compromise.

Building on the concept of Work 4.0, we have set out defining trends, important areas for action and central objectives for society in this Green Paper. And we have formulated concrete questions – as yet unanswered questions, because we do not have a good enough idea of the answers yet either. On this basis, we want to **LAUNCH A BROAD DIALOGUE**. After all, the working society of the future can only emerge from an intensive dialogue between all stakeholders. With Work 4.0, the Federal Ministry of Labour and Social Affairs is creating a framework and platform for diverse discussions to allow all aspects of the subject to be explored in full.

We want to engage in a **SPECIALISED DIALOGUE** with experts from the academic and practitioner communities, and to incorporate existing forms of dialogue. But we also want to engage in a **PUBLIC DIALOGUE**, online and offline, with members of the public. Both of these dialogues are intended to help us to better identify opportunities to shape developments and possible compromises. We will encourage discussion of interim findings via public events and publications. Further details are available on our website: **[www.arbeitsviernull.de](http://www.arbeitsviernull.de)**.

The dialogue will culminate in a White Paper on Work 4.0 in late 2016, which will reflect the conclusions which emerge from the dialogue.

*You are warmly invited to join in the discussion!*

# GLOSSARY

## *Big Data*

Big Data refers to the collection and analysis of ever larger volumes of data, made possible by technical progress in terms of processors and sensor technology, but also by advances in analysis methods.

## *Breakdown of boundaries*

The use of modern information and communication technologies is breaking down the boundaries on work, with a new openness replacing the structures previously imposed by the company in terms of location, time and organisation, in the form of fixed working hours and workplaces and the staff's long-term attachment to the company.

## *Comprehensive pension insurance scheme*

To date, the statutory pension insurance system has first and foremost – although not exclusively – covered people in dependent employment (employees). By contrast, this concept would include all gainfully active persons, including the self-employed, in a statutory pension scheme.

## *Crowdworking*

Crowdworking is the process of distributing work, generally broken down into smaller tasks, to crowdworkers via digital platforms. The work can be given either to a company's own employees (internal crowdworking) or to third parties (external crowdworking), who are often solo self-employed individuals working for many customers worldwide.

## *Democratic participation*

The terms “democratic participation” or the “democratic enterprise” refer to staff involvement, e.g. in strategic developments or the organisation of work, going beyond co-determination.

## *Digital literacy*

Digital literacy refers to the knowledge and skills required in the use of new technical devices and the associated information and communication networks.

## *Digital transformation*

The digital transformation is the sum of the changes which may result from rapid and widespread adoption of new information and communication technologies in the economy and in society. They all individually, and especially in combination, have a significant potential to transform the way in which we work and do business.

## *Dualisation*

In view of a growing and increasingly entrenched low-wage sector and the spread of non-standard forms of employment, even as the number of standard employment relationships remains high, academics have introduced the concept of the dualisation of the German labour market.

## *End of work*

There have been predictions of the end of work due to productivity gains from technological progress for over a century. Although entire sectors and occupations have repeatedly vanished in the past, new business models and occupational profiles emerged at the same time. It is therefore more a question of change, upheaval and new equilibriums in the labour market.

## *Family working-time model*

The family working-time model is designed to allow couples to share work and family commitments in a spirit of partnership. Both engage in paid employment with a significant number of weekly working hours (e.g. around 80% of a full-time position) and share family commitments. The possibility of a wage compensation benefit is under discussion, which would partly offset the difference in income compared to working full-time.

## *Full-time lite*

The terms “near full-time employment”, “full-time lite” or “part-time plus” refer to working-time models below the full-time level of 40 hours per week, but above the level of part-time employment, defined as 20 hours. Such models enable employees to better balance their personal and work commitments.

## *Generation Y*

Generation Y refers to the demographic cohort born between 1985 and 2000. Members of Generation Y are believed to place much more value than older generations on the meaningfulness of their work and on a work-life balance.

## *Humanisation of work*

This term means that the world of work should, as far as possible, be adapted to the worker. It encompasses all measures intended to enhance work content and working conditions.

## *Industry 4.0*

Industry 4.0 describes a revolution in the manufacturing sector. At the heart of Industry 4.0 is a highly automated and interconnected industrial production and logistics chain. Virtual and real processes merge on the basis of what are known as cyber-physical systems. This permits highly efficient and highly flexible production, with customer wishes being taken into account in real time, and allows a large number of product variations to be produced.

## *Knowledge society*

In a knowledge society, knowledge and its organisation are the foundation of society and a vital economic resource which determines the competitiveness of economies to a large degree. Work increasingly takes the form of knowledge work and mental tasks. Access to and sharing in knowledge via education is a central social issue.

## *Life-phase approach*

A life-phase approach to working time enables employees to reduce their hours in certain life phases, e.g. when starting a family or undertaking continuing training, so they can better balance the various demands on their time.

### *Low-wage sector*

The low-wage sector is defined in terms of the relative low-wage threshold. This is generally defined as two thirds of the median hourly wage. In 2012, the national low-wage threshold was 9.30 euros per hour, and 24% of all workers were active in the low-wage sector.

### *Mobile working*

Mobile working refers to work outside the workplace. It includes working from home (telework, alternating telework), working at customer locations (e.g. services or sales), working on the go (e.g. in planes and hotel rooms) and working during business trips (e.g. trade fairs, conferences).

### *New Quality of Work Initiative (INQA)*

A joint initiative of the Federation, the Länder (federal states), the social partners, chambers, the Federal Employment Agency, academia and businesses, the New Quality of Work Initiative seeks to promote an employee-centred corporate culture and develops incentives for work arrangements which foster motivation, health and innovation, above the statutory minimum standards. It offers advisory services, information, opportunities for exchange and an assistance programme to develop new practical aids for employees and enterprises.

### *Non-standard employment relationships*

Non-standard forms of employment include part-time work (under 20 hours per week), marginal employment, fixed-term employment and temporary work.

### *Polarisation*

When demand for mid-level qualifications declines relative to both higher-level and lower-level qualifications, e.g. as a result of technological progress, this can result in wage or employment polarisation. This can lead to a rise in wages at the top and bottom of the wage distribution relative to those in the middle, for example.

### *Rush hour of life*

The rush hour of life refers to a life phase with a particularly high concentration of demands and decisions that are of vital significance for an individual's future (e.g. the phase between the ages of 25 and 45). Completing education and training, entering the world of work and starting a career, choosing a partner and starting a family: all of these events fall within this phase and have to be dealt with simultaneously within a short space of time.

### *Services on demand*

Increasingly, services for private consumers and corporate customers are being offered via online platforms, which charge a fee for putting service users and providers in touch with each other. Observers believe a new and highly flexible "on-demand economy" is emerging, with new technical possibilities facilitating the direct provision of personalised services.

### *Shift in cultural values*

The change in societal and individual values and standards is called a shift in cultural values.

### *Skilled workers*

Individuals who have completed a vocational training programme lasting a minimum of two years are considered skilled workers. These are people who have completed an apprenticeship or hold a technical college certificate, a degree from a university or university of applied sciences, or an equivalent qualification.

### *Social market economy*

This term describes an economic system which combines free participation for all in a competitive economy, with social equity and socially compatible progress in society.

### *Solo self-employed persons*

Self-employed individuals who do not employ any staff are generally known as solo self-employed persons.

### *Standard employment relationship*

In the 1980s, a number of academics defined the empirically most widespread form of gainful activity in West Germany as the standard employment relationship, with the following characteristics: permanent, open-ended, full-time employment with compulsory social insurance coverage and regulated working hours, outside the agency work sector. Frequently, it was implicitly assumed that the employee in question was a sole male breadwinner with a family.

### *Time sovereignty*

In general, time sovereignty means that an individual has control over how to use his or her own time. In the narrower sense, it refers to workers having a say in the number and pattern of hours they work.