EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Specific objective

The specific objective is to ensure optimal development and dynamic use of Europe's intellectual capital in order to generate, develop and transfer new skills, knowledge and innovation and, thus, to realise its full potential across all sectors and regions.

Well-trained, dynamic and creative researchers are the essential element for the best science and the most productive research-based innovation.

Although Europe hosts a large and diversified pool of skilled human resources for research and innovation, this needs to be constantly replenished, improved and adapted to the rapidly evolving needs of the labour market. In 2011 only 46 % of this pool worked in the business sector, which is much lower than in Europe’s main economic competitors, e.g. 69 % in China, 73 % in Japan and 80 % in the United States. In addition, demographic factors mean that a disproportionate number of researchers will reach retirement age in the next few years. This, combined with the need for many more high-quality research jobs as the research intensity of the European economy increases, will be one of the main challenges facing European research, innovation and education systems in the years ahead.

The necessary reform must start at the first stages of the researchers’ careers, during their doctoral studies or comparable post-graduate training. Europe must develop state-of-the-art, innovative training schemes, consistent with the highly competitive and increasingly inter-disciplinary requirements of research and innovation. Significant involvement of businesses, including SMEs and other socio-economic actors, will be needed to equip researchers with the cross-cutting innovation and entrepreneurial skills
demanded by the jobs of tomorrow and encourage them to consider their careers in industry or in the most innovative companies. It will also be important to enhance the mobility of these researchers, as it currently remains at a too modest level: in 2008, only 7% of European doctoral candidates were trained in another Member State, whereas the target is 20% by 2030.

This reform must continue through every stage of researchers’ careers. It is vital to increase the mobility of researchers at all levels, including mid-career mobility, not only between countries but also between the public and private sectors. This creates a strong stimulus for learning and developing new skills. It is also a key factor in cooperation between academics, research centres and industry across countries. The human factor is the backbone of sustainable cooperation which is the key driver for an innovative and creative Europe able to face societal challenges, and key to overcoming fragmentation of national policies.

Collaborating and sharing knowledge, through individual mobility at all stages of a career and through exchanges of highly skilled R&I staff, are essential for Europe to re-take the path to sustainable growth, to tackle societal challenges and thereby contribute to overcoming disparities in research and innovation capacities.

In this context, Horizon 2020 should also encourage career development and mobility of researchers through improved conditions to be defined for the portability of Horizon 2020 grants.

Marie Skłodowska-Curie actions will ensure effective equal opportunities for the mobility of male and female researchers, including through specific measures to remove barriers.

If Europe is to match its competitors in research and innovation, it must entice more young women and men to embark on research careers and provide highly attractive opportunities and environments for research and innovation. The most talented individuals, from Europe and elsewhere, should see Europe as a pre-eminent place to work. Gender equality, high-quality and reliable employment and working conditions and recognition are crucial aspects that must be secured in a consistent way across the whole of Europe.

**Rationale and Union added value**

Neither Union funding alone nor Member States individually will be able to address this challenge. Although Member States have introduced reforms to improve their tertiary education institutions and modernise their training systems, progress is still uneven across Europe, with big differences between countries. Overall, scientific and technological cooperation between the public and private sectors generally remains weak in Europe. The same applies to gender equality and to the efforts to attract students and researchers from outside the ERA. Currently around 20% of the doctoral candidates in the Union are citizens of third countries, whereas about 35% in the United States come from abroad. To speed up this change, a strategic approach that goes beyond national borders is required at Union level.

Union funding is crucial to create incentives for and encourage the indispensable structural reforms. The Marie Skłodowska-Curie actions have made remarkable progress to promote mobility, both transnational and intersectoral, and to open research careers at European and international level, with excellent employment and working conditions following the principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. There is no equivalent in Member States as far as their scale and scope, funding, international character, generation and transfer of knowledge are concerned. They have strengthened the resources of those institutions able to attract researchers internationally and thereby encouraged the spread of centres of excellence around the Union. They have served as a role model with a pronounced structuring effect by spreading their best practices at
national level. The bottom-up approach taken by Marie Skłodowska-Curie actions has also allowed a large majority of those institutions to train and upgrade the skills of a new generation of researchers able to tackle societal challenges.

Further development of the Marie Skłodowska-Curie actions will make a significant contribution to development of the ERA. With their Europe-wide competitive funding structure, Marie Skłodowska-Curie actions will, whilst respecting the principle of subsidiarity, encourage new, creative and innovative types of training such as joint or multiple doctoral degrees and industrial doctorates, involving research, innovation and education players who will have to compete globally for a reputation of excellence. By providing Union funding for the best research and training programmes following the principles for innovative doctoral training in Europe, they will also promote wider dissemination and take-up, moving towards more structured doctoral training.

Marie Skłodowska-Curie grants will also be extended to the temporary mobility of experienced researchers and engineers from public institutions to the private sector or vice versa, thereby encouraging and supporting universities, research centres and businesses, and other socio-economic actors to cooperate with one another on a European and international scale. With the aid of their well-established, transparent and fair evaluation system, Marie Skłodowska-Curie actions will identify excellent talents in research and innovation in an international competition which gives prestige and therefore motivation for researchers to advance their career in Europe.

The societal challenges to be addressed by highly skilled R&I staff are not just Europe's problem. These are international challenges of colossal complexity and magnitude. The best researchers in Europe and in the world need to work together across countries, sectors and disciplines. Marie Skłodowska-Curie actions will play a key role in this respect by supporting staff exchanges that will foster collaborative thinking through international and intersectoral knowledge-sharing that is so crucial for open innovation.

The co-funding mechanism of the Marie Skłodowska-Curie actions will be crucial to expand Europe's pool of talents. The numerical and structural impact of Union action will be increased by leveraging regional, national and international funding, both public and private, to create new programmes with similar and complementary goals and to adapt existing ones to international and intersectoral training, mobility and career development. Such a mechanism will forge stronger links between research and education efforts at national and Union level.

All the activities under this challenge will contribute to creating a whole new mindset in Europe that is crucial for creativity and innovation. Marie Skłodowska-Curie funding measures will strengthen pooling of resources in Europe and thereby lead to improvements in coordination and governance of researchers' training, mobility and career development. They will contribute to the policy goals outlined in the flagship initiatives 'Innovation Union', 'Youth on the Move' and 'Agenda for New Skills and Jobs' and will be vital to turn the ERA into reality. The Marie Skłodowska-Curie actions will therefore be developed in close synergy with other programmes supporting these policy objectives, including the Erasmus+ programme and the KICs of the EIT.

**Broad lines of activities**

**a) Fostering new skills by means of excellent initial training of researchers**
The goal is to train a new generation of creative and innovative researchers, able to convert knowledge and ideas into products and services for economic and social benefit in the Union.

Key activities shall be to provide excellent and innovative training to early-stage researchers at post-graduate level through interdisciplinary projects, including mentoring to transfer knowledge and experience between researchers or doctoral programmes, helping researchers to develop their research career and involving universities, research institutions, research infrastructures, businesses, SMEs and other socio-economic groups from different Member States, associated countries and/or third countries. This will improve career prospects for young post-graduate researchers in both the public and private sectors.

(b) Nurturing excellence by means of cross-border and cross-sector mobility

The goal is to enhance the creative and innovative potential of experienced researchers at all career levels by creating opportunities for cross-border and cross-sector mobility.

Key activities shall be to encourage experienced researchers to broaden or deepen their skills by means of mobility by opening attractive career opportunities in universities, research institutions, research infrastructures, businesses, SMEs and other socio-economic groups all over Europe and beyond. This should enhance the innovativeness of the private sector and promote cross-sector mobility. Opportunities to be trained and to acquire new knowledge in a third-country high-level research institution, to restart a research career after a break and to (re-)integrate researchers into a longer-term research position in Europe, including in their country of origin, after a trans-national/international mobility experience covering return and reintegration aspects, shall also be supported.

(c) Stimulating innovation by means of cross-fertilisation of knowledge

The goal is to reinforce international cross-border and cross-sector collaboration in research and innovation by means of exchanges of research and innovation personnel in order to be able to face global challenges better.

Key activities shall be to support exchanges of R&I staff among a partnership of universities, research institutions, research infrastructures, businesses, SMEs and other socio-economic groups, both within Europe and worldwide. This will include fostering cooperation with third countries.

(d) Increasing the structural impact by co-funding the activities

The goal is, by leveraging additional funds, to increase the numerical and structural impact of Marie Skłodowska-Curie actions and to foster excellence at national level in researchers’ training, mobility and career development.

Key activities shall be, with the aid of a co-funding mechanism, to encourage regional, national and international organisations, both public and private, to create new programmes and to adapt existing ones to international and intersectoral training, mobility and career development. This will increase the quality of research training in Europe at all career stages, including at doctoral level, foster free circulation of
researchers and scientific knowledge in Europe, promote attractive research careers by offering open
recruitment and attractive working conditions, and support research and innovation cooperation between
universities, research institutions and enterprises and cooperation with third countries and international
organisations.

(e) Specific support and policy action

The goals are to monitor progress, identify gaps and barriers in the Marie Skłodowska-Curie actions and
to increase their impact. In this context, indicators shall be developed and data related to researchers' mobility, skills, careers and gender equality analysed, seeking synergies and close coordination with the policy support actions on researchers, their employers and funders carried out under the specific objective 'Europe in a changing world - Inclusive, innovative and reflective societies'. The activity shall further aim at raising awareness of the importance and attractiveness of a research career and at disseminating research and innovation results emanating from work supported by Marie Skłodowska-Curie actions.

Context

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