

Informazio Jardunaldia:
Zientziaren inpaktu sozial eta politikoa

Jornada Informativa:
Impacto social y político de la ciencia

Antolatzaileak / Organizadores:

ikerbasque
Basque Foundation for Science



***Evaluación y monitoreo del impacto social y político de los
programas de investigación en todas las ciencias***

***Jakintza arlo guztietako ikerketa-programei buruzko inpaktu
sozial eta politikoaren ebaluazioa eta monitorizazioa***



➤ ¿Es el impacto social la nueva prioridad de la investigación en la EU y a nivel mundial?

➤ ¿Cómo diferenciar el impacto social de la difusión y la transferencia?

➤ ¿Esta prioridad excluye la investigación fundamental o básica o la que no da directamente impacto social?

➤ ¿Cómo se evaluará ese impacto en los proyectos del próximo programa marco de investigación de la UE?

➤ ¿Qué retos tenemos en predecir, recoger y mostrar las evidencias de impacto?



➤ ¿Es el impacto social la nueva prioridad de la investigación en la EU y a nivel mundial?

➤ ¿Cómo diferenciar el impacto social de la difusión y la transferencia?

➤ ¿Esta prioridad excluye la investigación fundamental o básica o la que no da directamente impacto social?

➤ ¿Cómo se evaluará ese impacto en los proyectos del próximo programa marco de investigación de la UE?

➤ ¿Qué retos tenemos en predecir, recoger y mostrar las evidencias de impacto?



2007 – 2013

€55 billion



2014 – 2020

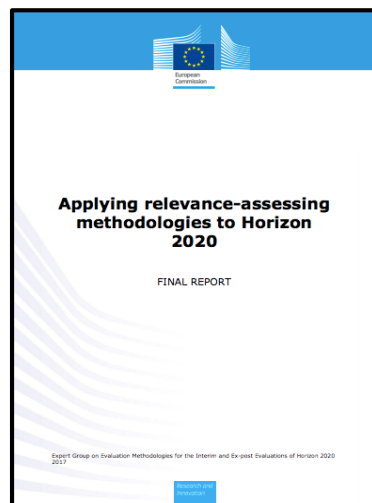
€70 billion



2021 – 2027

€100 billion

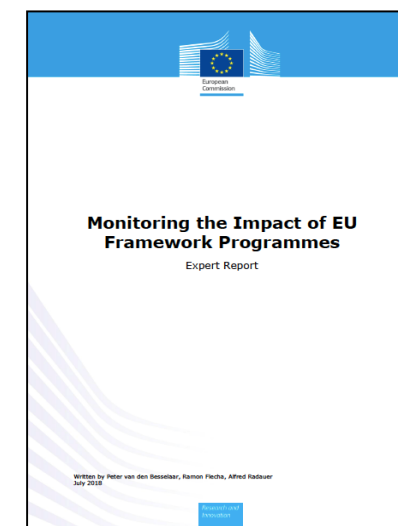
These inputs informed the European Commission proposal for the monitoring and evaluation system of Horizon Europe



Relevancia

Authors

This publication has been coordinated by Katerina Valta (Rapporteur), Mirjana Pejić Bach (Co-chair for Relevance), Irena Kondratenko, and Ramon Flecha (Chair), with the collaboration of Anna Maria Augustyn, Sorin Cheval, Michele De Gennaro, Toivo Maimets, Christine Mohler, Milan Palat, Krassimira Paskaleva, Angela Cristina Plescan, Alfred Radauer (Rapporteur), David Southwood, Karen Hanghoj Sorensen, Peter Van den Besselaar and Barbara Widera.



Impacto

Itinerarios hacia el impacto clave “Abordando Retos Globales”

Corto plazo

Medio plazo

Largo plazo

4.1 Key Impact Pathway “Addressing Global Challenges”

Short-term indicator	Number and share of outputs aimed at addressing specific cluster challenges and Sustainable Development Goals (SDGs)
Sub-indicators	- Number and share of articles published in peer review journals from FP funded activities in relation to cluster challenges and SDGs. - Number and share of innovations produced (e.g. prototypes, clinical trials that could be applied, products -goods or services-, processes, distribution methods, organisational or marketing methods, databases or infrastructures) from FP funded activities in relation to cluster challenges and SDGs. - Number and share of intellectual property rights produced in relation to cluster challenges and SDGs (e.g. patents, trademarks, registered designs, utility models).
Definition (s)	Number and share of outputs that have been produced related to specific cluster challenges and SDGs, therefore with potential to enable societal impact.
Rationale	Research-based outputs in any field are needed to later achieve results beyond academia and social impacts. Therefore, identifying outputs according to clusters of challenges and SDGs is an appropriate measure of the short-term progress towards them.
Assumptions	All projects generate outputs. Those that are addressing SDGs are assumed to potentially represent progress towards these global challenges, therefore societal impact.
Data/Information needs and source(s)	Data needs: - Publication metadata according to cluster challenges and SDGs. - Innovations, IPRs and other outputs produced according to cluster challenges and SDGs. Sources: - Databases and information systems: SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, TIM analytics, as well as commercially available bibliometric databases. - Patent databases (e.g. ESPACENET, EPO; WIPO). - Innovation databases (e.g. European Innovation Scoreboard²⁴, TIM).
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of outputs (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm will allocate different weights to the three Sub-indicators and will reward the diversity of outputs among the three. - Multivariate modelling will be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: Information to be provided by the beneficiaries but needs no elaboration. Some output information (publications) can be also gathered through commercially available bibliometric databases.

Medium-term indicator	Number and share of innovations and scientific results addressing specific cluster challenges and SDGs
Sub-indicators	- Number and share of technology transfers to industry (including beneficiary SMEs and other enterprises beyond FP funding). - Number and share of knowledge transfers and adoptions by diverse stakeholders (including beneficiaries and other stakeholders beyond FP funding). - Number and share of changes in professional standards, protocols, practices and services on stakeholder's activity and organisation (including beneficiaries and other stakeholders beyond FP funding).
Definition (s)	Number and share of results that have been obtained, related to specific cluster challenges and SDGs, understanding results as what has been introduced and adopted by industry, market, citizens and/or diverse stakeholders because of FP research and innovation.
Rationale	When companies, market, institutions or citizens use knowledge resulting from FP research and innovation activities, there is transference, and therefore potential for achieving societal impact.
Assumptions	It is easier to track innovations and transfer to SMEs and other stakeholders which participate as beneficiaries in the FP, and this could be used as mid-term estimate. However, citizens', companies' and stakeholders' uptake of research results is what would interest most here, with potential to enable societal impact.
Data/Information needs and source(s)	Data needs: - Technology transfer and innovations in industry 1) from participant SMEs (EC data) and 2) from SMEs and industry in general. - Knowledge transfer and adoption 1) from participant stakeholders (EC data) and 2) from stakeholders in general. - Creation of spin-offs and start-ups. Sources: - Datasets and information systems: SyGMA, CORDA, CORDIS, OpenAire, European Data Portal. - Innovation databases (e.g. European Innovation Scoreboard, TIM analytics)
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of results (see basket of sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity of results among the three. - Multivariate modelling would be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: It entails that beneficiaries like SMEs, institutions and other stakeholders would report the innovations they are using. Other data would be collected from innovation databases.

Longer-term indicator	Effects from the use of FP-funded scientific results and innovations on tackling specific cluster challenges and SDGs
Sub-indicators	- Number and share of evidence of improvements in relation to the previous situation tackling specific cluster challenges and SDGs. - Number and share of evidence of replicability of those improvements. - Number and share of evidence of sustainability of the improvement achieved.
Definition (s)	Evidence of societal impact resulting from the use of FP funded research which address specific cluster challenges and SDGs.
Rationale	The monitoring of the evidence of societal impact from FP funded research is the best longer-term indicator to evaluate the progress towards addressing cluster challenges and SDGs. Global challenges are being addressed when we have evidence supporting this, therefore assessment of societal impact evidence is required.
Assumptions	Researchers are increasingly using social impact databases to gather evidence about societal impact. Social media reflects citizens and stakeholders beyond academia; they can provide evidence about the impact beyond the lifespan of funded projects.
Data/Information needs and source(s)	Data needs: - Evidence of societal impact provided by researchers, citizens, media, companies, political institutions and scientific publications. Sources: - Scientific literature about the societal impact attained by FP research and innovation activities - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, among others. Through the APIs and other open libraries tools, it is possible to access data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions found in each social media (e.g. privacy policies, limit maximum number posts/tweets collected, number maximum of historical days). - Repositories and databases on social impact (or including societal impact evidence): OpenAire, Impactstory, SIDR, ORCID as well as those commercially available like Researchfish.
Who is providing this information?	Beneficiaries, datasets and information systems, expert panels and portfolio analysis.
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics (both bottom up and top down): 1) Monitoring how the societal impact evidence provided by beneficiaries are shared in social media, through monitoring page views, keywords and other identifiers related to societal impact evidence and results; 2) Monitoring the social media data of results and data analysis to identify the societal impact evidence provided by citizens, through data mining and machine learning. - Trajectories' analysis from individual researchers' profiles (e.g. ORCID data). - Algorithm drawing on the number of impacts (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity among the three. - An estimation would be performed to provide an estimate of the total improvement generated in the EU because of the replicability and sustainability of the different improvements. A comparison with the

	consequences of not having FP funding would be provided. Multivariate modelling would be used to explore the potential relationships of the three Sub-indicators, if any. Percentiles would be used to establish low, medium and high benchmarking levels of long-term effects of using FP-funded scientific results and innovations.
Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,5% of person months.
Level of reporting burden for beneficiaries	An indicative example would be: Medium: Beneficiaries should gather evidence of societal impact related to their research and innovation activities in social impact repositories and other; once these evidence are reported and stored, analysing data and trajectories is low demanding.



2007 – 2013

€55 billion



2014 – 2020

€70 billion



2021 – 2027

€100 billion



Itinerarios hacia el impacto clave “Consiguiendo Misiones R&I”

Corto plazo

Medio plazo

Largo plazo

4.1 Key Impact Pathway “Addressing Global Challenges”

Short-term indicator	Number and share of outputs aimed at addressing specific cluster challenges and Sustainable Development Goals (SDGs)
Sub-indicators	- Number and share of articles published in peer review journals from FP funded activities in relation to cluster challenges and SDGs. - Number and share of innovations produced (e.g. prototypes, clinical trials that could be applied, products – goods or services –, processes, distribution methods, organisational or marketing methods, databases or infrastructures) from FP funded activities in relation to cluster challenges and SDGs. - Number and share of intellectual property rights produced in relation to cluster challenges and SDGs (e.g. patents, trademarks, registered designs, utility models).
Definition (s)	Number and share of outputs that have been produced related to specific cluster challenges and SDGs, therefore with potential to enable societal impact.
Rationale	Research-based outputs in any field are needed to later achieve results beyond academia and social impacts. Therefore, identifying outputs according to clusters of challenges and SDGs is an appropriate measure of the short-term progress towards them.
Assumptions	All projects generate outputs. Those that are addressing SDGs are assumed to potentially represent progress towards these global challenges, therefore societal impact.
Data/Information needs and source(s)	Data needs: - Publication metadata according to cluster challenges and SDGs. - Innovations, IPRs and other outputs produced according to cluster challenges and SDGs. Sources: - Databases and information systems: SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, TIM analytics, as well as commercially available bibliometric databases. - Patent databases (e.g. ESPACENET, EPO; WIPO). - Innovation databases (e.g. European Innovation Scoreboard²⁴, TIM).
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of outputs (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm will allocate different weights to the three Sub-indicators and will reward the diversity of outputs among the three. - Multivariate modelling will be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: Information to be provided by the beneficiaries but needs no elaboration. Some output information (publications) can be also gathered through commercially available bibliometric databases.

Medium-term indicator	Number and share of innovations and scientific results addressing specific cluster challenges and SDGs
Sub-indicators	- Number and share of technology transfers to industry (including beneficiary SMEs and other enterprises beyond FP funding). - Number and share of knowledge transfers and adoptions by diverse stakeholders (including beneficiaries and other stakeholders beyond FP funding). - Number and share of changes in professional standards, protocols, practices and services on stakeholder's activity and organisation (including beneficiaries and other stakeholders beyond FP funding).
Definition (s)	Number and share of results that have been obtained, related to specific cluster challenges and SDGs, understanding results as what has been introduced and adopted by industry, market, citizens and/or diverse stakeholders because of FP research and innovation.
Rationale	When companies, market, institutions or citizens use knowledge resulting from FP research and innovation activities, there is transference, and therefore potential for achieving societal impact.
Assumptions	It is easier to track innovations and transfer to SMEs and other stakeholders which participate as beneficiaries in the FP, and this could be used as midterm estimate. However, citizens', companies' and stakeholders' uptake of research results is what would interest most here, with potential to enable societal impact.
Data/Information needs and source(s)	Data needs: - Technology transfer and innovations in industry 1) from participant SMEs (EC data) and 2) from SMEs and industry in general. - Knowledge transfer and adoption 1) from participant stakeholders (EC data) and 2) from stakeholders in general. - Creation of spin-offs and start-ups. Sources: - Datasets and information systems: SyGMA, CORDA, CORDIS, OpenAire, European Data Portal. - Innovation databases (e.g. European Innovation Scoreboard, TIM analytics)
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of results (see basket of sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity of results among the three. - Multivariate modelling would be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: It entails that beneficiaries like SMEs, institutions and other stakeholders would report the innovations they are using. Other data would be collected from innovation databases.

Longer-term indicator	Effects from the use of FP-funded scientific results and innovations on tackling specific cluster challenges and SDGs
Sub-indicators	- Number and share of evidence of improvements in relation to the previous situation tackling specific cluster challenges and SDGs. - Number and share of evidence of replicability of those improvements. - Number and share of evidence of sustainability of the improvement achieved.
Definition (s)	Evidence of societal impact resulting from the use of FP funded research which address specific cluster challenges and SDGs.
Rationale	The monitoring of the evidence of societal impact from FP funded research is the best longer-term indicator to evaluate the progress towards addressing cluster challenges and SDGs. Global challenges are being addressed when we have evidence supporting this, therefore assessment of societal impact evidence is required.
Assumptions	Researchers are increasingly using social impact databases to gather evidence about societal impact. Social media reflects citizens and stakeholders beyond academia; they can provide evidence about the impact beyond the lifespan of funded projects.
Data/Information needs and source(s)	Data needs: - Evidence of societal impact provided by researchers, citizens, media, companies, political institutions and scientific publications. Sources: - Scientific literature about the societal impact attained by FP research and innovation activities - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, among others. Through the APIs and other open libraries tools, it is possible to access data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions found in each social media (e.g. privacy policies, limit maximum number posts/tweets collected, number maximum of historical days). - Repositories and databases on social impact (or including societal impact evidence): OpenAire, ImpactStory, SIDR, ORCID as well as those commercially available like Researchfish.
Who is providing this information?	Beneficiaries, datasets and information systems, expert panels and portfolio analysis.
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics (both bottom up and top down): 1) Monitoring how the societal impact evidence provided by beneficiaries are shared in social media, through monitoring page views, keywords and other identifiers related to societal impact evidence and results; 2) Monitoring the social media data of results and data analysis to identify the societal impact evidence provided by citizens, through data mining and machine learning. - Trajectories' analysis from individual researchers' profiles (e.g. ORCID data). - Algorithm drawing on the number of impacts (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity among the three. - An estimation would be performed to provide an estimate of the total improvement generated in the EU because of the replicability and sustainability of the different improvements. A comparison with the

Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,5% of person months.
Level of reporting burden for beneficiaries	An indicative example would be: Medium: Beneficiaries should gather evidence of societal impact related to their research and innovation activities in social impact repositories and other; once these evidence are reported and stored, analysing data and trajectories is low demanding.

Adaptation to climate change, including societal transformation

**Healthy
oceans,
seas,
coastal
and inland
waters**



**Mission
areas**



Cancer



**Climate-neutral
and smart cities**



**Soil health
and food**





Itinerarios hacia el impacto clave

“Implicación a la ciudadanía de la UE”



Corto plazo

Medio plazo

Largo plazo

4.3 Key Impact Pathway “Engaging EU citizen”

Short-term indicator	Number and share of FP projects where EU citizens contribute to the co-creation of R&I content
Sub-indicators	- Number and share of FP projects where EU citizens contribute as beneficiaries. - Number and share of FP projects where EU citizens contribute through different type of activities (e.g. consultancy body, public forum, communicative methodology).
Definition (s)	Number and share of FP projects that include the participation of citizens at some stage of the research and innovation process to contribute to the co-creation of R&I content.
Rationale	Co-creation of knowledge is considered to increase societal impact of research through aligning research and social needs. It is therefore an appropriate measure of the short-term progress towards enabling societal impact.
Assumptions	Citizens contribution to the co-creation of R&I content might be fostered and feasible in different research and innovation fields. Citizens can make their own contributions as well as participate through civil society organisations (CSO).
Data/Information needs and source(s)	Data needs: - Type of participants in FP projects (e.g. individual citizens, CSOs, public administration, SMEs). - Type of activity/role in which citizens participate in FP projects (e.g. beneficiary, consultancy body, public - Social media.
Who is providing this information?	Beneficiaries, datasets and information systems
Detailed methodology for indicator computation	- Data analysis from the information provided in the project proposals. If needed, the following methodologies can be used as complementary: - Metric analysis. - Social media analytics (Pulido et al, 2018), monitoring the types of participation by citizens in FP projects, and their influence in the FP societal impact. - Algorithm drawing on the types of citizens' activities/roles (see basket of sub-indicators) in FP funded projects. The algorithm would allocate different weights to the diverse types of activities/roles and would reward the diversity among them. - Multivariate modelling would be used to analyse the relationship between types of participation and societal impact.
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (Incl. access to external databases)	Equivalent to <0,5% of person months.
Level of reporting burden for beneficiaries	Low: It entails collecting data from citizens' participation in projects

Medium-term indicator	Number and share of FP beneficiary entities developing citizen engagement mechanisms for R&I beyond FP project
Definition (s)	Number and share of FP beneficiary entities that develop specific mechanisms for citizen engagement in R&I activities beyond FP projects.
Rationale	The development of citizen engagement mechanisms is an appropriate measure of the medium-term progress towards promoting the engagement of EU citizens.
Assumptions	Citizen engagement in R&I is feasible in different research and innovation fields and with diverse beneficiary entities.
Data/Information needs and source(s)	Data needs: - Evidence of EU citizens' engagement mechanisms provided by researchers, citizens, media, companies, political institutions and scientific publications. Sources: - Datasets and information systems: SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal. - CSO reports - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, among others. Through the API's and other open libraries' tools, it is possible to access data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions found in each social media (e.g. privacy policies, limit maximum number posts/twitter collected, number maximum of historical days).
Who is providing this information?	Beneficiaries, datasets and information systems
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics, monitoring the types of participation by citizens in FP projects, and their influence in the FP societal impact. - The algorithm would be drawn from the cumulative number and share of beneficiary entities developing
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (Incl. access to external databases)	Equivalent to <0,08% of person months.
Level of reporting burden for beneficiaries	Medium: it entails collecting data from beneficiaries' activity beyond FP funding

Longer-term indicator	Uptake of FP scientific results and innovative solutions by citizen
Sub-indicators	- Number of activities/programmes/products which are based on FP scientific results that have been implemented by citizens and civil society organisations (CSO). - Percentage of FP scientific results and innovative solutions by number of end-users reached.
Definition (s)	Number of activities/programmes/products which are based on FP scientific results that have been implemented by citizens and CSOs.
Rationale	EU citizens' uptake of FP scientific results and innovative solutions is achieved when citizens and CSO use results from research to build up and develop their daily practices. Therefore, this is an appropriate longterm indicator to monitor the progress towards enabling societal impact.
Assumptions	The uptake of FP scientific results and innovative solutions by citizens is feasible in different scientific fields and R&I missions.
Data/Information needs and source(s)	Data needs: - Reporting activity from FP beneficiary entities on activities, programmes, products and innovations. - Citizens' share in the social media about activities, programmes, products and innovations which are FP based. - Citizens' (and CSO) share in internet about activities, programmes, products and innovations which are FP based. Sources: - Datasets and information systems: SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal. - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, through the API's and other open libraries tools to access social data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions of each social media (e.g. privacy policies, limit maximum number posts/twitter collected, number maximum of historical days). - CSO reports.
Who is providing this information?	Beneficiaries, datasets, information systems, endusers/stakeholders/citizens.
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics (top-down and bottom up approaches on FP based innovative solutions identified): Monitoring the social media data of FP scientific results and innovative solutions identified through data mining and machine learning. - The algorithm would be drawn from the cumulative number of activities/programmes/products/innovations based on FP scientific results which are mentioned by citizens

Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (Incl. access to external databases)	Equivalent to <0,4% of person months.
Level of reporting burden for beneficiaries	Medium: it entails collecting data from beneficiaries' activity beyond FP funding, as well as collecting data related to beneficiaries' activity through social media.



Itinerarios hacia el impacto clave “Apoyando la formación de políticas”



Corto plazo

Medio plazo

Largo plazo

4.4 Key Impact Pathway “Supporting policy-making”

Short-term Indicator	FP projects producing policy relevant findings
Sub-indicators	Number and share of FP projects producing policy briefs or other policy outputs which address EU policy targets.
Definition (s)	Number and share of projects producing findings that are relevant for policy-making because they address EU policy targets.
Rationale	Research and innovation based policy relevant knowledge is needed to achieve results and impacts in later stages and therefore is an appropriate measure of the short-term progress towards supporting policy-making at local, regional, national, international level.
Assumptions	Policy relevant findings are assumed to be outputs of the project (e.g. policy briefs or recommendations) which address the policy targets already decided by the EU through European citizens' representatives.
Data/Information needs and source(s)	Data needs: - Policy briefs, policy recommendations and position papers produced by FP projects. - Bulletins, reports and similar type of documents from European and national agencies, committees, Parliaments, and other institutional bodies, reporting debates, workshops, seminars among others-conferences produced by FP projects, addressed to policymakers. Sources: - Data bases: SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal.
Who is providing this information?	Beneficiaries, datasets and information systems
Detailed methodology for indicator computation	- Metric analysis. - The algorithm would be drawn from the share of FP projects producing policy outputs that address EU policy targets, among all policy outputs. The analysis would account for the scope of the policy output (local, regional, national, international).
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,7% of person months.
Level of reporting burden for beneficiaries	Low: Information to be provided by the beneficiaries, and it would need no elaboration.

Medium-term Indicator	FP policy relevant findings reaching policy makers
Sub-indicators	- Number and share of projects promoting policy interactions (e.g. forums, conferences, consultations) in relation to EU policy targets by scope of the interaction (e.g. local, regional, national, international). - Number and share of policy interactions with FP projects disseminated beyond FP project activities, in relation to EU policy targets by scope of the interaction (e.g. local, regional, national, international).
Definition (s)	Number and share of projects with policy relevant findings that reach policy makers through policy forums and other type of interactions. Policy findings are considered relevant when they address EU policy targets.
Rationale	Dialogue with policy makers is needed to transfer the results into policy recommendations relevant for society according to EU targets, and finally influence policy making.
Assumptions	Reaching policy makers can be done through different type of outreach activities (e.g. policy forums, meetings, advisory bodies, communicative methodology).
Data/Information needs and source(s)	Data needs: - Interactions with policy makers through different type of activities linked to FP projects: policy forums, meetings, consultations, policy requests, advisory bodies, etc. (e.g. interactions reported by beneficiaries). - Interactions with policy makers through different type of activities linked to FP projects done in internet: (e.g. forum interactions in the online public sphere). Sources: - Datasets and information systems: SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, EUR-Lex, SIQR. - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, through the APIs and other open libraries tools to access social data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions of each social media (e.g. privacy policies, limit maximum number posts/twitter collected, number maximum of historical days).
Who is providing this information?	Beneficiaries, datasets, information systems, policymakers and citizens.
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics: Monitoring how FP projects dissemination (e.g. forums, conferences, consultations) are sharing results with policy audiences, through monitoring keywords and other identifiers of FP projects results and EU policy targets. - An algorithm would be drawn from the number and share of projects that report policy interactions in relation to EU policy targets, as well as the number of interactions disseminated by citizens and stakeholders beyond project activities and lifetime. Analysis would look at scope of the policy interactions (local, regional, national, international) weighting differently each of them.
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,12% of person months.
Level of reporting burden for beneficiaries	Medium: It would entail beneficiaries reporting on policy driven outreach activities. However, this would be complemented by information found in internet, beyond projects.

Longer-term Indicator	Policy documents citing FP findings (This title could be widened to evidence of policy impacts based on FP findings)
Sub-indicators	- Number of policy documents citing knowledge from FP findings, by scope of the interaction (e.g. local, regional, national, international). - Policy makers citing knowledge from FP findings as the basis of their policy proposals. - Content analysis of the relation between FP findings and subsequent policies.
Definition (s)	Number of policy documents with evidence of having been influenced by findings from research and innovation activities, developed by governments (local, regional, national, international) or institutions.
Rationale	Policy impact is achieved when policies include findings and policy recommendations from FP research and innovation activities. Influence in policy-making would be relevant for the potential long-term societal impact.
Assumptions	Policy documents include a variety of official documents developed by governments or institutions of diverse scope. They include, for instance, regulations, directives, decisions, resolutions, recommendations, communications, declarations, treaties, protocols, plans of action, programmes, conventions or agreements.
Data/Information needs and source(s)	Policy documents rarely cite findings from research and innovation activities they might have used. Anyhow there are different forms of providing evidence of research and innovation influence on policy. Data needs: - Evidence of policy impact based on FP findings, reported by beneficiaries to the EC, policy maker and citizens. - Evidence of policy impact based on FP findings, uploaded to social & policy impact repositories. - Evidence of policy impact of FP projects published in peer review journals. Sources: - SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, EUR-Lex, SIQR. - Member States, and regional policy databases and bulletins (e.g. BOE, Bundesanzeiger, Belgisch Staatsblad, Gazzetta Ufficiale).
Who is providing this information?	Beneficiaries, Policy makers, Citizens.
Detailed methodology for indicator computation	- Metric analysis. - The algorithm would be drawn from the diverse evidence of policy impact. Percentiles would be used to establish low, medium and high benchmarking levels of Policy impact evidence citation index.
Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,35% of person months.
Level of reporting burden for beneficiaries	Low: it would entail collecting data from other organisations/individuals.



➤ ¿Es el impacto social la nueva prioridad de la investigación en la EU y a nivel mundial?

➤ ¿Cómo diferenciar el impacto social de la difusión y la transferencia?

➤ ¿Esta prioridad excluye la investigación fundamental o básica o la que no da directamente impacto social?

➤ ¿Cómo se evaluará ese impacto en los proyectos del próximo programa marco de investigación de la UE?

➤ ¿Qué retos tenemos en predecir, recoger y mostrar las evidencias de impacto?



¿Cómo se entiende el impacto social en el mundo?

1. **Crear conocimiento**
2. **Difusión** de este conocimiento a ciudadanía, empresas e instituciones
3. **Transferencia** (uso de este conocimiento por parte de ciudadanía, empresas e instituciones)
4. **Impacto social** (mejoras reales derivadas del uso de este conocimiento en relación a los objetivos marcados por las sociedades)



➤ ¿Es el impacto social la nueva prioridad de la investigación en la EU y a nivel mundial?

➤ ¿Cómo diferenciar el impacto social de la difusión y la transferencia?

➤ ¿Esta prioridad excluye la investigación fundamental o básica o la que no da directamente impacto social?

➤ ¿Cómo se evaluará ese impacto en los proyectos del próximo programa marco de investigación de la UE?

➤ ¿Qué retos tenemos en predecir, recoger y mostrar las evidencias de impacto?



RESI: Research Enabling Social Impact)

It is important to consider that the contribution of research and innovation activities to social impact does not only refer to those studies that indicate the solution to a given problem. It also refers to those studies that did not find any solution, but that still were necessary for those researches which later found it. For instance, the 2008 Medicine Nobel laureate Harold zur Hausen initiated in 1960 his research on human papillomavirus causing cervical cancer. Most of his early attempts to discover the processes that affected cells to degenerate in cervical cancer failed to demonstrate how the virus was causing this type of cancer. The social impact achieved by this Nobel laureate is not only consequence of the last discoveries of his research, but also all the previous ones. Zur Hausen would have not made his discoveries without his previous research. This is what 'Research Enabling Social Impact' refers to¹². Research Enabling Social Impact consists of the different studies, from different researchers and topics, that have been essential to finally conduct a concrete research that has specifically achieved social impact (Soler-Gallart, 2017).

[About](#)[Programme](#)[Registration](#)[Submissions](#)[Committees](#)[Perspectives](#)[Venue](#)

Keynote Speakers at SIS2016



The curiosity of the human mind is essential if you want citizens who think rather than accept the first nonsense they come to.

**François Englert, Nobel Prize in Physics
2013**



People called me a dreamer. Dreamer or not, it was hard work that brought results.

Ada Yonath, Nobel Prize in Chemistry 2009



I believe that we should take a position for basic research to advance in this topic. We need to look for epidemiological clues that indicate us the different tumors that could be caused by an infection, although we might not know it yet.

**Harald zur Hausen, Nobel Prize in Medicine
2008**

¿Cómo se entiende el impacto social en el mundo?

Social Impact of Research: combating cancer disease

Research Enabling Social Impact: research about the possible connection between infection agents and human cancer.



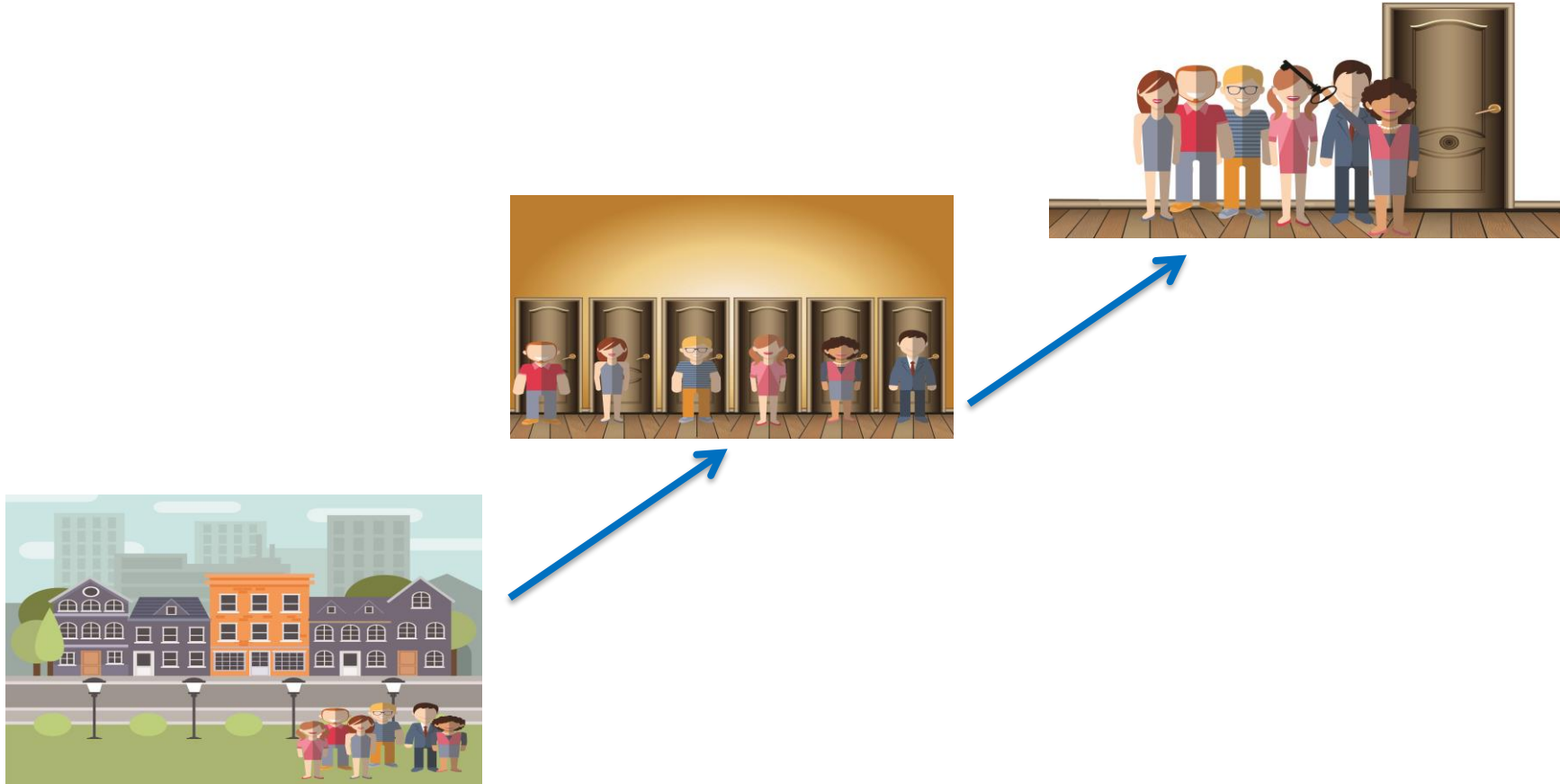
Harald zur Hausen
Nobel Prize in Medicine
2008

“In the late 1960s Herpes simplex type 2 (HSV-2) emerged as the prime suspect based on some seroepidemiological observations. I had asked my colleague Heinrich Schulte-Holthausen to use the same technique to search for HSV-2 sequences in cervical cancer biopsies. **All attempts, however, failed.**”

Later “Up to 20% of sera from human adults also revealed neutralising antibodies to this virus. **Our attempts** to isolate a human correlate, **however, failed.**”

“I have devoted my scientific life to the question to what extent infectious agents contribute to human cancer, trusting that this will contribute to novel modes of cancer prevention, diagnosis and hopefully later on also to cancer therapy. I am of course pleased to see that **at least part of this programme has been successful.**”

RESI: Research Enabling Social Impact)





➤ ¿Es el impacto social la nueva prioridad de la investigación en la EU y a nivel mundial?

➤ ¿Cómo diferenciar el impacto social de la difusión y la transferencia?

➤ ¿Esta prioridad excluye la investigación fundamental o básica o la que no da directamente impacto social?

➤ ¿Cómo se evaluará ese impacto en los proyectos del próximo programa marco de investigación de la UE?

➤ ¿Qué retos tenemos en predecir, recoger y mostrar las evidencias de impacto?

Article metrics for:

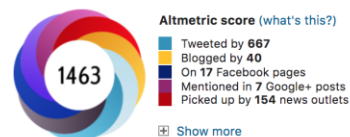
Consequences of twenty-first-century policy for multi-millennial climate and sea-level change

Last updated: Wed, 12 Feb 2020 18:06:13 GMT

Total citations



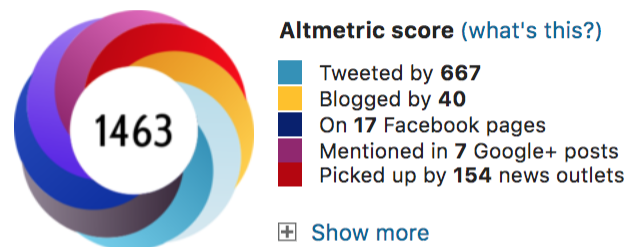
Online attention



This Altmetric score means that the article is:

- in the 99th percentile (ranked 62nd) of the 339,967 tracked articles of a similar age in all journals
- in the 97th percentile (ranked 2nd) of the 94 tracked articles of a similar age in *Nature Climate Change*

Online attention



This Altmetric score means that the article is:

- in the 99th percentile (ranked 62nd) of the 339,967 tracked articles of a similar age in all journals
- in the 97th percentile (ranked 2nd) of the 94 tracked articles of a similar age in *Nature Climate Change*

How is the Altmetric score calculated?

Modified on: Mon, 16 Nov. 2015 at 12:01 PM

News	8
Blog	5
Policy document (per source)	3
Patent	3
Wikipedia	3
Twitter (tweets and retweets)	1
Peer review (Publons, Pubpeer)	1
Weibo (not trackable since 2015, but historical data kept)	1
Google+ (not trackable since 2019, but historical data kept)	1
F1000	1
Syllabi (Open Syllabus)	1
LinkedIn (not trackable since 2014, but historical data kept)	0.5
Facebook (only a curated list of public Pages)	0.25
Reddit	0.25
Pinterest (not trackable since 2013, but historical data kept)	0.25
Q&A (Stack Overflow)	0.25
Youtube	0.25
Number of Mendeley readers	0
Number of Dimensions and Web of Science citations	0



Resolución de 20 de febrero de 2019, de la Secretaría de Estado de Universidades, Investigación, Desarrollo e Innovación, por la que se suspende el plazo máximo para resolver las solicitudes de evaluación de tramos de transferencia del conocimiento.

1. El número de solicitudes para la evaluación de tramos de transferencia (por áreas de conocimiento) que se han presentado en la convocatoria del año 2018 es el siguiente:

Ciencias: 5.840

Ingenierías y Arquitectura: 3.844

Economía y Ciencias Sociales: 2.944

Arte y Humanidades: 1.301

Ciencias Jurídicas: 1.242

Ciencias de la Salud: 837

Educación: 680

Expresión artística: 102

TOTAL:
16.790

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. - <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. - <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. - <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Número y compartición de las producciones destinadas a abordar retos específicos de clústers y Objetivos de Desarrollo Sostenible (SDGs)	Número y compartición de innovaciones y resultados científicos abordando retos específicos de clústers y SDGs	Efectos derivados del uso de resultados científicos e innovaciones financiadas por el FP para afrontar retos específicos de clústers y SDG
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según retos de clústers y SDGs. - Innovaciones, IPRs y otros productos producidos según los retos del clúster y los SDG. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las pymes y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Literatura científica sobre el impacto social conseguido para actividades de investigación e innovación del FP. - Redes sociales. - Repositorios y bases de datos de impacto social. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información, paneles de expertos y análisis de portafolios.
Método	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales. - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con los retos de los clústers y los SDGs abordados. - Estimación de la mejora total generada en la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. - <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Consiguiendo misiones R&I”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	TRANSFERENCIA	IMPACTO SOCIETAL
Indicador	Producciones en misiones específicas R&I	Resultados en misiones específicas R&I	Objetivos conseguidos en misiones específicas R&I
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Metadatos de publicación según misiones de R + I. - Innovaciones, IPRs y otros productos producidos. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de patentes. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Transferencia de tecnología e innovaciones en la industria 1) de las PYME participantes (datos de la CE) y 2) de las PYMEs y de la industria en general. - Transferencia de conocimiento y adopción 1) de las partes interesadas participantes (datos de la CE) y 2) de otros actores sociales relevantes. - Creación de spin-offs y start-ups. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Bases de datos de innovación. <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.	<u>Necesidades de datos:</u> - Evidencias de impacto social facilitadas por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Repositorios y bases de datos de impacto social - ORCID - Redes sociales <u>Quien proporciona esta información:</u> Beneficiarios, conjuntos de datos y sistemas de información.
	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con las misiones R&I. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,1% persona/mes	- Análisis métrico. - Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con las misiones R&I. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,2% persona/mes	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales - Algoritmo basándose en el número de impactos producidos por proyectos financiados del FP, de acuerdo con las misiones R&I abordadas - Estimación de la mejora total generada a la UE a causa de la replicabilidad y la sostenibilidad de las diferentes mejoras. Una comparación con las consecuencias de no disponer de financiación. - Modelización multivariante para explorar posibles relaciones de los tres sub-indicadores, si hay. <u>Coste:</u> Equivalente a <0,5% persona/mes

Itinerarios hacia el impacto clave “Implicando a la ciudadanía de la UE”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	INTERACCIONES INTERNAS CON LA CIUDADANÍA	INTERACCIONES EXTERNAS CON LA CIUDADANÍA	IMPACTO SOCIETAL
Indicador	Número y compartición de proyectos del FP en los que la ciudadanía de la UE contribuye a la co-creación de contenidos de R&I	Número y compartición de entidades beneficiarias del FP que desarrollan mecanismos de participación ciudadana para la R&I más allá de los proyectos del FP.	Incorporación de resultados científicos del FP y soluciones innovadoras por parte de la ciudadanía.
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Tipos de participantes en proyectos de FP (p. ex., ciudadanía individual, CSOs, administración pública, PYMES).. - Tipos de actividad / papel en que la ciudadanía participa en proyectos de FP (p. ex., beneficiario, órgano de consultoría, foro público, metodología comunicativa).. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Redes sociales. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos y sistemas de información	<u>Necesidades de datos:</u> - Evidencia de los mecanismos de participación de la ciudadanía de la UE proporcionados por investigadores e investigadoras, ciudadanía, medios de comunicación, empresas, instituciones políticas y publicaciones científicas. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Informes CSOs. - Redes sociales. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos y sistemas de información	<u>Necesidades de datos:</u> - Informes de la actividad de las entidades beneficiarias del FP en actividades, programas, productos e innovaciones. - Participación de la ciudadanía en las redes sociales sobre actividades, programas, productos e innovaciones basados en FP. - Compartición en Internet de la ciudadanía (y CSOs) sobre actividades, programas, productos e innovaciones basados en FP. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Redes sociales - Informes de CSOs. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos, sistemas de información, usuarios finales, otros actores sociales relevantes/ciudadanía.
	- Análisis de datos partir de la información proporcionada en las propuestas del proyecto. - Si es necesario, se pueden utilizar las siguientes metodologías para complementarlas: Análisis métrico; Análisis de redes sociales; Algoritmo basándose en el número de producciones realizadas por proyectos financiados del FP, de acuerdo con las misiones R&I; Modelización multivariante para explorar posibles relaciones de los beneficiarios individuales.	- Análisis métrico. - Análisis de redes sociales, seguimiento del tipo de participación de la ciudadanía en proyectos del FP y su influencia en el impacto social del FP. - El algoritmo se extraerá del número acumulativo y de la participación de las entidades beneficiarias que desarrollan un mecanismo de participación ciudadana para R+D más allá del proyecto del FP, que identifica esta información a través de los informes FP.	- Análisis métrico. - Análisis de redes sociales (tanto de abajo hacia arriba como de arriba hacia abajo) - Análisis de trayectorias de los perfiles de investigadores e investigadoras individuales - El algoritmo extraerá del número acumulado de actividades / programas / productos / innovaciones basadas en resultados científicos del FP que se mencionan por la ciudadanía y las CSOs, y el porcentaje de evidencia de implementación de acciones totales.
Método			

Itinerarios hacia el impacto clave “Dando apoyo a la formulación de políticas”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto	CONOCIMIENTO	INTERACCIONES POLÍTICAS	IMPACTO POLÍTICO
Indicador	Proyectos del FP que producen resultados políticos relevantes	Resultados políticos relevantes del FP que llegan a los responsables políticos	Documentos políticos que citen resultados del FP (se podría ampliar a evidencias de impactos políticos en base a resultados del FP)
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Breves informes políticos, recomendaciones políticas y documentos de posicionamiento producidos por proyectos del FP. - Boletines, informes y documentos similares de agencias europeas y nacionales, comités, parlamentos y otros organismos institucionales, informes de debates, talleres, seminarios, entre otros, conferencias realizadas bajo proyectos del FP, dirigidos a los responsables políticos. <u>Fuentes:</u> - Bases de datos. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos y sistemas de información.	<u>Necesidades de datos:</u> - Interacciones con los responsables políticos a través de diferentes tipos de actividades relacionadas con proyectos del FP: foros políticos, reuniones, consultas, solicitudes de políticas, organismos asesores, etc. - Interacciones con los responsables políticos a través de diferentes tipos de actividades relacionadas con proyectos del FP que se dan en Internet. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Redes sociales. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos, sistemas de información, responsables políticos y ciudadanía.	<u>Necesidades de datos:</u> - Evidencias de impacto político en base a resultados del FP, comunicadas por los beneficiarios a la EC, responsables políticos y ciudadanía. - Evidencias de impacto político basadas en resultados del FP, subidas a repositorios de impacto social y político. <u>Fuentes:</u> - SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, EUR-Lex, EUR-Lex, SIOR. - Estados miembro y bases de datos y boletines de políticas regionales. <u>Quien proporciona esta información:</u> Beneficiarios, otros actores sociales relevantes, ciudadanía.
Método	- Análisis métrico. - El algoritmo se extraerá de la compartición de proyectos del FP que produzcan resultados políticos que aborden objetivos de la política de la UE, entre todos los resultados de políticas. El análisis representaría el alcance del resultado de la política (local, regional, nacional e internacional). <u>Coste:</u> Equivalente a <0,7% persona/mes	- Análisis métrico. - Análisis de redes sociales: supervisar como la difusión de proyectos del FP comparten resultados con audiencias políticas mediante el seguimiento de palabras clave y otros identificadores de los resultados de los proyectos del FP y los objetivos de la política de la UE. - Se obtendrá un algoritmo a partir del número y la proporción de proyectos que informen las interacciones de la política de la UE, así como el número de interacciones diseminadas por la ciudadanía y las partes interesadas más allá de las actividades del proyecto y su vida útil. <u>Coste:</u> Equivalente a <0,12% persona/mes	- Análisis métrico. - El algoritmo se extraerá de las diversas pruebas de impacto político. <u>Coste:</u> Equivalente a <0,35% persona/mes

Itinerarios hacia el impacto clave “Abordando Retos Globales”

Corto plazo
Conocimiento

Medio plazo
Transferencia

Largo plazo
Impacto societal

4.1 Key Impact Pathway “Addressing Global Challenges”

Short-term indicator	Number and share of outputs aimed at addressing specific cluster challenges and Sustainable Development Goals (SDGs)
Sub-indicators	- Number and share of articles published in peer review journals from FP funded activities in relation to cluster challenges and SDGs. - Number and share of innovations produced (e.g. prototypes, clinical trials that could be applied, products -goods or services-, processes, distribution methods, organisational or marketing methods, databases or infrastructures) from FP funded activities in relation to cluster challenges and SDGs. - Number and share of intellectual property rights produced in relation to cluster challenges and SDGs (e.g. patents, trademarks, registered designs, utility models).
Definition (s)	Number and share of outputs that have been produced related to specific cluster challenges and SDGs, therefore with potential to enable societal impact.
Rationale	Research-based outputs in any field are needed to later achieve results beyond academia and social impacts. Therefore, identifying outputs according to clusters of challenges and SDGs is an appropriate measure of the short-term progress towards them.
Assumptions	All projects generate outputs. Those that are addressing SDGs are assumed to potentially represent progress towards these global challenges, therefore societal impact.
Data/Information needs and source(s)	Data needs: - Publication metadata according to cluster challenges and SDGs. - Innovations, IPRs and other outputs produced according to cluster challenges and SDGs. Sources: - Databases and information systems: SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, TIM analytics, as well as commercially available bibliometric databases. - Patent databases (e.g. ESPACENET, EPO; WIPO). - Innovation databases (e.g. European Innovation Scoreboard²⁴, TIM).
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of outputs (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm will allocate different weights to the three Sub-indicators and will reward the diversity of outputs among the three. - Multivariate modelling will be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: Information to be provided by the beneficiaries but needs no elaboration. Some output information (publications) can be also gathered through commercially available bibliometric databases.

Medium-term indicator	Number and share of innovations and scientific results addressing specific cluster challenges and SDGs
Sub-indicators	- Number and share of technology transfers to industry (including beneficiary SMEs and other enterprises beyond FP funding). - Number and share of knowledge transfers and adoptions by diverse stakeholders (including beneficiaries and other stakeholders beyond FP funding). - Number and share of changes in professional standards, protocols, practices and services on stakeholder's activity and organisation (including beneficiaries and other stakeholders beyond FP funding).
Definition (s)	Number and share of results that have been obtained, related to specific cluster challenges and SDGs, understanding results as what has been introduced and adopted by industry, market, citizens and/or diverse stakeholders because of FP research and innovation.
Rationale	When companies, market, institutions or citizens use knowledge resulting from FP research and innovation activities, there is transference, and therefore potential for achieving societal impact.
Assumptions	It is easier to track innovations and transfer to SMEs and other stakeholders which participate as beneficiaries in the FP, and this could be used as mid-term estimate. However, citizens', companies' and stakeholders' uptake of research results is what would interest most here, with potential to enable societal impact.
Data/Information needs and source(s)	Data needs: - Technology transfer and innovations in industry 1) from participant SMEs (EC data) and 2) from SMEs and industry in general. - Knowledge transfer and adoption 1) from participant stakeholders (EC data) and 2) from stakeholders in general. - Creation of spin-offs and start-ups. Sources: - Datasets and information systems: SyGMA, CORDA, CORDIS, OpenAire, European Data Portal. - Innovation databases (e.g. European Innovation Scoreboard, TIM analytics)
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of results (see basket of sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity of results among the three. - Multivariate modelling would be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: It entails that beneficiaries like SMEs, institutions and other stakeholders would report the innovations they are using. Other data would be collected from innovation databases.

Longer-term indicator	Effects from the use of FP-funded scientific results and innovations on tackling specific cluster challenges and SDGs
Sub-indicators	- Number and share of evidence of improvements in relation to the previous situation tackling specific cluster challenges and SDGs. - Number and share of evidence of replicability of those improvements. - Number and share of evidence of sustainability of the improvement achieved.
Definition (s)	Evidence of societal impact resulting from the use of FP funded research which address specific cluster challenges and SDGs.
Rationale	The monitoring of the evidence of societal impact from FP funded research is the best longer-term indicator to evaluate the progress towards addressing cluster challenges and SDGs. Global challenges are being addressed when we have evidence supporting this, therefore assessment of societal impact evidence is required.
Assumptions	Researchers are increasingly using social impact databases to gather evidence about societal impact. Social media reflects citizens and stakeholders beyond academia; they can provide evidence about the impact beyond the lifespan of funded projects.
Data/Information needs and source(s)	Data needs: - Evidence of societal impact provided by researchers, citizens, media, companies, political institutions and scientific publications. Sources: - Scientific literature about the societal impact attained by FP research and innovation activities - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, among others. Through the APIs and other open libraries tools, it is possible to access data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions found in each social media (e.g. privacy policies, limit maximum number posts/tweets collected, number maximum of historical days). - Repositories and databases on social impact (or including societal impact evidence): OpenAire, ImpactStory, SIDR, ORCID as well as those commercially available like Researchfish.
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems, expert panels and portfolio analysis. - Metric analysis. - Social media analytics (both bottom up and top down): 1) Monitoring how the societal impact evidence provided by beneficiaries are shared in social media, through monitoring page views, keywords and other identifiers related to societal impact evidence and results; 2) Monitoring the social media data of results and data analysis to identify the societal impact evidence provided by citizens, through data mining and machine learning. - Trajectories' analysis from individual researchers' profiles (e.g. ORCID data). - Algorithm drawing on the number of impacts (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity among the three. - An estimation would be performed to provide an estimate of the total improvement generated in the EU because of the replicability and sustainability of the different improvements. A comparison with the

Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,5% of person months.
Level of reporting burden for beneficiaries	An indicative example would be: Medium: Beneficiaries should gather evidence of societal impact related to their research and innovation activities in social impact repositories and other; once these evidence are reported and stored, analysing data and trajectories is low demanding.

Itinerarios hacia el impacto clave “Consiguiendo Misiones R&I”

Corto plazo
Conocimiento

Medio plazo
Transferencia

Largo plazo
Impacto societal

4.1 Key Impact Pathway “Addressing Global Challenges”

Short-term indicator	Number and share of outputs aimed at addressing specific cluster challenges and Sustainable Development Goals (SDGs)
Sub-indicators	- Number and share of articles published in peer review journals from FP funded activities in relation to cluster challenges and SDGs. - Number and share of innovations produced (e.g. prototypes, clinical trials that could be applied, products – goods or services –, processes, distribution methods, organisational or marketing methods, databases or infrastructures) from FP funded activities in relation to cluster challenges and SDGs. - Number and share of intellectual property rights produced in relation to cluster challenges and SDGs (e.g. patents, trademarks, registered designs, utility models).
Definition (s)	Number and share of outputs that have been produced related to specific cluster challenges and SDGs, therefore with potential to enable societal impact.
Rationale	Research-based outputs in any field are needed to later achieve results beyond academia and social impacts. Therefore, identifying outputs according to clusters of challenges and SDGs is an appropriate measure of the short-term progress towards them.
Assumptions	All projects generate outputs. Those that are addressing SDGs are assumed to potentially represent progress towards these global challenges, therefore societal impact.
Data/Information needs and source(s)	Data needs: - Publication metadata according to cluster challenges and SDGs. - Innovations, IPRs and other outputs produced according to cluster challenges and SDGs. Sources: - Databases and information systems: SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, TIM analytics, as well as commercially available bibliometric databases. - Patent databases (e.g. ESPACENET, EPO; WIPO). - Innovation databases (e.g. European Innovation Scoreboard²⁴, TIM).
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of outputs (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm will allocate different weights to the three Sub-indicators and will reward the diversity of outputs among the three. - Multivariate modelling will be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: Information to be provided by the beneficiaries but needs no elaboration. Some output information (publications) can be also gathered through commercially available bibliometric databases.

Medium-term indicator	Number and share of innovations and scientific results addressing specific cluster challenges and SDGs
Sub-indicators	- Number and share of technology transfers to industry (including beneficiary SMEs and other enterprises beyond FP funding). - Number and share of knowledge transfers and adoptions by diverse stakeholders (including beneficiaries and other stakeholders beyond FP funding). - Number and share of changes in professional standards, protocols, practices and services on stakeholder's activity and organisation (including beneficiaries and other stakeholders beyond FP funding).
Definition (s)	Number and share of results that have been obtained, related to specific cluster challenges and SDGs, understanding results as what has been introduced and adopted by industry, market, citizens and/or diverse stakeholders because of FP research and innovation.
Rationale	When companies, market, institutions or citizens use knowledge resulting from FP research and innovation activities, there is transference, and therefore potential for achieving societal impact.
Assumptions	It is easier to track innovations and transfer to SMEs and other stakeholders which participate as beneficiaries in the FP, and this could be used as midterm estimate. However, citizens', companies' and stakeholders' uptake of research results is what would interest most here, with potential to enable societal impact.
Data/Information needs and source(s)	Data needs: - Technology transfer and innovations in industry 1) from participant SMEs (EC data) and 2) from SMEs and industry in general. - Knowledge transfer and adoption 1) from participant stakeholders (EC data) and 2) from stakeholders in general. - Creation of spin-offs and start-ups. Sources: - Datasets and information systems: SyGMA, CORDA, CORDIS, OpenAire, European Data Portal. - Innovation databases (e.g. European Innovation Scoreboard, TIM analytics)
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems - Metric analysis. - Algorithm drawing on the number of results (see basket of sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity of results among the three. - Multivariate modelling would be used to explore the potential relationships of the three Sub-indicators, if any.
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,1% of person months.
Level of reporting burden for beneficiaries	Low: It entails that beneficiaries like SMEs, institutions and other stakeholders would report the innovations they are using. Other data would be collected from innovation databases.

Longer-term indicator	Effects from the use of FP-funded scientific results and innovations on tackling specific cluster challenges and SDGs
Sub-indicators	- Number and share of evidence of improvements in relation to the previous situation tackling specific cluster challenges and SDGs. - Number and share of evidence of replicability of those improvements. - Number and share of evidence of sustainability of the improvement achieved.
Definition (s)	Evidence of societal impact resulting from the use of FP funded research which address specific cluster challenges and SDGs.
Rationale	The monitoring of the evidence of societal impact from FP funded research is the best longer-term indicator to evaluate the progress towards addressing cluster challenges and SDGs. Global challenges are being addressed when we have evidence supporting this, therefore assessment of societal impact evidence is required.
Assumptions	Researchers are increasingly using social impact databases to gather evidence about societal impact. Social media reflects citizens and stakeholders beyond academia; they can provide evidence about the impact beyond the lifespan of funded projects.
Data/Information needs and source(s)	Data needs: - Evidence of societal impact provided by researchers, citizens, media, companies, political institutions and scientific publications. Sources: - Scientific literature about the societal impact attained by FP research and innovation activities - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, among others. Through the APIs and other open libraries tools, it is possible to access data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions found in each social media (e.g. privacy policies, limit maximum number posts/tweets collected, number maximum of historical days). - Repositories and databases on social impact (or including societal impact evidence): OpenAire, ImpactStory, SIDR, ORCID as well as those commercially available like Researchfish.
Who is providing this information?	Beneficiaries, datasets and information systems, expert panels and portfolio analysis.
Detailed methodology for indicator computation	- Metric analysis. - Social media analysis (both bottom up and top down): 1) Monitoring how the societal impact evidence provided by beneficiaries are shared in social media, through monitoring page views, keywords and other identifiers related to societal impact evidence and results; 2) Monitoring the social media data of results and data analysis to identify the societal impact evidence provided by citizens, through data mining and machine learning. - Trajectories' analysis from individual researchers' profiles (e.g. ORCID data). - Algorithm drawing on the number of impacts (see basket of Sub-indicators) produced by FP funded projects, according to cluster challenges and SDGs addressed. The algorithm would allocate different weights to the three Sub-indicators and would reward the diversity among the three. - An estimation would be performed to provide an estimate of the total improvement generated in the EU because of the replicability and sustainability of the different improvements. A comparison with the

Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,5% of person months.
Level of reporting burden for beneficiaries	An indicative example would be: Medium: Beneficiaries should gather evidence of societal impact related to their research and innovation activities in social impact repositories and other; once these evidence are reported and stored, analysing data and trajectories is low demanding.

Itinerarios hacia el impacto clave

“Implicación a la ciudadanía de la UE”



Corto plazo
Interacciones
internas

Medio plazo
Interacciones
externas

Largo plazo
Impacto
societal

4.3 Key Impact Pathway “Engaging EU citizen”

Short-term indicator	Number and share of FP projects where EU citizens contribute to the co-creation of R&I content
Sub-indicators	- Number and share of FP projects where EU citizens contribute as beneficiaries. - Number and share of FP projects where EU citizens contribute through different type of activities (e.g. consultancy body, public forum, communicative methodology).
Definition (s)	Number and share of FP projects that include the participation of citizens at some stage of the research and innovation process to contribute to the co-creation of R&I content.
Rationale	Co-creation of knowledge is considered to increase societal impact of research through aligning research and social needs. It is therefore an appropriate measure of the short-term progress towards enabling societal impact.
Assumptions	Citizens' contribution to the co-creation of R&I content might be fostered and feasible in different research and innovation fields. Citizens can make their own contributions as well as participate through civil society organisations (CSO).
Data/Information needs and source(s)	Data needs: - Type of participants in FP projects (e.g. individual citizens, CSOs, public administration, SMEs). - Type of activity/role in which citizens participate in FP projects (e.g. beneficiary, consultancy body, public - Social media.
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems. - Data analysis from the information provided in the project proposals. If needed, the following methodologies can be used as complementary: - Metric analysis. - Social media analytics (Pulido et al, 2018), monitoring the types of participation by citizens in FP projects, and their influence in the FP societal impact. - Algorithm drawing on the types of citizens' activities/roles (see basket of sub-indicators) in FP funded projects. The algorithm would allocate different weights to the diverse types of activities/roles and would reward the diversity among them. - Multivariate modelling would be used to analyse the relationship between types of participation and societal impact.
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (Incl. access to external databases)	Equivalent to <0,5% of person months.
Level of reporting burden for beneficiaries	Low: It entails collecting data from citizens' participation in projects

Medium-term indicator	Number and share of FP beneficiary entities developing citizen engagement mechanisms for R&I beyond FP project.
Definition (s)	Number and share of FP beneficiary entities that develop specific mechanisms for citizen engagement in R&I activities beyond FP projects.
Rationale	The development of citizen engagement mechanisms is an appropriate measure of the medium-term progress towards promoting the engagement of EU citizens.
Assumptions	Citizen engagement in R&I is feasible in different research and innovation fields and with diverse beneficiary entities.
Data/Information needs and source(s)	Data needs: - Evidence of EU citizens' engagement mechanisms provided by researchers, citizens, media, companies, political institutions and scientific publications. Sources: - Datasets and information systems: SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal. - CSO reports - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, among others. Through the API's and other open libraries' tools, it is possible to access data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions found in each social media (e.g. privacy policies, limit maximum number posts/twitter collected, number maximum of historical days).
Who is providing this information? Detailed methodology for indicator computation	Beneficiaries, datasets and information systems. - Metric analysis. - Social media analytics, monitoring the types of participation by citizens in FP projects, and their influence in the FP societal impact. - The algorithm would be drawn from the cumulative number and share of beneficiary entities developing
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (Incl. access to external databases)	Equivalent to <0,08% of person months.
Level of reporting burden for beneficiaries	Medium: it entails collecting data from beneficiaries' activity beyond FP funding

Longer-term indicator	Uptake of FP scientific results and innovative solutions by citizen
Sub-indicators	- Number of activities/programmes/products which are based on FP scientific results that have been implemented by citizens and civil society organisations (CSO). - Percentage of FP scientific results and innovative solutions by number of end-users reached.
Definition (s)	Number of activities/programmes/products which are based on FP scientific results that have been implemented by citizens and CSOs.
Rationale	EU citizens' uptake of FP scientific results and innovative solutions is achieved when citizens and CSO use results from research to build up and develop their daily practices. Therefore, this is an appropriate longterm indicator to monitor the progress towards enabling societal impact.
Assumptions	The uptake of FP scientific results and innovative solutions by citizens is feasible in different scientific fields and R&I missions.
Data/Information needs and source(s)	Data needs: - Reporting activity from FP beneficiary entities on activities, programmes, products and innovations. - Citizens' share in the social media about activities, programmes, products and innovations which are FP based. - Citizens' (and CSO) share in internet about activities, programmes, products and innovations which are FP based. Sources: - Datasets and information systems: SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal. - Social media: Pages (e.g. websites, blogs, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, through the API's and other open libraries tools to access social data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions of each social media (e.g. privacy policies, limit maximum number posts/twitter collected, number maximum of historical days). - CSO reports.
Who is providing this information?	Beneficiaries, datasets, information systems, endusers/stakeholders/citizens.
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics (top-down and bottom up approaches on FP based innovative solutions identified): Monitoring the social media data of FP scientific results and innovative solutions identified through data mining and machine learning. - The algorithm would be drawn from the cumulative number of activities/programmes/products/innovations based on FP scientific results which are mentioned by citizens

Frequency of measurement	Implementation from total shares. Percentiles would be used to establish low, medium and high benchmarking levels of uptake of FP scientific results and innovative solutions by citizen.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (Incl. access to external databases)	Equivalent to <0,4% of person months.
Level of reporting burden for beneficiaries	Medium: it entails collecting data from beneficiaries' activity beyond FP funding, as well as collecting data related to beneficiaries' activity through social media.



Itinerarios hacia el impacto clave “Apoyando la formación de políticas”



Corto plazo Conocimiento

Medio plazo Interacciones políticas

Largo plazo Impacto político

4.4 Key Impact Pathway “Supporting policy-making”

Short-term Indicator	FP projects producing policy relevant findings
Sub-indicators	Number and share of FP projects producing policy briefs or other policy outputs which address EU policy targets.
Definition (s)	Number and share of projects producing findings that are relevant for policy-making because they address EU policy targets.
Rationale	Research and innovation based policy relevant knowledge is needed to achieve results and impacts in later stages and therefore is an appropriate measure of the short-term progress towards supporting policy-making at local, regional, national, international level.
Assumptions	Policy relevant findings are assumed to be outputs of the project (e.g. policy briefs or recommendations) which address the policy targets already decided by the EU through European citizens’ representatives.
Data/Information needs and source(s)	Data needs: - Policy briefs, policy recommendations and position papers produced by FP projects. - Bulletins, reports and similar type of documents from European and national agencies, committees, Parliaments, and other institutional bodies, reporting debates, workshops, seminars among others-conferences produced by FP projects, addressed to policymakers. Sources: - Data bases: SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal.
Who is providing this information?	Beneficiaries, datasets and information systems
Detailed methodology for indicator computation	- Metric analysis. - The algorithm would be drawn from the share of FP projects producing policy outputs that address EU policy targets, among all policy outputs. The analysis would account for the scope of the policy output (local, regional, national, international).
Frequency of measurement	Annually, after one year of FP implementation and until FP finalisation.
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,7% of person months.
Level of reporting burden for beneficiaries	Low: Information to be provided by the beneficiaries, and it would need no elaboration.

Medium-term Indicator	FP policy relevant findings reaching policy makers
Sub-indicators	- Number and share of projects promoting policy interactions (e.g. forums, conferences, consultations) in relation to EU policy targets by scope of the interaction (e.g. local, regional, national, international). - Number and share of policy interactions with FP projects disseminated beyond FP project activities, in relation to EU policy targets by scope of the interaction (e.g. local, regional, national, international).
Definition (s)	Number and share of projects with policy relevant findings that reach policy makers through policy forums and other type of interactions. Policy findings are considered relevant when they address EU policy targets.
Rationale	Dialogue with policy makers is needed to transfer the results into policy recommendations relevant for society according to EU targets, and finally influence policy making.
Assumptions	Reaching policy makers can be done through different type of outreach activities (e.g. policy forums, meetings, advisory bodies, communicative methodology).
Data/Information needs and source(s)	Data needs: - Interactions with policy makers through different type of activities linked to FP projects: policy forums, meetings, consultations, policy requests, advisory bodies, etc. (e.g. interactions reported by beneficiaries). - Interactions with policy makers through different type of activities linked to FP projects done in internet: (e.g. forum interactions in the online public sphere). Sources: - Datasets and information systems: SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, EUR-Lex, SIOR. - Social media: Pages (e.g. websites, blog, forums) Twitter, Facebook, Instagram, google+, YouTube, Wikipedia, through the APIs and other open libraries tools to access social data (e.g. tweets, posts, comments, page views). The data available are limited to the restrictions of each social media (e.g. privacy policies, limit maximum number posts/twitter collected, number maximum of historical days).
Who is providing this information?	Beneficiaries, datasets, information systems, policymakers and citizens.
Detailed methodology for indicator computation	- Metric analysis. - Social media analytics: Monitoring how FP projects dissemination (e.g. forums, conferences, consultations) are sharing results with policy audiences, through monitoring keywords and other identifiers of FP projects results and EU policy targets. - An algorithm would be drawn from the number and share of projects that report policy interactions in relation to EU policy targets, as well as the number of interactions disseminated by citizens and stakeholders beyond project activities and lifetime. Analysis would look at scope of the policy interactions (local, regional, national, international) weighting differently each of them.
Frequency of measurement	Annually, after three years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,12% of person months.
Level of reporting burden for beneficiaries	Medium: It would entail beneficiaries reporting on policy driven outreach activities. However, this would be complemented by information found in internet, beyond projects.

Longer-term Indicator	Policy documents citing FP findings (This title could be widened to evidence of policy impacts based on FP findings)
Sub-indicators	- Number of policy documents citing knowledge from FP findings, by scope of the interaction (e.g. local, regional, national, international). - Policy makers citing knowledge from FP findings as the basis of their policy proposals. - Content analysis of the relation between FP findings and subsequent policies.
Definition (s)	Number of policy documents with evidence of having been influenced by findings from research and innovation activities, developed by governments (local, regional, national, international) or institutions.
Rationale	Policy impact is achieved when policies include findings and policy recommendations from FP research and innovation activities. Influence in policy-making would be relevant for the potential long-term societal impact.
Assumptions	Policy documents include a variety of official documents developed by governments or institutions of diverse scope. They include, for instance, regulations, directives, decisions, resolutions, recommendations, communications, declarations, treaties, protocols, plans of action, programmes, conventions or agreements.
Data/Information needs and source(s)	Policy documents rarely cite findings from research and innovation activities they might have used. Anyhow there are different forms of providing evidence of research and innovation influence on policy. Data needs: - Evidence of policy impact based on FP findings, reported by beneficiaries to the EC, policy maker and citizens. - Evidence of policy impact based on FP findings, uploaded to social & policy impact repositories. - Evidence of policy impact of FP projects published in peer review journals. Sources: - SyGMa, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, EUR-Lex, SIOR. - Member States, and regional policy databases and bulletins (e.g. BOE, Bundesanzeiger, Belgisch Staatsblad, Gazzetta Ufficiale).
Who is providing this information?	Beneficiaries, Policy makers, Citizens.
Detailed methodology for indicator computation	- Metric analysis. - The algorithm would be drawn from the diverse evidence of policy impact. Percentiles would be used to establish low, medium and high benchmarking levels of Policy impact evidence citation index.
Frequency of measurement	Annually, after five years of FP implementation (although it could start since year 1).
Assessment of indicator quality and comparability with existing monitoring systems of EC and Member States	RACER: Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation.
Estimated cost of data collection (incl. access to external databases)	Equivalent to <0,35% of person months.
Level of reporting burden for beneficiaries	Low: it would entail collecting data from other organisations/individuals.



➤ ¿Es el impacto social la nueva prioridad de la investigación en la EU y a nivel mundial?

➤ ¿Cómo diferenciar el impacto social de la difusión y la transferencia?

➤ ¿Esta prioridad excluye la investigación fundamental o básica o la que no da directamente impacto social?

➤ ¿Cómo se evaluará ese impacto en los proyectos del próximo programa marco de investigación de la UE?

➤ ¿Qué retos tenemos en predecir, recoger y mostrar las evidencias de impacto?

¿Qué indicadores se utilizan normalmente para medir el impacto social?

- Muchos organismos no miden el impacto social con indicadores.
- Entre los que utilizan indicadores, todavía hay mucha confusión entre la difusión, la transferencia y el impacto social.

■

Impacto Social	Difusión (presencia en los medios de comunicación, público, ...)
	Uso de resultados de investigación en documentos no académicos (por ejemplo, guías, materiales didácticos, ...)
	Cambios de comportamientos o prácticas
	Mejoras
	Participación del público
Impacto político	Colaboraciones con políticos
	Uso de resultados de investigación en políticas

Indicadores encontrados en:
REF (UK); NIHR (UK); SEP (Países Bajos); CAHS (Canadá); NSF, NIH (Estados Unidos); Literatura científica

Indicadores no encontrados en: Rusia, China, Japón, Corea, Sudáfrica, India, Brasil, otros países

Ejemplo: Canadian Academy of Health Sciences



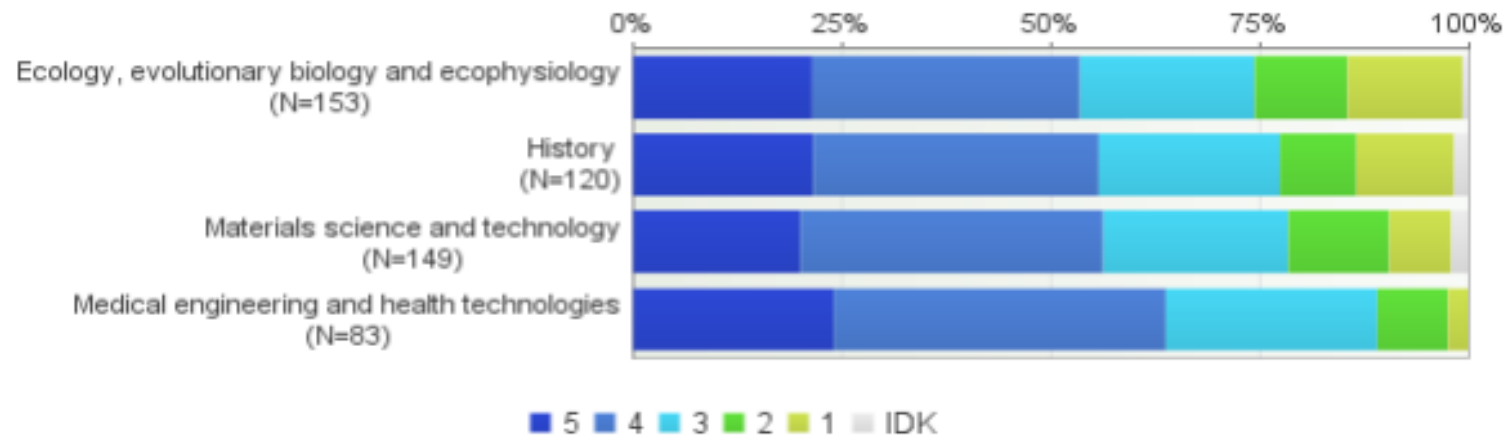
FRAMEWORK	Health R&D	Primary Outputs/ Dissemination	Secondary Outputs	Adoption	Final outcomes
IMPACT CATEGORIES					
Advancing Knowledge	• New molecular technique developed	• Publication of research results in a journal			
Research Capacity	• Research PhD gained by team member		• Further research in Industry		
Informing Decision Making		• Discussions between researchers and pharma define direction of pharma research	• Pharma company initiates research program to develop a drug	• Drug developed passed for use by the health system	
Health Impacts				• Adoption by the health system causes increased cost of drugs • Decreased re-admission for condition	• Reduced condition burden in the population
Broad Economic and Social Impacts			• Employment in the pharma company	• Sales of drugs by pharma	• Improved workplace productivity • Social and economic benefit of "wellness"

Source: http://www.cahs-acss.ca/wp-content/uploads/2011/09/ROI_FullReport.pdf

Ejemplo: State of Scientific Research in Finland 2016. Special theme: Broader impact of research in society



Research is discussed with various stakeholders (e.g. at meetings, workshops)



Knowledge is interpreted for a general audience (e.g. via popular articles, exhibitions)



Ejemplo: REF2014



Panel A - Clinical Medicine; Public Health, Health Services and Primary Care; Allied Health Professions, Dentistry, Nursing and Pharmacy; Psychology, Psychiatry and Neuroscience; Biological Sciences; Agriculture, Veterinary and Food Science

Table A2 Examples of evidence and indicators of impact³

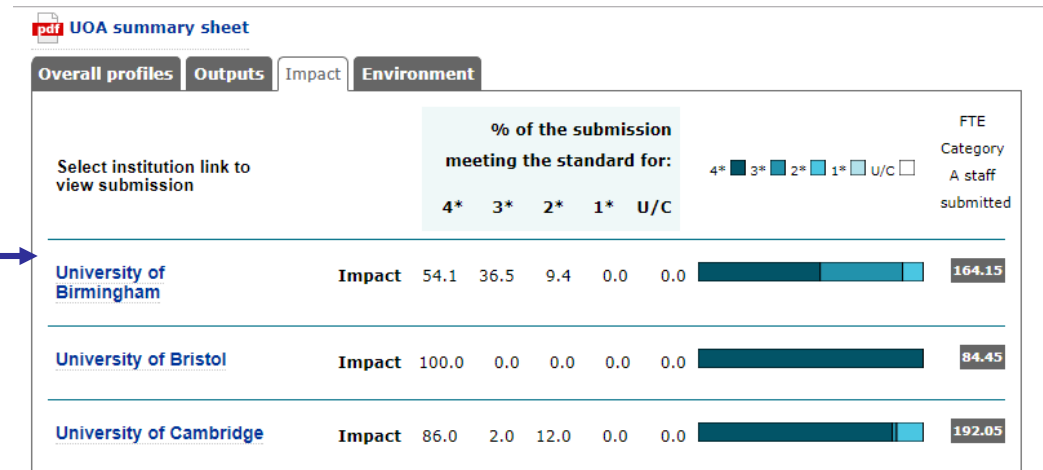
Impacts on health and welfare

- Measures of improved clinical outcomes, public behaviour or health services (lives saved, reduced infection rates).
- Measures of improved well-being.
- Documented changes to clinical and public health guidelines (documented references to research evidence in guidelines).
- Evidence from audit, change in guidelines.
- Documented changes to animal welfare codes or guidelines.
- Evidence of enhanced awareness of health risks and benefits by consumers.

1 - Clinical Medicine
University of Birmingham

% of the submission meeting the standard for:

	4*	3*	2*	1*	U/C
Overall	27	53	18	1	1
Outputs	17.0	55.7	24.6	1.1	1.6
Impact	54.1	36.5	9.4	0.0	0.0
Environment	37.5	62.5	0.0	0.0	0.0



Ejemplo: National Science Foundation Approach



NATIONAL SCIENCE FOUNDATION		
	INTELLECTUAL MERIT	BROADER IMPACTS
APPROACH	Advance knowledge and understanding within its own field or across different fields Activity suggest and explore creative, original, or potentially transformative concepts	NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes. Such outcomes include, but are not limited to: 1. full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); 2. improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; 3. improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; 4. increased partnerships between academia, industry, and others; improved national security; 5. increased economic competitiveness of the United States; 6. enhanced infrastructure for research and education.
RECOMMENDATION	The following information must be provided: (a) the NSF award number, amount and period of support; (b) the title of the project; (c) a summary of the results of the completed work, including accomplishments, supported by the award. The results must be separately described under two distinct headings: Intellectual Merit and Broader Impacts; (d) a listing of the publications resulting from the NSF award (a complete bibliographic citation for each publication must be provided either in this section or in the References Cited section of the proposal); if none, state "No publications were produced under this award." (e) evidence of research products and their availability, including, but not limited to: data, publications, samples, physical collections, software, and models, as described in any Data Management Plan; and (f) if the proposal is for renewed support, a description of the relation of the completed work to the proposed work. If the project was recently awarded and therefore no new results exist, describe the major goals and broader impacts of the project. Note that the proposal may contain up to five pages to describe the results. Results may be summarized in fewer than five pages, which would give the balance of the 15 pages for the Project Description.	

¿Cómo se recopilan los datos relevantes?

FUENTES	QUIEN
• Auto-información • Estudios de caso • Encuestas a los beneficiarios • Revisiones de expertos y expertas • Seguimiento de bases de datos • Minería de datos de documentos • Encuestas a otros actores sociales relevantes • Entrevistas con los co-solicitantes, colaboradores, representantes de los paneles de selección y otros actores sociales externos pertinentes	Todas las agencias utilizan la información de los investigadores e investigadoras La mayoría de las agencias piden a los investigadores e investigadoras que investiguen evidencias de impacto social La mayoría de las agencias también utilizan información de instituciones y otros informadores, además de investigadores e investigadoras



¿Qué podemos aprender de la experiencia mundial para realizar un seguimiento del impacto del Programa Marco?



1. Es necesario superar la confusión entre los indicadores de difusión, transferencia e impacto social. El hecho de que el conocimiento científico producido llegue fuera de la academia y también se extienda mucho más allá no significa que se haya producido impacto social
2. La mayoría de los sistemas de I+D no utilizan indicadores RACER (*Relevant, Accepted, Credible, Easy to monitor and Robust against manipulation*), pero utilizan otros que suelen ser muy amplios.
3. Se requiere la contribución de los investigadores e investigadoras a aportar información y debe complementarse con otras fuentes.
4. Aunque el impacto científico está relacionado principalmente con la comunidad científica, su impacto social y evaluación requieren las voces de la ciudadanía y otros actores sociales relevantes.



¿Cuáles son los principales retos metodológicos?

- La creación de una cultura entre investigadores e investigadoras sobre el impacto social, que ha requerido décadas para ser adoptada en el caso del impacto científico
- El uso de metodologías que puedan responder a los requisitos a corto plazo y al mismo tiempo promover la creación de instrumentos y culturas que permitan la orientación continua de la investigación hacia el impacto social

Itinerarios hacia el impacto clave “Dando apoyo a la formulación de políticas”



	Indicador de corto plazo	Indicador de medio plazo	Indicador de largo plazo
Concepto Indicador	CONOCIMIENTO Proyectos del FP que producen resultados políticos relevantes	INTERACCIONES POLÍTICAS Resultados políticos relevantes del FP que llegan a los responsables políticos	IMPACTO POLÍTICO Documentos políticos que citen resultados del FP (se podría ampliar a evidencias de impactos políticos en base a resultados del FP)
Datos / necesidades de información y fuente(s)	<u>Necesidades de datos:</u> - Breves informes políticos, recomendaciones políticas y documentos de posicionamiento producidos por proyectos del FP. - Boletines, informes y documentos similares de agencias europeas y nacionales, comités, parlamentos y otros organismos institucionales, informes de debates, talleres, seminarios, entre otros, conferencias realizadas bajo proyectos del FP, dirigidos a los responsables políticos. <u>Fuentes:</u> - Bases de datos. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos y sistemas de información.	<u>Necesidades de datos:</u> - Interacciones con los responsables políticos a través de diferentes tipos de actividades relacionadas con proyectos del FP: foros políticos, reuniones, consultas, solicitudes de políticas, organismos asesores, etc. - Interacciones con los responsables políticos a través de diferentes tipos de actividades relacionadas con proyectos del FP que se dan en Internet. <u>Fuentes:</u> - Conjunto de datos y sistemas de información. - Redes sociales. <u>Quien proporciona esta información:</u> Beneficiarios, conjunto de datos, sistemas de información, responsables políticos y ciudadanía.	<u>Necesidades de datos:</u> - Evidencias de impacto político en base a resultados del FP, comunicadas por los beneficiarios a la EC, responsables políticos y ciudadanía. - Evidencias de impacto político basadas en resultados del FP, subidas a repositorios de impacto social y político. <u>Fuentes:</u> - SyGMA, CORDA, CORDIS, OpenAire, EU Open Data Portal, European Data Portal, EUR-Lex, EUR-Lex, SIOR - Estados miembro y bases de datos y boletines de políticas regionales. <u>Quien proporciona esta información:</u> Beneficiarios, otros actores sociales relevantes, ciudadanía.
Método	- Análisis métrico. - El algoritmo se extraerá de la comparación de proyectos del FP que produzcan resultados políticos que aborden objetivos de la política de la UE, entre todos los resultados de políticas. El análisis representaría el alcance del resultado de la política (local, regional, nacional e internacional). <u>Coste:</u> Equivalente a <0,7% persona/mes	- Análisis métrico. - Análisis de redes sociales: supervisar como la difusión de proyectos del FP comparten resultados con audiencias políticas mediante el seguimiento de palabras clave y otros identificadores de los resultados de los proyectos del FP y los objetivos de la política de la UE. - Se obtendrá un algoritmo a partir del número y la proporción de proyectos que informen las interacciones de la política de la UE, así como el número de interacciones diseminadas por la ciudadanía y las partes interesadas más allá de las actividades del proyecto y su vida útil. <u>Coste:</u> Equivalente a <0,12% persona/mes	- Análisis métrico. - El algoritmo se extraerá de las diversas pruebas de impacto político. <u>Coste:</u> Equivalente a <0,35% persona/mes

Informazio Jardunaldia:
Zientziaren inpaktu sozial eta politikoa

Jornada Informativa:
Impacto social y político de la ciencia

Antolatzaileak / Organizadores:

ikerbasque
Basque Foundation for Science



***Evaluación y monitoreo del impacto social y político de los
programas de investigación en todas las ciencias***

***Jakintza arlo guztietako ikerketa-programei buruzko inpaktu
sozial eta politikoaren ebaluazioa eta monitorizazioa***

Our vision

A sustainable, fair and **prosperous** future for **people** and **planet** based on European values.

- Tackling **climate change** (35 % budgetary target)
- Helping to achieve **Sustainable Development Goals**
- Boosting the Union's **competitiveness and growth**



Credits: <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Pillar 2 - Clusters

Global Challenges & European Industrial

Competitiveness: boosting key technologies and solutions underpinning EU policies & Sustainable Development Goals

Commission proposal for budget: € 52.7 billion

