LEARNING FROM EVALUATIONS TO SHAPE THE FUTURE: DEVELOPING KEY IMPACT PATHWAYS FOR THE EUROPEAN FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

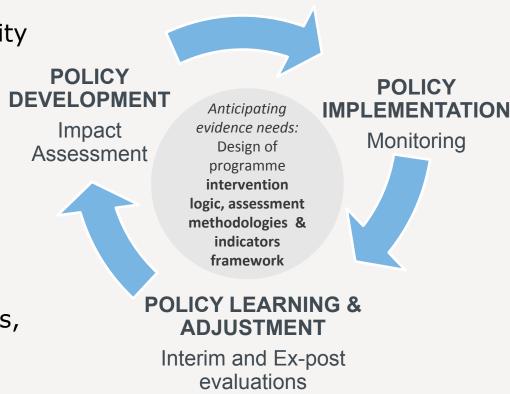**Nelly Bruno**
European Commission, DG Research & Innovation

1. INTRODUCTION

Better regulation agenda
´Make sure every action delivers maximum performance and value added´

> Horizon Europe proposal adopted by EC in May 2018: context of socio-economic pressures, budgetary austerity

> Need to demonstrate and communicate why EU investments in research and innovation matter

> Key Impact Pathways as backbone of Horizon Europe indicator framework

> Reconciling policy needs with methodological challenges, taking into account latest technological developments

POLICY DEVELOPMENT
Impact Assessment

POLICY IMPLEMENTATION
Monitoring

Anticipating evidence needs: Design of programme **intervention logic, assessment methodologies & indicators framework**

POLICY LEARNING & ADJUSTMENT
Interim and Ex-post evaluations

2. THE CHALLENGE OF CAPTURING IMPACTS FROM RESEARCH & INNOVATION

> **Better Regulation:** evaluations to look not only at *what* happened, but also *why* and *how much* with evidence of causality

> Specific challenges of R&I programmes evaluations:

> > **Uncertainty and risk:** need risk taking, trials and errors, role of public intervention when markets fail, **what** to measure

> > **The time lag issue:** possibly very long timeframe before impact occurs, when to measure

> > **The attribution/contribution problem:** nature of knowledge (non-rival, cumulative), other projects running, R&I systems influence

> Particularly difficult when it comes to measure outputs/results/impacts

3. LEARNING FROM OTHER INDICATORS FRAMEWORKS

› **No one-fit-all solution** (Graham et al., 2018): mainly accountability/advocacy purpose (more quantitative, comparable) than learning

› Traditionally two main areas of indicators on outputs side: 1) scientific publications and citations; 2) patent applications, awards and citations

› Now (van den Besselaar, Flecha, Radauer, 2018) turning to **economic impact** data (jobs, turnover), but other types of IPR rather unused, missing data links on market reach of innovations

› Most agencies and models do not consider **societal impact** from R&I at all. Some attempts with indicators leading to societal impact (SIAMPI)

› Still, **data limitations**: funder ID, control groups, data linking

4. LEARNING BY DOING – PAST FRAMEWORK PROGRAMMES

> Since 1984, **multiple evaluations of FP**: different approaches, inadequate timing, limited data, difficulty to capture wider effects, e.g. on economy/society (Arnold, 2012)

> Evolution for Horizon 2020: **Key Performance Indicators**

> Horizon 2020 *Interim evaluation*: triangulation of data, long-term impact of FP7, 3 categories of impact, counterfactual analysis on research outputs, econometric modeling on jobs & growth

> But **limitations**: data availability, reliability, aggregation; lack of benchmarks and baselines; attribution/contribution

5. LEARNING BY DOING – PAST FRAMEWORK PROGRAMMES

> Evaluations are needed to inform the policy cycle (cannot wait 25 years to know what works or not) but they also need to be informed.

> Need to handle complexity in practice (Pawson 2003):

> > ***Stare it in the face:*** mapping the complexity, the collision of theories

> > ***Concentrate your fire:*** prioritisation on what is vital for programme theory

> > ***Go back to the future:*** reviewing systematically past findings & fitting future evaluation needs

> > ***Stand on other's shoulders:*** when theories have already been tested in evaluations

> > ***Criss and cross:*** comparing with similar programmes in different contexts

> > ***Remember your job:*** look for enlightment rather than 'political arithmetic'

6. THE EMERGENCE OF IMPACT PATHWAYS

› Impossible to predict R&I impact trajectory; not linear, within systems

› Programme-theory approach aims to look into a 'black box' of causation, became an EC standard

› Impact pathways fall under this theory; simple and likely interpretation on how the project (e.g.UK REF)/programme/policy expects to lead to impact

› Interpreting Rogers (2008): keep impact pathways wide & use mixed methods for performance measures

› Challenge of quantification of impact; counterfactual impact evaluation with high data requirements

7. PATHS PRINCIPLES - BEHIND THE REVAMPED SYSTEM FOR THE FRAMEWORK PROGRAMME

› **<u>P</u>roximity** - Knowing who the individual researchers and companies are, for example through unique identifiers such as VAT numbers, researchers IDs, funder ID

› **<u>A</u>ttribution** – Microdata collection supporting the identification of control groups for counterfactual analysis

› **<u>T</u>raceability** – Minimised burden on beneficiaries through automatic data harvesting from existing databases; use of additional primary (including qualitative) data sources such as project evaluators and reviewers

› **<u>H</u>olism** - Telling the story of the progress of the Programme as a whole according to the objectives, at any moment in time

› **<u>S</u>tability** - Building on the current systems, piloting evolutions in Horizon 2020

8. THE FRAMEWORK - THREE IMPACT DIMENSIONS

Scientific impact
Promote scientific excellence, support the creation and diffusion of high-quality new fundamental and applied knowledge, skills, training and mobility of researchers, attract talent at all levels, and contribute to full engagement of Union's talent pool in actions supported under the Programme
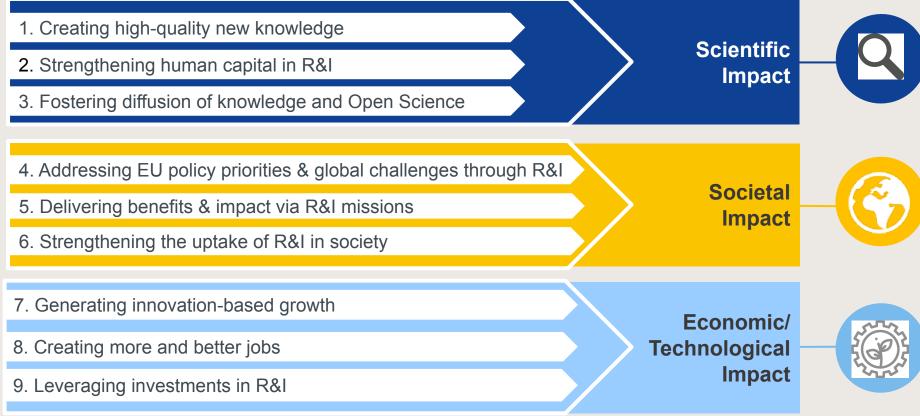
Societal impact
Generate knowledge, strengthen the impact of R&I in developing, supporting and implementing Union policies, and support the uptake of innovative solutions in industry, notably in SMEs, and society to address global challenges, inter alia the SDGs

Economic/Technological impact
Foster all forms of innovation, facilitate technological development, demonstration and knowledge transfer, and strengthen deployment of innovative solutions

9. THE FRAMEWORK – KEY IMPACT PATHWAYS OF HORIZON EUROPE

1. Creating high-quality new knowledge
2. Strengthening human capital in R&I
3. Fostering diffusion of knowledge and Open Science

Scientific Impact

4. Addressing EU policy priorities & global challenges through R&I
5. Delivering benefits & impact via R&I missions
6. Strengthening the uptake of R&I in society

Societal Impact

7. Generating innovation-based growth
8. Creating more and better jobs
9. Leveraging investments in R&I

Economic/ Technological Impact

Pathway 1. Creating high quality new knowledge

STORY LINE: The FP creates and diffuses high quality new knowledge, as shown by the high-quality publications that become influential in their field and worldwide.

- ## Indicator (short, medium, long-term)

**Typically
As of YEAR 1+**

**Typically
As of YEAR 3+**

**Typically
As of YEAR 5+**

Number of FP peer reviewed scientific publications	Field-Weighted Citation Index of FP peer reviewed publications	Number and share of peer reviewed publications from FP projects that are core contribution to scientific fields

Data needs: Identification of publications co-funded by the FP through the insertion of a specific funding source ID when publishing, allowing follow-up tracking of the perceived quality and influence through publication databases and topic mapping.

2

Pathway 4. Addressing EU priorities & global challenges through R&I

STORY LINE: The FP helps addressing EU policy priorities (including meeting the SDGs) through research and innovation, as shown by the portfolios of projects generating outputs contributing to tackling global challenges.

Portfolio-level EXAMPLE: After 3 years, from all projects pursuing reduction of CO_2 emissions, 8% already produced relevant innovations and scientific results. After 5 years, experts estimate that all achieved solutions together can contribute to a reduction of CO_2 emissions of 0.1% based on current market & policy trends

Typically
As of YEAR 1+

Typically
As of YEAR 3+

Typically
As of YEAR 5+

Number and share of outputs aimed at addressing specific EU policy priorities & global challenges (including SDGs)

Number and share of innovations and scientific results addressing specific EU policy priorities & global challenges (including SDGs)

Aggregated estimated effects from use of FP-funded results on tackling specific EU policy priorities & global challenges (including SDGs) including contribution to the policy and law-making cycle (such as norms and standards)

Data needs: Projects classified according to specific EU policy priorities pursued (including SDGs) and follow-up tracking of their outputs, results & impacts. Portfolio analysis on effects from scientific results & innovations in specific EU policy priority/SDGs areas, text mining.

2

Pathway 7. Creating more & better jobs

STORY LINE: The FP generates more and better jobs, initially in the projects, and then through the exploitation of the results and their diffusion in the economy.

Counterfactual EXAMPLE: After 3 years, on average, a company that participates in Horizon Europe has created 1,5 more jobs than a similar company not participating.

- **Indicator (short, medium, long-term)**

Typically
As of YEAR 1+

Typically
As of YEAR 3+

Typically
As of YEAR 5+

Number of FTE jobs created, and jobs maintained in beneficiary entities for the FP project (by type of job)

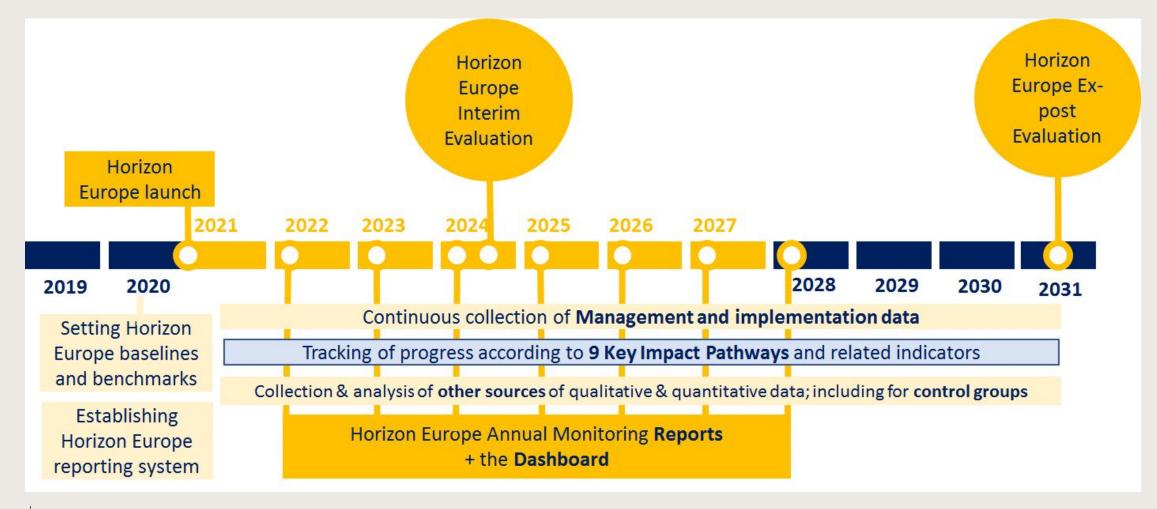**Increase of FTE jobs in beneficiary entities following FP project (by type of job)**

Number of direct & indirect jobs created or maintained due to diffusion of FP results (by type of job)

Data needs: Collection of information on individuals involved in FP projects, including their workload (Full Time Equivalent) and job profile allowing follow-up tracking of employment in beneficiary organisations. Longer-term indicator to be estimated based on dedicated study.

9. MEETING THE DATA NEEDS

› Building on Horizon 2020 but streamlining

› Relying much more on microdata and unique persistent identifiers (researchers, companies, funder ID), allowing data disaggregation

› Further simplifying and minimizing the reporting burden on beneficiaries (data linking)

› Providing a solid basis for accountability, for evaluations to dive deeper into learning and identifying policy adjustments

› Interim evaluation to focus on relevance, coherence, efficiency + longer term assessment of past programmes for effectiveness/impact

10. MONITORING & EVALUATING HORIZON EUROPE

11. CONCLUSIONS

Key Impact Pathways **novel, ambitious yet pragmatic** approach for indicator frameworks when facing complexity

By applying PATHS principles, expected to be able to **better communicate** the progress of Horizon Europe towards its objectives around a set of key storylines

And to **better capture** the progress made through by focusing on microdata collection and data linking, acknowledging multiple impacts of R&I investments as well as early identification of potential barriers or drivers to impact

A key element for improving the quality of programme **evaluations**, and their usefulness for **policy learning** and **policy design**

THANK YOU!