

Annex A- potential indicators

Metrics and indicators measure characteristics of a project/programme and enable the policy maker to measure outcomes and impacts. It is difficult to know the best indicators to use without knowing the type of programme to be evaluated. However, they should be SMART (specific, measurable, achievable, relevant and time-bound). Below there are some suggestions for different space projects/programmes, although the categories should not be considered as strict.

Every programme is unique and is almost never as simple as picking suitable metrics and indicators from a long-list. Below are some suggested metrics and indicators to help you to identify suitable ways to evaluate science missions/programmes and the impact of knowledge transfer, though it is impossible to produce a comprehensive list here – you should develop a logic map for your programme to help identify the best way to measure impact on a case-by-case basis. In addition, remember that all impact should be assessed relative to a baseline or counterfactual scenario.

Indicators related to science programmes and the impact of knowledge transfer¹

- **Scientific publications** deriving from the programme (journal prestige is important to determine the quality of the publication) and **citations**
- **Salaries** of PhDs involved in the publications related to the science programme (e.g. wage uplift can be an indication of net economic impact)
- Increased **no. of PhDs** as a result of the programme
- **Additional contracts/investment** won by universities that participated in a mission/programme
- **Intellectual Property Rights (IPR)** (patents, copyright and trademarks) developed and registered as a result of the project and revenues generated through IP licencing
- **Income of contracts**
- **Value of contracts**
- **Spin-outs** formed and revenues generated; external investment raised
- Number of end-users
- Amount of **funding received** as a result of this project (especially for universities participating in mission)
- No. of collaborations and partnerships
- No. of principal investigators and research fellowships
- **Future expectations**

Next are suggested metrics and indicators that could be used in order to evaluate the impact of a project/programme on companies:

¹ http://ec.europa.eu/invest-in-research/pdf/download_en/library_house_2008_unico.pdf

Indicators related to funded companies

- Increased **revenue** of companies involved in the project (e.g. as a result of winning an ESA contract to build an instrument)
- **GVA (output) increase, profitability or market share** change
- Additional **exports** (proportion of revenue outside the home country and outside the EU)
- **Jobs creation** induced by the project (consider FTE, contractors or permanent, which level, etc.), and jobs safeguarded
- **Investment leverage** (total 3rd party investment in terms of equity, debt, grant, public funds or M&A following from the project) by £ of Agency spend
- Increase in **R&D spend** or other **internal investment**
- **Number of new products/services** developed through this mission/project, including revenues generated / expected to be generated in the future
- Increase in **market share**
- **Sales** performance
- **New business relationships** as a result of the project (consortium partners, JV etc.)
- **Future expectations** (sales, market share, new markets, etc.)
- **Improved productivity** (output per worker)
- Ease of **access to finance**

Finally, some other indicators that could be taken into account where possible:

- **Return on investment (Net Present Value, Internal Rate of Return)**
- Technological advances, e.g. **TRL increase** or impact on **years to market**
- Impact on **technology cost**
- **Spillovers**, such as new applications of technology developed in other markets, or spin-out companies/products created and their value
- Similarly, the **nature and transferability of knowledge** / know-how or technology, and the extent to which suppliers / sub-contractors and partners operate in non-space sectors
- Environmental impact, e.g. risk caused by space debris; **reduced damage costs**
- Long term independence from other countries
- **Competitiveness** (linked to productivity and profitability) and reputation
- Commercial applications developed
- Value creation for the users
- If it relates to educational programmes:
 - Size of the audience reached
 - Number of events held
- Increase in **STEM uptake** and level of **skills** of labour force (upskilling)
- Attractiveness of careers in space
- Avoided revenue losses
- Disease prevention (no. of cases)