Horizon 2020 Policy Support Facility

Specific Support to Georgia

Options for Improving the Effectiveness of the R&I System of Georgia through Prioritisation, Selectivity and Links to Business/Industry

5-8 / 02/ 2018

Contents

Task of the Expert Group

Provide tailored advice and specific recommendations to the Georgian authorities linked to the following three focus areas for Science, Technology and Innovation (STI) policies:

I. Support in identification of promising research fields (prioritisation)

II. Proposal for the performance-based funding of research entities (PBRF)

III. Measures for narrowing the gap between research and industry/business

Status of work of the Expert Group

- The expert group started it's work in autumn 2017. Several **personal and on-line meetings** were held and **evidence gathered -** via background report, studying material, and the first in-country mission in Dec 17

- On this basis, the expert group has formulated a set of **overarching issues** and developed **preliminary options** for improvements in the **three focus areas**. Therefore, the work of the EG goes beyond the scope and focus areas formulated in the letter of the Ministry of Education and Science.

- The preliminary options will be outlined in the following slides.

Status of work of the Expert Group

- During the second mission (5-8 Feb. 2018), these **preliminary options will be presented to, and discussed with, the key stakeholders**

- This will serve to **test the usefulness and feasibility** of the options, to consider **further options**, to check the **correctness of available information,** and to gather **further information**

- Based on this process, and the options discussed, we will **develop specific recommendations and prepare a report.**

GE R&I Policy achievements

Much has been achieved over the recent years to improve the R&I system, e.g.:

- innovation funding has been introduced via GITA,

- public expenditure on R&D has been raised significantly,

- SRNSF has been established as a research funding agency with a diversified portfolio of instruments,

- R&I statistics have been improved

- …

GE R&I Policy overarching issues to be addressed I

Fragmented research system. Research institutes/units with similar remits are in different organisational silos; subcritical units exist: small groups, ageing, weak infrastructure

Options

- Integrate research facilities and equipment according to broad priority areas. Facilitate equipment sharing.

- Create 3-4 R&I Centres around the equipment and facilities, establish a joint research agenda. Two organisational options: virtual platform vs. new organisation to be established and physical integration

- Close or reform/redirect, merge into other entities all research units that don't have critical mass and/or are 'loose ends'. To be done based on evaluation.

Fragmented research system: integration option

Research institute X

Research Unit Y

Innovation organisation Z

R&I CENTRE / PLATFORM
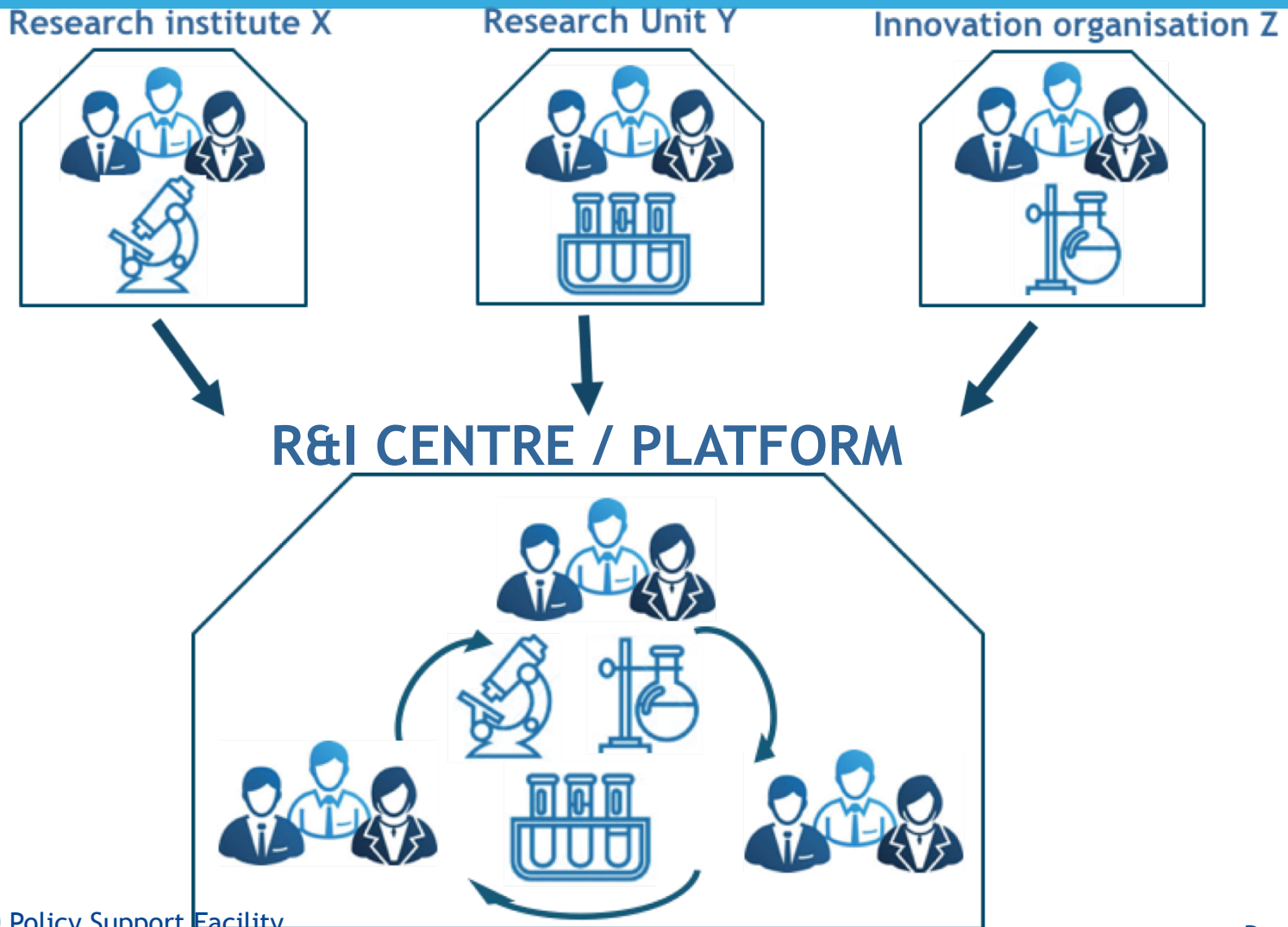
GE R&I Policy overarching issues to be addressed II

Un-clear authority structures and responsibilities regarding decisions on, and implementation of, research funding, priorities and evaluation.

<u>Options</u>

- Clearly define the roles of the strategic, operational and performance levels, and ensure interactions between coordination/decision bodies at these levels.

- Strategic level – Ministerial – deals with the strategic issues. E.g. decide on overall levels of funding for R&I, on few strategic priorities

- Operational level – a coordination body is required here among Ministries & agencies, which also serves to integrate research and innovation policies

GE R&I Policy overarching issues to be addressed III

Incomplete reform of the institute sector/GNAS. Integration of Research Institutes (RIs) has remained largely formal.

Options

- Full integration of RIs in the universities, with possibilities for research and teaching activities.

- Assess the RIs to enable streamlining and integration in universities. (Assessment of the RIs should have been done at point of transfer to the Universities; this has still not been done.)

GE R&I Policy overarching issues to be addressed IV

Contradiction between ease of doing business, and complications of doing research. Doing research is complicated in Georgia by overregulation and red tape.
<u>Options</u>

- Rules and administrative hurdles need to be reduced and cut at the levels of ministry, agency and university administration.

- R&I activities have to be made, administratively, as easy as possible.

- The country should also pride itself for the ease of doing research and innovation.

- Introduce impact assessment and measure progress on reducing red tape

GE R&I Policy overarching issues to be addressed V

Systemic measures will have to be taken for achieving higher R&I performance.

Options:

- Training for research managers.

- Further increasing the payment of researchers.

- Devising measures for bringing emigrated researchers back and for establishing linkages and cooperation with them.

- Building of research groups, attracting young people and educating them to address the aging of research personnel.

GE R&I Policy overarching issues to be addressed VI

Research infrastructure and facilities are in decline. Upgrading the research infrastructure and facilities in the R&I system of Georgia is of an utmost importance.

Options

- Upgrade the equipment and facilities of priority areas to at least medium (international) standard.

- Concentrate research equipment and facilities.

- Work out equipment sharing arrangements across research groups.

GE R&I Policy overarching issues to be addressed VII

Incoherent allocation of base-line funding for research. Base-line funding is in general rather low, and it is not allocated to all public research organisations – research inst. versus univ. research labs.

Options

- Base-line research funding in the Georgian R&I system should be open to all public research entities
- The basis of the base-line funding should be performance.
- Research and innovation priorities - to be decided yet - may form an additional basis for the allocation of base-line funding

# GE R&I Policy overarching issues to be addressed VIII

Mismatch between the low level of research funding and size and breadth of the R&I system.

Options

- Further decisive measures are required to stabilise and strengthen the R&I system. Measures and reforms must be supported with adequate funding so they can be really implemented.

- Continue the efforts to increase research funding, set funding targets, e.g. in which time interval to reach 0.5% of GDP, etc. Make better use of available funds, focus resources on few priorities, and link funding to reforms.

- A proactive, state-level attraction of international funds is required, e.g. EU European Neighbourhood instrument

Prioritisation in research and innovation I

Situation
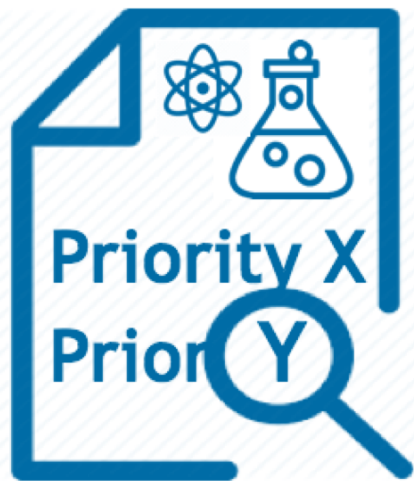
- Current number of 90 priorities is not sustainable; it does not meet the challenge of directing (limited) resources strategically to higher excellence and relevance of R&I

- Research and Innovation Council (RIC) has been tasked to define the priorities, but did not fulfil this role yet

- Weak coordination/harmonisation of R&I priorities with other economic and social priorities/needs/challenges

Prioritisation in research and innovation II

Assumptions

- Low level of funding and the mismatch with the size and breadth of the research system limit priority areas to 3-4

- Identifying and enforcing a small number of research priorities is of vital importance for the future of Georgia and for increasing its competitiveness

- Research priorities should be integrated with the strategic priorities of the country and the priorities for innovation

- Unified R&I policy needs to be developed, or these two policies need to be aligned through coordination, funding mechanisms and frameworks

Prioritisation in research and innovation III

Options for priority selection

- Introduce a **well organised prioritisation process** in the country, based on a well established methodology

- A **programme committee** for priorities and related programmes will be needed.

- In addition, an **external competence** /support will be required for priority selection

Prioritisation in research and innovation IV

How to identify research priorities

Option 1 – Foresight exercise

- assess the potential of the research base, including via international peer review.

- achieve consensus between different participants/ stakeholders of the R&I system – via structured workshops

- generate priority ideas that cross research, innovation and the economy.

Prioritisation in research and innovation V

Option 2 – Smart specialisation (S3)

- Smart specialisation is a regional policy framework for innovation driven growth.
- It helps focus resources on key national and regional priorities, challenges, and needs for knowledge-based development.
- bottom-up process relying on an entrepreneurial discovery process, which involves various stakeholders
- Georgia could try to join a S3 process initiated by the EU's Joint Research Centre for MD, RS, UA
- S3 should be applied in GE for the whole country/at national level

Prioritisation in research and innovation VI

Criteria for identifying priorities

- Importance of area/field for the future prosperity of Georgia, for improved competitiveness based on innovation, and for the wellbeing of its citizens.

- Is there business/industry (or potential for developing industry) that supports this priority.

- Level of excellence of research and innovation field(s) as measured by traditional indicators and application.

- Quality of infrastructure (buildings, etc.), facilities and equipment and how expensive it will be to upgrade this to at least average international standards.

- Is there critical mass (in the context of Georgia) in the R&I field in terms of size, research capacity and sustainability

Prioritisation in research and innovation VII

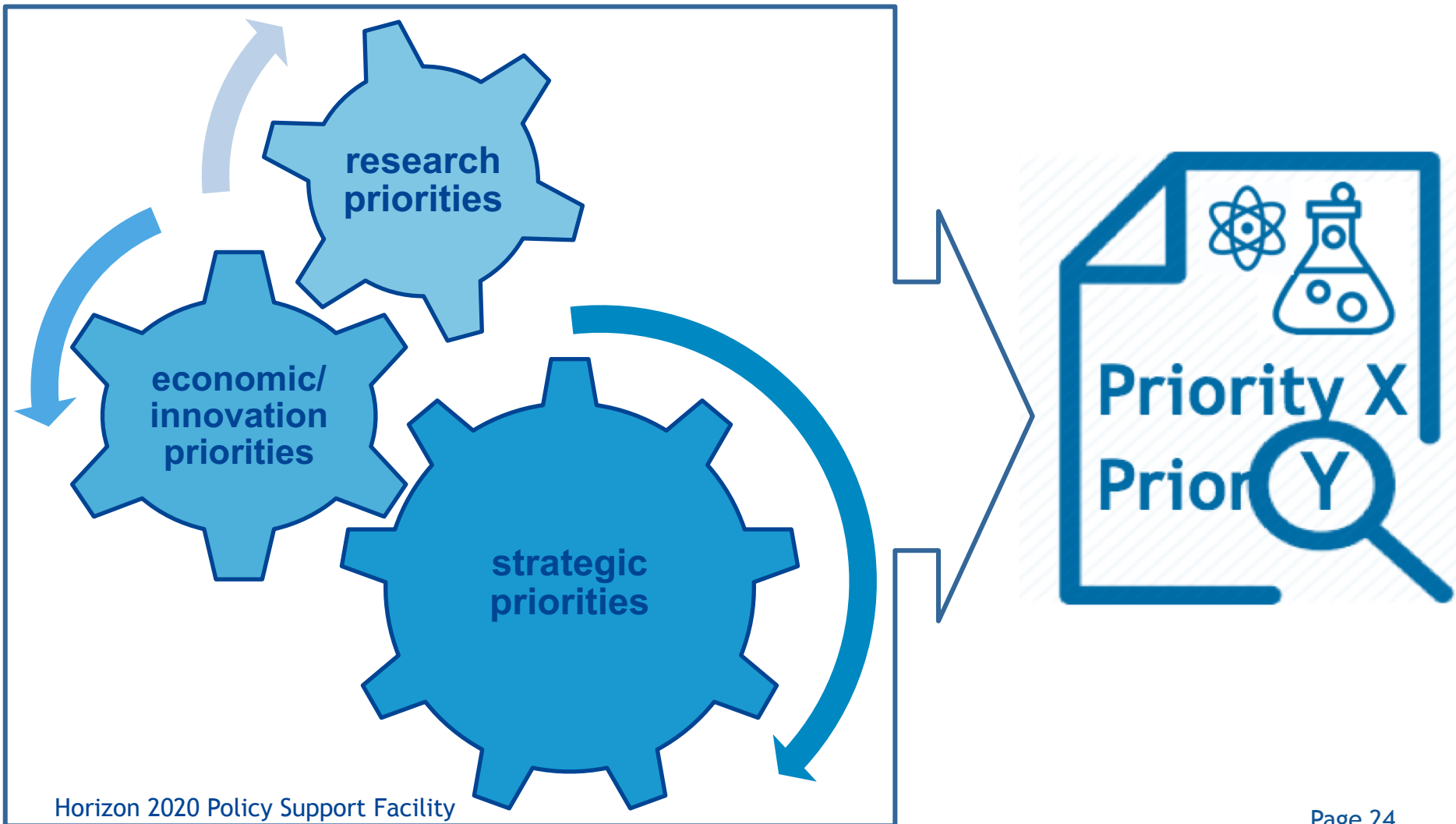**Options for priority decision and management**

- Priorities will be **decided at the strategic level** (ministerial) and by a related decision body (see overarching issues – authority structures)

- A **managing body** will be required for priority programmes. This may be within one of the existing R&I agencies, or distributed over the agencies, or another option. The key issue is here that actors both in Research and Innovation are involved and communicate and cooperate with each other

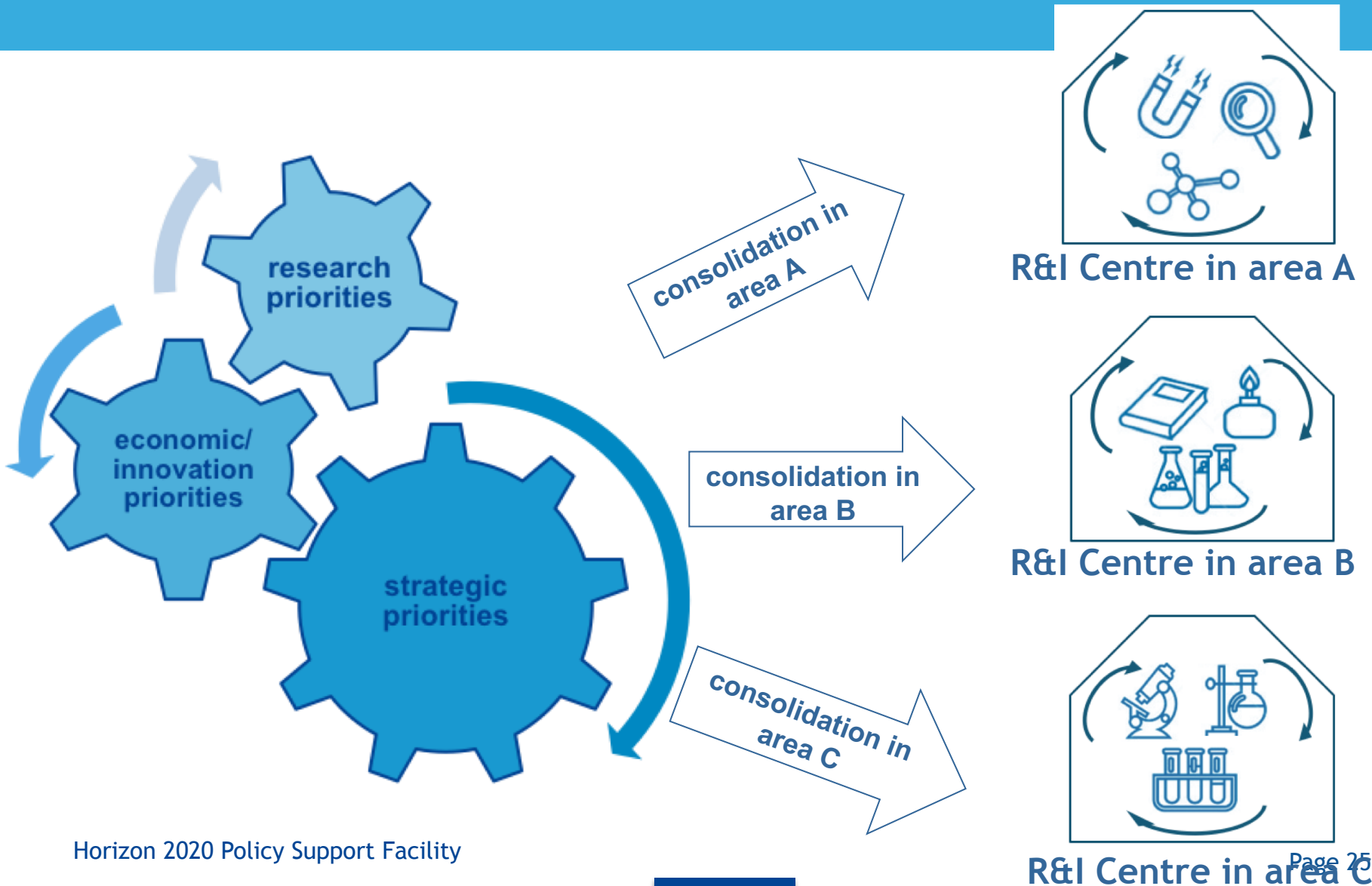# Prioritisation in research and innovation VIII

Options for implementation of the R&I priorities

- Through **R&I funding**, e.g. via broad R&I programmes linked to parts of the economy. Base-line funding for R&I could be directed through priority programmes like: Energy for Georgia, Food Safety and Standards, etc.

- Through positive incentives: **R&I Centres** approach could be a solution to various problems on priority setting: clustering of R&I groups in similar fields, joint use of equipment, horizontal coordination, more research and administrative efficiency

- **Monitoring & evaluation** of priorities and related programmes will be necessary, as well as feedback loops and adaptions of the programmes

Prioritisation in research and innovation

research priorities

economic/ innovation priorities

strategic priorities

Priority X
Prior Y

Prioritisation in research and innovation

consolidation in area A

R&I Centre in area A

consolidation in area B

R&I Centre in area B

consolidation in area C

R&I Centre in area C

Performance-based research funding I

Situation

- Base-line funding is available in Georgia, but it is **not allocated coherently** to all public research entities. It is only allocated to RIs having emerged from the Academy and those under Ministries (e.g. Eliava).

- Base-line funding is provided in exchange for **reporting** to the Georgian Academy of Sciences (GNAS)

- Base-line funding **lacks a solid evaluation** basis for its allocation, no systemic evaluation is done.

- GNAS is tasked to assess the reporting of the RIs, but this procedure does not fulfill the role of assessing the performance and of evaluation.

Performance-based research funding II

Situation

- Some **practice on performance assessment** is available: Research labs of universities report to the academic council of the university on real output: publications, patents, conferences, innovations, etc . On this basis the research board and academic council allocate internal research money.

Performance-based research funding III

Assumptions

- Performance based funding usually applies to the allocation of base-line funding to public research organisations, taking into account the organisation's performance

- A combination of metrics and peer review is getting more common in PBRF.

Performance-based research funding IV

Assumptions

Small countries face particular design issues of PBRF:

- the costs associated with small scale;

- the limited number of fields that can be addressed in peer review systems, as a result of which the few fields defined have to be broader than in big systems;

- the need to use foreign peers;

- the constraints of 'small' languages on peer recruitment and the corresponding need for a quality-assured national current research information system (CRIS);

- national capacity to run a research assessment exercise

Performance-based research funding V

Options

- The current **differentiation for allocating base-line funding** to public research entities (institutes versus labs) needs to be lifted as a pre-condition for PBRF.

- The **reporting requirements** to GNAS should be stopped.

- A **body/agency responsible for managing PBRF** has to be defined. Its task should include taking care of collecting data, organising the assessment of data and managing peer reviews.

Performance-based research funding VI

Options

- Georgia needs a **R&I system database** including information about researchers, affiliation, current research projects and findings, and output. **Incentives** will be necessary to ensure filling of the database, e.g. allocation of public funding only if data are/have been provided.

- The **local conditions for doing research** have to be taken into account in performance measurement. E.g. Infrastructure is in many cases so run down, that researchers cannot do proper research. Developing infrastructure for research is therefore a priority.

Performance-based research funding VII

Options

- Performance measurement should start at individual researcher and/or research group level, and can be **aggregated to research institutes and institutions**.

- Different **funding formulae** provide incentives for different kinds of behaviour. The use of skewed formulae – where the best performers are rewarded disproportionately – is a way to concentrate resources on 'excellence'.

- A **proportion of base-line versus competitive** R&I funding suitable for Georgia needs to be considered and defined.

- Principles of **transparency and objectivity** have to be applied in the allocation of performance based base-line funding

Performance-based research funding VIII

Options

- **International good practice** should be studied in detail before a Georgian version of PBRF will be established. Recent comparative studies from the EU are available – PSF Mutual Learning Exercise

- In certain time intervals **peer review panels** should be called in for assessing the performance of RI & HEI research. Panels should include foreign experts and emigrated Georgian scientists. The inclusion of foreign experts will help tackling the problem of closed clubs - the evaluation and decision making in small R&I communities among the same actors.

Performance-based research funding IX

Options for measuring performance via indicators

Metrics can measure via Knowledge and performance indicators (KPIs) the performance.

- **Scientific dimension** can be measured via publications and bibliometric analysis, national projects and budgets acquired.

- **Economic dimension** can be measured via contracts with business and related income.

Performance-based research funding X

- **Societal dimension** can be measured via dissemination and communication to policy makers and general public, innovations generated with impact for society (addressing societal challenges faced by Georgia).

- **Collaboration dimension** can be measured via international grants acquired, their budgets, and scientific prizes received.

- **Education for research dimension** can be measured via PhD students educated and their career path.

Science Business Links (SBL) I

Situation

- There no coordination between governance actors responsible for SBL policy and for SBL support.

- No reliable data on business R&D.

- There has been no working, SBL-specific tool implemented with measurable effects in the country.

- Contract research happens at HEIs and RI level, but without public support.

- Applied research scheme of SNRSF does not work:

  - Participation of companies is often only formal. Co-funding condition was mostly not fulfilled.

  - Financial incentives for companies are formally not possible.

Science Business Links (SBL) II

Situation

- GITA has introduced new measures, but acts as a non-integrated element of the innovation ecosystem:
  - Focus on start-ups and the young generation (via fablabs, hackathons),
  - provides limited amounts, and follow-up support for upscaling is missing,
  - work in progress on large scale matching fund for industrial R&D.
- Enterprise GE and InnoFin via banks are also available as innovation support tools.
- success stories of SBLs are available, however, they are not mapped systematically

Science Business Links (SBL) III

Assumptions for SBL policies

- SBL policy design must **involve local stakeholders** in such a way that enables and supports their creative and active participation, i.e., the design must be developed with them, not for them.

- Stakeholders **from all institutional sectors** representing all the relevant intra-sectoral variants/roles in the RDI system must be involved

- SBL require adequate motivations, opportunities, and capacities (**MOCs triad**) of the involved actors to be fulfilled simultaneously and at sufficient extent and quality

Science Business Links (SBL) IV

Assumptions

- SBL support needs to **take into account both supply and demand** sides: research and business

- Proposed improvements/changes should (to a maximum possible extent) **build on available SBL success stories** and fix the existing deficiencies in the MOCs triad for linking the knowledge creation and application actors

- **Platform for research-business cooperation**: a new tool should be created in the form of a **viable platform** for the direct (MOCs adequate) involvement of both (!) knowledge and demand actors, to make it sustainable and capable of further development.

Science Business Links (SBL) V

Options for supporting researchers in SBL

- **Individual researchers (experts) could play a role of SBL agents** stimulating formal collaboration between research organisations and companies.

- A systemic **mapping of available SBL expertise and physical infrastructure** should be performed and the results should be publicly available for the community.

- **Specific public support** for experts could cover:
  - clear and simple framework for SB contracts
  - clear and enforceable rules for engagement of R&D organisation employees in company activities
  - advice on possible synergies/sharing available infrastructure
  - support for physical infrastructure of commercial interest.

Science Business Links (SBL) VI

Options for technology transfer drivers

- Success stories show that **intermediary structures** (e.g. technology transfer offices) at the level of research organisations are not necessary for the development of functioning and productive SBL. However, more information on the situation at leading RIs is needed.

- In an environment of limited supply and demand (deal flow), a well coordinated **network of active, knowledgeable, and well motivated individual brokers** could play an important role to stimulate technology transfer between science and business organisations. These brokers would be responsible for project scouting, partner search and IP transactions. They should be subject to quality control mechanisms.

Science Business Links (SBL) VII

Options for technology transfer drivers

- Instead of creating new TTO structures at research organisation level, **one back office** could be established **to coordinate a network of brokers** (e.g. one person at each major public HEI and RI) providing back office activity e.g. IP, legal, negotiation support etc.

- This back office could **map the available brokering capacities** within the existing organisations, identify their needs/barriers for growth (including systemic/administrative burdens).

- GITA could play a role in hosting this back office.

Science Business Links (SBL) VIII

Options for collaborative R&D: Competence Centre

A competence centre is a **clustering and collaborative tool**, designed in a way that actors from diverse knowledge supply and demand sectors are motivated to cooperate on development and application of marketable outputs (products).

- Publicly owned and financed (or co-financed);
- centre should be created close to industry concentration (regional aspect; producers of something e.g. wine).
- focus on technology services, quality, R&D with strong focus on development, skills development, etc.
- might be related to local HEI (outside Tbilisi)

Science Business Links (SBL) IX

Options for collaborative R&D: Funding

- A **portfolio of instruments** for supporting collaborative R&D is required – in a systemic approach. E.g.
  - big matchmaking grant,
  - medium grant with low entry barrier,
  - small grant with minimum administrative effort
- GITA plans to establish a **matching grant scheme**, with rather solid funding (for GE standards) per one project - 250,000 USD per grant

Science Business Links (SBL) X

Options for collaborative R&D: Funding

- Important will be to have also **schemes for stimulating SME-research cooperation with low entry barrier**:

  - limited funding (e.g. Max €50,000) available to both research and business actors,

  - low administration effort,

  - This instrument could be a revised (working) version of the existing applied research funding scheme of SRNSF

- A **voucher scheme** could be introduced, for lowering transaction costs of (starting and/or developing) SB interactions, with very low (minimum) administrative burden and limited funding (e.g. €5,000)

Science Business Links (SBL) XI

Options for SBL support: Favourable IPR regime (more clarification needed)

- National legislation has to define **IP ownership** of research results. Dominant model in the EU: employers (HEI, RI etc.) own IP produced by employees (researchers), but author's participation in income from exploitation is obligatory.

- Each research organisation should define **IP policy** in internal regulations:
  - rights and obligations of authors (researchers) and organisation
  - division of income, coverage of enforcement costs, etc.
  - rules of commercialisation.

- A **supporting structure** for researchers with IPR is required, which could be linked to the back office for brokers.

Science Business Links (SBL) XII

Options for SBL support: Tax incentives

- not a first line measure in transitional economies.

- there is general discussion on the OECD and EC level on effectiveness of tax incentives.

- very dependent on local context.

- As tax incentives require a certain stability of the tax system and maturity of the innovation ecosystem, we do not recommend tax instruments in the current situation in Georgia