ADVANCE QUEENSLAND
made for innovation

ADVANCE QUEENSLAND EVALUATION FRAMEWORK

Queensland Government

ACRONYMS

ABS	Australian Bureau of Statistics
AQ	Advance Queensland
ATO	Australian Taxation Office
BERD	Business Expenditure on Research and Development
BLADE	Business Longitudinal Analysis Data Environment
CBA	Cost Benefit Analysis
DDG	Deputy Director-General
DG	Director-General
DITID	Department of Innovation, Tourism Industry Development, and the Commonwealth Games
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GBAORD	Government Budget Appropriations or Outlays for Research and Development
GOVERD	Government Expenditure on Research and Development
GSP	Gross State Product
HERD	Higher Education Expenditure on Research and Development
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Development
ROGS	Report of Government Services
STEM	Science, Technology, Engineering and Mathematics
UNDP	United Nations Development Programme

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FOREWORD

Advance Queensland is an investment by the Queensland Government of over half a billion dollars, designed to foster innovation and build a more diversified Queensland economy, creating jobs now and for the future.

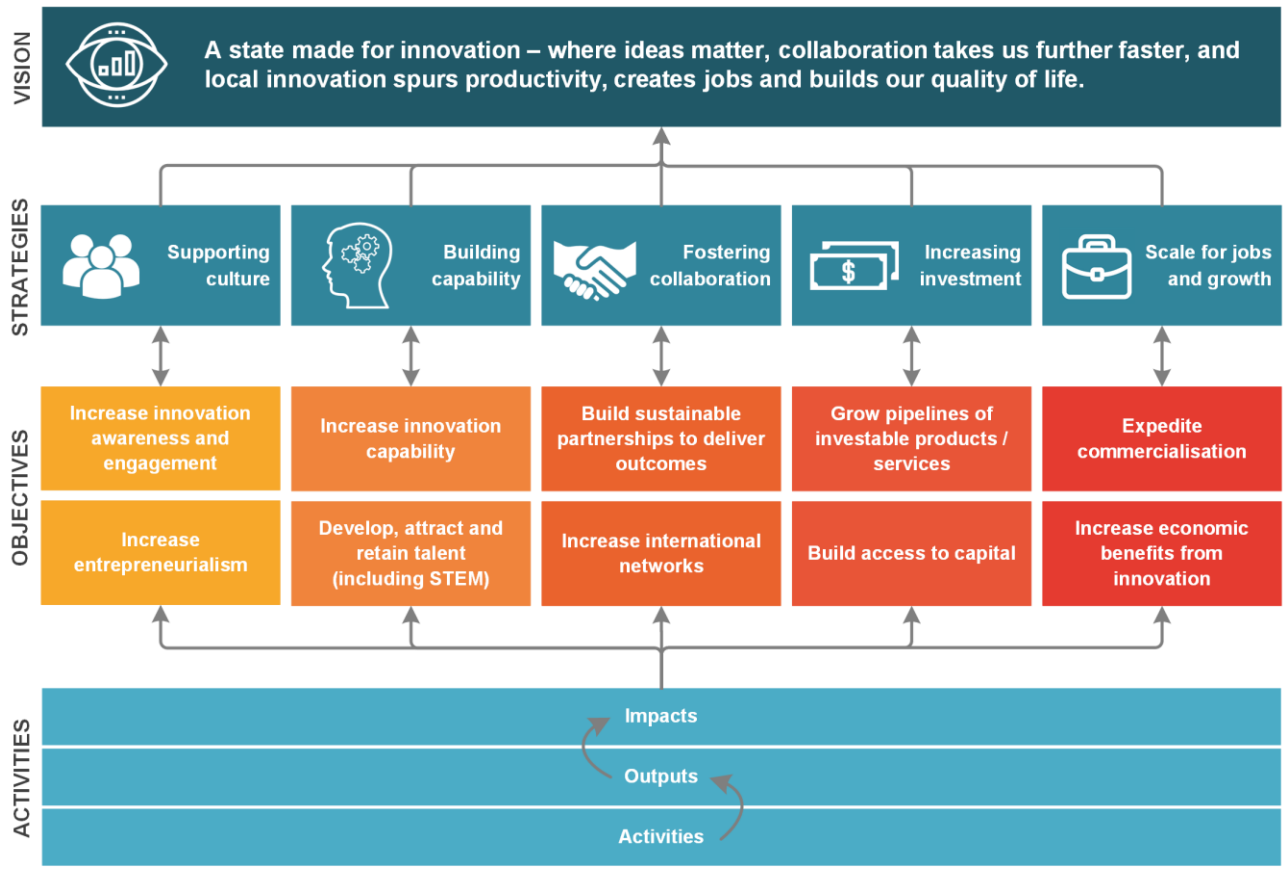
The initiative is a whole-of-government agenda designed to impact all aspects of Queensland's innovation system, from inspiring Queenslanders to innovate, enabling the discovery of new breakthroughs and connecting innovators across boundaries, to promoting investment in Queensland ideas and supporting local companies to grow.

Advance Queensland encompasses the delivery of a suite of programs and activities, led by multiple agencies across the Queensland Government to deliver a state made for innovation designed to prosper now and in the future. A state where ideas matter, collaboration takes us further faster and local innovation spurs productivity, creates growth and improves the quality of life for all Queenslanders.

These programs and activities are wide ranging and are designed to deliver outcomes that contribute to the Advance Queensland vision. Co-designed with industry and based on international evidence of what works, Advance Queensland includes modest programs such as provision of scholarships and small grants; to ambitious multi-million dollar investments that are re-shaping Queensland's future.

Advance Queensland is led by an Advance Queensland Strategic Leadership Group, chaired by the Minister for Innovation. An Advance Queensland Steering Committee, chaired by the Director-General of the Department of Innovation, Tourism Industry Development, and the Commonwealth Games (DITID) provides whole-of-government oversight. The Advance Queensland Implementation Unit, established in DITID, provides whole of government coordination of the initiative.

Framework for Advance Queensland



Advance Queensland Handbook

This document forms part of the Advance Queensland Handbook – a suite of frameworks, strategies, guides and tools which document the approach to managing the initiative.

The Advance Queensland Handbook provides a comprehensive guide to achieving a consistent approach to planning, implementation and evaluation of Advance Queensland activities within participating agencies.

Key elements of the Handbook include:

1. ***Advance Queensland Policy Framework*** – outlines the rationale and overarching aims of Advance Queensland
2. ***Advance Queensland Organising Framework*** – outlines the programs and activities that contribute to Advance Queensland goals and objectives, and processes for program initiation, approval and closure
3. ***Advance Queensland Governance Arrangements*** – outlines the whole-of-initiative governance arrangements for oversight of Advance Queensland
    a. ***DITID Advance Governance Arrangements*** – outlines the departmental governance arrangements for oversight of Advance Queensland
4. ***Advance Queensland Reporting Framework*** – outlines reporting requirements and mechanisms
5. ***Advance Queensland Evaluation Framework*** – outlines the approach and high-level strategy for evaluation
    a. ***Advance Queensland Evaluation Plan*** – outlines the key evaluations to be undertaken
6. ***Advance Queensland Grants Management Framework*** – provides guidance for grants programs and processes
7. ***Advance Queensland Risk and Issue Management Strategy*** – describes the specific risk and issue management techniques and standards to be applied
8. ***Advance Queensland Budget Guidelines –*** describes budget management processes
9. ***Advance Queensland Sponsorship Strategy*** – provides an overview of the sponsorship governance arrangements and the approach and high-level strategy for sponsorship
    a. ***Advance Queensland Sponsorship Guidelines*** – provides guidance on the assessment, approval and management of sponsorships supported by the initiative
10. ***Advance Queensland Communications and Events Strategy –*** provides a framework for coordinating communication activities and major events

Advance Queensland represents is a significant investment by the Queensland Government to transform the Queensland economy through innovation for the benefit of Queenslanders. It is appropriate to safeguard this investment with the commensurate program management, governance and evaluation measures.

1. Introduction

1.1 Purpose

This document outlines the approach and high-level strategy for evaluating the Advance Queensland initiative, programs and activities, and provides guidance on appropriate evaluation methodologies, measures and data.

The Advance Queensland Evaluation Framework is designed to ensure a coordinated approach to reviewing implementation of Advance Queensland and measuring its outcomes and to inform future investment and policy direction.

This Framework is consistent with the *Queensland Government Program Evaluation Guidelines* (2014)[1], and draws on examples of best practice from other jurisdictions, including:

- *The Magenta Book: Guidance for Evaluation* [2]
- *CSIRO's Impact Evaluation Guide* [3]
- *BetterEvaluation: International collaboration around improving evaluation practice and theory*[4]
- *Report on Government Services – Approach to Performance Measurement*[5]
- *Better Practice Guide: Successful Implementation of Policy Initiatives* [6]

It has also been informed by work undertaken by Deloitte Access Economics, commissioned in 2017 by the (then) Department of Science, Information Technology and Innovation.

1.2 Scope

The framework is focused on Advance Queensland programs but notes the influence of external factors and the indirect contribution of other government policies and programs.

This framework provides:

- an **overview** of:
  - the Advance Queensland initiative's vision, strategies, objectives, themes and programs/activities
  - evaluation within the context of Queensland Government programs
- the **approach** that will be taken to evaluate the Advance Queensland initiative and associated programs/activities:
  - key principles underpinning evaluation methodology and activities
  - adopting a system-wide approach to identify collective impact
  - the levels at which and types of evaluations that will be conducted
  - the development of logic frameworks for key elements of the initiative
  - planning and prioritisation of evaluation activities .
- **evaluation domains and methodologies** relevant to the Advance Queensland initiative
- a **data strategy** for collecting and managing data relevant to the Advance Queensland initiative

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[1] Queensland Treasury (Queensland Government) (2014). *Queensland Government Program Evaluation Guidelines* https://s3.treasury.qld.gov.au/files/qld-government-program-evaluation-guidelines.pdf

[2] HM Treasury (2011). *The Magenta Book: Guidance for Evaluation.* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/220542/magenta_book_combined.pdf

[3] CSIRO (2015). *Impact Evaluation Guide*. https://www.csiro.au/en/About/Our-impact/Evaluating-our-impact

[4] *BetterEvaluation*. http://www.betterevaluation.org/

[5] Productivity Commission, (2017). *Report on Government Services – Approach to Performance Measurement.* http://www.pc.gov.au/research/ongoing/report-on-government-services/2017/approach/performance-measurement

[6] Australian National Audit Office (Australian Government) (2104): *Better Practice Guide: Successful Implementation of Policy Initiatives* https://www.anao.gov.au/work/better-practice-guide/successful-implementation-policy-initiatives

- **governance arrangements** including roles and responsibilities, risk and issue management
- guidance on **stakeholder engagement, communication and reporting** of evaluation findings.

1.2.1 Exclusions and other evaluation resources

This framework focuses on the approach and high-level strategy for evaluating the Advance Queensland initiative. It does not articulate the schedule for the evaluations planned to be undertaken – this is included in the *Advance Queensland Evaluation Plan*[7].

While this framework provides guiding principles and specifies some requirements regarding the development of specific evaluation plans and reports, it does not include a process for the development of those documents.

The *Queensland Government Program Evaluation Guidelines*[8] provide a framework to guide agencies in the development, design and implementation of measureable programs, interventions, initiatives, services or trials.

1.3 Review

This document will be regularly reviewed and updated as required, especially after substantial changes to the Advance Queensland initiative.

[7] Queensland Government. Advance Queensland Handbook (unpublished)

[8] https://www.treasury.qld.gov.au/economy-and-budget/queensland-economy/evaluating-government-programs/

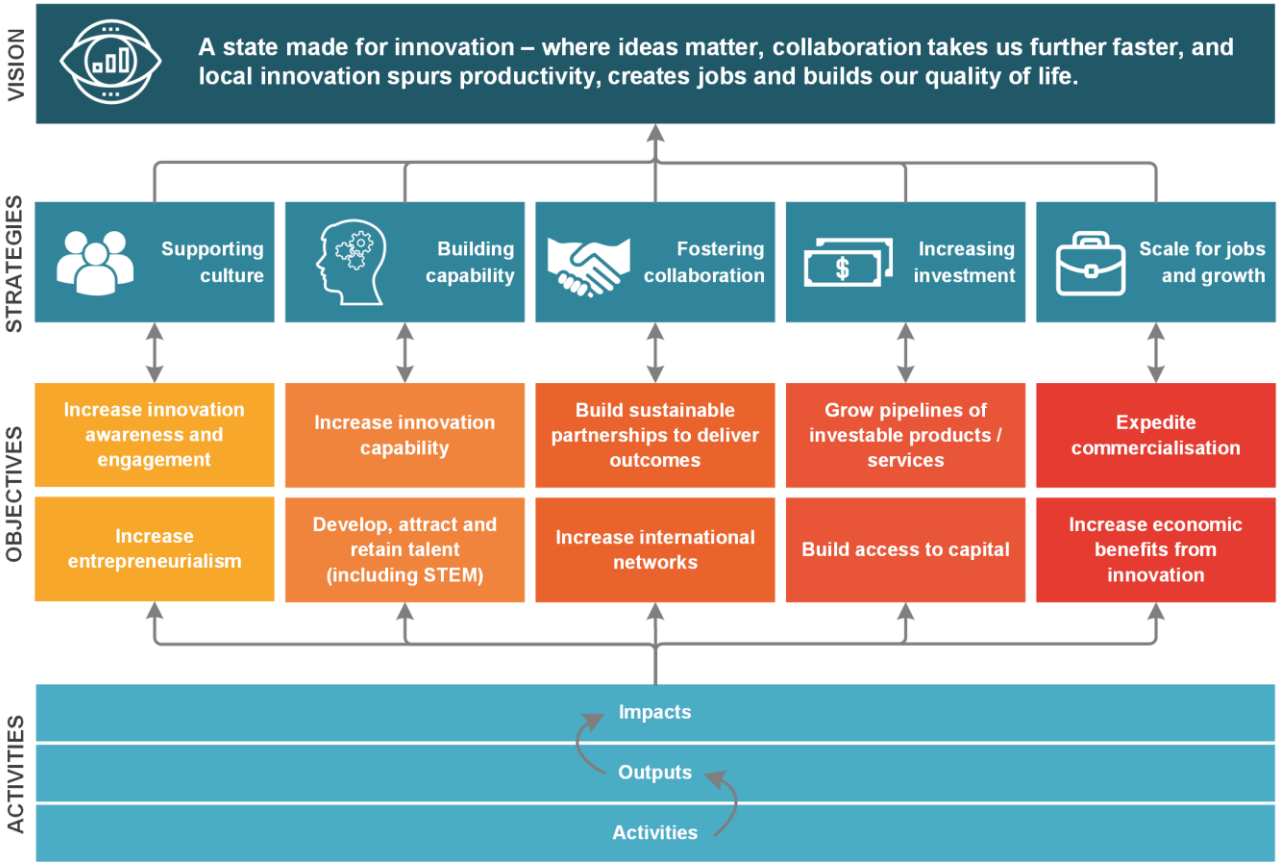
2. Overview

2.1 Advance Queensland

The Advance Queensland initiative encompasses the delivery of a comprehensive suite of programs and activities, led by multiple agencies across Queensland Government.

The Advance Queensland framework outlines how the delivery of each individual program contributes to something that is more than the sum of its parts — how the programs work together to achieve the Advance Queensland vision. Conceptually this forms an integrated relationship between the individual programs, their objectives and their contribution to the overarching initiative's strategies and vision.

Figure 2.1 – Advance Queensland framework



2.1.1 Advance Queensland Vision

The vision of Advance Queensland positions Queensland as a leader in the knowledge economy, creating jobs both now and for the future. It seeks to empower our best entrepreneurs, innovators and researchers, and help translate their ideas into commercial success and social benefit. Creating jobs now and the jobs of the future requires having the right environment for businesses to thrive - Advance Queensland fosters and creates an innovation system that enables this to occur.

2.1.2 Advance Queensland Strategies and Objectives

Five key strategies have been identified to implement the vision for Advance Queensland and guide the design and implementation of all Advance Queensland programs.

These strategies, described in detail in the *Advance Queensland Policy Framework*[9], are:

- ***Supporting culture*** – engaging the community in innovation, inspiring current and future generation to be creative, develop ideas, work together and identify innovation potential.
- ***Building capability*** – maintaining a strong research base to support entrepreneurship, business commercialisation, creativity and the creation and uptake of new technologies; increase the uptake and level STEM skills in the community.
- ***Fostering collaboration*** – building networks and partnerships across organisations, sectors and disciplines to help spark creativity and ideas, diffuse existing knowledge, and increase the translation of ideas into outcomes.
- ***Increase investment*** – facilitating access to capital to fund the translation of ideas to outcomes, and assisting innovators to be "investment ready".
- ***Scaling for jobs and growth*** – empowering businesses and key industries to benefit from accelerating technological disruption and access changing global chains, unlocking the potential of small businesses, high grown firms and regions to innovate and develop.

To meet the vision of the Advance Queensland initiative, the strategies collectively target weaknesses in the existing innovation system and, as a result, create economic and social value which would not have otherwise occurred.

The Advance Queensland objectives specify key elements to be achieved across all programs, and align with a particular strategy.

Table 2.1 – Advance Queensland Strategies and Objectives

Strategy	Objective	Description
Supporting culture	**SC1 – Increase innovation awareness and engagement**	Increase Queensland's reputation as a knowledge economy, and Queenslander awareness and engagement in innovation, including science, research, technology, business and startup activity
	SC2 – Increase entrepreneurialism	Building Queensland's culture of entrepreneurialism, and clusters of entrepreneurial activity
Building capability	**BC1 – Increase innovation capability**	Initiatives that specifically target improving research capability and business and industry skills for undertaking innovation activity
	BC2 – Develop, attract and retain talented people (including STEM skills)	Initiatives that increase the uptake and level of individual skills (including STEM), and build the science, research and technology strength that enables increased innovation and entrepreneurial activity
Fostering collaboration	**FC1 – Build sustainable partnerships to deliver outcomes**	Increase the value of local, national and international collaboration between business to research; business to business; and research to research
	FC2 – Increase local and international networks	Increase the number and scale of business to research; business to business; and research to business connections locally, nationally and globally

[9] Queensland Government. *Advance Queensland Handbook* (unpublished)

Strategy	Objective	Description
Increase investment	**II1 – Grow pipeline of investable products /services**	Increase business investment in innovation and startup activity, including capital expenditure and external innovation investment (such as research and technology uptake)
	II2 – Build access to capital	Build Queensland's venture capital industry, increase cross-industry innovation investment and investment from third parties
Scaling for jobs and growth	**SJ1 – Expedite commercialisation**	Increase the level of ideas, research and technologies turned into commercial products, processes or systems
	SJ2 – Increase economic benefits from innovation (including jobs)	Increase employment opportunities; improve profitability and productivity; exports; and stimulate economic growth through increased level of innovation

2.1.3 Advance Queensland Programs and Activities

The Advance Queensland initiative is made up of a wide portfolio of programs and activities, delivered by a range of Queensland Government agencies.

Types of programs and activities delivered under the Advance Queensland include:

- ***Grants*** – funding provided to defined entities for a specific purpose or project under a structured program which includes an application, assessment, decision and funding agreement process
- ***Partnerships*** – Financial contribution to one-off strategic projects or organisations to support unique opportunities
- ***Competitions*** – a contest in which people or companies take part in order to win a defined end-prize
- ***Procurement*** – obtaining goods or services in a fair and equitable manner that aligns with Advance Queensland strategic goals
- ***Events*** – an event for external participants that is funded by and or/supports Advance Queensland aims, objectives or programs
- ***Sponsorships*** – provision of financial support for an external event or activity
- ***Foundations and administrative activities*** – activities to support the delivery and governance of the initiative.

2.1.4 Advance Queensland Organising Framework and Themes

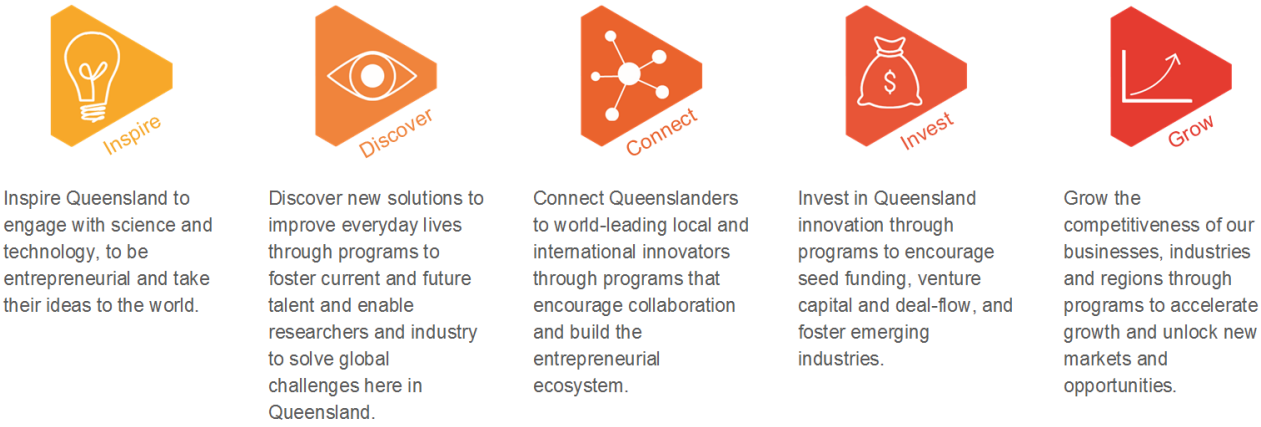
The *Advance Queensland Organising Framework*[10] was developed to provide a single point of truth on programs and activities that contribute to Advance Queensland goals and objectives, and a basis for reporting on the progress and performance of the initiative.

The Organising Framework outlines all programs and activities, and clarifies and confirms their key attributes including status, program type, funding arrangements and lead agency.

Programs are grouped under five key themes: ***Inspire, Discover, Connect, Invest*** and ***Grow***. Program foundations and administrative activities are grouped under a sixth category.

[10] Queensland Government. *Advance Queensland Handbook* (unpublished)

Figure 2.2 – Advance Queensland themes



While individual programs may contribute to one or more of the Advance Queensland strategies and objectives (see section 2.1.5), each theme is aligned to a primary strategy and associated objectives.

Table 2.2 – Advance Queensland Themes and alignment to Advance Queensland strategies and objectives

Theme	Description	Aims	Primary Strategies/ Objectives
Inspire *Queenslanders to engage with science and technology, be entrepreneurial and take their ideas to the world*	Programs aligned to this theme promote a transformational agenda that aims to inspire Queenslanders to embrace new ways of thinking and working, and to back themselves and their ideas	Programs aligned to this theme aim to: • ignite the innovation spirit of Queenslanders • inspire the entrepreneurs of the future • celebrate and support those having a go.	**Supporting culture**: • SC1 – Increase innovation awareness and engagement • SC2 – Increase entrepreneurialism
Discover *new solutions to improve everyday lives in Queensland through programs that foster current and future talent and enable researchers and Industry to solve local and global challenges.*	Programs aligned to this theme aim to inspire and mobilise Queensland communities – including parents, families, startups and business – to prepare themselves and their children for the jobs of the future.	Programs aligned to this theme aim to: • attract and retain world class talent • enable researchers and industry to solve global challenges • prepare Queenslanders for the jobs of tomorrow.	**Building capacity:** • BC1 – Increase innovation capability • BC2 – Develop, attract and retain talented people (including STEM skills)

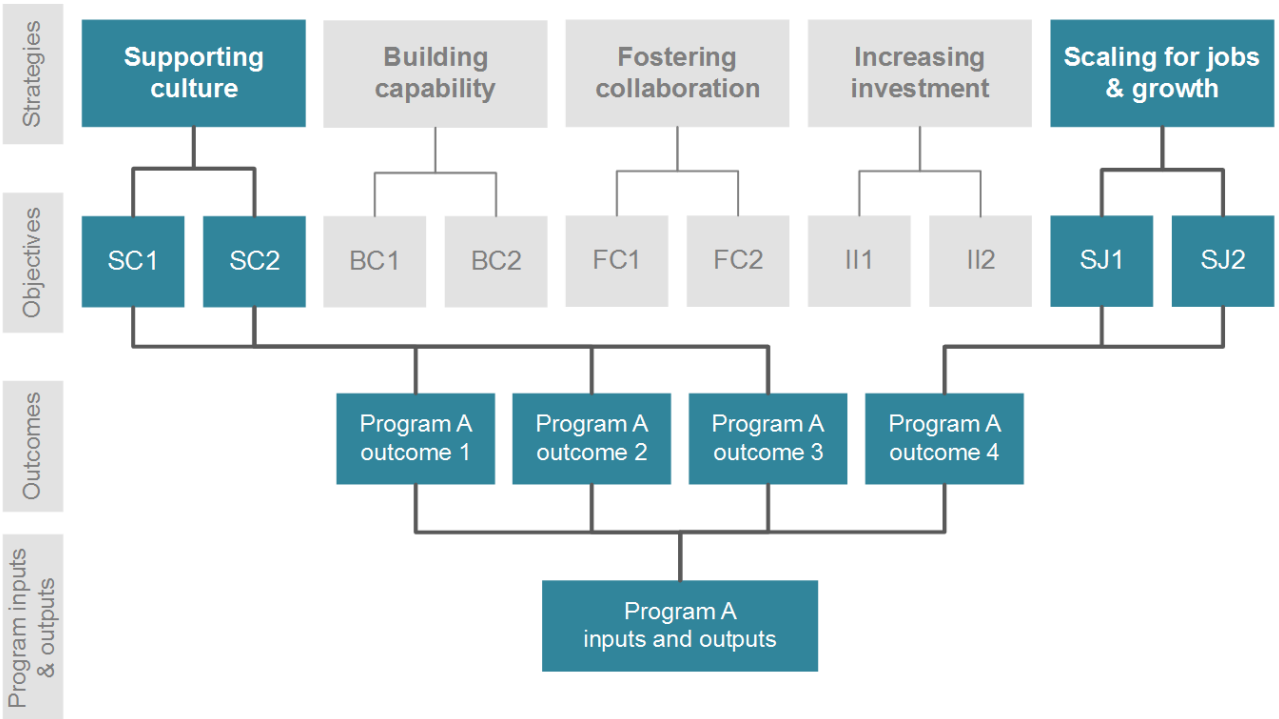
Theme	Description	Aims	Primary Strategies/ Objectives
Connect *Queenslanders to world-leading local and international innovators through programs that encourage collaboration and build the entrepreneurial and innovation ecosystem.*	Programs aligned to this theme are designed to develop, attract and retain the talent needed to support a strong and vibrant knowledge economy. They are designed to connect Queenslanders with local and international collaborators, innovators and investors.	Programs aligned to this theme aim to: • build innovation networks that spark opportunities to connect, learn and partner • create global connections for talent, markets and opportunities • increase collaboration between industry, researchers and startups.	**Fostering collaboration:** • FC1 – Build sustainable partnerships to deliver outcomes • FC2 – Increase international networks
Invest *in Queensland innovation through programs to encourage seed funding, venture capital and deal-flow, and foster emerging industries.*	Programs aligned to this theme are helping Queensland businesses, researchers and innovators build their skills and businesses to take their ideas to market, access finance; scale and become investment-ready; and increase the level of deal flow.	Programs aligned to this theme aim to: • attract local and global investment and investors into Queensland innovation • help innovators to become market and investment ready • improve service delivery through innovation.	**Increase investment:** • II1 – Grow pipeline of investable products/services • II2 – Build access to capital

Theme	Description	Aims	Primary Strategies/ Objectives
Grow *the competitiveness of our businesses, industries and regions through programs to accelerate growth and unlock new markets and opportunities*	Programs aligned to this theme are unlocking new opportunities for traditional industries and creating new industries. Programs expand venture capital funding available to Queenslanders, and provide targeted funding assistance to address gaps in key strategic opportunities for the state.	Programs aligned to this theme aim to: • harness innovation to create opportunities for traditional and emerging industries • unlock the potential of small business and regions to innovate • accelerate development of our high growth firms (scale up faster) • establish government as a lead customer and innovator.	**Scaling for jobs and growth:** • SJ1 – Expedite commercialisation • SJ2 – Increase economic benefits from innovation (including jobs)

2.1.5 Program objectives and intended outcomes

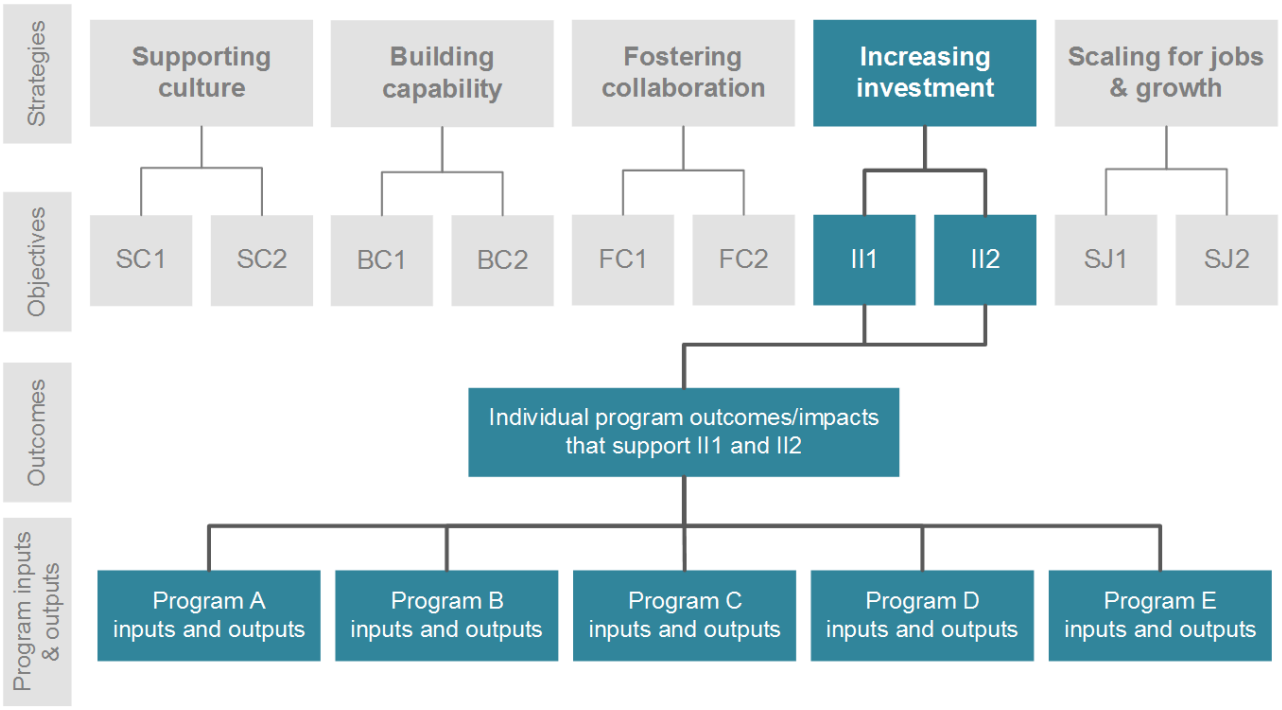
Each program within the Advance Queensland initiative has a number of expected outputs and outcomes, and will contribute to one or more of the Advance Queensland strategies and objectives (see Figure 2.3).

Figure 2.3 – Links between program outcomes and AQ objectives and strategies – bottom up



Conversely, each Advance Queensland strategy and objective is supported and achieved through the outcomes and impacts of multiple individual programs (see Figure 2.4).

Figure 2.4 – Links between program outcomes and AQ objectives and strategies – top down



The relationship between individual program inputs, outputs, outcomes and the broader Advance Queensland strategies and objectives are detailed in individual program theories or logic models (see section 3.5 for further detail).

2.2 Evaluation

Evaluation is the systematic, objective process of understanding how a policy or other intervention was implemented, what effects it had, for whom, how and why.

Evaluation activities can occur before, during or after implementation, and may include an assessment of the appropriateness, relevancy, process, effectiveness and/or efficiency of a program.

This section gives an overview of how and when to evaluate within the context of Queensland Government programs.

2.2.1 Why evaluate?

Evaluation is the foundation for effective, evidence-based policy and continual improvement of Advance Queensland.

Evaluation delivers on the Queensland Government's commitment to accountability, transparency and achieving value for money on investments and policy initiatives.

Evaluation can determine whether programs are operating as planned and on track to deliver intended objectives. It communicates to program managers what elements of a program are working effectively and highlights areas that require improvement. Incorporating this feedback into program delivery can improve efficiency and optimise return on investment.

Evaluation is particularly important for innovation programs, such as Advance Queensland, which are intended to disrupt business as usual. Evaluating a program targeting innovation can signal to government the appropriateness and cost-effectiveness of this disruption.

Given the complexity of an innovation system, and the breadth of the Advance Queensland program, such interventions may have unintended impacts elsewhere in the economy. Effective evaluation allows these impacts to be captured, accounted for, and addressed as part of the program's ongoing implementation.

Equally, Advance Queensland programs may spur unintended positive impacts to be further maximised including knowledge spill overs, as well as potential cumulative benefits of well-designed programs targeting common outcomes.

Evaluation also creates an evidence base to support continued investment in programs that work and to refine innovation policy over time.

2.2.2 When to evaluate

Evaluation planning and activity should be part of program design and delivery.

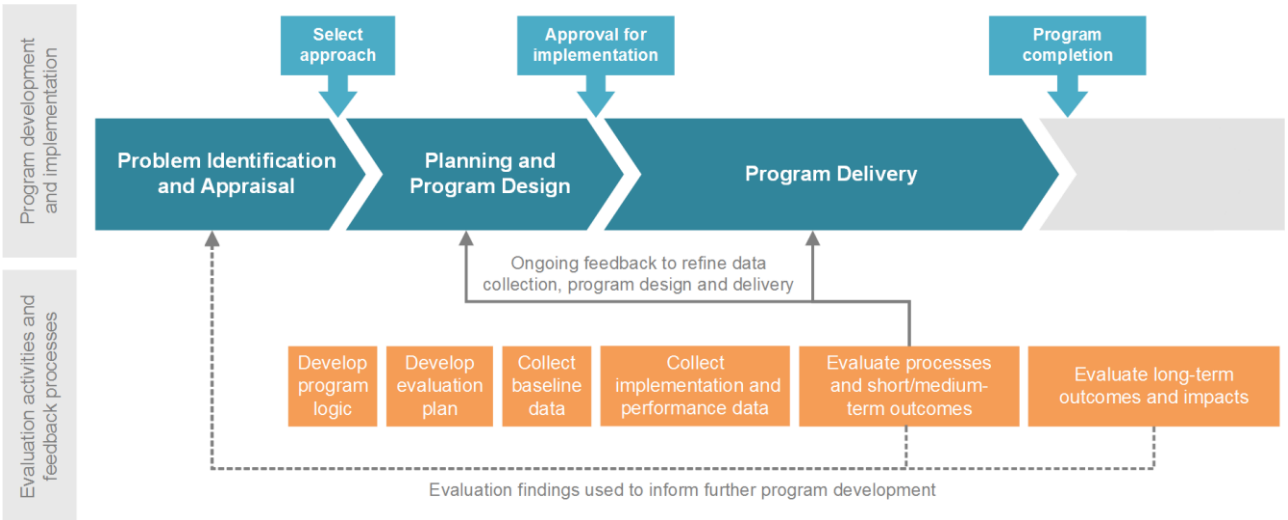
Evaluation planning is best embedded into the program development and design stage to ensure efficiency and effectiveness in the delivery of outcomes.

Early evaluation planning can enhance a program's design by clarifying the program's goals, objectives and desired outcomes, activities and key deliverables; and how these will be measured, including appropriate data sources. The identification and collection of baseline data at the commencement of the program will strengthen evaluative activities and findings.

Ongoing feedback from evaluations conducted during program implementation can be used to refine data collection, program design and delivery. At a broader policy level, evaluation findings should be used to inform future program development and drive improvement in program design and delivery.

Short-term and medium-term outcomes can be measured and evaluated during program implementation, and at the closure of program funding rounds. Longer-term outcomes, such as wider economic and social impacts may require a study of program impact to be undertaken a significant time after project and program completion.

Figure 2.5: Incorporating evaluation into program development and implementation



2.2.3 Queensland Government Program Evaluation Guidelines

The *Queensland Government Program Evaluation Guidelines* (2014)[11] outline a broad set of principles that are expected to underpin the planning and implementation of evaluations for programs funded by the Queensland Government.

The guidelines outline the minimum requirements expected to be met for the planning, implementation and management of program evaluations and are intended as a resource for those responsible for developing, designing and implementing programs.

The *Queensland Government Program Evaluation Guidelines* require that all evaluations of public sector programs will:

- Specify criteria for determining the success of the program
- Focus on the key issues that will inform decision making
- Use a systematic and evidence-based approach to assess performance
- Be reliable, useful and relevant to decision makers and stakeholders
- Be timely.

Ideally, evaluation should be built into program design and have the following features:

- A clear, considered evaluation plan and, where relevant, a well-drafted terms of reference
- Clearly defined roles and responsibilities
- Strong stakeholder engagement
- Evaluation milestones timed to be able to inform decision making
- Strategies in place to compensate for any potential deficiencies in evaluation design, data collection and analytical methods
- Checks and balances in place to ensure validity of evaluation findings
- Clear, transparent reporting that outlines methods, assumptions and key findings.

2.2.4 Other relevant Queensland Government frameworks and principles

All evaluations should also be consistent with the principles and approaches outlined in other relevant Queensland Government frameworks, including:

- ***Queensland Government Performance Management Framework***[12] – provides a mechanism to help strengthen public sector accountability, adopting a holistic approach to performance management directed at a whole-of-Government, ministerial portfolio, agency and individual level. The PMF focusses on three key aspects of public sector performance management: planning, measuring and monitoring performance, and public reporting.
- ***Project Assessment Framework*** [13]– used across government to ensure a common, rigorous approach to assessing projects at critical stages in their lifecycle, from the initial assessment of the service required, through to delivery.

[11] Queensland Treasury (Queensland Government) (2014). *Queensland Government Program Evaluation Guidelines* https://s3.treasury.qld.gov.au/files/qld-government-program-evaluation-guidelines.pdf

[12] https://www.forgov.qld.gov.au/manage-government-performance

[13] https://www.treasury.qld.gov.au/growing-queensland/project-assessment-framework/

3. Approach to evaluation of the Advance Queensland initiative and programs

This section outlines the key elements of the approach that will be taken to evaluate the Advance Queensland initiative and associated programs/activities, including:

- key principles underpinning evaluation methodology and activities
- adopting a system-wide approach to identify collective impact
- the levels at which evaluations will be conducted (micro, meso and macro)
- the types of evaluations that will be undertaken (formative, process, effectiveness and efficiency)
- the development of logic frameworks for key elements of the initiative and evaluations plans
- prioritisation of evaluations.

3.1 Principles for evaluation of the Advance Queensland initiative and programs

There are eight core principles that underpin the evaluation methodology. All Advance Queensland evaluation activities will adhere to these principles as closely as is practical.

Figure 3.1 Principles for evaluation of Advance Queensland

PROVIDES VALUE

Evaluation is integrated into program design and delivery with a view to change and improve the program throughout its lifecycle. Evaluation provides value to program owners and managers, to policy makers, analysts and senior executives, and to citizens.

FIT FOR PURPOSE

The scale of effort and resources allocated to evaluation are proportional to the value, impact, strategic importance and risk profile of the program and its contribution to achieving the overall objectives of the initiative.

INFORMED BY EVIDENCE

Robust research and analytical methods to assess impact and outcomes are used. Evaluation should strive to meet best practice standards.

INTEGRATED AND COMPREHENSIVE

The evaluation approach is consistently applied across all Advance Queensland programs yet adaptable to dynamic changes to the initiative. It complements the overarching vision and is monitored from a whole-of-initiative perspective.

SMARTR

Evaluation activities should be specific, measurable, achievable, results-focused, and reportable. The timing of evaluation activity should enable outcomes to be fed into the policy cycle and inform future decision making.

TRANSPARENT

Evaluation results are communicated to key stakeholders including the public, except in some circumstances where this would be inappropriate. Any limitations and assumptions should be clearly articulated. This transparency allows key findings of evaluation to be shared and incorporated across all Advance Queensland programs where this might be beneficial.

IMPARTIAL

Evaluation processes consider the need for independence and impartiality. Evaluations must not reflect personal nor sectoral interests and should avoid any possible conflict of interest.

ADAPTABLE AND FLEXIBLE

The evaluation approach should be flexible to adapt to changes in policy or external environments, to changes in the suite of programs approved by Government, and to recognise the diversity of the Advance Queensland suite of programs.

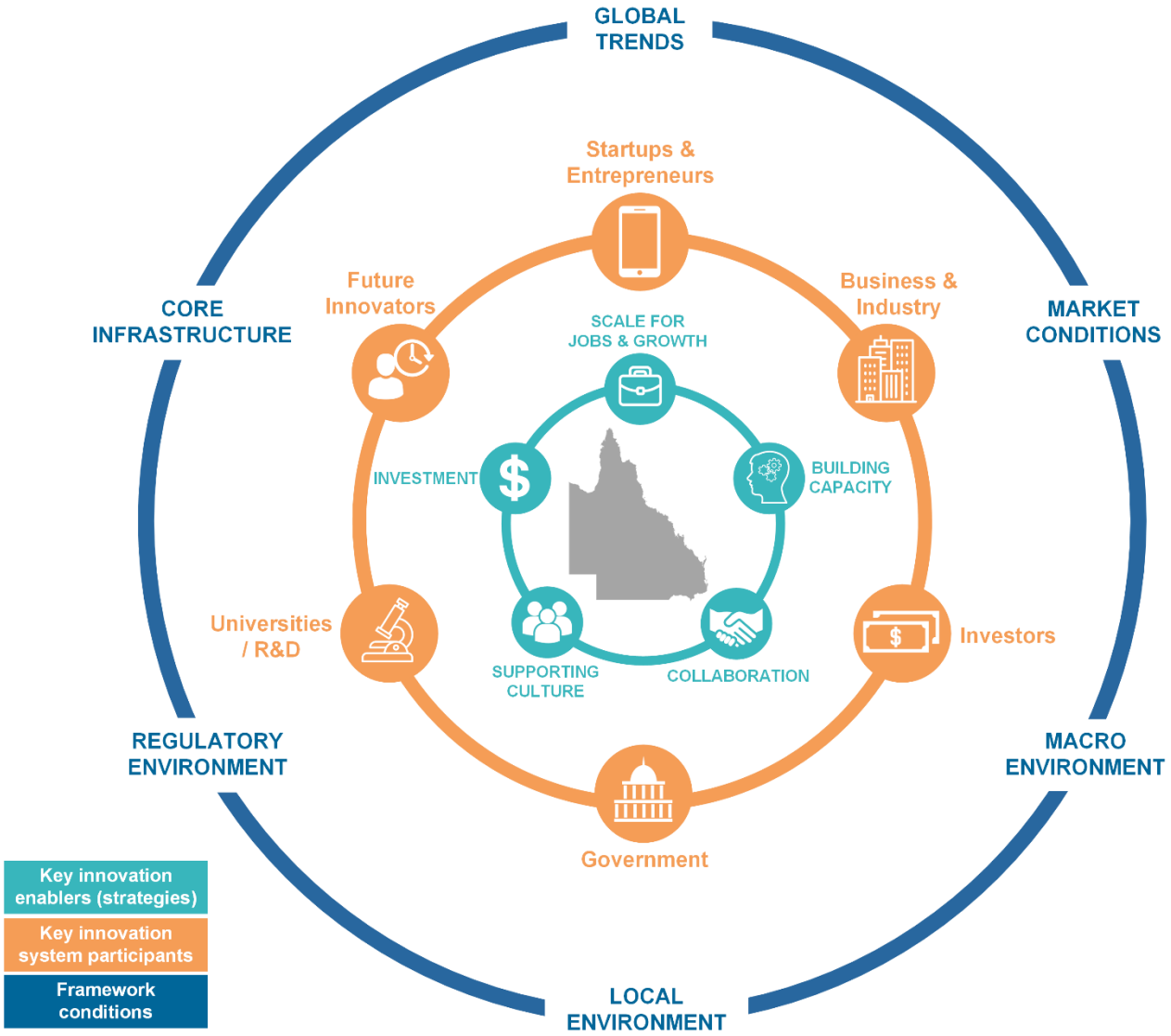
3.2 A system-wide approach

Innovation does not occur in isolation. Interaction is central to the innovation process, with change in one part of the system often causing or catalysing change in another. This may be synergistic, with a combination of programs working together to deliver desired outcomes, or unintended, where one program impacts on another in a manner that was not anticipated.

Given the complex nature of innovation systems, evaluating innovation programs using a systems approach can identify their collective impact and help with recognition of gaps or disconnects in the system that decrease the overall effectiveness of program investments[14].

Another characteristic of a suite of programs like Advance Queensland is individual programs with common goals may affect the same indicators. Both these factors can make attribution of impacts to individual programs challenging, which makes outcome evaluation a difficult task. Evaluating at a system-wide level can side step this problem.

Figure 4.1: An overview of the Queensland Innovation System



[14] Woothuis, Lank Woolthuis, Lankhuizen & Gilsing (2005). A system failure framework for innovation policy design

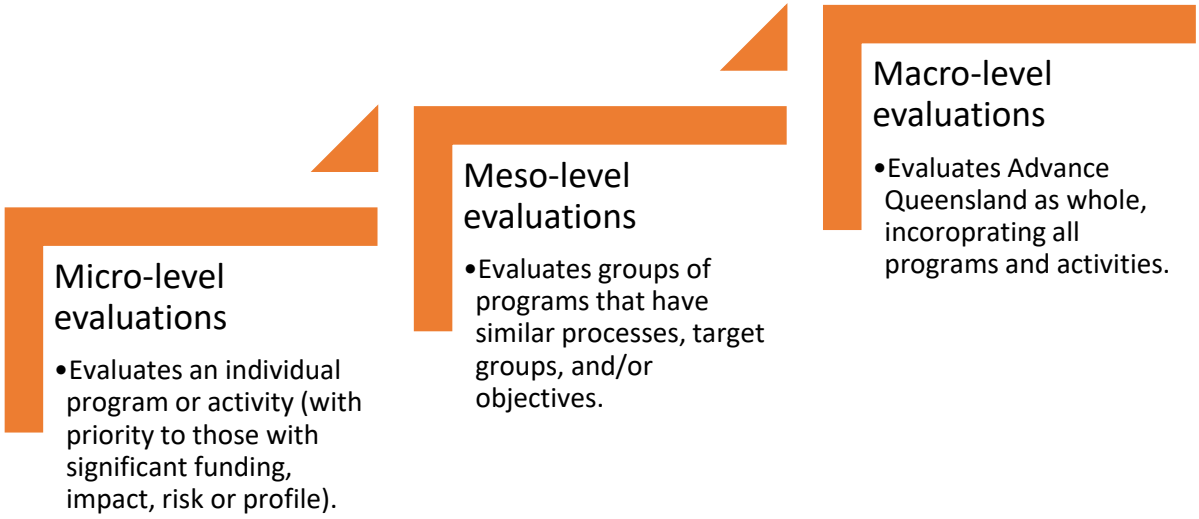
3.3 Levels of evaluation

Evaluation of the Advance Queensland initiative and associated programs/activities occurs at three different levels:

- ***Micro-level evaluations*** – for single programs or activities, with priority given to those that are that are more complex and/or have significant funding, impact, risk or profile.
- ***Meso-level evaluations*** – for groups or clusters of programs which have common processes, audiences and/or objectives, and therefore could be most efficiently and effectively evaluated together.
- ***Macro-level evaluations*** – incorporating all programs and activities, taking into account interlinkages between programs and outcomes at a system-wide level.

This approach will ensure that evaluative consideration is given to key aspects of the initiative, as well as making better use of limited resources by consolidating evaluation activity where it makes sense to do so.

Figure 4.2: Levels of evaluation of Advance Queensland initiative and programs/activities



The level of evaluation at which a specific program will be evaluation will be determined by the Evaluation Sub-Committee, and endorsed by the Advance Queensland Steering Committee, and will be based on an assessment of key attributes of programs, including:

- ***Program objectives and scope*** – including number and scope of program outcomes, linkages to Advance Queensland strategies and objectives and priorities in the Building Our Innovation Economy - Advance Queensland Strategy
- ***Data requirements*** – including type and availability of data required to support evaluation
- ***Complexity and risk*** – including interdependencies with other programs and functional areas
- ***Funding and value for money*** – including budget and expected cost of delivering outputs and achieving outcomes
- ***Profile or nature of the program*** – program type and scale, level of scrutiny program is expected to attract
- ***Target participants*** – number and type of innovation system participants targeted by the program
- ***Governance and stakeholders*** – number of government departments and stakeholders involved in program delivery
- ***Timeframes for implementation and expected impacts*** – when program outputs are expected to be delivered, implementation completed, and outcomes and impacts realised
- ***Evidence base*** – opportunity or requirement to build the evidence base for program leaders or decision-makers to rely upon when assessing the development, implementation, continuation or cessation of the program or other similar programs.

3.4 Types of evaluation

Evaluations of the Advance Queensland initiative and associated programs/activities will be designed to answer four broad classes of questions:

- What is the need for the program/activity, and how is it best designed for maximum benefit?
- How was the program/activity implemented and/or delivered?
- What difference did the program/activity make? Was it effective?
- Did the benefits of the program/activity justify the costs? Was it efficient?

The specific objectives for each evaluation will vary according to the type of program (or group of programs) being evaluated, the stage of program implementation, the existing body of evidence/availability of data, and stakeholder expectations.

3.4.1 Formative (ex-ante) – design and clarification

Formative evaluations are typically undertaken at the beginning of a program that is relatively large or contributes to an ongoing policy commitment.

This approach can be used:

- when developing a new program or refining an existing program, and/or
- to compare actual performance against what was originally intended.

Formative evaluations help to assess whether the program will address an identified need, inform the design of the program, identify key environmental elements that may influence the program's success, make clear the theory or change that the program is based on and what outcomes the program is aiming to achieve.

Formative evaluation often involve qualitative methods of inquiry, and key evaluation questions are generally more open and lead to exploration and clarification of aims, objectives and processes.

3.4.2 Process – implementation and delivery

Process evaluations assess whether a policy is being implemented as intended and what, in practice, is felt to be working more or less well, and why.

This approach can be used:

- when refining an existing program to inform and improve program design;
- during implementation to inform and improve implementation processes, and/or
- at the end of program to determine design or program elements that contributed to the program's success, and inform future program development.

Process evaluations can employ a wide range of data collection and analysis techniques, covering multiple topics and participants. Process evaluations often include the collection of qualitative and quantitative data from different stakeholders, as well as organisational and administrative information.

3.4.3 Effectiveness – impact/outcome

Impact evaluations assesses the outcomes of a program against its short term, medium, or long term goals. This kind of evaluation is useful to answer the question "has our program worked?"

This approach can be used:

- at key points during implementation to assess achievement of intermediate outcomes and inform improvements to program design and/implementation approach;
- at the end of program to determine the outcomes achieved; and/or
- at points in time after the program has been completed to assess longer-term impacts, including wider economic and social impacts.

A comprehensive approach to outcome evaluation also assesses any unintended impacts of a program, as well as the "counterfactual" or what would have happened in the absence of the program.

Experimental, quasi-experimental, or non-experimental methods are the main approaches used to attribute observable impacts on relevant indicators to a program's interventions.

3.4.4 Efficiency – value for money

This approach is used to assess the program's value for money, or the efficiency in achieving the outcome/s. For the purposes of program evaluation, are three types of efficiencies:

- ***Technical efficiency*** – the program was delivered at the lowest possible cost
- ***Allocative efficiency*** – the program is delivered to the areas of greatest needs, and provides the types of outputs and outcomes that recipients value most (for the given set of resources)
- ***Dynamic efficiency*** – the program continues to improve over time, by finding better or lower cost ways to achieve outcomes.

3.5 Logic frameworks and models

3.5.1 Logic frameworks

A logic framework shows how program activities are understood to contribute to a series of intermediate outcomes that then produce the intended long-term outcomes.

The development of a logic framework is recommended by the *Queensland Government Program Evaluation Guidelines*[15] in order to develop an understanding of how the program works (or is intended to work), what it is trying to achieve (in terms of measurable objectives), and why (the underlying policy program).

Development of a program logic framework provides:

- a tool to create a dialogue and shared understanding of the program's goals, objectives and desired outcomes, activities and key deliverables
- clarity of the cause-and-effect relationship between program activities, outputs and immediate, intermediate and ultimate outcomes
- a tool to identify and assess the plausibility of the assumptions made
- a method to evaluate and strengthen program design
- a hierarchy of outcomes expected at different times scales
- a framework to monitor and evaluate performance, including an outline of data requirements, collection methods and analysis techniques.

3.5.2 Logic models

Different types of diagrams can be used to represent a program theory. These are often referred to as logic models, as they show the overall logic of how the intervention is understood to work.

There are many ways of developing and representing logic models. The methods chosen will likely depend on the program (or cluster of programs) being assessed or evaluated, however all models should consider:

- ***Need or driver(s) –*** why the program is required
- ***Objectives***: what the program aims to achieve and why
- ***Inputs***: the resources needed to operate the program (labour, materials etc.)
- ***Activities***: processes, tools, events, technology and actions integral to program implementation
- ***Outputs***: direct products of program activities (such as types of services to be delivered)
- ***Short-term outcomes***: such as changes in awareness, knowledge, skills, and attitude

[15] Queensland Treasury (Queensland Government) (2014). *Queensland Government Program Evaluation Guidelines* https://s3.treasury.qld.gov.au/files/qld-government-program-evaluation-guidelines.pdf

- ***Medium-term outcomes***: such as changes in behaviour
- ***Long-term outcomes***: such as wider economic, environmental and social impacts.
- ***Alignment and contribution*** to broader objectives and frameworks.

Table 3.1 – Sample of methods to represent logic models

Model type	Method	Represented as:
Logframe	Considers the relationships between available resources, planned activities, and desired changes or results.	A matrix of key program attributes which may include: ○ Goal, Purpose, Outputs, Activities ○ Summary, Indicators, Data sources, Assumptions
Outcomes Hierarchy	Demonstrates a series of outcomes leading up to the final impacts of a project	Can be shown as a series of "boxes and lines" or a table showing outcomes to be achieved at different temporal scales
Results Chain *(pipeline model)*	Represents a program as a linear process with inputs and activities at the front and long-term outcomes at the end	A series of boxes: inputs –> activities –> outputs –> outcomes –>impacts

3.5.3 Advance Queensland logic frameworks

Individual logic frameworks are developed for key elements of the Advance Queensland initiative, including:

- ***Micro-level frameworks*** – for significant programs or activities including those that are that are more complex and/or have significant funding, impact, risk or profile (i.e. subjects of micro-level evaluations)
- ***Meso-level frameworks –*** for groups or clusters of programs which have common processes, audiences and/or objectives, and therefore could be most efficiently and effectively evaluated together (i.e. subjects of meso-level evaluations)
- ***Macro-level framework*** – incorporating all programs and activities, taking into account interlinkages between programs and outcomes at a system-wide level.

The Advance Queensland Framework provided in Section 2.1 of this document, and the *Advance Queensland Organising Framework*[16] provides a high-level logic framework for the initiative.

All logic frameworks and models are to be reviewed and updated as required to ensure they remain accurate and fit for purpose.

3.6 Evaluation plans

Evaluation plans are developed for each individual evaluation to set out the proposed details of an evaluation – what will be evaluated, how and when.

Evaluation plans are specific to each evaluation, but generally include:

- what is to be evaluated (the 'evaluand')
- the logic framework
- the purpose/s of the evaluation
- key evaluation questions
- when the evaluation will be conducted
- who will conduct the evaluation
- what resources are required and available

[16] Queensland Government. Advance Queensland Handbook (unpublished)

- what data will be collected, how and when, how data will be analysed,
- who are the key stakeholders and how they will be engaged
- how and when results will be reported.

3.7 Priority evaluations

A system-level approach is used to prioritise the number, frequency, level and type of evaluation activity to ensure efficient allocation of resources when evaluating the Advance Queensland portfolio.

Advance Queensland programs are identified as a priority evaluation by implementing agencies through the Evaluation Sub-Committee, and endorsed by the Advance Queensland Steering Committee based on an assessment of key attributes of programs (refer to Section 3.3) and the following key considerations include:

- what evaluation activity needs to be prioritised and the reasons for prioritisation
- what types of evaluation activity will be undertaken
- what program activities need to be undertaken and finalised in order for evaluation activity to commence
- what data is required to undertake the evaluation and when it will be available
- when program outputs will be delivered, and outcomes and impacts will be realised
- resourcing strategy to undertake evaluation activities, including capacity to undertake concurrent activities.

The priority evaluations will be regularly reviewed and updated to take into account changes to evaluation priorities, capacity and capability.

Cross-cutting themes

Outcomes for Indigenous, female and regional Queenslanders should be investigated as cross-cutting themes in all AQ priority evaluations, as appropriate. Rather than specific evaluations focused only on these groups, including them across the priority evaluations allows for enablers, barriers and outcomes to be assessed in the context of each specific program. Some programs specifically focus on these groups, and consequently evaluations of these programs will include a greater investigation of these outcomes.

3.8 Supporting programs of work

To support the approach to Advance Queensland evaluation outlined in the previous sections, two supporting programs of work have been identified to progress critical issues impacting across the evaluation activities.

The table below outlines the purpose of the supporting programs of work and the related sections of this Framework. They are also identified as management strategies to the high-level risks identified in Section 7.2.2.

Table 3.2 – Outline of the supporting programs of work

Supporting Program of Work	Aims	AQ Evaluation Framework
1. Evaluation capability, capacity and resourcing	• Confirm the human and financial resourcing required to adequately evaluate the Advance Queensland initiative • Build the evaluation culture and skills within implementing agencies, and • Develop a long-term, staged resourcing and sourcing strategy for the evaluation of Advance Queensland.	Section 9 – Evaluation Resources
2. Evaluation methodologies, metrics & data	• Support the assessment, acquisition and/or development of appropriate methodologies, metrics and data sets required to effectively evaluate innovation performance	Section 4 – Evaluation Methodologies Section 5 – Evaluation indicators/ measures Section 6 – Data strategy

4. Evaluation methodologies

This section outlines key evaluation domains and methodologies for each evaluation type detailed in section 3.4, as well as some general consideration in choosing a methodology.

4.1 Evaluation domains and methodologies

To guide the selection of evaluation methodologies, evaluation domains for each type of evaluation based on output and outcome indicators in the *Report of Government Services (ROGS) Performance Indicator Framework*[17] and possible evaluation questions have been developed.

Table 4.1 – Overview of evaluation types, domains and methodologies.

Evaluation type	Evaluation domains	Possible evaluation questions	Possible evaluation methodologies
Formative	• ***Need*** – clarify the need for the program, and how it addresses an identified need • ***Logic*** – clarify the logic or theory of change underpinning the program, and identify key assumptions • ***Objectives*** – clarify what it the program is trying to achieve • ***Design*** – clarify and test key design elements • ***Context*** – key environmental elements that may influence the program's success • ***Target audience*** – clarify the groups that the program aims to serve • ***Appropriateness –*** clarify how the program will meets the stated objectives and needs	• What are the underlying causes of problem that the program is looking to solve? • What has worked in solving similar problems? • What key features of similar programs have contributed to outcomes? • How could program design improve on past programs? • What are the characteristics of the intended audience that are relevant to program design? • What data needs to be collected and how/when will it be available?	• Literature scan • Exploratory research • Case study/interviews • Program Logics • Systematic literature review

[17] Productivity Commission, (2017). *Report on Government Services – Approach to Performance Measurement.* http://www.pc.gov.au/research/ongoing/report-on-government-services/2017/approach/performance-measurement

Evaluation type	Evaluation domains	Possible evaluation questions	Possible evaluation methodologies
Process (Implementation and delivery)	• ***Fidelity*** – the extent to which the program has been delivered as intended or planned • ***Reach*** – the extent to which the program has been adopted by key stakeholders and the extent to which target groups have been adequately reached • ***Governance*** – the extent to which governance arrangements support implementation	• Is the initiative/ program being implemented as intended? • What design or features influenced variation in implementation? • How appropriate are the processes compared with quality standards? • Are potential participants being reached and/or engaging in the program as intended?	• Program reports • Expert review (process) • Program monitoring documentation • Semi-structured interviews/surveys with program team and participants
Effectiveness (Outcome/ Impact)	• ***Effectiveness*** – the extent to which the program delivers on stated objectives • ***Access*** – how easily the target audience can access the program or service • ***Appropriateness –*** how well the program meets the needs of stakeholders • ***Quality*** – the extent to which a service is suited to its purpose and conforms to specifications • ***Unintended impacts*** – any unexpected impacts	• To what extent does the program address an identified need/ deliver on the intended objectives? • How satisfied are the target audience and/or key stakeholders with the program and its accessibility? • What short, medium or long term outcomes have been observed? • Would outcomes have been achieved without intervention? • What is the sustained change because of this program? • What benefits would be absent if this program had not been implemented? • What unintended outcomes/impacts (positive/negative) were produced?	• Quasi-experimental • Non-experimental • Expert review • Realist evaluation • Regression econometrics • Semi-structured interviews/surveys with program team and participants

Evaluation type	Evaluation domains	Possible evaluation questions	Possible evaluation methodologies
Efficiency (Value for money)	• ***Technical efficiency*** – whether program was delivered at the lowest possible cost • ***Allocative efficiency*** – whether the program provides the types of outputs/outcomes that recipients value most (for the given set of resources) • ***Dynamic efficiency*** – whether the program continues to improve over time, by finding better or lower cost ways to achieve outcomes	• Was the program delivered at the lowest possible cost? • Is the program providing good value for money? • What has been the ratio of costs to benefits)?	• Rapid cost-benefit analysis • Full cost-benefit analysis • Cost effectiveness analysis

4.2 Considerations in selecting methodologies

There is no one size fits all approach to choosing a methodology: selection should be program specific, taking into account the motivation and objectives of evaluating the program, data requirements and availability, resourcing and the complexity of the evaluation methodology.

The table below provides an overview of the evaluation methodologies listed in Section 4.1 and their relative complexity.

Table 4.2 – Evaluation methodologies and relative complexity.

	Straightforward →		More Complex
Formative	• Literature scan	• Targeted literature review • Exploratory research • Case study/interviews • Program Logics	• Systematic literature review
Process (Implementation and delivery)	• Program report • Program monitoring (e.g. health check report)	• Expert review (process) • Semi structured interviews	
Effectiveness (Outcome/ Impact)	• Qualitative assessment of program impact based on interviews or surveys	• Non-experimental • Expert review (outcome) • Regression/econometric	• Experimental • Quasi-experimental

	Straightforward	→	More Complex
Efficiency (Value for money)		• Rapid CBA • Cost effectiveness	• Full economic CBA

Given the nature Advance Queensland programs, it is unlikely that any of the more complex methodologies would be required.

5. Evaluation indicators/measures

Measuring innovation is complex and many of the impacts of programs delivered by Advance Queensland will not be apparent for many years.

Therefore success will be measured through a combination of:

- ***Macro/system indicators*** aligned to Advance Queensland strategies and objectives
- ***Whole-of-initiative implementation and performance measures***
- ***Bespoke indicators*** for individual programs

5.1 Indicator categories

Indicators relevant to the evaluation of innovation programs and initiatives can be broadly grouped into the following categories:

- ***Intangible outcomes*** – unmeasurable and are identified as outcomes such as maintaining relationships or networks.
- ***Tangible outcomes*** – can be measured either qualitatively or quantitatively.
- ***Qualitative indicators*** –can't be articulated in a numeric form.
- ***Quantitative indictors*** – outcomes that can be represented numerically, either monetised or non-monetised.

o *Non-monetised indicators* – include examples such as volume or percentage change;

o *Monetised indicators* – can be deemed financial or economic

- Financial indicators relate to direct financial impacts
- Economic indicators relate to the impact on the overall economy (GSP or GDP), with a relevant example identified as, education related government expenses as a share of GSP.

5.2 Macro/system indicators

Recognising the range of external influences and the difficulty of establishing direct causality, macro-level indicators will be used to determine progress towards the Advance Queensland vision.

Examples of high-level system indicators aligned to the Advance Queensland strategies and objectives are provided below. This is not intended to be an exhaustive list but rather provides initial high level guidance to support the identification of indicators for evaluation activities. Further details, along with additional measures that could be explored or developed are provided at Appendix 3.

Table 5.1 – Currently available macro measures/ system indicators aligned to AQ Strategies and Objectives

AQ Strategy	AQ Objective	System Indicator/ Macro Measure
Supporting culture (SC)	**SC1 – Increase innovation awareness and engagement**	Increased awareness of science in Queensland community
		Increased awareness of science in regional Queensland
		Perceptions of innovation activity (including Advance Queensland)
	SC2 – Increase entrepreneurial-ism	Value of new and follow-up investment in investee companies
		Business entry and exit rates
		Count of co-working spaces, startup incubators and accelerators
		Increase in Queensland's share of tech startups

AQ Strategy	AQ Objective	System Indicator/ Macro Measure
Building Capacity (BC)	**BC1 – Increase innovation capability**	Gross expenditure on R&D as a share of GSP including business expenditure on R&D as well as higher education
		Scholarly output per 1000 population
		Share of scholarly output in top 1% (or 10%) most cited publications
		Share of SMEs with new to market (world) products
	BC2 – Develop, attract and retain talent including STEM	Year 12 students studying identified science, technology and mathematics subjects
		STEM literacy scores (including National Assessment Program (NAP) – Science Literacy scores)
		Proportion of Queenslanders with a non-school qualification
		Count of university, TAFE and research institutions per 1,000 population
Fostering Collaboration (FC)	**FC1 – Build sustainable partnerships to deliver outcomes**	Share of businesses conducting innovative activity
		Share (%) of Queensland scholarly outputs with international co-authorship
	FC2 – Increase international networks	Percentage of R&D financed abroad for Higher Education Expenditure on R&D (HERD)
Increase investment (II)	**II1 – Grow pipeline of investible products and services**	New capital expenditure attracted to Queensland (measured as growth in business capital expenditure)
		Spend on innovation by businesses as a proportion of GSP
		More business investment in R&D
		Increased investment in research
	II2 – Build access to capital	Value of venture capital by investee company head offices as a share of GSP
Scaling for jobs and growth (SJ)	**SJ1 – Expedite commercialisation**	*Nil measures readily available*
	SJ2 – Increase economic benefits from innovation (including jobs)	Jobs driven by Advance Queensland programs
		Increase knowledge based jobs in Queensland

5.3 Whole-of-initiative implementation and performance measures

As part of the whole-of-initiative reporting arrangements outlined in the *Advance Queensland Reporting Framework*[18], all Advance Queensland program managers are required to provide regular reports on a suite of key implementation and performance measures.

These measures are listed below, along with relevant evaluation domains, and may be used as key data sources for process, effectiveness and efficiency evaluations at all levels (micro, meso and macro).

Table 5.2 – Whole-of-initiative measures and relevant evaluation domains

Type	Measure	Relevant evaluation domain/s
Implementation	***Program status*** • Programs launched • Rounds opened/closed • Events held (incl. regional events) • Milestones and key activities	• ***Fidelity*** – the extent to which the program has been delivered as intended or planned • ***Reach*** – the extent to which the program has been adopted by key stakeholders and the extent to which target groups have been adequately reached • ***Access*** – how easily the target audience can access the program or service
Implementation	***Program budget*** • Expenditure • Funds contractually committed	• ***Fidelity*** – the extent to which the program has been delivered as intended or planned • ***Technical efficiency*** – whether program was delivered at the lowest possible cost • ***Dynamic efficiency*** – whether the program continues to improve over time, by finding better or lower cost ways to achieve outcomes
Performance	***Innovators reached*** • Applications received • Attendance at events	• ***Fidelity*** – the extent to which the program has been delivered as intended or planned • ***Reach*** – the extent to which the program has been adopted by key stakeholders and the extent to which target groups have been adequately reached • ***Access*** – how easily the target audience can access the program or service • ***Appropriateness –*** how well the program meets the needs of stakeholders • ***Allocative efficiency*** – whether the program provides the types of outputs/outcomes that recipients value most (for the given set of resources)

[18] Queensland Government. *Advance Queensland Handbook* (in development)

Type	Measure	Relevant evaluation domain/s
Performance	***Innovators supported*** • Recipients of grants, prizes and opportunities (incl. regional recipients, female recipients	• ***Effectiveness*** – the extent to which the program delivers on stated objectives • ***Reach*** – the extent to which the program has been adopted by key stakeholders and the extent to which target groups have been adequately reached • ***Access*** – how easily the target audience can access the program or service • ***Appropriateness –*** how well the program meets the needs of stakeholders
Performance	***Funds leveraged*** • External investment leveraged	• ***Effectiveness*** – the extent to which the program delivers on stated objectives • ***Technical efficiency*** – whether program was delivered at the lowest possible cost • ***Dynamic efficiency*** – whether the program continues to improve over time, by finding better or lower cost ways to achieve outcomes
Performance	***Jobs supported*** • New jobs reported • New jobs forecast	• ***Effectiveness*** – the extent to which the program delivers on stated objectives • ***Quality*** – the extent to which a service is suited to its purpose and conforms to specifications

Further details about these reporting measures, including data definitions, can be found in the *Advance Queensland Reporting Framework*[19].

5.4 Program outcomes and measures

As outlined in section 2.1.5, each program within the Advance Queensland initiative has a number of expected outputs and outcomes, and will contribute to one or more of the Advance Queensland strategies and objectives.

Program outputs, outcomes and the alignment to broader Advance Queensland strategies and objectives should be detailed in individual program theories or logic models (see section 6 for more detail).

Program measures and indicators will likely include a combination of:

- System indicators aligned to the relevant Advance Queensland strategies and objectives
- Whole-of-initiative implementation and performance measures
- Individual and bespoke indicators.

[19] Queensland Government. *Advance Queensland Handbook* (in development)

6. Data strategy

A data strategy is a plan for collecting and managing data to provide evidence-based answers to the evaluation questions. Data requirements, availability, and approach to collection should be considered and planned.

6.1 Identifying data requirements

Key questions to ask when assessing data for use in an evaluation include[20]:

- What data needs to be gathered to give reliable and consistent measurement against policy's objectives?
- What additional data should be collected to meet the policy maker's requirements for feedback on the policy and to support any planned evaluations?
- Who will be in charge of gathering data?
- What are the key timeframes for collection?
- How will the data be gathered, transferred, stored and disposed of?
- What considerations required for appropriate privacy and security?
- What format is the data required in?
- How will the data be verified to ensure it is accurate and consistent with the relevant requirements?

A data matrix linking evaluation questions to qualitative and quantitative data sources is a useful tool to guide the next steps in performing a program evaluation. Indicators corresponding to the Program Logic should be described and mapped to the available data sources.

A data matrix for a process evaluation for the grant program example is show in the table below

Table 6.1 – Example data matrix

Evaluation Domain	Evaluation Questions	Indicators	Data Sources
Fidelity	Has the program been implemented as planned?	• Rounds opened/closed • Proportion of program budget expended and contractually committed • Number and proportion of funded projects on track for completion	• Program data • Program performance reports
Appropriateness	How well does the program meet stakeholders' needs?	Reported satisfaction from: • Grant recipients • Supervisors • Industry partners • Implementation team	• Surveys • Semi-structured interviews

6.2 Collecting and/or retrieving data

There are five main sources for collecting and/or retrieving data[21]:

- information from individuals;

[20] Evaluation Guidance Note, Scottish Enterprise, 2008. https://www.scottish-enterprise.com/

[21] *BetterEvaluation*. http://www.betterevaluation.org/

- information from groups;
- observation;
- physical measurements; and
- existing records and data.

Data collection methods will depend on the identified need. It is important to consider the type of information required and how it will be analysed before data collection options is selected. It is also recommended that, where possible, more than one option is selected in order to ensure multiple data sources and perspectives.

Table 6.2 – Data collection options (adapted from BetterEvaluation)

Data source	Data collection options

Information from individuals	• Interviews
	• Questionnaires or surveys
	  ○ Email
	  ○ Face-to face
	  ○ Internet
	  ○ Telephone
	• Mobile data collection
	• Stories and case studies
	• Opinion polls

Information from groups	• Interviews/Focus group discussions • Debriefs or “After Action Reviews” • Delphi Study • SWOT analysis • World Cafe
Observation	• Field Trips • Non-participant observation • Participant observation

Physical measurements	• Geographical
	  ○ Demographic mapping
	  ○ Geotagging

Existing records and data	• National datasets and ‘big data’ • Official statistics and reports published by government agencies or other public bodies • Previous evaluations and research • Individual program data, records and reports

Further information about these data collection options is available at http://www.betterevaluation.org/en/plan/describe/collect_retrieve_data

6.3 Managing data

Data quality assurance – the processes and procedures that are used to ensure data quality – is an essential component of data management. Using poor quality data may result in inaccurate or inappropriate decisions about policies and programs. Data quality assurance should be built into each step in the data cycle − data collection, aggregation and reporting, analysis and use, and dissemination and feedback.

Ensuring data quality extends to checking and 'cleansing' datasets using standardised procedures, as well as presenting the data appropriately in the evaluation report so that the findings are clear and conclusions can be substantiated. Often, this involves making the data accessible so that they can be verified by others and/or used for additional purposes such as for synthesising results across different evaluations.

Key aspects of data quality[22] include:

- ***Validity*** – the degree to which the data measure what they are intended to measure
- ***Reliability*** – data are collected consistently; definitions and methodologies are the same when doing repeated measurements over time
- ***Completeness*** – data are complete (i.e., no missing data or data elements)
- ***Precision*** – data have sufficient detail
- ***Integrity*** – data are protected from deliberate bias or manipulation for political or personal reasons
- ***Availability*** – data are accessible so they can be validated and used for other purposes
- ***Timeliness*** – data are up-to-date current and available on time.

6.4 Existing data sources

The following section provides an overview of some of the key existing data sources that may be used to evaluate the Advance Queensland initiative. This is not intended to be an exhaustive list, as additional data sets will continue to be developed and made available.

6.4.1 National Innovation datasets

The following datasets have been developed by the Commonwealth Department of Industry, Innovation and Science with additional data from the Australian Bureau of Statistics (ABS) and other domestic and international sources:

- ***Business Longitudinal Analysis Data Environment (BLADE)*** – a series of integrated, linked longitudinal datasets combining administrative data from the Australian Taxation Office (ATO) with primary survey data on more than two million actively trading Australian businesses
- ***National Innovation Map –*** visually presenting new business creation, expenditure on research and development, patenting activity and trademarking activity for each statistical region in Australia[23]
- ***Innovation Insights Database*** – released as part of the annual Australian Innovation System Report to provide greater information and understanding to policy makers, academics and other who are interested in Australia's innovation history[24]

Further information on these datasets is provided at Appendix 4.

6.4.2 Program records and reports

In addition to the implementation and performance measures required for whole-of-initiative reports (see section 5.3), individual programs will have a range of data that can be used in evaluation.

This includes, but is not limited to:

- Literature reviews and needs assessments
- Baseline data
- Program guidelines, logic frameworks, and work plans
- Budget and procurement documents

[22] *BetterEvaluation*. http://www.betterevaluation.org/

[23] https://industry.gov.au/Office-of-the-Chief-Economist/Publications/AustralianIndustryReport/Industry-Innovation-Map.html

[24] https://industry.gov.au/Office-of-the-Chief-Economist/Publications/AustralianInnovationSystemReport2017/index.html

- Minutes of meetings and other governance documents
- Funding applications
- Recipient milestone and final progress reports
- Program performance reports
- Case studies and media releases.

6.4.3 Other existing data sources

Other data sources which may be used in the evaluation of innovation programs include:

- Australian Bureau of Statistics (ABS)[25]
- Australian Government reports
- Elsevier information and analytics[26]
- Independently published surveys and reports
- Queensland Government reports
- University surveys and reports.

High-level system indicators aligned to the Advance Queensland strategies and objectives are provided at Appendix 3. Two lists are provided:

1. *System indicators and macro measures currently available*
2. *Additional measures that could be explored or developed*

6.5 Data limitations

All data sets mentioned are constructed using different methodologies and all have their limitations. For example, there are limitations in using patents and trademarks as indicators of regional innovation because innovation could have happened at a location other than where patent holder resides and patents do not necessarily equal products. Nevertheless, there are few other indicators that provide a superior measure of innovation.

Data limitations all broadly surround whether the data set is complete and appropriate for use in the context of the evaluation.

It is also important to ensure validation of externally reported benefits from program participants. For instance, if data to support the measurement of innovation benefits comes from program participants it is vital to ensure this self-reporting data is ground-truthed in reality so that it provides reliable evidence to inform robust evaluations.

[25] http://www.abs.gov.au/

[26] https://www.elsevier.com

7. Governance

As a number of agencies share responsibilities for the implementation of Advance Queensland initiatives, a coordinated approach for monitoring, review and evaluation is required.

The table below outlines the relationship of Advance Queensland evaluation to the Advance Queensland Governance Arrangements[27].

Table 7.1 – Advance Queensland Governance Arrangements relationship to Advance Queensland evaluation

Title	Role statement/s	Evaluation responsibilities
Advance Queensland Leadership Group	• Provides strategic direction for the Advance Queensland initiative	• Consider significant evaluation findings to inform the development policy options and future directions for Advance Queensland
Advance Queensland Steering Committee	• Providing leadership and oversight in the delivery of Advance Queensland initiative, programs and activities	• Approve Advance Queensland Evaluation Framework, Strategies and Plan • Ensure a coordinated whole-of-government approach to evaluation of the Advance Queensland initiative • Endorse/ approve major evaluation reports. • Review key evaluation reports. • Address strategic and directional risks and issues relating to evaluation, as escalated by the Evaluation Sub-Committee
Evaluation Sub-Committee	• Provides oversight of evaluation activities	• Endorse the Advance Queensland Evaluation Framework, Plan and guidance material • Review, update and oversee the implementation of the Advance Queensland Evaluation Plan • Review and endorse evaluation plans and reports • Provide guidance and support on evaluation principles and practices • Address risks and issues as relevant to monitoring and evaluation and escalate when appropriate
Advance Queensland Implementation Unit	• Provides whole-of-initiative coordination through: ○ management strategies and guidance material	• Commission and provide oversight of key macro-level evaluations (as outlined in the Evaluation Plan) • Provide standardised and routine reports on the implementation and performance of Advance Queensland

[27] Queensland Government. *Advance Queensland Handbook* (unpublished)

Title	Role statement/s	Evaluation responsibilities
	• maintenance and provision of key program information and data	• Coordinate the collection and dissemination of key macro/system level data sets • Provide guidance and support on evaluation principles and practices
Implementing agencies and program managers	• Planning, implementation, monitoring, evaluation and reporting on Advance Queensland programs and activities	• Develop program logics and evaluation plans for meso-groups and priority programs (as outlined in the Evaluation Plan) • Conduct or commission evaluations. • Conduct data collection, analysis and validation • Provide regular implementation and performance reports
Program recipients	• Plan, deliver and report on Advance Queensland projects and activities as per contacts	• Provide regular implementation and performance reports • Contribute to data collection(e.g. through surveys and interviews
Universities, research institutes and collaboration partners	• Conduct data collection, analysis and validation	• Provide data, information and reports that may be used to evaluate the Advance Queensland initiative

7.1 Roles and responsibilities

Effective evaluation requires clear governance so that key points of accountability are defined and documented, and stakeholders understand their roles and responsibilities, including leadership for evaluation, who has ultimate responsibility for the evaluation activity, who is responsible for undertaking evaluation activities.

The following table outlines the key tasks or activities and the responsible stakeholders.

Table 7.2 – Key tasks and activities in planning and implementation of Advance Queensland evaluation

Task or activity	Responsible stakeholder	Description of role
Lead the development of whole-of-initiative evaluation frameworks, plans and guidance material	• Advance Queensland Implementation Unit, DITID • AQ Evaluation Sub-Committee • AQ Steering Committee	• Develop, endorse and/or approve: - AQ Evaluation Framework - AQ Evaluation Plan - Other materials as appropriate
Provide oversight of all evaluation activities	• AQ Evaluation Sub-Committee	• Review, update and oversee the implementation of the AQ Evaluation Plan • Review and endorse evaluation plans and reports • Provide guidance and support on evaluation principles and practices.

Task or activity	Responsible stakeholder	Description of role
Commission and provide oversight of key macro-level evaluations	• Advance Queensland Implementation Unit, DITID • Department of the Premier and Cabinet • Queensland Treasury	• Develop program logics and evaluation plans • Conduct or commission evaluations • Conduct data collection, analysis and validation • Engage stakeholders and communicate evaluation findings.
Undertake/commission meso-level and priority micro-level evaluations	• Implementing agencies and program managers	• Develop program logics and evaluation plans • Conduct or commission evaluations • Conduct data collection, analysis and validation • Engage stakeholders and communicate evaluation findings.
Coordinate the collection and dissemination of key macro/system level data sets.	• Advance Queensland Implementation and Policy Units, DITID	•

7.2 Risk and issue management

Governance arrangements should also consider risks and issues, including ethical considerations of conducting evaluations.

7.2.1 Management of risks and issues

Risks and issues associated with the evaluation of Advance Queensland initiative, programs and activities should be managed in accordance with the *Advance Queensland Risk and Issue Management Strategy*[28].

At the highest level, this involves:

- ***Identifying*** what may happen (risks) /has happened (issues) and record in the risk/issue register
- ***Analysing*** the consequences/likely impact
- ***Evaluate*** and develop treatment options
- ***Treat*** by implementing agreed management responses
- ***Communicate*** and consult with relevant stakeholder
- ***Monitor and review*** the effectiveness of management responses and remaining risk/issue levels.

The Advance Queensland Evaluation Sub-Committee is responsible for identifying and addressing high-level risks and issues relating to monitoring and evaluation. The AQIU will undertake an analysis and evaluation of the proposed risks/issues, and provide to the AQ Evaluation Sub-Committee for consideration. If accepted, the risks and issues will be recorded in the relevant register and presented to the AQ Evaluation Sub-Committee as a standing agenda item at each meeting.

Where appropriate, significant high-level risks and issues relevant to monitoring and evaluation of AQ programs and activities will be escalated to the AQ Steering Committee, and to the AQ Strategic Leadership Group.

Program level risks and issues, including those relating to monitoring and evaluation of programs, are to be managed locally by the program team as per the risk management process within the implementing agency. Significant program level risks and issues relating to monitoring and evaluation may be escalated to the AQ Evaluation Sub-Committee via the Secretariat, or raised directly at meetings.

Table 7.3 – Roles and responsibilities for managing evaluation risks and issues

Governance group	Relevant roles and matters for consideration
AQ Strategic Leadership Group	• Resolving strategic and directional issues between departments delivering AQ programs and activities • Considering significant strategic risks and issues.
AQ Steering Committee	• Addressing strategic and directional issues between departments delivering AQ programs and activities • Addressing program risks and issues as escalated by implementing departments • Considering significant operational risks and issues.

[28] Queensland Government. Advance Queensland Handbook (in development)

Governance group	Relevant roles and matters for consideration
AQ Evaluation Sub-Committee	• Considering risks and issues relevant to monitoring and evaluation of AQ programs and activities • Addressing evaluation risks and issues as escalated by implementing departments • Providing advice to the AQ Steering Committee on significant strategic and directional issues relating to monitoring and evaluation of AQ programs and activities.
Implementing Agencies	• Resolving strategic and directional issues within departments delivering AQ programs and activities • Defining the acceptable risk profile thresholds for the program and related activities • Addressing program risk and issues as necessary and escalate when appropriate.

7.2.2 High-level risks and issues

While identification and management of risks and issues is an iterative process, the following have been identified as current high-level risks relevant to the evaluation of all Advance Queensland activities.

These risks will be assessed and managed through the progression of two supporting programs of work.

Table 7.4 – High-level risks relevant to all Advance Queensland activities

Risk	Risk description	Management strategy
Financial resourcing	There is a risk that there is inadequate financial resourcing to complete evaluation activities required to adequately evaluate the Advance Queensland initiative. This may impact the number of evaluation activities completed and the quality and/or independence of the evaluations.	Risk to be assessed and managed through *Supporting Program of Work 1 – Evaluation capability, capacity and resourcing*
Evaluation capability, capacity	There is a risk that there is inadequate capability/capacity to undertake evaluation activities required to adequately evaluate the Advance Queensland initiative. This may impact the number of evaluation activities completed and the quality of the evaluations.	Risk to be assessed and managed through *Supporting Program of Work 1 – Evaluation capability, capacity and resourcing*.
Data/data quality	There is a risk that there is/will be inadequate data/ data quality to undertake evaluation activities required to adequately evaluate the Advance Queensland initiative. This may impact the quality of evaluations activities and outcomes.	Risk to be assessed and managed through *Supporting Program of Work 2 – Evaluation methodologies, metrics and data.*

7.2.3 Ethical and cultural considerations

Planning, implementation and reporting of evaluations must also consider the potential risk of harm to people participating in the evaluation, whether as informants or as evaluators. The types of harm can range from loss of privacy or benefits to program participants, damage to vulnerable groups, or physical or mental harm to informants or researchers.

During the evaluation design step, it is critical to identify:

- Whether external ethics review is required
- If there vulnerable or culturally distinct groups involved
- Consent and privacy issues regarding data and information.

Sources of advice for evaluations to consider ethical and cultural considerations include:

- Australasian Evaluation Society – Guidelines for the Ethical Conduct of Evaluation[29].
- Australian Institute of Aboriginal and Torres Strait Islander Studies – *Guidelines for Ethical Research in Australian Indigenous Studies*[30].
- The *Information Privacy Act 2009* and the Office of the of the Information Commissioner[31]

[29] Australasian Evaluation Society (2013). *Guidelines for the Ethical Conduct of Evaluation.* *https://www.aes.asn.au/images/stories/files/membership/AES_Guidelines_web_v2.pdf*

[30]Australian Institute of Aboriginal and Torres Strait Islander Studies (2012) *Guidelines for Ethical Research in Australian Indigenous Studies* https://aiatsis.gov.au/sites/default/files/docs/research-and-guides/ethics/GERAIS.pdf

[31] https://www.oic.qld.gov.au/about/privacy

8. Stakeholder engagement and communication

Commitment and cooperation from stakeholders is key to a successful evaluation. Evaluation plans should include a stakeholder consultation and communication plan with a view to ensuring stakeholder 'buy in' and ownership of evaluation activity.

Consideration should be given to who will be responsible for engaging stakeholder groups and ensuring they have a clear understanding of their respective responsibilities.

Consideration should also be given to how and when evaluation findings will be disseminated.

8.1 Communication plan

A communication plan helps with managing communications during an evaluation, ensuring that the messages are consistent and the right messages are disseminated to the appropriate audiences at an appropriate time.

When devising a communication plan, consideration of audience is key. Different evaluation audience require different levels of detail and mediums for communicating evaluation results. The most appropriate forum or method of communicating the results should be chosen for each stakeholder group, and communication methods should be determined during the planning phase of the evaluation activity.

Communication plans should:

- Determine the desired outcomes of communication, including[32]:
  - Boosting awareness of the program and its outcomes
  - Outlining the rationale of a program to stakeholders, to bolster understanding
  - Encouraging action (from funders, stakeholders, industry or other target audiences)
- Identify the audiences required to achieve desired outcomes, including[33]:
  - Staff internal to the program
  - Broader management and staff members of a department
  - Key stakeholders (both internal and external, e.g. industry members, program participants, funding bodies)
- Establish governance over communication
  - Who is in charge of each aspect of communication?
  - Is there sensitive information involved; if so, how will the associated risks be managed?
- Outline content, timeframes and channels for communication required to achieve the previously identified outcomes[34]
  - What needs to be communicated?
  - When does it need to be communicated?
  - How will it be communicated?
- Establish mechanisms for two-way communication (i.e. how stakeholders are able to provide feedback, and how this feedback is to be incorporated).

The communication plan should be considered within the context of the program and throughout the program – rather than an afterthought. If communication around a particular outcome is desired, it is necessary that data or information informing progress toward achieving the outcome is collected over the course of the program and evaluation.

[32] Myers, P. and Barnes, J. (2004). Sharing Evaluation Findings: Disseminating the Evidence

[33] Rural Health Innovations. (2016). A Guide to Writing a Program Evaluation Plan

[34] BetterEvaluation. (2016). Communication plan

8.2 Dissemination of evaluation findings

For evaluation findings to be useful they must be shared. The final step in performing a high quality evaluation is effectively communicating the findings of evaluation activity to the appropriate audiences.

The goal of communications will be audience dependent. For the staff of an individual program, sharing evaluation findings might inform program re-design. For government, evaluation may act as feedback and inform the development of future policy. For the general public, the goal of communication might be raise awareness for the effectiveness and success of an Advance Queensland initiative.

Communicating evaluation findings with the public, where they are non-sensitive in nature and it is deemed appropriate to do so, strengthens engagement and builds awareness of the program.

Evaluation findings can be disseminated through a broad range of internal and external channels, and communication needs to be tailored in each instance to ensure that the appropriate messages are conveyed.

Table 8.1 – Examples of dissemination strategies for key participants in the innovation system

	Queensland community	Startups and Entrepreneurs	Business and Industry	Investors	Government	Universities and R&D	Future Innovators
Formal evaluation reports					☒		
Summary evaluation reports	☒	☒	☒	☒	☒	☒	☒
Learn and share workshops		☒	☒		☒	☒	☒
Webinars		☒	☒		☒	☒	☒
Social media	☒	☒	☒	☒	☒	☒	☒
Other interactive online content	☒	☒	☒	☒	☒	☒	☒

9. Evaluation resources

Evaluation can be a long-term process and requires adequate resources, including:

- dedicated human resourcing to coordinate and oversee evaluation activities and conduct internal evaluation activities
- financial resources to procure independent externals services to conduct evaluations, develop/verify appropriate evaluation metrics and methodologies, and provide training and skills development
- financial resources to acquire appropriate data sources and acquire/enhance data management systems.

The *Supporting Program of Work 1 – Evaluation capability, capacity and resourcing* has been established to:

- confirm the human and financial resourcing required to adequately evaluate the Advance Queensland initiative
- build the evaluation culture and skills within implementing agencies
- develop a long-term, staged resourcing and sourcing strategy for the evaluation of Advance Queensland.

9.1 Internal evaluation capability/capacity

9.1.1 Implementing agencies

All implementing agencies are responsible for undertaking and/or commissioning evaluation activities. The evaluative effort required by each agency will be dependent upon the scope and nature of the programs administered by the agency.

9.1.2 Evaluation guidance and support

The following Queensland Government governance groups and work units provide additional evaluation guidance and support for Advance Queensland evaluation activities:

Advance Queensland Evaluation Sub-Committee – provides guidance and support on evaluation principles and practices, providing strategic advice on resourcing strategies for evaluation activities

- ***Advance Queensland Implementation Unit, Innovation Division, DITID*** – provides whole-of-initiative coordination through management strategies and guidance material; commissioning and oversight of macro-level and other key evaluations and standardised and routine implementation and performance reports.
- ***Innovation Policy Unit, Innovation Division, DITID*** – coordinates the collection and dissemination of key macro/system level data sets
- ***Queensland Government Statistician's Office –*** provides a range of statistical services to support stakeholders' evidence base for policy evaluation and performance.

9.2 Financial resources

9.2.1 Whole-of-initiative

In 2015-16, funding of $1.1 million was allocated for evaluation of the Advance Queensland initiative. This funding is utilised for core evaluation activities, including (but not limited to):

- development and review of key evaluation frameworks, plans and guides
- commissioning independent macro-level evaluations
- acquisition of key data sets
- development of suitable and accurate innovation metrics and methodologies.

Through the 2018-19 budget process, a further $1 million was provided to enable the implementation of the first tranche of priority evaluation activities, in line with recommendations provided by Deloitte Access

Economics. This funding has been used to form a Cross-Agency AQ Evaluation Fund, managed by the AQIU, with allocations overseen by the Evaluation Sub- Committee in line with agreed priorities.

Appropriate allocations from the Fund to priority evaluations will be determined based on the level of evaluation (refer Section 3.3) and relative complexity (refer Section 4.2).

9.2.2 Departmental/program specific

All implementing agencies are responsible for appropriately identifying and managing financial resources for evaluation activities at a departmental and program level. Queensland Treasury advise that agencies should consider appropriate allocations for evaluation activities when requesting funding for new or continuation of existing programs.

9.3 External/independent resources

External resources may be required to undertake evaluation activities, particularly where evaluation is sensitive, complex or requires specific technical expertise.

External resources may also provide independent peer review of evaluation plans and activities.

Additionally, collaboration partners may provide data, information and reports or innovation metrics and methodologies that may be used to evaluate the Advance Queensland initiative.

Sources of external evaluation resources include:

- Consultants and contractors
- Australian Evaluation Society
- Universities, research institutes and collaboration partners.

Appendix 1 – Glossary of key terms

The following glossary has been adapted from the *Queensland Government Program Evaluation Guidelines*[35] and provides definitions of key terms as they apply to the evaluation of Advance Queensland.

Term	Definition
Advance Queensland	Advance Queensland is a flagship Queensland Government initiative, designed to promote innovation and build a stronger and more diversified Queensland economy, creating jobs now and for the future.
Counterfactual	An estimate of what would have happened in the absence of the policy and associated programs.
Effectiveness	The extent to which a program is responsible for a particular outcome or outcomes. To ascertain effectiveness requires consideration of other potential influences on the outcomes of interest and the counterfactual (what would have happened in absence of the program).
Efficiency	The extent to which a program is delivered at the lowest possible cost, to the areas of greatest need, and continues to improve over time by finding better or lower cost ways to deliver outcomes.
Evaluation	The systematic, objective process of understanding how a policy or other intervention was implemented, what effects it had, for whom, how and why. Evaluation activities can occur before, during or after implementation, and may include an assessment of the appropriateness, relevancy, process, effectiveness and/or efficiency of a program.
Evaluation process	The steps involved in planning and conducting an evaluation, and disseminating evaluation findings.
Foundations and administrative activities	Activities undertaken to support the delivery and governance of the Advance Queensland initiative, including secretariat support to key governance groups, grant administration and assessment, supporting and promoting significant events, programs, and achievements, sponsorship activities.
Impact evaluation	Assessment of whether the program was effective in meeting its objectives and achieving its ultimate goals.
Monitoring	A systematic and ongoing process of collecting, analysing and using information about the progress of development activities over time, to help guide activities and improve programs, projects and initiatives.
Outcomes	The short, medium and/or long term results generated as a direct result of the delivery of a program (i.e. what difference the program made). Possible outcomes of programs can include changes in awareness, knowledge, skills, attitude and behaviour, as well as economic environmental and social impacts. For the purposes of the guidelines, the terms outcomes and impacts are used interchangeably.

[35] Queensland Treasury (Queensland Government) (2014). *Queensland Government Program Evaluation Guidelines* https://s3.treasury.qld.gov.au/files/qld-government-program-evaluation-guidelines.pdf

Term	Definition
Outputs	The services or facilities provided as a result of a program's processes or activities. Outputs capture what the program does and who it reaches, rather than what difference the program made (i.e. outcomes).
Objective	Key elements to be achieved across all Advance Queensland programs, aligned to a particular strategy.
Policy	A statement of Government intent in relation to an issue, which can be implemented through the use of policy instruments, such as laws, advocacy, monetary flows and direct actions. The development and implementation of programs is one way that Government can act in response to a policy decision.
Program	A discrete set of activities created in response to an identified need and/or targeting weaknesses in the innovation system, create economic and/or social value. Types of programs delivered under the Advance Queensland initiative include grants, partnerships, competitions, procurement, events and sponsorships.
Program design	The process undertaken to develop a program prior to program implementation. Program design will often include development of an implementation plan, consideration of resource or training requirements, and agreement on a governance structures. Program design should also include the development of an evaluation plan. Program design is also commonly referred to as program development or program planning.
Program logic	A method to assist program design. It depicts the logic or pathways through which the programs processes (inputs, activities and outputs) are intended to achieve the desired outcomes. Logic models can assist in understanding how the program is intended to work, what it is trying to achieve and why. Program logic is also commonly referred to as program theory or service logic.
Strategy	A plan of action to achieve the vision of Advance Queensland by targeting weaknesses in the innovation system and creating economic and social value which would otherwise not have occurred.
Theme	Categories under which Advance Queensland programs are grouped for governance and reporting purposes. While individual programs may contribute to one or more of the Advance Queensland strategies and objectives, each theme is aligned to a single strategy and associated objectives.

Appendix 2 – Macro measures/system indicators

The following tables provide examples of high-level system indicators aligned to the Advance Queensland strategies and objectives. This is not intended to be an exhaustive list but rather provides initial high level guidance to support the identification of indicators for evaluation activities.

Two lists are provided:

1. ***System indicators and macro measures currently available***
2. ***Additional measures that could be explored or developed***

A2.1 Currently available macro measures and system indicators

The following table provide a list of currently available macro measures and system indicators aligned to Advance Queensland strategies and objectives.

The measures have been selected based on relevance to the objective, availability of the data and likelihood for ongoing collection. The tables also provide the latest available data for each measure to illustrate the way in which each measure is expressed and provided a baseline of current performance.

Table A3.1 – Currently available macro measures and system indicators

Objective	System Indicator/ Macro Measure	Source(s)	Baseline (latest available period)
Strategy: Supporting culture (SC)			
SC1 – Increase innovation awareness and engagement	Increased awareness of science in Queensland community	• Queenslanders' Perceptions and Attitudes to Science (Office of the Queensland Chief Scientist, 2016)	• Three in four (74%) Queenslanders are somewhat or very interested in science • 72% believe science is critical for our economy • Interest levels are higher amongst males (79%) compared to females (70%) • Those aged 18-24 years are less interested in science than other age groups (65%)
	Increased awareness of science in regional Queensland	• Queenslanders' Perceptions and Attitudes to Science (Office of the Queensland Chief Scientist, 2016)	• Interest in science across the whole state: ○ Greater Brisbane/Gold Coast/Sunshine Coast (75%) ○ Darling Downs (72%) ○ Northern/ Mackay (75%) ○ Far North Metro (76%) ○ Fitzroy/Wide Bay/Burnett (69%) ○ Remote/Outback Queensland (66%)

Objective	System Indicator/ Macro Measure	Source(s)	Baseline (latest available period)
	Perceptions of innovation activity (including Advance Queensland)	• Queenslanders' Perceptions & Attitudes to Innovation (Colmar Brunton, 2017)	• 94% of Queenslanders are somewhat or very interested in innovation. • 90% of Queenslanders feel innovation positively impacts on themselves and the state.
SC2 – Increase entrepreneurial-ism	Value of new and follow-up investment in investee companies	• ABS 5678.0 – Venture Capital and Later State Private Equity Australia	• $286 million in 2015-16 (18.5% of national total)
	Business entry and exit rates	• ABS 8165.0, Counts of Australian Businesses, including Entries and Exits	• Survival rate (60.2% as at June 2016; national is 62.1%) • Entry rate (14.6% in 2015-16; national is 14.6%) • Exit rate (12.7% in 2015-16; national is 12.3%)
	Count of co-working spaces, startup incubators and accelerators	• The Fetch – Startup Incubators and Accelerators in Australia	• Counts (data accessed via The Fetch on 10/1/18): ○ Count of co-working spaces: 23 • Count of startup incubators and accelerators: 7
	Increase in Queensland's share of tech startups	• Startup Muster – Annual Report	• 20.8% of founders in 2017
Strategy: Building Capacity (BC)			
BC1 – Increase innovation capability	Gross expenditure on R&D as a share of GSP including business expenditure on R&D as well as higher education	• ABS 8104.0 – Research and Experimental Development, Businesses	• BERD intensity (BERD/GSP) 0.62% in 2015-16
		• ABS 8111.0, Research and Experimental Development, Higher Education Organisations	• HERD intensity (HERD/GSP) 0.5% in 2014

Objective	System Indicator/ Macro Measure	Source(s)	Baseline (latest available period)
		• ABS 8109.0, Research and Experimental Development, Government and Private Non-Profit Organisations	• GOVERD intensity (GOVERD/GSP) 0.1% in 2014-15
		• Health of Queensland Science and Innovation Report by Office of Queensland Chief Scientist	• GERD intensity (GERD/GSP) 1.5% in 2013
	Scholarly output per 1000 population	• Elsevier SciVal	• 3.83 in 2017
	Share of scholarly output in top 1% (or 10%) most cited publications	• Elsevier SciVal	• 1.6% (2017 top 1%) • 15.6% (2017 top 10%)
	Share of SMEs with new to market (world) products	• ABS 8158.0 – Innovation in Australian Business *NB: Queensland specific data not currently available*	• 0-4 persons: 7.7% • 5-19 persons: 8.8% in 2014-15
BC2 – Develop, attract and retain talent including STEM	Year 12 students studying identified science, technology and mathematics subjects	• Office of Queensland Chief Scientist (Sourced from: Queensland Curriculum and Assessment Authority)	• 90,508 in 2016
	STEM literacy scores (including National Assessment Program (NAP) – Science Literacy scores)	• NAP Sample Assessment Science Literacy Public report (ACARA, 2015)	• 398 mean score in 2015
	Proportion of Queenslanders with a non-school qualification	• ABS Census of Population and Housing	• 54.5% in 2016
	Count of university, TAFE and research institutions per 1,000 population	• Office of the Chief Economist, National Innovation Map	• 0.04 per thousand population (non-recurring)

Objective	System Indicator/ Macro Measure	Source(s)	Baseline (latest available period)
Strategy: Fostering Collaboration (FC)			
FC1 – Build sustainable partnerships to deliver outcomes	Share of businesses conducting innovative activity	• ABS 8166.0 – Summary of IT Use and Innovation in Australian Business *NB: Queensland specific data not currently available*	• 48.7% in 2015-16 • 45.0% in 2014-15
	Share (%) of Queensland scholarly outputs with international co-authorship	• Health of Queensland Science and Innovation (Office of the Queensland Chief Scientist, 2016)	• 52.2% in 2017 • 48.5% in 2015
FC2 – Increase international networks	Percentage of R&D financed abroad for Higher Education Expenditure on R&D (HERD)	• ABS 8111.0 – Research and Experimental Development, Higher Education Organisations, Australia	• $27.1M (11.3% of total national overseas funding) in 2014
Strategy: Increase investment (II)			
II1 – Grow pipeline of investible products and services	New capital expenditure attracted to Queensland (measured as growth in business capital expenditure)	• National Accounts: State Details – Queensland Treasury	• Quarterly growth (2.9% Sept 17) • Annual growth (9.1% Sept 17)
	Spend on innovation by businesses as a proportion of GSP	• ABS 8158.0 – Innovation in Australian Business *NB: Queensland specific data not currently available*	• Estimated total expenditure spent (by Australian businesses) on innovation in 2014-15 is between $26B to $30B (approx. 2% of GDP)
	More business investment in R&D	• ABS 8104.0, Research and Experimental Development, Businesses	• BERD intensity (BERD/GSP) 0.62% in 2015-16

Objective	System Indicator/ Macro Measure	Source(s)	Baseline (latest available period)
	Increased investment in research	• ABS 8111.0 – Research and Experimental Development, Higher Education Organisations	• HERD intensity (HERD/GSP) 0.5% in 2014
		• ABS 8109.0 – Research and Experimental Development, Government and Private Non-Profit Organisations	• GOVERD intensity (GOVERD/GSP) 0.1% in 2014-15
II2 – Build access to capital	Value of venture capital by investee company head offices as a share of GSP	• ABS 5678.0 – Venture Capital and Later Stage Private Equity, Australia	• $1,1B in 2015-16 or 0.3% of GSP
Strategy: Scaling for jobs and growth (SJ)			
SJ1 – Expedite commercialisation	*Nil measures readily available*		
SJ2 – Increase economic benefits from innovation (including jobs)	Jobs driven by Advance Queensland programs	• Advance Queensland Program Data	• 9,426 as at 30 September 2017
	Increase knowledge based jobs in Queensland	• Health of Queensland Science and Innovation (Office of the Queensland Chief Scientist, 2016)	• 244,000 Queenslanders worked in knowledge-based occupations (10.4% of total workforce, up from 7.6% in May 2001)

A2.2 Additional measures that could be explored or developed

In addition to the available macro measures and system indicators, listed above, a range of additional measures may also exist or could be developed to further quantify the impact of Advance Queensland. The following tables provide a list of potential measures and is provided as initial high level guidance to support the future identification of additional indicators for evaluation purposes.

Table A3.2: Additional measures that could be explored or developed

Objective	System Indicator/ Macro Measure	Possible source(s)
Strategy: Supporting culture		
SC1 – Increase innovation awareness and engagement	Increased participation in innovation initiatives (including Advance Queensland)	• Program/recipient data
	Feedback of participants attending innovation events	• Program/recipient data
	Feedback of partners hosting sessions at innovation events	• Program/recipient data
SC2 – Increase entrepreneurialism	Value of funding raised by Queensland startups	• Program/recipient data • VC databases or monitoring services
	Survival rate of startups assisted	• Program/recipient data • Startup databases or monitoring services
	Early stage entrepreneurship activity and increased number of entrepreneurs	• Program/recipient data • Startup databases or monitoring services
	Value added of new startup operators attracted to the State	• Program/recipient data • Startup databases or monitoring services
	Proportion of participants engaged in entrepreneurial activities	• Program/recipient data
Strategy: Building Capability		
BC1 – Increase innovation capability	Number of global and national innovation awards	• Program/recipient data • Media monitors
	Percentage of population working in knowledge intensive industries (as a ratio of the labour force)	• ABS 6291.0 – Labour Force *NB: Requires an agreed definition of 'knowledge intensive industries'*
	Share of innovators in key industry sectors including emerging knowledge intensive industries	• ABS 8158.0 – Innovation in Australian Business *NB: Requires an agreed definition of 'knowledge intensive industries'*
	Share of medium and high technology industries as a share of GSP	• ABS 5220 – Australian National Accounts: State Accounts *NB: Requires an agreed definition of 'medium and high technology industries'*

Objective	System Indicator/ Macro Measure	Possible source(s)
	Share of businesses more regularly innovating (i.e. persistent innovators)	• Requires further investigation
	Discovery research spend	• Requires further investigation
BC2 – Develop, attract and retain talent including STEM	Proportion of population workforce holding STEM field qualifications	• ABS Census of Population and Housing *NB: Requires an agreed definition of 'STEM field qualifications'*
	Count of individuals per 1,000 knowledge workers and STEM	• ABS Census of Population and Housing • *NB: Requires an agreed definition of 'knowledge workers' and 'STEM'*
	Increased uptake of STEM careers	• Requires further investigation
	Share of workforce that applies complex skills in their everyday work tasks	• Requires further investigation
	Education related government expenses as a share of GSP	• ABS 5518.0.55.001 - Government Finance Statistics, Education, Australia
	Aboriginal and Torres Strait Islander students much more likely to engage with industry/continue research	• Requires further investigation
	Industry/end use partner much more likely to engage with researchers/graduates	• Requires further investigation
	Fellows maintain research careers long term	• Requires further investigation
	Industry/end user partner much more likely to engage with industry in the future	• Requires further investigation
Strategy: Fostering Collaboration		
FC1 – Build sustainable partnerships to deliver outcomes	Ongoing collaborative partnerships after project completion	• Program/recipient data
	Increased commercialisation of research	• Requires further investigation
	Number of joint projects between industry, science and government	• Program/recipient data • Media monitoring
	R&D expenditure of foreign affiliates/partners of Advance Queensland programs	• Program/recipient data
FC2 – Increase international networks	Proportion of patents with foreign co-investors	• Intellectual Property Government Open Data
	Foreign Direct Investment (FDI) investment inflows related to innovation activities	• Requires further investigation
	Exports of knowledge intensive industries	• Requires further investigation *NB: Requires an agreed definition of 'knowledge intensive industries'*
	Increased research outcomes from international collaborations	• Requires further investigation

Objective	System Indicator/ Macro Measure	Possible source(s)
Strategy: Increase investment		
II1 – Grow pipeline of investible products and services	Growth in re-investment in innovation/knowledge precincts	• Requires further investigation
II2 – Build access to capital	Success stories generating inward investment related to innovation activities	• Program/recipient data • Media monitoring
	New discoveries are quicker to market	• Requires further investigation
	More investment raised by startups	• Program/recipient data • Startup databases or monitoring services
	Increased startup investment	• Program/recipient data • Startup databases or monitoring services
Strategy: Scaling for jobs and growth		
SJ1 – Expedite commercialisation	Total revenue generated by patents per 1000 population	• Requires further investigation
	Increasing number of discoveries entering the innovation system	• Requires further investigation
	Translation of research into commercialisable products	• Requires further investigation
SJ2 – Increase economic benefits from innovation (including jobs)	Multi-factor productivity	• Requires further investigation
	Increased retention of wealth capture by Queensland science and research	• Requires further investigation

Appendix 3 – National Innovation Datasets

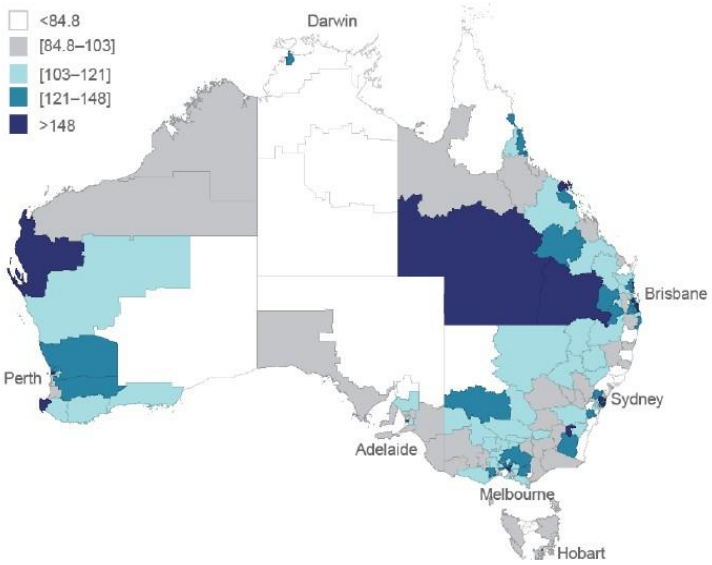
The following data sources were developed by the Commonwealth Department of Industry, Innovation and Science are increasingly used to evaluate innovation in Australia. However, the availability of state level data through these datasets varies and in most instances is not readily available to support the evaluation of state level programs.

A3.1 National Innovation Map

The National Innovation Map provides easy to understand information on innovation in Australia's regions. The interactive map visually presents new business creation, expenditure on research and development, patenting activity and trademarking activity for each statistical region in Australia. The map lets users tailor their information by indictor, year or state, territory and suburb. The map highlights innovation hot spots and regional innovation trends.

Studies using the map show that innovation and entrepreneurship are concentrated in the major metropolitan areas of Australia, and there is a correlation between research institutions and higher innovation activity and creation of new businesses. Queensland is performing extremely well in terms of new business entries especially in regional areas, as shown in the National Innovation Map snapshot in Figure 5.2.

Figure A4.1: Business Entries per 10,000 inhabitants, averaged 2009-2014, by Statistical Area 3 regions



A3.2 BLADE

The Business Longitudinal Analysis Data Environment (BLADE) is a series of integrated, linked longitudinal datasets that contains administrative data on more than two million actively trading Australian businesses over the period of 2001-02 to 2012-13. The data set combines administrative data from the Australian Taxation Office (ATO) with primary survey data to increase the research capacity of businesses to undertake firm- level evaluations and to offer a robust evidence base for broader policy evaluation and decision making.

BLADE offers decision makers:

- Data on actively trading businesses' turnover, employment and labour productivity from 2000-2001 to now to analyse firm performance overtime
- Reports on export status, foreign ownership status and innovation status as well as the size and industry distribution of program participants.
- Trend data on the number of new business entries, business startup rates and the survival rates of such business over time

A3.3 Innovation Insights Database

As part of the annual Australian Innovation System Report, the department of industry, Innovation and Science release an Innovation Insights Database to provide greater information and understanding to policy makers, academics and other who are interested in Australia's innovation history.

A sample of the indictors are presented in Table A5.1, these indicators are compared against all countries in the OECD, as well as Singapore, China and Taiwan (when data is available).

Table A4.1: Sample of indicators in the Innovation Insights Database

Measurements	Sample of indicators
Outcomes	• GDP per capita relative to the USA (USA = 100) (index) • Real GDP growth • UNDP Human Development Index • Gini coefficient
Innovation and entrepreneurship activity	• Percentage of innovation-active large firms • Proportion of businesses introducing operational/ process innovation • Innovation Patents by AU residents
International engagement	• Trade, % of GDP • Net Foreign Direct Investment Inflows (% of GDP) • Proportion of patents with foreign co-inventors • Short term business trips churn
Business collaboration activity by innovation-active businesses	• Percentage of innovation-active SMEs collaborating on innovation • Percentage of innovation-active total businesses with international collaboration on innovation
Framework conditions in Australia	• Operating surplus (% of GDP) • NAB Index of capacity utilisation • Barrier to innovation: Lack of access to additional funds (% of respondents)
Education and skills base	• Proportion of population aged 25-64 attaining tertiary education • Barrier to innovation: Lack of skilled persons in any location (% of respondents)
Investment in research	• Business expenditure on R&D (BERD) • Higher education expenditure on R&D (HERD) • Government Budget Appropriations or Outlays for R&D (GBAORD)
Research workforce	• PhD graduation rate • Proportion of international students enrolled in advanced research programs • Researchers (% of total labour force)
Research publications	• Share of world publications • Share of world's top 1% highly cited publications • Top 1% publications per Bn PPP GERD (excluding BERD) • Proportion of publications in top 10%
Research commercialisation outcomes	• Number of startup companies in which major publicly funded research • agencies, universities and medical research institutes have an equity holding