RIE2020 AME Strategy
PM announced RIE2020 on 8 Jan 2016

Govt commits S$19b to new 5-year plan for R&D initiatives RIE2020

Plan will contribute significantly to the economy and create opportunities and jobs, support national initiatives like Smart Nation and SkillsFuture, and help workers to thrive amidst technological changes and globalisation, says PM Lee.

Singapore commits S$19b for new research, innovation and enterprise plan

THE government is committing S$19 billion for its new Research, Innovation and Enterprise (RIE) 2020 plan, which is 18 per cent higher than the S$16.1 billion set aside for the previous five-year plan.

- Public R&D spending sustained at 1% of GDP
- Priority in four technology domains
Where S$19B funds will go …

Advanced Manufacturing and Engineering
$3.3 billion

Health and Biomedical Sciences
$4 billion

Urban Solutions and Sustainability
$0.9 billion

Services and Digital Economy
$0.4 billion

Innovation and Enterprise
$3.3 billion

Manpower
$1.9 billion

Academic Research
$2.8 billion

White Space
$2.5 billion

17%
10%
15%
13%
21%
5%
2%
17%
Priority in Four Technology Domains

**Advanced Manufacturing and Engineering (AME)**
To develop technological capabilities that support the growth and competitiveness of our manufacturing and engineering sectors.

**Health and Biomedical Sciences (HBMS)**
To be a leading centre that advances human health and wellness, and creates economic value for Singapore and Singaporeans through the pursuit of excellence in research and its applications.

**Urban Solutions and Sustainability (USS)**
To develop a sustainable and liveable city through integrated solutions for Singapore and the world.

**Services and Digital Economy (SDE)**
To develop, integrate and leverage Singapore’s digital innovation capabilities to meet national priorities, raise productivity and support key services, create sustainable economic opportunities and quality jobs.

Due to the pervasive and cross-cutting nature of digital technologies, AME, HBMS and USS domains will draw on and fund research in digital technology capabilities that support the research agenda within their domains.

**Academic Research**
To build up a significant base of capabilities and a pipeline of ideas that can feed into applied and industrial research to drive the next phase of growth.

**Manpower**
To build a strong research and innovation community.

**Innovation and Enterprise**
To build up a strong core of innovative enterprises that drive value creation and economic competitiveness.
Key RIE2020 Thrusts

Closer Integration of Research Thrusts

- Encourage multi-disciplinary & multi-stakeholder collaboration
- Greater coordination of national efforts
- Strategic investments in basic and mission-oriented research

Sharper Focus on Value Creation

- Strengthen flow-through from research to societal and economic impact
- More budget allocation towards public-private research collabs
- Build up private sector’s absorptive capacities for new tech

Optimise RIE Manpower

- Sustain a strong research and innovation workforce
- Strong Singaporean core, supplemented with international talent

Stronger Dynamic towards the Best Teams and Ideas

- Continued shift towards competitive funding
- More White Space funding to ensure flexibility
Aims to develop technological capabilities to support continued growth and competitiveness of our manufacturing and engineering sectors, in order to generate GDP growth, Good jobs for Singaporeans & Position the Economy for the Future
AME RIE2020 Strategic Goals

• Strengthen linkages across public research performers and both large & small companies to sharpen value creation from public R&D investments
• Build capabilities where Singapore can offer a differentiated value proposition, incl making strategic bets ahead of industry to position Singapore for emerging opportunities
• Maximise value capture by developing integrated strategies across entire innovation value chain

Key AME Industry Verticals:


4 Cross-Cutting Technology Areas

Robotics and Automation  Digital Manufacturing  Additive Manufacturing  Advanced Materials
Manufacturing in Singapore Today

2015 GDP: S$402.5 bil (US$292.7 bil)

- **Others**: 23%
- **Construction**: 5%
- **Wholesale & Retail Trade**: 16%
- **Transport & Storage**: 7%
- **Finance & Insurance**: 13%
- **Business Services**: 16%
- **Manufacturing**: 20%

Value Added:

- **27%** Electronics
- **20%** Biomedical Manufacturing
- **15%** Chemicals
- **14%** Transport Engineering
- **13%** Precision Engineering
- **11%** General

- Employment contribution >500,000
- Manufacturing productivity growth of 6.1% per annum (‘09 to ‘15)

2015 GDP growth: 2.0%
2016 Forecast GDP growth: 1.0% - 3.0%

Source: MTI 2016 Growth Forecast
Manufacturing in Singapore has evolved over time

Global trends and local landscape require a new approach

Emerging Technologies
- Additive Manufacturing
- Robotics
- Advanced materials
- Manufacturing IT

Business Model Disruptions
- Servitisation of Manufacturing
- Mass Customisation

Growth of ASEAN
- Emerging region for production and consumption

Sustainability
- Land
- Energy
- Labour

Competitive Manufacturing Location
- Fast technology adopter
- Host to server & offshore plants

Boosting Productivity
- Pilot location for cutting-edge technology & systems

Growing New Activities
- Thought leader and first mover in growth areas

Globally Leading Manufacturing Hub
- Manufacturing technology developer
- Location of choice for lead plants
# Value Creation Framework for Economic Outcomes

<table>
<thead>
<tr>
<th>Public Sector R&amp;D</th>
<th>Innovation &amp; Commercialisation</th>
<th>Business Outcomes</th>
<th>Economic Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Research</td>
<td>Research Collaborations</td>
<td>Anchor MNC Investments</td>
<td>GDP Growth</td>
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<tr>
<td>Technology</td>
<td>R&amp;D Centres &amp; Joint Labs</td>
<td>Enable Growth of LLEs and SMEs</td>
<td>Good Jobs for Singaporeans</td>
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<tr>
<td>Development</td>
<td>Contract R&amp;D</td>
<td>Foster a Vibrant Start-Up Ecosystem</td>
<td>Positioning Economy for the Future</td>
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<td>Licensing &amp; Technology Adoption</td>
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<td>Spin-offs</td>
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</table>

**Talent & Infrastructure**

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**Note:** MNC – Multinational Corporation; LLE – Large Local Enterprise; SME – Small and Medium Enterprise
Competitive Funding to Support AME Research
Open to public sector research performers

AME Domain

Individual Research Grants (IRG)
- Develop novel ideas solicited through an investigator-led, ground up mechanism across the research ecosystem

Programmatic Funds
- Seed long-term capabilities for future industry readiness, typically beyond a 5-year timeframe

Industry Alignment Fund – Prepositioning Programmes (IAF PP)
- Develop industry-ready capabilities
- Projects supported by IAF-PP are expected to lead to industry traction in a 3- to 5-year timeframe

*Industry Alignment Fund – Industry Collaboration Projects (IAF ICP)
- Support projects between industry and public sector R&D performers that involve commitment of tangible industry contributions

*Queries to be directed to: IAF_ICP@a-star.edu.sg
Summary

• Under RIE2020, Singapore government committing S$19billion, 18% more than previous plan and at about 1% of GDP

• Four major shifts to **capture more value** from our investments and research

• Domain framework allows for a more **focused approach** to achieve strategic goals

• Manufacturing will continue to be an important pillar of Singapore’s economy

• R&D and technology play key roles in **strengthening existing manufacturing sectors**, seeding new growth niches and boosting productivity

• More competitive funding will be available to support research aligned with AME strategy
Overview of AME IAF PP

Queries to be directed to:
iaf_pp_ame@hq.a-star.edu.sg
AME IAF-PP Overview

• To develop **industry-ready** capabilities towards deepening alignment of public sector research

• To develop **multidisciplinary and integrated programmes** with early **industry involvement**

• Supports **new programmes**, as well as **existing programmes** that have demonstrated strong track record of success and industry potential

• Programmes supported should be aligned with **domains’ themes and strategies**
AME IAF-PP Governance

• Strategic Oversight Committee (SOC*)
  - Makes decisions on all IAF-PP policies and programmes
  - Comprises MD A*STAR, MD EDB and CEO NRF

• The RIE Strategy Committee has tasked A*STAR as the Implementing Agency, reporting to the IAF-PP SOC

Role of Implementing Agency includes
• evaluation and scoping of proposals together with research performers and companies
• management of budget (e.g. fund disbursement, monitoring overall fund commitment and utilisation)
• tracking progress of endorsed proposals

*Co-chaired by MD A*STAR and MD EDB
AME IAF-PP General Assessment Criteria

• Programmes supported by IAF-PP are expected to **lead to industry investments within 3-5 years**

• Key Criteria: **Potential for industry development and economic impact**
  – Alignment of programme to Domain strategic objectives and ability to deliver RIE2020 outcomes (Details can be found at [http://www.nrf.gov.sg/rie2020](http://www.nrf.gov.sg/rie2020))
  – Pre-positioning for **value creation** and **value capture** in Singapore
  – Potential to **attract corporate R&D spending and investments** (e.g. joint or corporate lab, co-development of project, creation of high quality jobs)
  – **Differentiation and competitiveness** at regional or global level
AME IAF-PP Application Process

• Announcements will be made periodically to inform or solicit proposals from the R&D community on key focus areas via:
  • A*STAR website (https://www.a-star.edu.sg/Research/Funding-Opportunities/Grants-Sponsorship/IAF-PP.aspx)
  • Thematic workshops and grant calls
  • Announcements through the Research Administration Office (or equivalent) of the institutes of higher learning, academic medical centres, hospitals and A*STAR research institutes

• Applications must be endorsed by the applying Host Institution(s) prior to submission

• All queries and applications must be submitted through A*STAR (as the Implementing agency) at iaf_pp_ame@hq.a-star.edu.sg
AME IAF-PP Proposal Evaluation Criteria

**Catalytic**
- The project is expected to lead to industry participation within 3 – 5 years
- The project will either contribute to the creation of new (niche) sectors or in existing sectors, bring about the attraction of new investments or transformation of existing base of activities.

**Synergistic**
- The project integrates strengths and capabilities across various publicly-funded research and tertiary institutions in Singapore.

**Innovative**
- The technological innovation in the project is sufficiently unique and it is differentiated from related projects in the region and globally.

**Strategic Outcomes**
- The project can either bring about economic impact, boost industry’s innovation capacity or address national priorities.
- The project is in line with the overall sectorial development plan (e.g. ITMs).
AME IAF-PP Eligibility Criteria

• Programme director should:
  – Hold at least a 0.7 FTE primary appointment in a Singapore publicly funded research or tertiary institution;
  – Run a laboratory or research programme that carries out research in Singapore; and
  – Have a track record of leadership ability in coordinating research programmes, as well as achieving productive research outcomes.
**AME IAF-PP Workflow**

<table>
<thead>
<tr>
<th>Application</th>
<th>Submission of and Review of Letter of Intent</th>
<th>Submission and Review of Full Proposal</th>
<th>Endorsement and Approval of Proposal</th>
<th>Issuance of Letter of Award</th>
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<tr>
<td><strong>The Letter of Intent (LOI) can be drafted based on:</strong></td>
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<tr>
<td>• <strong>Directed approach:</strong> Themes announced by Implementing Agency (IA); or</td>
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<td>• <strong>Non-directed approach:</strong> Ground-up idea(s) that do not fall under announced theme(s), but have potential for industry development and economic impact may be considered.</td>
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<td>• LOI submission deadlines will be communicated via emails and the A*STAR website.</td>
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<td>• Host Institute (HI) submits LOI (PPT) and email endorsement of HI’s Director of Research (or equivalent)</td>
<td>• HI submits softcopy of full proposal, together with email endorsement of HI’s Director of Research (or equivalent)</td>
<td>• IA seeks SOC’s endorsement of shortlisted proposal(s)</td>
<td>• IA informs HI of approval decision</td>
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<td>• IA issues Letter of Award (LOA) to awardee</td>
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<td></td>
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<td>• IA seeks SOC’s endorsement of shortlisted proposal(s)</td>
<td>• Approving Authority approves SOC-endorsed proposal</td>
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<td>• IAF-PP Review Panel reviews and shortlists proposals(s)</td>
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*Timeline stipulated is only an estimation and applicable to proposals requesting for funding quantum of not more than $25M*