

Contents

Prologue	ix
Preface: The SAF Program – rethinking science advice to government	xiii
Introduction	xvii
An evidence-based approach to informing policy	xvii
Securing Australia's future	xviii
Golden threads	xix
Interdisciplinary research topics	xx
The Australian Council of Learned Academies (ACOLA)	xxii
1 Australia's strengths – and a plan for a secure future	1
Introduction	2
Addressing the fundamentals	6
Policy directions	11
Opportunities for sectors of the economy	12
An innovative workforce	19
Protecting our environment	20
Conclusion	22
2 Engagement with Asia: time to be smarter	23
Introduction	24
Smart engagement: identifying the opportunities	25
Tapping into the market while avoiding the risks	28
Teaming with our neighbours	35
Better business	40
Conclusion	45
3 Boosting productivity with innovation and new technologies	47
Introduction	48
Investing in ourselves	50
Transforming research into value	51
Innovation requires skilled labour and collaboration across disciplines	56
Tinkering, failing and adapting: working with new technology	62
Conclusion	69
4 Recharging education to power the nation	71
Introduction	72
Achieving an innovative, flexible and creative workforce	73
Science, technology, engineering and mathematics education: a national report card	77
Encouraging and improving STEM teaching	82
Too few women in STEM	83
Lifting Indigenous engagement in STEM	85
Partnering and enriching	86
National STEM coordination	87
Lessons for Australia and STEM	88
Findings for the future	92
Engaging with the world	92
Conclusion	94

5	Green and clean: securing a sustainable future	95
	Introduction	96
	Environment and energy	97
	Cities and mobility	106
	Collaborative research for sustainability	110
	Preparing for the future	115
	Conclusion	120
6	Conclusion: challenges and opportunities for Australia	121
	Advice for an unknowable future	121
	Past performance ≠ future success	122
	Smart farming, smart engagement	122
	Educating the future workforce	124
	Exporting knowledge	125
	Securing Australia's environment	126
	Taking it home: key messages	126
	Segue: Securing Australia's Future compendium	131
	Appendix 1. Australia's Comparative Advantage	133
	Appendix 2. STEM: Country Comparisons: International Comparisons of Science, Technology, Engineering and Mathematics (STEM) Education	137
	Appendix 3. Smart Engagement with Asia: Leveraging Language, Research and Culture	140
	Appendix 4. The Role of Science, Research and Technology in Lifting Australian Productivity	144
	Appendix 5. Technology and Australia's Future: New Technologies and their Role in Australia's Security, Cultural, Democratic, Social and Economic Systems	147
	Appendix 6. Engineering Energy: Unconventional Gas Production	150
	Appendix 7. Australia's Agricultural Future	154
	Appendix 8. Delivering Sustainable Urban Mobility	158
	Appendix 9. Translating Research for Economic and Social Benefit: Country Comparisons	162
	Appendix 10. Skills and Capabilities for Australian Enterprise Innovation	166
	Appendix 11. Australia's Diaspora Advantage: Realising the Potential for Building Transnational Business Networks with Asia	170
	Index	174