

Index

- Aboriginal and Torres Strait Islander people 36, 105
 - Asian interaction with 38, 39
 - see also* Indigenous Australians
- Academy of Social Sciences in Australia xviii, xxiii
- accessibility, rural population 160–1
- ACIL Allen report 34, 134
- active travel, need for 161
- Adelaide 100, 106
- advanced manufacturing 15, 16
- advantage creation (chart) 135
- affordability, energy sources 102
- age level, STEM interest level and 90
- age profile
 - agricultural workers 116, 155
 - Australian workers 19–20
- agribusiness 111
- Agricultural Competiveness White Paper* (2015) xv
- agricultural land, development of 98
- agricultural science jobs, reductions in 115, 116
- agriculture 20, 21
 - Asia and 29–30
 - Australian xxi, 12–14, 134
 - ‘clean green’ 98
 - future of 115, 122–4, 154–7
 - historical changes 117
 - improvements in 129
 - productivity increases 114
 - public perceptions of 117
 - research and 110, 111–14
 - tariff reforms 51
 - technology 97, 154, 156–7
- air pollution reduction 99, 101
- alternative energy sources 96, 110, 129
- American Academy of Arts and Sciences xix
- Anderson, Kent 35
- arts and humanities, Asia 141
- ASEAN countries 123, 172
 - agriculture and 156
 - investment in 40
- Asia
 - Australia and 123, 170–3
 - Australian agriculture and 123, 154, 156
 - Australian business fear of 41
 - Australian economy and 23–46, 135
 - Australians living overseas and 43
 - dietary changes 30, 112
 - economy 8, 18
 - education sector and 134
 - export markets 19
 - links with xxi
 - STEM education 92
 - urbanisation and 110
- Asian Century White Paper* 2012 40, 92
- Asian descendants, Australians 42–3
 - Australians and 24, 123, 128, 142, 170–3
- Asian languages 35–6
 - Australians and 123, 141, 143
 - collaboration 35–7
 - education in 93, 124
 - teaching decline 37
- Asian markets 24, 41, 127
- Asia-Pacific region xx
 - Australia and 2, 27–8, 123–4, 127–8, 129, 140–3, 170
 - education and 125
- attrition rate, female STEM teachers 84
- audience receptivity 132
- Australia
 - agricultural sector 154–7
 - challenges and opportunities 121–9
 - comparative advantages 133–6
 - environmental sustainability options 95–120
 - innovation deficiency 60, 61–2, 166
 - international relationships 92–3
 - secure future plan 1–22
 - service industries 17–19
 - STEM subjects ratings 138
 - technological innovation 62–8, 147–9
- Australian Academy of Science xviii, xxiii, 72, 84, 87
- Australian Academy of Technological Sciences and Engineering (ATSE) xviii, xxiii–xxiv, 84, 87
- Australian Academy of the Humanities xviii, xxiii
- Australian Bureau of Agricultural and Resource Economics (ABARES) 29
- Australian Bureau of Statistics (ABS) 8, 60, 76, 166
 - multi-factor productivity study 48
 - qualifications study 73
- Australian bush 116
- Australian businesses, Asia and 40–1
- Australian Census 2011 79
- Australian Climate Roundtable 101
- Australian Council of Learned Academies (ACOLA) ix, xiii–xv, xvii, xxii–xxiv, 12, 14, 17, 20, 23, 24, 26, 39, 43, 50, 51, 52, 58, 69, 80, 92, 94, 95, 102, 103, 105, 110, 120, 121, 126, 127, 131, 132, 133, 135, 140, 144, 147, 150, 154, 158, 162, 166, 167

- global business survey 5
- Securing Australia's Future reports xviii, xix, 22, 27–8, 45
- technology reports 63, 64
- Australian Council of Social Services 101
- Australian economy, Asia and 23–46
- Australian Government
 - ACOLA and xvii
 - future directions and 67–8
- Australian Industry Group 41, 101
- Australian Infrastructure Plan* (2016) xv
- Australian locations, Bollywood films 39
- Australian Population and Migration Research Centre 45
- Australian Research Council ix, xiii, xviii, xix, xxiii, 50, 54, 146
- Australians living overseas 43
- Australian Stock Exchange 18
- Australia's Agricultural Future* (SAF07) xxi, 22, 120, 154–7
- Australia's Diaspora Advantage: Realising the Potential for Building Transnational Business Networks with Asia* (SAF01) xx–xxi, xxii, 22, 27–8, 30, 39, 45, 50, 69, 94, 95, 102, 133–6, 170–3
- automation 64, 157
- autonomous vehicles 64
- baby formula, exports of 29
- banking industry 18, 34, 60
- Barber, Michael N xiii–xv, xix
- basic skills 61, 74
 - technological development and 66
- Batterham, Robin xviii, xxii
- b-carotene 118
- beef industry, Asia and 35
- Belgium 77, 80
- Bell, John 47, 56
- Better life index 4
- 'big data' 160
- biodiversity impacts
 - Australia and 133
 - failures of protective measures 99
 - shale gas extraction and 105
- biofuels 119
- biology 78, 138
- Bissell, Richard xv–xvi, xix
- black coal-fired energy 104
- Bollywood film industry 39
- Boosting the Commercial Returns from Research* (2015) xv
- Botanical Resources Australia (BRA) 114
- Brazil 51, 55, 80, 162
- Brisbane 59, 106
- bulk commodities exports 28, 155
- Bureau of Meteorology 21–2
- Business Characteristics Survey (ABS) 8, 60, 76, 166
- Business Council of Australia 101
- business links, Asia and Australia 24, 41–2, 140, 170–3
- business skills 61
- Canada 19, 44, 51, 77, 80, 162, 172
 - Indigenous 80
 - STEM education 86
- capability investment 12
- carbon dioxide emissions 21, 64, 102
- career information, STEM subjects 90, 91
- car transport 126, 159
 - future of 97
 - limits to 109
- central Australia 98
- challenges and opportunities, Australia 121–9
- Chief Scientist, Office of the ix, x, xiv, xv, xvii, xviii, xix, 68, 88
- Chile 51, 55, 162
- China 26, 28, 30, 31, 43, 51, 77, 80, 112, 156, 162, 172
 - Australian investment in 40
 - board directors from 42
 - export markets to 39, 40, 122
 - investment and 30, 40, 123
 - research collaboration and 31, 32, 141–2
 - rise of 140
 - STEM skills promotion 81, 92
 - tourism from 33
 - world trade and 27
- Chinese language studies 36
- Chinese migrants 93
 - Australian citizenship 43
 - businesses 41, 170
 - diaspora 44, 171
 - year of arrival 173
- chip prototypes 68
- chrysanthemum crop 114
- Chubb, Ian ix–xi, xiii, xvii, xviii
- cities, liveability 106–8
- 'clean green' Australia
 - agriculture 154–5
 - Asia and 34
 - support for 29–30, 95–120, 128–9, 157
- climate change 111, 125
 - agriculture and 155
 - Australia and 96, 99, 101
 - cities and 31
 - costs of 126
 - future projections 21–2
 - lack of report xvii
 - urbanisation and 107
- Climate Institute 101
- coal industry 14, 104
 - reliance on 101–2
 - safety issues 118–19
- coal seam gas (CSG) 104, 150
- Cochlear 58

- collaboration 19, 57
 - Asia 35–40
 - banking industry and 60
 - businesses 55
 - manufacturing 15
 - need for 54–5, 69
 - research 52, 110–14, 164
 - systems 167
 - workplace skills 56–62
- commercialisation, public sector research 55, 164, 165
- Committee for Economic Development of Australia 6, 133
- commodity exports
 - agriculture 12–14, 123
 - mining 14–15
- Commonwealth Science Council xviii, 131, 132
- Commonwealth Scientific and Industrial Research Organisation (CSIRO) 16, 21–2, 55, 87, 114
- community concerns, agriculture 155, 157
- compact cities 109, 126, 159, 161
- company boards, women and 125
- comparative economic advantage, Australia 25, 27–8, 95, 133–6
- competitiveness, manufacturing 16
- compulsory language studies 93
- congestion, future cities 106, 107
- connectivity, Asia-Pacific and Australia 26
- conservation tillage 13
- Convention on Biological Diversity 99
- conventional gas supplies 104, 150
- Cook, Peter 103
- Cooper Basin 104, 150
- Cooperative Research Centres Programme 54, 164
- coordinating agency, STEM skills 71, 72, 88
- corporate power, agriculture 117
- Corruption Perception Index 4
- costs
 - oil imports 109–10
 - research translation 55
 - road transport 109
 - shale gas 105
- Council for the Humanities, Arts and Social Sciences (CHASS) 57, 75
- creativity skills 61
- cross-sector collaborations 57, 75
- cultural change 117, 123
- cultural diplomacy, Asia and 23, 25, 38–40, 41, 42, 127, 142, 143
- culturally responsive teaching 37, 86
- Cunningham, Stuart 56
- curriculum diversity 90
 - STEM participation 84, 137
- customer orientation 16, 60
- Daly, Joanne 110
- data sources, shale gas industry 152
- deaths per unit of energy 119
- decarbonisation 96, 101–3
- decentralisation 109, 120, 126
- Delivering Sustainable Urban Mobility* (SAF08) xvii, xxi, 10, 22, 109, 120, 158–61
- Denmark 51, 80, 162
- Department of Foreign Affairs and Trade (Cth) 26, 37
- desalination plants 100
- design skills 59, 60
- diasporas, Asian 42–5
- dietary changes
 - agriculture and 112
 - Asia and 30
- digital infrastructure 64, 127
- di Lampedusa, Giuseppe Tomasi 6
- direct funding, research and 54
- Diversity Council Australia 93, 170, 171
- drought 1990s–2000s 100
- Earth system, future of 119
- East Asia 26, 31, 81
 - trade relations with 27
- ‘easy option’ subject choice 89
- ecological approaches, innovation and 167
- economic growth
 - environmental sustainability and 100–1
 - impediments to 5–6
 - improvements in 127
 - productivity and 146
 - research and 52–4
 - technological innovation and 64
- economic performance
 - Australia 136
 - STEM skills and 80
 - technology and 63, 148
- economic relations, Asia–Australia 140–1, 171
- ecosystems 133, 167
- education
 - aims xx
 - Asia and 30–1, 35, 170
 - Australian development 71–94, 133
 - Indigenous Australians’ disadvantage 85–6
 - provision of 4–5, 17, 18
 - spending 72
 - technological development and 65–6
 - workforce and 124–5
- electric cars 110, 160
- emotional distance poll 2015 26
- employment
 - Australian industry analysis 17
 - STEM skills 79
- energy security 111, 120
- energy sources
 - alternatives 126, 129
 - deaths per unit of energy 119

- natural gas 103–6
- energy storage 102
- Energy Supply Association of Australia 101
- engineering 138
 - participation rates 19, 78–9
 - skills 59
 - women in 125
- Engineering Energy: Unconventional Gas Production* (SAF06) xxi, 14, 22, 105, 120, 150–3
- English language studies, Asia 36
- entrepreneurial skills 61
- environmental degradation
 - agriculture and 114
 - Australia 100
- environmental footprint
 - cities 159
 - ‘clean green’ 96
 - shale gas production 151
- environmental measures, Australia 21, 101, 133
- environmental science, reductions in 115
- environmental sustainability 10, 20–2, 28, 95–120
 - Asia 28
 - Australia 126, 128–9
- ethical issues, education 124
- Europe 31, 40, 43, 58, 117–18
 - carbon emissions 99
 - heritage 26
- European Union 32, 146
- evidence-based findings xiii, xvii–xviii
- excellence, support for 131
- existing industries, favouritism toward 67
- experimentation, entrepreneurship and 148
- Expert Working Groups (EWGs) xiv, xxii
 - SAF01 136
 - SAF02 139
 - SAF03 143
 - SAF04 146
 - SAF05 149
 - SAF06 153
 - SAF07 157
 - SAF08 161
 - SAF09 165
 - SAF10 169
 - SAF11 45, 173
- export-earning industries 4, 112, 122
- failure, uses of 66–7
- family involvement, STEM subjects 91
- family-owned farms 155
- farming communities, future of 116–17
- Federal Institute of Technology (Switzerland) 117
- federal system 7–8
- field robotics 111
- Filipinos, Australian citizens 43
- finance and insurance industry 18, 35, 135
- Finkel, Alan 88, 121, 131–2
- Finland 16, 19, 51, 77, 80, 162
 - skills indicators 81
 - STEM skills 81
- fishing, productivity increases 114
- Fitzgerald, John 24
- Flinders Street station 9
- food products, international competition and 34
- food security 111
 - Asia and 29–30
- foreign ownership, agriculture 155
- forestry, productivity increases 114
- fossil fuels 101–2, 159
 - replacement for 28
- foundations for creating advantage (chart) 135
- freight transport 109, 160
- fuel cells 110
- fuel efficiency 160
- fuel security risk 126, 159
 - lack of 109–10
- future
 - Australia ix, 1–22, 121
 - investment 67–8
 - preparations for the 115–19
 - prosperity xx
 - Securing Australia’s Future projects 129, 132
 - STEM education 92
 - technology 148
- GameBoy Advance 59
- gas resources 14
- gender balance
 - PISA scores 77
 - STEM subjects 79, 83–5
- genetic engineering, distrust of 117
- genetically modified crops 64, 117–18, 155
- Germany 10, 44, 50, 51, 55, 77, 80, 162, 172
- global demand, Australian agriculture 14, 156
- Global Innovation Index 2015 4, 60, 166
- globalisation 7, 127
 - Australian solutions xx, 111
 - energy sources 103
 - shale gas industry 152
 - technological development and 65, 147–8
- global markets, Cochlear 58
- Global Technology Revolution 2020, The* 64, 148
- global value chains 144
- Gluckman, Peter xiii
- Gold Coast 33, 39
- Golden Rice 117–18
- golden welcome scheme (UK) 82
- gold rush (nineteenth century) 9
- governments
 - Australian 10
 - educational responsibilities 77
 - entrepreneurship and 67

- grants 164
- inadequacy of 6
- language studies and 37
- manufacturing support 145
- research and 52–3, 56
- system collaboration and 167
- technological investment 148
- government spending, need for 47
- graduates (STEM), lack of 137
- grazing industry 155
- greenhouse gas emissions
 - Australia 20, 21, 22, 97, 99, 101, 107, 118, 151
 - cities and 159
 - transport and 109
- Green Revolution 117
- gross domestic product (GDP)
 - agricultural products 154
 - education 77
 - industry sectors 50
 - manufacturing and 15, 144
 - service industries 18
- groundwater, shale gas extraction and 105
- habitat fragmentation 105
- health care industry 18
- hearing restoration implants 58
- Henry Tax Review 12
- higher education, Australia xxii, 10, 18, 162–5
- high-skilled operations 16
- high-tech nodes 109, 126
- Hindi studies 36
- hobby farms 111
- holism, innovation and 167, 168
- Holper, Paul xv, xvi
- Hong Kong 27, 37, 81
- horse transport, pollution 108
- Human Development Index (UN) 4, 133
- humanities
 - education in 124
 - manufacturing 15
 - research 164
 - technical staff and 59
 - technology and 57, 65
- humanities arts and social sciences (HASS)
 - skills xiv, xvii, xx, xxiv, 7, 20, 47, 54, 92, 121
 - STEM skills and 75, 168
- hydraulic fracturing (fracking) 151
- hydroelectric energy 101, 102, 119
- ideas diffusion 49
- immigration 8, 135, 142
- incentives 49
 - research and development 164, 165
- India 26, 28, 30, 31, 58, 112, 156, 172
 - collaborative research with 142
 - film industry 39
 - rise of 140
 - tourism from 33
 - world trade and 27
- Indian migrants
 - Australian citizens and 26, 43
 - board directors 42
 - businesses and 41, 170, 171
 - diaspora 44, 171
 - year of arrival 173
- Indian student crisis 2009 39
- Indigenous Australians
 - disadvantage 135
 - land rights and shale gas industry 105
 - STEM education and 85–6, 138
 - workplace opportunities 125
- Indonesia 2, 28, 31, 37, 43, 112, 123, 140, 156, 172
 - Australians and 26, 40, 43
 - collaborative research with 142
- Indonesian language studies 36, 93
- Industrial Revolution 118
- industry analysis, Australian employment 17
- industry development, investment in 50–1
- industry innovation, ratings xv, 133–4
- industry partners 162
- industry policy 1, 127
- infectious diseases 111
- information technology skills 7, 68, 74
- infrastructure 2, 4, 11, 12, 127
 - coal seam gas industry and 150, 151
 - inadequacy 6
 - nineteenth-century expansion 9
 - transport 158
- innovation xxii, 62, 124–5
 - agriculture 14, 112, 113, 156
 - Asia and 31, 171
 - Australia and 4, 60–2, 133
 - barriers to 168
 - definitions xviii
 - education 72
 - future directions 69
 - infrastructure 8
 - manufacturing 15
 - mining industry 15
 - need for 8
 - productivity increases and 47–69
 - prosperity and 144–6
 - public policy 10, 16
 - skills investment and 59
 - STEM subjects and 128, 139
 - technological 120, 122, 123, 149
 - workforce and 19–20, 73–6
- innovation agenda 2015 67
- innovation clusters 109, 126, 129
- innovation strategy 3, 56, 166–9
 - lack of 162, 165
 - OECD (2010) 51
- Institute of Public Administration Australia 6, 133

- institutional learning, Indigenous Australians and 86
- institutional reforms, need for 47
- intellectual property 10
- intercultural skills, need for 23, 37
- interdisciplinary research xvii, xviii, xix, xx–xxii, xxiii, 120, 122, 126, 127, 131
 - Cochlear 58
 - environmental studies 97
 - technological change 147
- interdisciplinary skills 71, 72, 74–5
- international attitudes, STEM subjects 138–9
- International Baccalaureate 93
- International Council on Science 119
- international relationships, Australia and 7, 92–3, 145, 146
- international students 30–1, 125, 133, 140
- internships 76
- interpersonal skills 75
- inventions, history of 63
- investment 7–8
 - increase in 136
 - industry development 50–1
 - research and development 111
- Investor Group on Climate Change 101
- Ireland 44, 172
- irrigated agriculture 100
- Islamic financial services 18, 34
- Israel 19, 51, 55, 80, 162
- Italian studies 36
- Japan 26, 27, 28, 30, 37, 43, 51, 55, 58, 77, 80, 93, 162
 - collaborative research with 142
 - Indigenous art and 39
 - investment policy 40
- Japanese language 36
- Jetpack Joyride 59
- Jetstar 41
- Johnson, Lesley 82
- Joshi, Nalini 83
- ‘joy of invention’ 63
- knowledge economy 52, 61, 125–6
- Korea 28, 30, 58, 77, 80, 81
- labour market, Asian born 42
- labour productivity 49, 146
- labour shortages, rural 155
- land availability, agriculture 34
- land security, Australia 28
- language education 93, 124, 127
 - tourism and 33
- leadership 11, 134, 136
- legal system 2, 127
- Leighton Group 41
- Leopard, The* (di Lampedusa) 6
- lifestyle farms 111
- linear approaches, innovation 167
- Linfox Logistics 41
- linguistic barriers, Asia-Pacific region and 25, 35–7
- Linkage Program 54
- liquid natural gas (LNG) exports 30
- literacy skills 5, 74, 138
- livable cities, Australia 106, 159
- Livability survey 4
- living standards
 - improvements in 12, 127
 - nineteenth-century 9
 - productivity and 48, 49
- Lo Bianco, Joseph 35
- low-skills occupations 16
- Lowy Institute poll 2015 26
- McCarthy, John 108
- McPhee, Peter xiii
- Macquarie University 58
- Malaysia 31, 43, 140
- management
 - inadequacy 6
 - innovation and 168
 - skills 61, 74, 76
- Mandarin studies 36, 45
- manufacturing sector
 - Australian performance 15–17, 134, 144–5
 - future of 122
 - industry reform 51
 - role of 2, 3
- markets 49
 - agriculture 14
 - Asia 24, 28–35
 - governments and 134
- mass manufacturing 16
- Masters, Geoff 85
- mathematics 78
 - Australian students and 78–9, 128
 - compulsory subject 72, 89, 139
 - decline in 72, 77–8, 138
 - promotion of 81
- Maximum Residue Limits 98
- mechanical harvesting 114
- medical knowledge, increase in 58
- medium-sized enterprises 163
- megacities, Asia 31
- Melbourne 39, 100, 106
 - railways 9
 - traffic congestion 107
- mentoring programs, STEM teachers 84
- methane hydrates 150
- microeconomic reform 7, 134, 146
- middle classes, Asia 27, 28, 40
- ‘middle performer’, Australia as 8
- middle suburbs 159
- Migrant Intake into Australia* (Productivity Commission) xiv

- migrants
 - Asian 170
 - business investment by 41
 - languages of 36
- migration policies, advanced countries 172
- mining industry
 - Asia and 30
 - Australia 14–15, 122, 134
 - China and 35
- minority groups, opportunities 8
- misunderstandings, Asia-Pacific and Australia 26–7
- monolingual speakers, Australians 93, 141
- Monsanto 117
- Muir, Ian 60
- multiculturalism, Asian diaspora and 172
- multidisciplinary approach, technological change 149
- multi-factor productivity (ABS scale) 48, 49
- multilingualism, Australia and 93
- multinational research 24
- Murray–Darling Basin 100
- nanotechnology 68
- National Academies of Sciences, Engineering and Medicine (US) x, xix, xxiii, 74
- National Asian Languages and Studies in Australian Schools Taskforce 37
- national identity, agriculture and 155
- National Innovation and Science Agenda (2015)* xv
- national level coordination, STEM education 87–8
- National Livestock Identification System 98
- national policy, innovation 162
- National Research Council (US) x
- National Research Infrastructure Roadmap 2016 68
- Native Title lands 105
- natural assets, Australia 98–9
- natural gas 101, 103–6, 119, 150
- Nepal 31, 140
- Netherlands 77, 80
- New Colombo Plan (Cth) 37
- New South Wales 58, 98, 103
 - female STEM participation rate 84
- New Zealand 26, 80
 - Australian investment in 40, 123
 - migrants from 173
- Newspoll survey 2013 93
- niche markets 112, 148, 154
- Nintendo DS 59
- non-innovative businesses 168
- non-school qualifications 73–4
- non-technical skills, Cochlear 58
- North America 31, 43, 105, 151
- Northern Territory 104, 150
- Norway 19, 80, 82
- nuclear safety issues 118–19
- numeracy skills 5, 138
- nursing 78
- Office of Technology Assessment (US) 66
- oil imports 109–10, 119
- older employees 20
- Omari, Arshad 89
- online services 109
- Organisation for Economic Co-operation and Development (OECD) countries 8, 12, 19, 64
 - air pollution and 99
 - Australian rates compared with 78
 - education spending 72, 162–5
 - innovation strategy 2010 51
 - knowledge basis 52
 - research and development 128, 146
 - scientific literacy 77–8
 - standards 47, 50
- organisations, innovation and 167–8
- out-of-field teachers 82, 83, 138
- outside-classroom learning experiences, STEM 86
- overseas students, STEM skills training 80–2
- Pacific area, Australian economy and 23–46, 123
- Page, Scott xiii–xiv
- participation rates (Australia), science 137–8, 139
- partnerships, STEM education and 86–7
- patents 9, 117
- Pathways to Impact 54
- pay incentives, STEM teachers 82
- peak hour traffic 107
- performance, Australia 3, 4, 122
- personal identity, STEM subjects and 90
- Perth 100, 106
- pesticides 114, 155
- PhD programs
 - industry-based 76
 - STEM subjects 79, 138
- planning, cities and 106
- platform licences 59
- PlayStation 59
- politics, environmental performance and 100
- pollution research 31, 108
- population components, Australia 27
- population growth
 - agriculture and 112
 - Australia 9
 - cities 158
 - pressures 111
- postgraduate research, reduction of 115
- powertrains 110

- PricewaterhouseCoopers report 30, 40, 41, 80
- primary commodities exports, Asia 28
- Primary Connections 87
- primary teachers, STEM skills 82–3, 84
- Prime Minister's Science Engineering and Innovation Council (PMSEIC) xviii–xix
- priority setting 11
- problem-solving skills 66, 76
 - STEM subjects 91–2
- processed food imports 113, 154
- procurement contracts 164
- production costs, fracking 151
- productivity
 - agricultural 13, 111, 156–7
 - future of 144
 - growth (Australia) xx, 114, 128
 - innovation and 47–69
 - STEM education and 137
- Productivity Commission xiv
- product specialisation, agriculture 112
- professional development
 - Indigenous education 86
 - STEM subjects 90–1
- Professional Scientists Australia 73
- Program for International Student Assessment (PISA) survey 77, 81, 138
- project steering committee, ACOLA xiii–xiv, xxii
- Promising Practices for Strengthening the Region STEM Workforce Development Ecosystem* 74
- prosperity, Australian xxi, 144
- Psychology of the Inventor, The* (Rossman) 63
- public policy, development of 10
- public sector research 50, 162–4
 - Australia 52–5
 - innovation and 16
 - productivity and 146
- public transport, cities and 158, 160, 161
- pyrethrum production 114
- qualifications study 73, 137
- quality, definition of 131
- quality of living 4
- Queensland 33, 98, 104, 150
- racism perceptions
 - Asia-Pacific region 26
 - Indian film industry and 39
- Rahman, AR 39
- rail freight 160
- railways, Melbourne 9
- rainfall
 - Australian trends 21–2, 98–100
 - variability 155
- RAND Corporation 64, 148
- rankings
 - environmental sustainability 21
 - STEM subjects (Australia) 138
- recycled drinking water 118
- regulations
 - Australia 133, 136
 - industrial safety 119
 - shale gas industry 151–2
- remedial programs, mathematics 88
- renewable energy sources 101, 102, 103
- report card, Australian STEM skills 77–82
- research and development
 - Asia and 31–2
 - commercialisation of 55
 - farmers and 113
 - future directions 68
 - increases 128
 - innovative 96
 - manufacturing and 144
 - multinational 127, 129
 - productivity and 47, 48, 49–50
 - support for 162–5
 - workforce 19
- research applications 51–6, 163
- research articles
 - Asian countries 141
 - China 31
- research collaboration
 - Asia and 141–2
 - China and 32
 - India and 39
- Research Councils (UK) 54
- research intensity, definition 146
- research partnerships 55, 125
- research translation xxi–xxii, 48, 55–6
- resilience, problem solving and 66
- re-skilling 149
- returns to scale 49
- Review of Australia's Research Training System* xxii
- riches, Australia's history of 9
- Rio Earth Summit 1992 99
- risk
 - Asian business opportunities and 34–5
 - innovation and 146
- Rizvi, Fazal 45
- RMIT University International 41
- road transport, inefficiencies 110
- Roberts, Chris 58
- role models, STEM subjects 90, 91
- Role of Science, Research and Technology in Lifting Australia's Productivity, The* (SAF04) xxi, 22, 47, 58, 69, 94, 144–6
- Rossman, Joseph 63
- Rowling, JK 66–7
- Royal Society (UK) 115
- rural populations, transport accessibility 160

- SAF01 (*Australia's Comparative Advantage*) xiv, 22, 27–8, 30, 50, 69, 95, 102, 133–6
- SAF02 (*STEM: Country Comparisons: International Comparisons of Science, Technology, Engineering and Mathematics (STEM) Education*) xi, xv, 20, 22, 71, 72, 80, 92, 94, 137–9
- SAF03 (*Smart Engagement with Asia: Leveraging Language, Research and Culture*) xv, 24, 25, 35, 43, 45, 94, 140–3
- SAF04 (*Role of Science, Research and Technology in Lifting Australia's Productivity, The*) xv, 22, 58, 69, 94, 144–6
- SAF05 (*Technology and Australia's Future: New Technologies and their Role in Australia's Security, Cultural, Democratic, Social and Economic Systems*) 62, 64, 147–9
- SAF06 (*Engineering Energy: Unconventional Gas Production*) xv, 14, 22, 103, 105, 120, 150–3
- SAF07 (*Australia's Agricultural Future*) xv, 22, 110, 120, 154–7
- SAF08 (*Delivering Sustainable Urban Mobility*) xv, xvii, 10, 22, 109, 120, 158–61
- SAF09 (*Translating Research for Economic and Social Benefit: Country Comparisons*) xv, 51, 55, 56, 162–5
- SAF10 (*Skills and Capabilities for Australian Enterprise Innovation*) 56, 59, 60, 62, 73, 94, 121, 166–9
- SAF11 (*Australia's Diaspora Advantage: Realising the Potential for Building Transnational Business Networks with Asia*) 43, 45, 94, 170
- scholarships, Indigenous education and 86
- school subject choice, Victoria 88
- science, Australian participation rates 78–9, 89, 124, 138, 139
- Science by Doing 87
- Science in Australia Gender Equity (SAGE) program 83, 84–5
- Science, Technology, Engineering and Mathematics in the National Interest: A Strategic Approach* xv
see also *Securing Australia's Future* projects
- science/maths teaching 89, 124
- scientific literacy 74, 77, 80, 115
- Scientists and Mathematicians in Schools 87
- sea-level rise
cities and 159
Pacific nations and 32
- secondary education, STEM training 78, 89
- sector opportunities 12–19
- sector performance ratings 134
- Securing Australia's Future projects x, xiii–xv, xvii–xx, xxii, 12, 17, 23, 26, 69, 92, 95, 120, 121, 122, 126–9, 131–2
- see also Australian Council of Learned Academies (ACOLA); SAF01; SAF02; SAF03; SAF04; SAF05; SAF06; SAF07; SAF08; SAF09; SAF10; SAF11
- sedimentary basins, natural gas 150
- self-driving cars 147
- senior management, Asian cultural literacy and 42
- services industries 134
future of 122
performance 17–19
role of 2, 3
threats to 19
- shale gas energy 14, 97, 102, 119, 150–2
economics of 103–4, 105
policies (2014) xv
- Shanghai region, STEM skills 81
- shortages, STEM teachers 82–3
- Singapore 10, 27, 28, 37, 43, 44, 50, 51, 55, 77, 80, 81, 162
- single-language barrier 35–6
- skilled workforce 128
agricultural 157
reductions in 115
shortages 69, 76, 124, 145
- Skills and Capabilities for Australian Enterprise Innovation* (SAF10) xxii, 56, 59, 60, 62, 69, 73, 94, 121, 166–9
- skills development 56, 59, 65, 134
- small and medium-sized enterprises (SMEs) 53, 144
- small family farms 116, 117
- Smart Engagement with Asia: Leveraging Language, Research and Culture* (SAF03) xxi, 24, 25–8, 35, 45, 94, 140–3
- 'smarter country' policy 23–46
- smart farming 113–14
- smart growth cities 159, 161
- social inertia 110
- social rankings, comparative 4
Australian advantage 133
- Social Science Research Council of Australia xxiii
- social sciences
environmental science and 97, 100
future directions and 119
- socioeconomic background, STEM education and 88
- 'soft skills' 61, 125
- soils 155
- solar (rooftop) power 119
- solar research 103
- South Asia 26
- South Australia 102, 104, 150
- South-east Asia 26, 35
- South Korea 31, 51, 140, 162
collaborative research with 142

- investment policy 40
- specialised agricultural products 154, 155
- spending, investment versus 69
- Standing Council on Tertiary Education Skills and Employment 74
- start-up companies 55, 163
- Steering Committee, Securing Australia's Future Program xxii
- STEM: Country Comparisons: International Comparisons of Science, Technology, Engineering and Mathematics (STEM) Education (SAF02)* xi, xxi, 20, 22, 71, 72, 80, 92, 94, 137–9
- STEM (science, technology, engineering and mathematics) skills xi, xiv, xvii, xx, xxiv, 2, 7, 19, 20, 47, 56, 61, 71, 74, 76, 94, 121, 124
 - age level and 90
 - Asian countries and 93
 - Australian report card 77–82
 - decline in 4–5, 77–80, 138
 - encouragement of 128, 139
 - HASS skills and 168
 - importance of 137
 - Indigenous people and 85–6, 125
 - innovation and 167
 - national characteristics 73
 - national promotion of 80
 - participation rates 78–9
 - qualifications (manufacturing) and 144
 - teaching improvement in 82–3
 - tracking 89
- strengths, Australia 1–22
- student participation, STEM skills 72, 77
- student placements 54
- students, Chinese 45
- suburban workplaces 109
- sunlight bottling 64
- superannuation industry 18
- super-economies, Asian 27
- sustainability 16
 - cities 159
 - collaborative research and 110–14
 - goals (Australia) 126
 - growth targets 120
- Sweden 19, 50, 51, 55, 80, 162
- Swinburne University of Technology 60–1, 166
- Switzerland 10, 77, 80, 81
- Sydney 39, 44, 106
- systems approaches 167
- Taiwan 30, 80, 81
- Tapsell, Ross 92
- targeted funding, female STEM teachers 84
- taxation system, Australia 2, 3, 12, 127, 133, 136
 - research and development 54, 163
- teachers
 - professional development 82
 - qualifications 73
 - status 71, 73, 128, 137, 138
- team-building skills 75, 125
- technical skills 61, 76, 166–9
- technical staff, humanities staff and 59
- technological change 63, 147–9
 - agricultural productivity and 114
 - resistance to 117
- technological education 65, 124, 148
- technological evaluation 149
- technological harmonisation 28
- technological innovation 62–8, 146
- technological lock-in 102
- technology
 - advances 16
 - definition 63
 - importation of 145
- Technology and Australia's Future: New Technologies and their Role in Australia's Security, Cultural, Democratic, Social and Economic Systems (SAF05)* xxi, 62, 64, 69, 147–9
- Technology as Experience* (McCarthy and Wright) 108
- technology-based industries, humanities skills and 57
- technology capacity, Australia 64–5
- technology reports, ACOLA 64
- technology research and development 128
 - need for 48, 49
- technology transfer offices 55
- 'technology winners' 68
- telecommuting 159
- tertiary education, innovative skills 76
- tertiary participation rates, STEM subjects 78–80, 84
- Thailand 31, 43, 140
- thirty-minute city 108
- 3D printing 62, 64
- tight gas 150
- Torok, Simon xv, xvi
- tourism 20, 21
- tourism industry 33–4, 39
- trading partners 27
 - Asia 34, 172
 - China 140
- traditional agricultural markets 113
- traditional manufacturing 16
- Translating Research for Economic and Social Benefit: Country Comparisons (SAF09)* xxi, 51, 52, 55, 56, 69, 162–5
- transnational businesses 170, 171
- transport infrastructure 148, 158, 159–60
 - future cities 106, 107, 108, 109–10
- travel options, cities 108

- Treasury Ten-Year Review (UK) 81
- Tyler, Russell 71
- unconventional gas production xxi, 104, 150–3
- undergraduate studies, Asian culture 37
- underrepresentation, Asian migrants 171
- unemployment, STEM-skilled workers 73
- United Kingdom 26, 40, 51, 80, 141–2, 162
 - investment in Australia 27
 - language deficiencies 37
 - migration from 173
 - research translation 54, 55
 - STEM primary teachers 83
 - trade relations with 27
- United States of America (USA) 10, 16, 21, 26, 31, 40, 44, 50, 51, 58, 80, 93, 109, 141, 142, 162, 172
 - Indigenous people 80
 - investment in Australia 27
 - scientific awareness 91
 - shale gas production 151
- universities
 - Asia–Australia collaboration 143
 - mathematics incentives 89
 - US 93
- university entry standards, decline 78
- university research, economic benefits 52
- unprocessed foods, traditional markets 113
- urban design 96, 97, 108–9, 159
- urbanisation, Australia 9, 106–8, 158
- urban mobility xxi, 10
- urban planning 120, 161
- urban transport 96, 97, 158–61
 - improvements in 129
 - limits to 108
- value-added industries 2, 16, 19, 22, 116, 120, 127
 - agricultural products 112–13, 123
- values and beliefs
 - STEM education and 90
 - technological change and 117–18
- vehicle emissions 161
- Victoria 98, 150
- Vietnam 31, 43, 140, 172
 - Australian citizens from 43
- Vietnamese studies 36
- vitamin A deficiency 117, 118
- Vocational Education and Training 31, 79
- Western Australia 98, 104, 150
 - university entrance incentives 89
- water extraction, shale gas industry 151
- water resource management 100, 107, 155, 157
- Watt Review of Research Policy and Funding Arrangements* (2015) xv
- wealthy countries, STEM skills 82
- Wells, HG ix
- Westpac 60
- White Australia Policy 26
- wind power 119
- wine industry, Chinese markets 45
- women
 - opportunities 8
 - STEM teaching and 79, 83–5
 - workforce participation 20, 125
- wool industry 12
- workforce 5
 - future 115–16
 - inclusive 20
 - innovation 145–6
 - participation rates 8, 19–20
 - scientific knowledge and 96
- work-integrated placements 164
- workplace skills 2, 124–5, 127, 145, 166–9
 - collaboration and 56–62
 - innovation and 73–6
 - manufacturing 15
 - need for 48
- workplaces, future of 108
- world demand, natural gas 105
- Wright, Peter 108
- Yeap, Jason 40