

# CONTENTS

<i>Foreword by Ross Garnaut</i>	v
<i>Acknowledgement</i>	xiii
<i>Acronyms</i>	xiv
<i>Table of cases</i>	xviii
<i>Table of statutes</i>	xx
<b>1 Ownership of minerals and natural resources</b>	<b>1</b>
<b>1.1</b> Introduction	2
1.1.1 The nature and scope of energy resources in Australia	2
<b>1.2</b> Ownership of the subsurface strata at common law	5
<b>1.3</b> Public ownership for minerals and petroleum	10
<b>1.4</b> The proprietary status of mining tenements	14
<b>1.5</b> Royal minerals: Gold and silver	18
<b>1.6</b> Ownership of renewable resources: Hydro-electricity, geothermal, solar, and wind	21
1.6.1 Hydro-electrical power	22
1.6.2 Geothermal energy	22
1.6.3 Ownership of water in Australia	23
1.6.4 Access entitlements for wind and solar	28
1.6.5 Market progression	30
<b>1.7</b> Division of land and resources: Overlapping tenures	31
<b>1.8</b> Land access and compensation	34
<b>1.9</b> Native title, cultural heritage, and mining rights	40
<b>1.10</b> Review questions	46
<b>1.11</b> Further reading	47
<b>2 Resource titles: Permits, licenses, and leases</b>	<b>51</b>
<b>2.1</b> Introduction	52
<b>2.2</b> Mining approval process: Exploration, assessment, and extraction phases	52
<b>2.3</b> Exploration licences and permits	54
2.3.1 Approval process	54

2.3.2	The character of an exploration licence/permit	57
2.3.3	Relevant legislative provisions	59
2.3.3.1	New South Wales	59
2.3.3.2	Western Australia	62
2.3.3.3	Queensland	64
2.3.4	Proprietary status of the exploration licence	69
2.3.5	Legal status of offshore exploration permits: s 51(xxxi) <i>Constitution</i>	70
<b>2.4</b>	Retention licences and assessment leases	75
<b>2.5</b>	Mining and production leases	80
2.5.1	Statutory character of a mining lease	80
2.5.2	General terms and conditions of a mining lease	83
2.5.3	General entitlements of a mining lease	84
<b>2.6</b>	Review questions	90
<b>2.7</b>	Further reading	92
<b>3</b>	<b>Australian offshore petroleum and minerals regulation</b>	<b>94</b>
<b>3.1</b>	Introduction	95
<b>3.2</b>	Constitutional arrangements for offshore regulation	97
3.2.1	United Nations Convention on the Law of the Sea	103
3.2.2	Territorial waters	105
3.2.3	State jurisdiction in the territorial sea	106
3.2.4	Contiguous zone, exclusive economic zone, and the continental shelf	107
3.2.5	The high seas	113
3.2.6	<i>Offshore Petroleum and Greenhouse Gas Storage Act 2006</i> (Cth)	117
3.2.7	Overview of the OGGSA title framework	119
3.2.7.1	Petroleum exploration permit	120
3.2.7.2	Petroleum retention lease	120
3.2.7.3	Petroleum production licence	121
3.2.7.4	Infrastructure licence	123
3.2.7.5	Pipeline licence	124
3.2.8	Sea installations	124
3.2.9	Offshore petroleum safety: NOPSEMA	125
3.2.10	Joint petroleum area and Greater Sunrise: Australia and Timor-Leste	127
3.2.11	<i>Offshore Minerals Act 1994</i> (Cth)	130
<b>3.3</b>	Review questions	131
<b>3.4</b>	Further reading	132
<b>4</b>	<b>Natural gas regulation</b>	<b>136</b>
<b>4.1</b>	Introduction	137

<b>4.2</b>	What is natural gas?	139
<b>4.3</b>	The Australian gas market	140
<b>4.4</b>	The regulatory framework for natural gas	143
4.4.1	The former natural gas access code	144
4.4.2	The National Gas Law: Functions of the AER and the AEMC	147
4.4.3	The National Gas Law: An overview	158
4.4.4	Pipeline classification under the National Gas Law	159
4.4.5	Light and fully regulated pipelines	164
4.4.6	Access determination disputes	166
4.4.7	Access arrangement information for light and full regulation pipelines	167
<b>4.5</b>	Review questions	171
<b>4.6</b>	Further reading	172
<b>5</b>	<b>Unconventional gas regulation</b>	<b>175</b>
<b>5.1</b>	Introduction	176
<b>5.2</b>	What is unconventional gas?	178
5.2.1	Shale gas	179
5.2.2	Tight gas	179
5.2.3	Coal seam gas	179
<b>5.3</b>	How is unconventional gas extracted?	180
5.3.1	Hydraulic fracturing and horizontal drilling	181
5.3.2	Water pumping for coal seam gas extraction	182
<b>5.4</b>	Environmental and social issues associated with unconventional gas extraction	184
<b>5.5</b>	Regulatory frameworks for unconventional gas: Queensland and New South Wales	188
5.5.1	Queensland: <i>Petroleum and Gas (Production and Safety) Act 2004</i>	188
5.5.1.1	Regulatory requirements for resource titles	188
5.5.1.2	Access and compensation framework	196
5.5.2	New South Wales	202
5.5.2.1	The ownership framework under the <i>Petroleum (Onshore) Act 1991</i> (NSW)	207
5.5.2.2	Petroleum licences and conditions under the <i>Petroleum (Onshore) Act 1991</i> (NSW)	208
5.5.2.3	Land access, compensation and access disputes	212
5.5.2.4	Codes of practice for CSG: Fracture stimulation and well integrity	216
5.5.2.5	The gateway process	219

5.5.2.6	<i>Environmental Planning and Assessment Act 1979</i> (NSW); <i>Protection of the Environment Operations Act 1997</i> (NSW)	223
5.5.2.7	The <i>Water Management Act 2000</i> (NSW) and the Aquifer Interference Policy	227
<b>5.6</b>	Regulatory framework: <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)	230
<b>5.7</b>	Review questions	232
<b>5.8</b>	Further reading	233
<b>6</b>	<b>Renewable energy: Regulation, the RET, wind energy, and the market framework</b>	<b>239</b>
<b>6.1</b>	Introduction	240
<b>6.2</b>	What is renewable energy?	241
<b>6.3</b>	The renewable energy market	244
<b>6.4</b>	Statutory regulation: <i>Renewable Energy (Electricity) Act 2000</i> (Cth)	246
<b>6.5</b>	Background to the RET	250
<b>6.6</b>	Australian Renewable Energy Agency (ARENA), the Clean Energy Regulator (CER), and the Clean Energy Finance Corporation (CEFC)	252
<b>6.7</b>	The Large-scale Renewable Energy Target	254
<b>6.8</b>	The SRES and the Solar Credits Scheme	257
<b>6.9</b>	The economics of renewable energy	258
<b>6.10</b>	National electricity market	260
<b>6.11</b>	Wind energy: Regulatory and practical issues	262
<b>6.12</b>	Review questions	273
<b>6.13</b>	Further reading	274
<b>7</b>	<b>Carbon capture sequestration</b>	<b>279</b>
<b>7.1</b>	Introduction	280
<b>7.2</b>	What is carbon capture and storage?	282
<b>7.3</b>	Why do we need CCS?	286
<b>7.4</b>	Capturing CO <sub>2</sub>	288
7.4.1	Pre-combustion technology	289
7.4.2	Post-combustion technology	289
7.4.3	Oxyfuel combustion	289

	7.4.3.1	Enhanced oil recovery operations	290
	7.4.3.2	CCS operations in the cement industry	290
<b>7.5</b>		Transporting CO <sub>2</sub>	291
<b>7.6</b>		Storing CO <sub>2</sub>	292
<b>7.7</b>		International CCS projects	292
<b>7.8</b>		CCS in Australia	294
<b>7.9</b>		Regulating the storage of CO <sub>2</sub> in Australia	296
	7.9.1	Victoria: <i>Greenhouse Gas Geological Sequestration Act 2008</i>	297
	7.9.2	Queensland: <i>Greenhouse Gas Storage Act 2009</i>	301
	7.9.3	The Australian offshore statutory regime	304
	7.9.3.1	Commonwealth: <i>Offshore Petroleum and Greenhouse Gas Storage Act 2006</i>	305
	7.9.3.2	Victoria: <i>Offshore Petroleum and Greenhouse Gas Storage Act 2010</i>	307
	7.9.4	Legal liability for carbon capture in Australia	307
	7.9.4.1	Environmental concerns	307
	7.9.4.2	Tortious actions	308
	7.9.4.3	Regulatory standards	309
<b>7.10</b>		Review questions	310
<b>7.11</b>		Further reading	311
<b>8</b>		<b>Climate change and mining and energy policy</b>	<b>315</b>
<b>8.1</b>		Introduction	316
<b>8.2</b>		Changes in the climate system: Atmosphere, ocean, cryosphere, and sea level	318
<b>8.3</b>		The legal framework	320
	8.3.1	The IPCC	321
	8.3.2	The <i>United Nations Framework Convention on Climate Change</i>	321
	8.3.3	The <i>Kyoto Protocol</i>	324
	8.3.4	The <i>Energy Charter</i> and the <i>Energy Charter Treaty</i>	329
	8.3.5	The Harvard Project: a new proposed framework for climate change	333
<b>8.4</b>		The economics of climate change	335
<b>8.5</b>		The impact of climate change on Australian mining and energy industries	342
<b>8.6</b>		Review questions	348
<b>8.7</b>		Further reading	349

<b>9</b>	<b>Environmental regulation</b>	<b>354</b>
9.1	Introduction	355
9.2	Jurisdictional framework	360
9.3	Bilateral agreements	362
9.4	Environmental impact assessment	365
9.5	Environmental assessment of onshore mining projects in Western Australia	368
9.6	Environmental assessment of onshore mining projects in Queensland	374
9.7	Environmental assessment of onshore mining projects in New South Wales	381
9.8	Commonwealth environmental legislation: <i>Environment Protection and Biodiversity Conservation Act 1999</i>	387
9.9	Review questions	398
9.10	Further reading	399
<b>10</b>	<b>Mining agreements and revenue frameworks</b>	<b>405</b>
10.1	Introduction	406
10.2	Mining agreements	407
10.2.1	Concession agreements	409
10.2.2	Profit sharing contracts	410
10.2.3	Risk service contracts	414
10.2.4	Joint venture agreements	414
10.3	The core elements of a mining agreement	417
10.4	Revenue frameworks	422
10.4.1	Royalties	422
10.4.2	Royalty rates and mining taxes in the Australian context	425
10.4.2.1	Coal royalty rates	428
10.4.2.2	Iron ore royalty rates	428
10.4.2.3	Petroleum royalty rates	428
10.4.2.4	Privately owned minerals	429
10.4.2.5	Meaning of a well-head	430
10.4.2.6	Mining taxes in Australia	434
10.4.2.7	Minerals resource rent tax	435
10.4.2.8	Petroleum resource rent tax	436
10.5	Review questions	437
10.6	Further reading	438
	<i>Index</i>	444